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ABSTRACT

We investigate how differences in legal and financial systems affect firms' use of external financing to fund growth. We show that in countries whose legal systems score high on an efficiency index, a greater proportion of firms use long-term external financing. An active, though not necessarily large, stock market and a large banking sector are also associated with externally financed firm growth. The increased reliance on external financing occurs in part because established firms in countries with well-functioning institutions have lower profit rates. Government subsidies to industry do not increase the proportion of firms relying on external financing.

THE CORPORATE FINANCE LITERATURE suggests that market imperfections, caused by conflicts of interest and informational asymmetries between corporate insiders and investors, constrain firms in their ability to fund investment projects. The magnitude of these imperfections depends in part on the effectiveness of the legal and financial systems. Because these systems differ across countries, the literature implies that there should exist systematic cross-country differences in firms' ability to obtain external capital to finance investment.

In this paper, we examine whether the underdevelopment of legal and financial systems does prevent firms in some countries from investing in potentially profitable growth opportunities. In particular, we focus on the use of long-term debt or external equity to fund growth (see our earlier work, Demirgüç-Kunt and Maksimovic (1996a), which compares firms' financial structures in developed and developing countries and finds the greatest difference to be in the provision of long-term credit). We estimate a financial planning model to obtain the maximum growth rate that each firm in our thirty-country sample could attain without access to long-term financing. We then compare these predicted growth rates to growth rates realized by firms in countries with differing degrees of development in their legal and financial systems. Our approach enables us to identify specific characteristics of the legal and financial systems that are associated with long-term financing of firm growth. Thus, we provide a micro-level test of the hypoth-

esis, advanced by King and Levine (1993) and Levine and Zervos (1998), that the degree to which financial markets and intermediaries are developed is a determinant of economic growth.

An effective legal system is important because a firm that wishes to obtain long-term financing must be able to commit credibly to controlling opportunistic behavior by corporate insiders. Long-term creditors commonly use debt covenants to constrain debtors' opportunistic behavior; likewise, outside shareholders rely on explicit fiduciary responsibilities to constrain opportunistic behavior by corporate insiders. For these checks on insider behavior to work, there must exist an effective legal system that deters violations and that can enforce compensation for infractions.[1]

An effective financial system is important because well-developed markets and financial intermediaries serve as direct sources of capital and as mechanisms for ensuring that investors have access to information about firms' activities. Thus, the existence of developed and active financial markets and a large intermediary sector should make it easier for firms to raise long-term capital.[2]

The empirical results for our sample suggest that an active stock market (though not necessarily a large one) and high scores on an index of respect for legal norms are associated with firm growth financed by long-term external debt and equity. These two characteristics are also associated with lower returns on capital for established firms. Thus, greater reliance on external financing to fund investment in countries with more developed legal and financial systems may be due in part to relatively small internally generated resources. This is consistent with the hypothesis that, as financial markets develop, the role of established firms' internal capital diminishes.

Our approach to identifying financially constrained firms differs from other approaches in the literature on financial constraints and investments in the United States. Following Fazzari, Hubbard, and Petersen (1988), firms have been interpreted to be financially constrained if they are observed to have a high correlation between long-term investment and internal financing, an interpretation that Kaplan and Zingales (1996) question. Our approach, in contrast, directly identifies firms that cannot internally fund their investment by estimating the excess growth made possible by external financing for each firm in our cross-county sample.

This paper is related to the literature comparing the financial policies of firms in different countries. Several recent papers have examined the choice of financial structure. Rajan and Zingales (1995) compare financial structures in a sample of developed countries. Demirgüç-Kunt and Maksimovic (1996a, 1996b) analyze how institutional and economic differences between

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[1] For a more extensive discussion of the role of commitments and the legal system in investment, see Williamson (1988, 1994) and Shleifer (1994). La Porta et al. (1996) identify important differences between legal systems and discuss their implications.

[2] For a theoretical treatment of the role of financial markets and intermediaries, see Allen (1993), Diamond (1993, 1996), and Holmstrom and Tirole (1993).

countries affect firms' debt-equity ratios and maturity choice. This paper explores the links between financial markets and institutions and firms' ability to obtain debt and equity financing.[3]

The remainder of the paper is organized as follows. In Section I we discuss the financial planning models we use in our empirical tests. In Sections II and III we analyze how the development of markets and institutions affects firms' ability to obtain external financing. Section IV provides some sensitivity tests. Section V concludes.

I. External Financing and Growth

Our objective is to investigate whether the underdevelopment of legal and financial systems prevents firms in some countries from investing in potentially profitable growth opportunities. Such an effect, if it exists, does not constrain all firms equally. Firms that can finance themselves from retained earnings are minimally affected, whereas firms whose financing needs exceed their internal resources may be severely constrained.[4] To gauge whether access to financial markets affects a firm's ability to exploit growth options, it is necessary to identify firms that have an external financing need and examine whether their realized growth depends on the development of financial markets.

A firm's external financing need depends on the magnitude of its internal cash flows relative to its investment opportunities. Both the firm's cash flow and its optimal investment level are endogenous, and their ratio may differ systematically across countries even for firms employing the same technology. Consider, for example, a firm whose technology is capital intensive and which therefore needs to finance large investment expenditures in order to grow. If the firm has sufficient market power or faces high demand, it may be able to generate sufficient cash flow to finance investment internally; however, an equivalent firm in a more competitive economy may require external financing to grow at the same rate. Moreover, the level of competition faced by a capital-intensive firm may itself depend on the development of legal and financial systems. In an economy in which financial markets are not well developed, new firms may not be

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[3] In contemporaneous work Rajan and Zingales (1998) investigate the relationship between financial dependence and industry growth. Some of the issues they address are a subset of the topics we cover in Sections II and III, but the papers differ in major respects. First, Rajan and Zingales do not use the indicators of stock market liquidity, the legal system, or government subsidies that are the major focus of Sections II and III. Second, they use aggregate industry data, rather than firm-specific data. Third, they assume that financing requirements of industries in other countries are similar to those of corresponding U.S. industries. By contrast, we estimate the external financing need of each individual firm in our sample. Fourth, our approach separates long-term and short-term financing needs.

[4] In this paper we focus on direct effects of access to external financing on firms. Financial market development may spur economic growth and thereby also indirectly affect internally financed firms (see Levine and Zervos (1998)).

able to enter capital-intensive industries. As a result, established firms in capital-intensive industries may earn supernormal profits and be able to finance their growth internally.[5]

To control for this endogeneity, we adapt a financial planning model to estimate, for each firm in our sample, the maximum rate of growth that can be financed internally or with limited access to the market for long-term capital.[6] If demand for their products is sufficiently high, firms can grow faster than this maximum constrained rate by obtaining external long-term financing. The proportion of firms that do so depends both on access to financial markets and on the cost of external financing. We test the hypothesis that the less developed the market and financial intermediaries, the higher the cost of external financing and the lower the proportion of firms that grow faster than this maximum constrained rate.

Our estimate of the firm's constrained growth rate is based on the standard "percentage of sales" approach to financial planning.[7] This approach makes three simplifying assumptions about the relation between the growth rate of the firm's sales and the need for investment funds. First, the ratio of assets used in production to sales is constant. Thus, the required total investment increases in proportion to the firm's growth in sales. Second, the firm's profit rate per unit of sales is constant.[8] Third, the economic depreciation of existing assets equals that reported in the financial statements. Given these assumptions, the external financing need at time t of a firm growing at g_t percent a year is given by

$$\text{EFN}_t = g_t * \text{Assets}_t - (1 + g_t) * \text{Earnings}_t * b_t, \tag{1}$$

where EFN_t is the external financing need and b_t is the proportion of the firm's earnings that are retained for reinvestment at time t. Earnings are calculated after interest and taxes. The first term on the right-hand side is the required investment for a firm growing at g_t percent. The second term is the internally available capital for investment, taking the firm's dividend payout as given.

We present three progressively less constrained estimates of a firm's maximum attainable growth rate: the internally financed growth rate (IG), the short-term financed growth rate (SFG), and the sustainable growth rate

[5] Moreover, the capital intensity of an industry depends on the cost of labor, which may differ across countries. This reasoning suggests that industries that depend on external financing may differ across countries and cannot be identified a priori.

[6] Below we also investigate the effect of legal and financial system development on the returns to capital invested in our sample countries.

[7] For financial planning models, see Higgins (1977). The percentage of sales approach is explained in most introductory corporate finance texts. For an especially clear presentation, see Ross, Westerfield, and Jordan (1995).

[8] This is a strong assumption. Below we provide sensitivity tests that show that our results remain unaffected if we assume that the earnings on marginal sales are lower than on average sales.

(SG). IG is the maximum growth rate that can be financed if a firm relies only on its internal resources and maintains its dividend. It is obtained by equating EFN_t to zero and solving equation (1) for g_t and is given by

$$IG_t = (ROA_t * b_t)/(1 - ROA_t * b_t), \tag{2}$$

where ROA_t is the firm's return on assets, or the ratio of earnings after taxes and interest to assets. IG_t is convex and increasing in the firm's return on assets. Thus, more profitable firms can finance higher growth rates internally.

The maximum short-term financed growth rate, SFG_t, is an estimate of the maximum rate of growth of a firm that reinvests all its earnings and obtains enough short-term credit to maintain the ratio of its short-term borrowing to assets. The definition of SFG_t thus assumes that the firm does not engage in long-term borrowing or sales of equity to finance growth.

The use of the current realized ratio of short-term borrowing to assets to calculate SFG_t ensures that the estimate is feasible and does not assume levels of short-term credit that are too costly for firms to choose. By the same token, the estimate is likely to be conservative, because some firms may have additional short-term borrowing capacity. The estimate of SFG_t is obtained by setting $b_t = 1$ and by using the value of assets that are not financed by new short-term credit in place of total assets in equation (1). The assets not financed by short-term debt are termed "long-term capital" and are obtained by multiplying total assets by one minus the ratio of short-term liabilities to total assets. More specifically, SFG_t is given by

$$SFG_t = ROLTC_t/(1 - ROLTC_t), \tag{3}$$

where $ROLTC_t$ is given by the ratio of earnings, after tax and interest, to long-term capital. For brevity we refer to a firm growing at a rate that exceeds SFG_t as growing at above its "predicted" rate.

Our final estimate of the firm's growth rate is given by the "maximum sustainable growth rate," SG_t, the maximum growth attainable if the firm does not pay dividends and obtains just enough short-term and long-term debt financing to maintain a constant ratio of total debt to assets. Thus, it is implicitly assumed that the firm does not issue equity or increase leverage beyond the realized level.

SG_t is obtained from equation (1) by setting $b_t = 1$ and by using the book value of equity in place of total assets. Setting EFN_t to zero and solving for the growth rate yields

$$SG_t = ROE_t/(1 - ROE_t), \tag{4}$$

where ROE_t is the ratio of net income to equity.[9]

The estimates of IG, SFG, and SG are conservative in three ways. First, as discussed above, each maximum growth rate assumes that a firm utilizes the unconstrained sources of finance no more intensively than it is currently

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[9] For a discussion of a practical application of SG, see Ross et al. (1995).

doing.[10] Accordingly, interpretations of our results below take this into account. Second, firms with spare capacity do not need to invest and may grow at a faster rate than predicted by the financial planning model. We attempt to mitigate the potential problem of spare capacity by using each firm's maximum constrained growth rates averaged over the second half of the sample period in our tests below. Third, the financial planning model abstracts from technical advances that reduce the requirements for investment capital. Thus, it may overstate the cost of growth and underestimate the maximum growth rate attainable using unconstrained sources of finance.

II. Data and Empirical Results

A. *Description of Sample*

Our sample contains thirty countries. The developed countries are Australia, Austria, Belgium, Canada, Finland, France, Germany, Hong Kong, Italy, Japan, Netherlands, New Zealand, Norway, Singapore, Spain, Sweden, Switzerland, United Kingdom, and the United States. The developing countries are Brazil, India, Jordan, Korea, Malaysia, Mexico, Pakistan, South Africa, Thailand, Turkey, and Zimbabwe.

In Table I we summarize relevant facts about the level of economic and institutional development in the sample countries. Details of sources are given in the Appendix. The countries are arranged from highest to lowest per capita Gross Domestic Product (GDP). We also provide the average annual growth rate of per capita GDP over the sample period: If investment opportunities in an economy are correlated, there should be a relationship between the growth rate of individual firms and the growth rate of the economy. Thus, the aggregate growth rate may serve as a control variable in cross-country comparisons of firm financing choices and their growth rates.

The average inflation rate over the sample period provides both an indication of a government's management of its economy and evidence on whether the local currency provides a stable measure of value to be used in long-term contracting. The average annual rate of inflation differs dramatically among the sample countries, from a high of 327.6 percent in Brazil to a low of 1.5 percent in Japan. Accordingly, we choose variables for our empirical tests that tend not to be significantly affected by price level changes. We do not compare earnings and stocks of assets over several years; rather, we rely on ratios of contemporaneous earnings and assets and annual growth rates of sales.[11]

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[10] The assumption in the calculation of SG that the firm maintains its current leverage ensures that SG is feasible.

[11] In the two highest inflation countries, Brazil and Mexico, firms' financial statements are adjusted for changes in the price level. In other countries, the stated value of a firm's long-term assets may be lower than their replacement cost. In the regressions below, we include an inflation variable to detect possible misspecifications and present estimates in which the dependent variable is corrected for within-year inflation. There is no indication that price level changes produce significant misspecifications.

Table I
Economic and Institutional Indicators

The sample consists of all the countries in the IFC's Corporate Finance database, and all the countries in the Global Vantage database having data on more than thirty-five firms. GDP/CAP is real GDP per capita in US$ in 1991. Growth 80–91 is the average annual growth rate in GDP/CAP for the period 1980 to 1991. Average annual inflation is given for the period 1980 to 1991. Law and Order Indicator is scored 0–6. It reflects the degree to which the citizens of a country are able to use the existing legal system to mediate disputes and enforce contracts. Higher scores indicate sound political institutions and a strong court system. Lower scores indicate a tradition of depending on physical force or illegal means to settle claims. Values reported are 1985 to 1991 averages. Government Subsidies are defined as grants on current account by the public authorities to (i) private industries and public corporations and (ii) government enterprises. The figures are calculated as a percentage of GDP averaged over 1983 to 1991.

	GDP/CAP (US$)	Growth 80–91 (%)	Inflation 80–91 (%)	Law and Order Indicator 1985–1991	Government Subsidies to Private and Public Enterprises 83–91
Switzerland	27,492	1.7	3.8	6	1.4
Japan	23,584	3.9	1.5	5	0.6
Norway	19,664	1.7	5.2	6	5.9
Sweden	19,649	1.6	7.4	6	4.8
United States	18,972	1.9	4.2	6	0.6
Finland	18,046	1.6	6.6	6	3.0
France	17,365	1.8	5.7	5	2.4
Austria	17,288	2.2	3.6	6	1.3
Netherlands	16,479	2.3	1.8	6	2.6
Germany	16,439	1.8	2.8	5.5	2.0
Canada	16,098	2.0	4.3	6	1.9
Belgium	16,051	2.2	4.2	6	3.5
Italy	14,570	2.5	9.5	5	2.9
Australia	13,095	1.6	7.0	6	3.0
United Kingdom	12,585	2.3	5.8	4.5	1.5
New Zealand	10,643	1.0	10.3	6	1.2
Singapore	10,294	4.9	1.9	5	1.9
Hong Kong	9,820	5.8	7.5	5	n.a.
Spain	8,752	3.3	8.9	4	2.4
Korea	4,259	6.8	5.6	2	6.3
Malaysia	2,465	3.6	1.7	4	4.6
South Africa	2,198	−1.0	14.4	2	n.a.
Brazil	2,073	2.1	327.6	4	10.7
Mexico	1,801	1.0	66.5	3	2.3
Turkey	1,375	3.1	44.7	2.5	2.2
Jordan	1,372	−2.1	1.6	2	n.a.
Thailand	1,362	7.0	3.7	3.5	1.4
Zimbabwe	630	1.7	12.5	2	n.a.
India	375	3.3	8.2	2	5.8
Pakistan	359	3.9	7.0	2	5.4

As an indicator of the ease with which firms can enter into long-term contracts, we use a commercial index of experts' evaluations of the efficiency of the state in enforcing property rights within each country. This measure, Law and Order, prepared by the International Country Risk Guide, aggregates reports by a panel of more than one hundred analysts on a scale of

0–6. Low levels of the index denote less reliance on the legal system to mediate disputes. This indicator has been used in previous studies comparing institutions in different countries (e.g., Knack and Keefer (1995)).

We use this index instead of comparing specific differences in the legal codes across countries. Such a comparison may be misleading because firms may be able to compensate for the absence of specific legal protections by altering the provisions of contracts. It is much harder to compensate for systemic failures of the legal system. In Demirgüç-Kunt and Maksimovic (1996a) we show that the index is a good predictor of the use of long-term debt by large firms in our sample of countries. By contrast, we find less evidence that the specific measures of legal protections identified by La Porta et al. (1996) predict the use of long-term debt.

Government subsidies are a measure of the government's intervention in the corporate sector. This affects financial structure decisions because implicit or explicit guarantees by the government may distort market incentives and permit firms to obtain long-term loans on favorable terms. Our measure of government intervention is the level of government grants as a percentage of GDP. As Table I reveals, the level of government subsidies is significant in some countries, exceeding 10 percent of GDP in the case of Brazil, for example.

The firm-level data consist of financial statements for the largest publicly traded firms in each country. The data are from Global Vantage for the developed countries and from IFC Developing Countries database for the developing countries.[12] For the developed countries in our sample, data are

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[12] Financial reporting practices differ across the countries in our sample. The principal reporting requirements at the beginning of our sample period are described in Fitzgerald, Stickler, and Watts (1979) (for a more contemporary perspective, see Ball (1995)). A direct comparison of the key provisions of the accounting systems shows that they broadly conform to U.S. principles. The statistical errors introduced by differences between countries in the timing of income recognition are unlikely to be critical for our purposes because we do not use time-series properties of accounting data in our cross-country comparisons. The most significant concern in interpreting the financial statements from the sample of countries pertains to differences arising from different levels of inflation and differences in how inflation is treated in financial statements. This problem is likely to be most severe for Brazil, Mexico, and Turkey, which, as Table I shows, have the highest rates of inflation during the sample period. In contrast to the other countries, where fixed assets are stated at their historical cost, the reported financial statements of firms in Mexico and Brazil are adjusted during part or the whole of the sample period. Since 1984, listed firms in Mexico are required to use current replacement costs for valuing inventories and property, plant, and equipment. Other nonmonetary assets and stockholders' equity are restated using specified consumer price indices. Any gains or losses resulting from inflation adjustments are reported in the income statement. The financial accounts of Brazilian firms are adjusted for inflation throughout the sample period, although specific requirements were modified in 1987 and again in 1989. Permanent assets and shareholder equity are adjusted using specified government indices. As in the case of Mexico, the adjustment is reflected in the income statement. However, observers note that the increases in the specified index do not fully reflect the realized inflation. Turkey, which has the third highest average inflation rate, 24 percent, did not permit inflation-adjusted accounting (Price Waterhouse (1993)). The high average return on assets reported by Turkish firms may be caused by this underreporting. Thus care must be exercised in comparing the results for Brazil and Turkey with those of other countries in the sample. To check the robustness of the cross-country results, we omit the high inflation countries in Section IV.

available for the period from 1983 to 1991; for the developing countries, the periods of data availability vary but are usually between 1980 and 1988. Data availability by country and the item numbers of Global Vantage data used to construct firm-specific variables are described in the Appendix, Table A1.

B. *Differences in Externally Financed Growth across Countries*

Table II presents, for each sample country, the proportion of firms whose mean annual growth rate of sales exceeds the means of the three maximum constrained growth rates discussed above. Thus, taking SFG as an example, for each firm f in each country c and for each year t we estimate SFG_{fct}. For each firm we obtain the average predicted growth rate over the sample period of T years, $\text{SFG}_{fc} = \Sigma_t \text{SFG}_{fct}/\text{T}$. For each firm in each country we also obtain the average growth rate over the sample period, g_{fc}. We then form a dummy variable for each firm f that takes on the value one if the firm grows at a rate exceeding the predicted rate and zero otherwise: $d_{fc} = 1$ if $g_{fc} > \text{SFG}_{fc}$ and is 0 otherwise. Finally, for each country we find the proportion of firms that grow at average rates exceeding the SFG rate over the sample period, $\Sigma_f d_{fc}/n_c$, where n_c is the number of firms in each country. We repeat the same calculations for IG and SG.

Column 1 of Table II provides an estimate of the proportion of firms that grow faster than our estimate of IG, the maximum growth rate compatible with a firm maintaining its dividend payout ratio and relying only on internal financing. Column 2 shows the proportion of firms whose growth rates exceed the estimate of the maximum growth rate that can be financed by relying only on internal and short-term finance, SFG, as defined above. Column 3 shows the proportion of firms in each country whose realized growth rate exceeds the maximum rate compatible with the maintenance of their leverage ratio and reliance on retained earnings for infusions of equity capital, SG.

Inspection of column 1 shows that in all but six of the thirty countries, a majority of firms grow at rates that exceed those that can be internally financed while maintaining their dividend payouts, and thus require some form of external financing. Among the six, Brazil and South Africa are noteworthy, as almost two-thirds of the firms in those countries grow at rates at which they can self-finance. At the other end of the spectrum are Thailand, Japan, and Korea, where approximately two-thirds of the firms require outside financing. For most of the other countries, our conservative estimate is that 40 to 50 percent of firms have a supply of investment capital that does not depend directly on external financing and the development of financial markets.[13] Column 2 shows that the majority of firms in most countries can

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[13] Thus, 50 to 60 percent of firms require some form of external financing. Note that although a firm may be able to finance its desired growth rate internally, it may not be optimal to do so. For example, in some tax regimes a firm may increase value by issuing debt to repurchase stock in order to take advantage of interest tax shields. In the absence of well-functioning banks or financial intermediaries, the firm may not be able to exploit available tax shields fully. However, although this may be a private cost for the firm, it is not necessarily an economic cost for the country.

Proportion of Firms Growing Faster than Predicted

For each firm internal growth rate (IG_t) is given by $(ROA_t * b_t)/(1 - ROA_t * b_t)$ where ROA_t is the firm's return on assets and b_t is the proportion of the firm's earnings that are retained for reinvestment at time t. Maximum short-term financed growth rate (SFG_t) is defined as $ROLTC_t/(1 - ROLTC_t)$ where $ROLTC_t$ is the ratio of earnings, after tax and interest, to long-term capital. Maximum sustainable growth rate (SG_t) is given by $ROE_t/(1 - ROE_t)$ where ROE_t is the return on equity. The sample consists of firms from all the countries in the IFC's Corporate Finance database, and all the countries in the Global Vantage database having data on more than thirty-five firms. For each firm, these growth rates are calculated annually. For each country, the proportion of firms whose mean annual growth rate of sales exceeds the means of the three constrained growth rates (IG, SFG, SG) are presented below.

	Proportion of Firms that Exceed Their:		
	Internal Growth Rate IG = (ROA * b)/(1 − ROA * b)	Maximum Short-Term Financed Growth Rate SFG = ROLTC/(1 − ROLTC)	Maximum Sustainable Growth Rate SG = ROE/(1 − ROE)
Australia	0.58	0.41	0.34
Austria	0.54	0.43	0.32
Belgium	0.49	0.33	0.18
Brazil	0.38	0.37	0.37
Canada	0.57	0.47	0.36
Finland	0.55	0.44	0.23
France	0.59	0.38	0.22
Germany	0.60	0.48	0.30
Hong Kong	0.52	0.35	0.31
India	0.58	0.38	0.25
Italy	0.44	0.31	0.20
Japan	0.68	0.52	0.38
Jordan	0.55	0.40	0.37
Korea	0.67	0.56	0.43
Malaysia	0.63	0.48	0.42
Mexico	0.47	0.44	0.42
Netherlands	0.58	0.34	0.22
New Zealand	0.50	0.40	0.30
Norway	0.54	0.48	0.23
Pakistan	0.50	0.28	0.19
South Africa	0.35	0.19	0.14
Singapore	0.61	0.50	0.45
Spain	0.58	0.41	0.32
Sweden	0.45	0.30	0.15
Switzerland	0.53	0.39	0.29
Thailand	0.71	0.50	0.41
Turkey	0.50	0.23	0.18
United Kingdom	0.55	0.32	0.26
United States	0.55	0.42	0.31
Zimbabwe	0.54	0.37	0.30

finance their realized growth using conventional amounts of short-term financing. The highest proportions again are in Japan, Korea, Thailand, and Singapore.

By comparing across columns it is possible to obtain a rough indication of the relative importance of long-term and short-term debt in providing capital for growth. Thus, for example, in the case of Australia, 58 percent of firms require some form of external financing over our sample period. Of

these, 17 percent could finance their growth entirely using short-term debt, and an additional 7 percent could finance their growth by also borrowing enough to maintain their debt-equity ratios. Assuming a pecking-order for financing, as suggested by Myers and Majluf (1984) and Donaldson (1961), inspection of Table II suggests that in most countries short-term credit appears to be more important than long-term credit in relaxing financing constraints on the growth of firms. In only five countries, Canada, Germany, Finland, Korea, and Norway, does long-term debt play a greater role than short-term debt in providing resources for growth.

Developing countries in our sample fall into one of three rough categories. In the two countries with the highest inflation rates, Brazil and Mexico, neither long-term nor short-term credit is of importance in relaxing the constraints on firm growth.[14] In some other developing countries, such as Jordan, Malaysia, South Africa, Turkey, and Zimbabwe, short-term credit is relatively more important than long-term credit. Finally, there is a group of countries that includes India, Korea, Pakistan, and Thailand where the relative contributions of long-term and short-term credit to growth are similar to those in the developed economies.

The comparison of India with Italy is particularly instructive. More Indian than Italian firms grow at rates that exceed those that could be self-financed. As expected, most of the difference is accounted for by greater use of short-term debt in India. However, the role of long-term debt and equity is comparable between the two countries.

C. Firm Characteristics and Externally Financed Growth

We next describe the characteristics of externally financed firms in each country. For each firm we calculate the proportion of years in which its growth rate in the sample period exceeds its predicted growth rate. For each country we regress this variable on several key firm characteristics: the ratio of net fixed assets to total assets, dividends divided by total assets, the ratio of net sales to net fixed assets, and the lags of the ratios of total investment and long-term debt, each divided by total assets.[15] Because there is no formal model linking firm characteristics to the external financing need, the regression coefficients should be interpreted as providing descriptive partial correlations rather than estimates of a model.

The results are presented in Table III. Inspection of the table reveals that less profitable firms are more likely to grow at rates that require them to obtain long-term credit or equity. In twenty-one of the thirty cases the coefficients are negative and significant at the 10 percent level or better. Only in the case of Zimbabwe are more profitable firms more likely to require external financing. In seventeen of the thirty cases there is a significant positive association between the level of investment and reliance on external long-term capital.

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[14] This result is consistent with our finding (Demirgüç-Kunt and Maksimovic (1996a)) on the financing of Brazilian and Mexican firms.

[15] These variables are defined in the Appendix.

Table III

Firms Growing above Predicted Rates and Their Characteristics

The estimated model is: Excess Growth$_{[Firm\ i]}$ = α + β_1NFA/TA$_i$ + β_2 DIV/TA$_i$ + β_3 PROFIT$_i$ + β_4 TA/GDP$_i$ + β_5 NS/NFA$_i$ + β_6 INV/TA$_{t-1,i}$ + β_7LTD/TA$_{t-1,i}$ + ϵ_I. The regressions are estimated using OLS. The sample consists of firms from all the countries in the IFC's Corporate Finance database, and all the countries in the Global Vantage database having data on more than thirty-five firms. The dependent variable is the proportion of years in the sample period that a firm grows faster than its maximum short-term financed growth rate, SFG, which is defined as ROLTC$_t$/(1 − ROLTC$_t$) where ROLTC$_t$ is the ratio of earnings, after tax and interest, to long-term capital. Firm characteristics are averaged over the firms' sample period, so that each firm has one observation. NFA/TA is the net fixed assets divided by total assets. DIV/TA is the dividends divided by total assets. PROFIT is the income before interest and taxes divided by total assets. TA/GDP is the total assets of the firm divided by the GDP of the country. NS/NFA is the net sales divided by net fixed assets. INV/TA$_{t-1}$ is total investment divided by total assets in the previous period. LTD/TA$_{t-1}$ is long-term debt divided by total assets in the previous period.

	CONST.	NFA/TA	DIV/TA	Profit	TA/GDP	NS/NFA	INV/TA$_{t-1}$	LTD/TA$_{t-1}$	Adj. R^2	No. of obs.
Australia	0.558***	0.020	−0.901	−1.348***	−2.239	−0.001	0.264***	0.147	0.16	304
Austria	0.461***	0.030	3.317	−2.000**	6.205**	0.001	0.427*	0.044	0.12	42
Belgium	0.419***	−0.103	−2.487	−0.791	−2.171	0.001	0.896***	−0.167	0.07	66
Brazil	0.355**	−0.017	4.923	−0.272	5.859	0.030	−0.067	−0.057	0.01	98
Canada	0.749***	−0.142*	−6.378***	−0.782***	−8.034**	−0.009**	0.004	0.117	0.23	395
Finland	1.030***	−0.089	−3.132	−3.880*	−4.315	−0.012	0.373	−0.406	0.06	50
France	0.363***	0.015	−0.645	−1.096***	−3.476	−0.001	0.216***	0.474***	0.11	478
Germany	0.606***	−0.080	−2.308*	−0.714***	−3.917	−0.001	0.786***	−0.239	0.12	329
Hong Kong	0.347***	0.116	−0.278	−1.194**	−1.879	0.000	0.403**	0.527**	0.17	147
India	0.254***	−0.048	0.994	−1.254**	−12.762	0.002	1.066***	0.545*	0.22	97
Italy	0.321*	0.274	−5.864	−1.279	0.752	0.013	0.519*	−0.103	0.07	74
Japan	0.524***	−0.296***	−3.468*	−2.209***	−2.168	−0.000	1.814***	0.391***	0.19	1093
Jordan	−0.066	0.387	1.356	−1.438*	−4.275*	0.001	0.726**	0.926*	0.38	35
Korea	0.509***	0.017	−4.534	−2.496**	10.317	0.004	1.405***	0.187	0.22	100
Malaysia	0.627***	−0.090	−4.752***	0.496	0.785	−0.004	−0.072	0.072	0.08	123

Mexico	0.301	0.182	n.a.	−0.751	7.808	−0.070	0.403*	−0.132	0.18	57
New Zealand	0.306	−0.066	−0.151	−2.165*	−0.626	0.007	0.243	1.137**	0.23	37
Netherlands	0.464***	−0.121	2.644*	−2.455***	−2.342	0.001	0.162	0.673***	0.16	136
Norway	0.137	−0.015	0.594	−1.876*	−0.999	0.056	0.706	0.596	0.14	41
Pakistan	0.067	0.226	−0.820	−0.433	12.859*	0.000	0.701**	0.669***	0.41	100
South Africa	0.565***	−0.379**	−1.437	−0.218	−0.110	0.000	0.103*	−0.058	0.15	60
Singapore	0.629***	−0.086	0.469	−1.573***	1.294*	−0.004	0.143	0.164	0.10	186
Spain	0.607***	−0.133	−0.674	−2.081***	3.963	0.006	0.004	0.565	0.19	107
Sweden	0.306*	0.184	0.119	−1.192	0.781	−0.007	0.283	0.075	0.01	63
Switzerland	0.405***	−0.308**	0.526	−2.175***	−0.172	−0.006*	0.568***	0.763***	0.21	127
Thailand	0.611***	−0.015	−0.228	−1.670***	−57.827**	0.000	0.545***	0.446	0.27	129
Turkey	0.080	0.560***	−2.427***	−0.262	−2.586	0.011	0.124	−0.065	0.38	45
United Kingdom	0.437***	−0.046	−1.914***	−1.068***	−22.509***	0.002*	0.332***	0.539***	0.15	1054
United States	0.498***	−0.175***	−3.022***	−1.162***	−53.655***	0.001*	0.869***	0.257***	0.31	2863
Zimbabwe	0.372***	n.a.	−6.297**	1.299**	6.681	n.a.	−0.450**	0.090	0.19	47

***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

The associations between growth at rates that exceed the predicted rate and the other firm-specific variables show more variation across countries. For example, in Canada, the United Kingdom, and the United States, large firms tend to grow at rates that could be financed without access to long-term credit or to the stock market. In Austria, large size is associated with rates of growth that require long-term credit or equity.[16]

In seven countries, including Canada, Germany, Japan, the United Kingdom, and the United States, high dividends are associated with rates of growth below the predicted rate. In several countries there is no association, suggesting that some firms may be maintaining dividends in preference to reducing their long-term borrowing or equity financing.[17]

In five countries, again including Canada, Japan, and the United States, there is a significant negative association between the ratio of fixed assets to total assets and rates of growth that exceed the predicted rate. In the case of Turkey there is a positive relation. These differences may also reflect industry composition and demand patterns in these countries. The final firm-specific variable, sales to total assets, is not related to the probability that the firm is growing at a rate that exceeds the predicted rate.

III. Differences in Legal and Financial Systems and Firm Growth

A. *Do the Differences in Systems Explain Externally Financed Growth?*

We next examine how the proportion of firms in each country whose growth exceeds the predicted rate depends on the development of legal and financial systems. We test the hypothesis that the more developed the market, the greater the proportion of firms able to grow at rates in excess of the predicted rate. We use the proportion of firms growing at rates that exceed the predicted rate for three reasons. First, the predicted rate is an upper bound for the growth rate of a firm that does not rely on long-term external capital. Thus, a growth rate exceeding that rate can be interpreted as evidence of

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[16] We also investigate using the proportion of firms that grow at rates in excess of the sustainable growth rate SG as the dependent variable in Table III instead of the proportion of firms growing at rates that require long-term credit or equity. An interesting pattern of association between firm size and excess growth emerges. With the probability of growth at rates above SG as the dependent variable, the coefficient of the size variable, TA/GDP, is statistically significant in twelve cases out of thirty. Of the eleven developing countries, it is positive and significant in five and negative and significant in one. By contrast, of the nineteen developed countries it is negative and significant in five and positive and significant in only one. This pattern suggests that in developing countries equity financing and high levels of long-term credit finance the growth of large firms, whereas in developed countries they tend to provide growth capital to small firms. Note that this does not imply that large firms in developed countries do not issue equity or have high leverage, only that these forms of financing are not as likely to be strictly necessary to permit desired growth.

[17] This association is stronger when the dependent variable is SG. The coefficient of DIV/TA is negative and significant in nineteen of the twenty-nine cases.

external financing of marginal investment. Second, this approach reduces the effect of outliers.[18] Third, we are interested in the breadth of access to external finance.

In our regressions the development of stock markets is measured by the ratio of market capitalization to GDP (MCAP/GDP) and by a measure of market activity, the stock market turnover ratio in each economy (TOR). Both variables are found to be useful indicators of market development by Demirgüç-Kunt and Levine (1996). However, in the present context they are likely to affect the excess growth of firms in our sample of publicly traded firms differently. The ratio of market capitalization to GDP is a proxy for the importance of the stock market to asset allocation for the economy as a whole. Market capitalization may also affect individual firms because they can spread the risks of new projects more efficiently in large markets. However, because all the firms in our sample are already publicly traded, MCAP/GDP is an imperfect indicator of their access to capital. These firms' access may be better proxied by the level of activity in a given market, measured by the turnover ratio.[19] The size of the banking sector is measured by the ratio of the domestic assets of deposit banks to GDP (BANK/GDP).

As an indicator of the ease with which firms can enter into long-term contracts, we use the index of experts' evaluations of the adherence to legal norms within each country, shown in Table I.

Four variables describe the economic environment of each country. We control for differences in the development of institutions using real GDP per capita. In the regressions below, we use the rate of inflation as a control variable to detect possible biases resulting from price level changes which make long-term financial contracting difficult.[20] The ratio of government subsidies to GDP is an indicator of government intervention in the economy. The government both provides direct funding to firms and acts as an implicit or explicit guarantor of loans. Finally, to control for differences in economy-wide growth opportunities we use one of two variables: the ratio of market values to book values and the growth rate of the real GDP per capita.

We use two direct measures of the use of external capital, PERLTD and PEREQ, which are the proportions of increases in total assets financed by long-term debt and newly issued shares, respectively. If external financing

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[18] In unreported regressions we have estimated an alternative specification using the difference between the rate of growth and the return on capital of firms in our sample as a measure of excess growth. The principal results are not altered.

[19] Market turnover may depend on the firms' investment decisions, leading to reverse causality. In the regressions below we attempt to control for this potential bias by using period turnover ratios.

[20] The rate of inflation is highly correlated with the variance of the inflation rate. Thus, the rate of inflation may also be a proxy for the costs of entering into long-term financing contracts.

enables firms to undertake investments they otherwise would forgo, then there will exist a positive relation between PERLTD and PEREQ and the proportion of firms growing faster than the predicted rate.

Table IV contains summary statistics and the correlation matrix for the descriptors for the economy and firm-specific characteristics used in the regressions reported below. Several correlations presented in Panel B are of independent interest. The law and order variable is highly positively correlated both with the size of the banking sector and with the proportion of firm asset growth financed with long-term debt. Interestingly, we do not find a significant correlation between the law and order variable and the proportion of firm asset growth financed with external equity. There is also a highly significant negative correlation between the law and order variable and the rate of return on long-term capital (ROLTC) of our sample firms. This relation is consistent with the conjecture that a well-functioning legal system reduces political risks and, therefore, the rate of return required on investment. We do not find a significant correlation between the efficiency of the legal system and the growth rate of real sales of firms in our sample. We investigate these relations further below.

Another variable measuring the level of development, GDP per capita, also exhibits correlations with the return on capital and with growth rates of sales that are similar to those exhibited by the legal efficiency variable. However, the correlations between GDP per capita and the efficiency of the legal system and the firm financing variables, PERLTD and PEREQ differ in a significant way. Though both GDP per capita and the efficiency of the legal system are positively correlated with the proportion of investment funded with long-term debt, only GDP per capita is significantly negatively related to the proportion of investment funded with externally issued equity. Thus, the efficiency of the legal system has an effect on financing investment that is independent of the effect of GDP per capita. However, GDP per capita is positively correlated with the efficiency of the legal system.

Our statistical model follows the cross-sectional approach used in the growth literature.[21] In Table V, the proportion of firms in each country whose mean annual growth exceeded their mean annual predicted growth rate is regressed on the means of the market and institutional indicators and firm characteristics in each country.[22] To mitigate possible simultaneity bias, the dependent variable is averaged over the second half of the sample period (1986 to 1991), whereas the independent variables, with two exceptions, are averaged over the available years in the first half of the sample period (1980

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[21] This statistical specification takes into account that the questions addressed are cross-sectional and that long-term financing is likely to be responsive to permanent rather than transitory changes in the institutions. A panel approach would give equal weights to time series and cross-sectional effects.

[22] These proportions are calculated in column 2 of Table II. We do not have government subsidy data for Hong Kong, Jordan, South Africa, and Zimbabwe, and dividend data are not available for Mexico. However, excluding these variables from the analysis to expand the sample size to all thirty countries does not significantly alter the rest of the results.

to 1985). The exceptions are PERLTD and PEREQ, which are averaged over the second half of the sample period.[23]

In our first specification, column (1) of Table V, we control for firms' growth opportunities by including an economy-wide variable, the growth rate of real GDP per capita. In column (2) we replace this growth variable by the ratio of market value to book value, and in column (3) we do not control for growth opportunities at all. Finally, in column (4) we directly test for the association between excess growth and external financing of capital expenditures.

In principle, our legal and financial system variables may have both a direct and an indirect effect on firm growth. The direct effect occurs because legal and financial institutions affect a firm's ability to obtain external financing. The indirect effect occurs because increased access to investment capital affects the profits of all firms in the economy and thus their ability to self-finance. Our construction of the dependent variables enables us to isolate the extent to which firms obtain external financing to fund growth, controlling for the indirect effect. Thus, in specifications (1) to (3) we can interpret the finding of a significant positive coefficient of an independent variable in the following way: In countries with high values of this variable, a larger proportion of firms is growing at a level that requires access to external sources of long-term capital, all other things being equal.

In specification (4) we include two direct measures of external financing, PERLTD and PEREQ, as independent variables. Accordingly, in specification (4) our interpretation of the other coefficients is changed: We expect that some of the variables that predict the availability of external financing in specifications (1) to (3) will *lose* significance once the direct measures of external financing are introduced.

In specifications (1) to (3) the coefficient of the law and order variable is significant and positive. We interpret this to indicate that a high degree of adherence to legal norms facilitates long-term contracts between creditors and firms. The coefficient of the size of the commercial banking sector is also positive and significant in each specification. Thus, as expected, firms use more external financing in countries with large banking sectors.

Two variables measure the development and effectiveness of stock markets. One of these, the turnover ratio, is positive and highly significant in all three specifications. The market capitalization ratio is not significant in any specification. Thus, an active stock market facilitates the relaxation of financing constraints. By contrast, the market capitalization ratio is not associated with the growth of firms in the sample.

The final institutional variable is the ratio of government subsidies to GDP. The coefficients of the level of subsidies are consistently negative, but not significant. Thus, we find no evidence that subsidies increase the proportion of firms growing at rates in excess of those that can be financed

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[23] Thus, PERLTD and PEREQ are contemporaneous with our measure of excess growth. This is because these variables are used only in a robustness check to establish a contemporaneous association between external financing and excess growth.

Table IV

Summary Statistics

The proportion of firms that are growing faster than predicted is the proportion of firms in a country whose mean growth in sales exceeds their mean maximum short-term financed growth rate (SFG). For each firm SFG is defined as ROLTC/(1 − ROLTC) where ROLTC is the ratio of earnings, after tax and interest, to long-term capital. The sample consists of all the countries in the IFC's Corporate Finance database, and all the countries in the Global Vantage database having data on more than thirty-five firms. GDP/CAP is the real GDP per capita. MCAP/GDP is the stock market capitalization of the country divided by its GDP. TOR is stock market turnover defined as the total value of shares traded divided by market capitalization. Inflation is the inflation rate of the GDP deflator. BANK/GDP is the domestic assets of the deposit banks divided by GDP. LAW and ORDER, scored 0 to 6, is an indicator of the degree to which the citizens of a country are able to utilize the existing legal system to mediate disputes and enforce contracts. GROWTH is the growth rate of real GDP per capita. MV/BV is the market value of firm equity over its book value. GOV. SUBS./GDP are the grants on current account by the public authorities to (i) private industries and public corporations and (ii) government enterprises, divided by GDP. All country-level variables are annual figures, averaged over the 1980 to 1991 period. NFA/TA is the net fixed assets divided by total assets. PERLTD and PEREQ are the proportion of firms' investment financed by long-term debt and equity, respectively. RGRSAL is the real growth rate of firms' sales. All firm-level variables are averaged over firms in each country and over the 1980 to 1991 period. Panel A presents the summary statistics for the thirty countries listed in Table I. Panel B reports Pearson correlation coefficients. p-values are given in italics.

Panel A: Summary Statistics					
	N	Mean	Std. Dev.	Minimum	Maximum
Proportion of firms that are growing faster than predicted (SFG)	30	0.396	0.086	0.192	0.564
GDP/CAP	30	9.864	7.461	0.312	25.582
ROLTC	30	0.092	0.084	0.012	0.467
MCAP/GDP	30	0.388	0.352	0.051	1.257
TOR	30	0.325	0.201	0.049	0.901
INFLATION	30	0.137	0.261	0.026	1.420
BANK/GDP	30	0.621	0.313	0.177	1.453
LAW AND ORDER	30	4.452	1.591	1.714	6.000
GROWTH	30	0.021	0.020	−0.022	0.069
MV/BV	28	1.929	0.689	0.741	3.717
GOV. SUBS./GDP	26	3.164	2.298	0.600	10.933
NFA/TA	29	0.379	0.095	0.209	0.639
PERLTD	30	0.138	0.092	0.009	0.410
PEREQ	30	0.121	0.090	0.002	0.300
RGRSAL	30	0.078	0.054	−0.071	0.219

						Panel B: Correlation Matrix								
	GDP/CAP	MCAP/GDP	TOR	INFL.	BANK/GDP	LAW AND ORDER	GROWTH	MV/BV	GOV. SUBS./GDP	NFA/TA	PERLTD	PEREQ	ROLTC	RGRSAL
Proportion	0.170	−0.034	0.542	−0.170	0.307	0.257	0.409	0.150	−0.093	−0.079	0.242	0.172	−0.358	0.330
	0.370	*0.859*	*0.002*	*0.370*	*0.098*	*0.170*	*0.025*	*0.445*	*0.651*	*0.683*	*0.198*	*0.363*	*0.052*	*0.075*
GDP/CAP		0.090	0.150	−0.346	0.675	0.873	−0.137	0.149	−0.408	−0.602	0.755	−0.455	−0.475	−0.197
		0.636	*0.428*	*0.061*	*0.000*	*0.000*	*0.471*	*0.451*	*0.038*	*0.000*	*0.000*	*0.012*	*0.008*	*0.296*
MCAP/GDP			−0.150	−0.246	0.309	0.067	0.134	0.192	−0.395	−0.032	−0.103	0.249	0.076	−0.009
			0.429	*0.190*	*0.097*	*0.725*	*0.480*	*0.328*	*0.046*	*0.869*	*0.589*	*0.184*	*0.689*	*0.961*
TOR				0.111	0.233	0.099	0.232	0.197	0.066	−0.020	−0.016	0.099	−0.344	−0.011
				0.559	*0.215*	*0.604*	*0.217*	*0.315*	*0.749*	*0.918*	*0.933*	*0.603*	*0.063*	*0.954*
PI					−0.442	−0.206	−0.264	0.027	0.633	0.661	−0.358	0.429	−0.031	−0.299
					0.015	*0.275*	*0.159*	*0.890*	*0.001*	*0.000*	*0.052*	*0.018*	*0.870*	*0.108*
BANK/GDP						0.517	0.149	0.293	−0.388	−0.625	0.376	−0.366	−0.133	−0.042
						0.003	*0.431*	*0.130*	*0.050*	*0.000*	*0.041*	*0.047*	*0.482*	*0.826*
LAW AND ORDER							−0.038	0.128	−0.372	−0.477	0.786	−0.189	−0.584	−0.142
							0.843	*0.517*	*0.061*	*0.009*	*0.000*	*0.318*	*0.001*	*0.454*
GROWTH								0.163	0.025	−0.321	−0.009	0.231	−0.309	0.307
								0.409	*0.904*	*0.090*	*0.961*	*0.220*	*0.097*	*0.098*
MV/BV									−0.206	−0.085	−0.058	0.043	−0.089	−0.047
									0.333	*0.674*	*0.770*	*0.826*	*0.652*	*0.812*
GOV. SUBS./GDP										−0.305	0.053	0.022	−0.294	
										0.012	*0.129*	*0.798*	*0.916*	*0.145*
NFA/TA											−0.467	0.416	0.204	−0.019
											0.011	*0.025*	*0.288*	*0.923*
PERLTD												−0.438	−0.508	−0.114
												0.015	*0.004*	*0.547*
PEREQ													−0.127	−0.019
													0.504	*0.922*
ROLTC														0.287
														0.124

Table V
Excess Growth of Firms and External Financing—
Cross Country Results

The regression equation estimated is: Excess Growth$_{[Country=i]}$ = α + β_1 MCAP/GDP$_i$ + β_2 TOR$_i$ + β_3 INFLATION$_i$ + β_4 BANK/GDP$_i$ + β_5 LAW AND ORDER$_i$ + β_6 GROWTH$_i$ + β_7 GOV. SUBS./GDP$_i$ + β_8 NFA/TA$_i$ +β_9GDP/CAP$_i$ β_{10}PERLTD$_i$ + β_{11}PEREQ$_i$ + ϵ_i. The sample consists of all the countries in the IFC's Corporate Finance database, and all the countries in the Global Vantage database having data on more than thirty-five firms. The dependent variable is the proportion of firms that grow faster than their predicted growth rate. These are firms in a country whose mean growth in sales exceeds their mean maximum short-term financed growth rate (SFG). In column (2) GROWTH is replaced by MV/BV. Column (3) does not include either GROWTH or MV/BV. MCAP/GDP is the stock market capitalization of the country divided by its GDP. TOR is stock market turnover defined as the total value of shares traded divided by market capitalization. INFLATION is the inflation rate of the GDP deflator. BANK/GDP is the domestic assets of the deposit banks divided by GDP. LAW AND ORDER, scored 0 to 6, is an indicator of the degree to which the citizens of a country are able to utilize the existing legal system to mediate disputes and enforce contracts. GROWTH is the growth rate of real GDP per capita. MV/BV is the market value of the firm's equity over its book value. GOV. SUBS./GDP are the grants on current account by the public authorities to (i) private industries and public corporations and (ii) government enterprises, divided by GDP. NFA/TA is the net fixed assets divided by total assets. GDP/CAP is real GDP per capita. PERLTD and PEREQ are the proportions of firms' investment financed by long-term debt and equity, respectively. The dependent variable and PERLTD and PEREQ are averaged over the 1986–1991 period, whereas all other variables are averaged over the 1980–1985 period to the extent available. White's heteroskedasticity-consistent standard errors are given in parentheses.

	(1)	(2)	(3)	(4)
INTERCEPT	−0.126	0.106	0.057	0.004
	(0.127)	(0.199)	(0.085)	(0.055)
MCAP/GDP	−0.106	−0.043	−0.028	−0.045
	(0.058)	(0.039)	(0.036)	(0.027)
TOR	0.311***	0.261*	0.312***	0.177
	(0.072)	(0.150)	(0.101)	(0.104)
INFLATION	0.049	−0.432**	−0.198**	−0.298***
	(0.114)	(0.183)	(0.087)	(0.073)
BANK/GDP	0.162***	0.132***	0.148***	0.216***
	(0.050)	(0.042)	(0.047)	(0.040)
LAW AND ORDER	0.070***	0.051**	0.054***	0.005
	(0.023)	(0.021)	(0.019)	(0.020)
GROWTH	3.666***			
	(1.178)			
MV/BV		0.012		
		(0.048)		
GOV. SUBS./GDP	−0.009	−0.007	−0.004	0.005
	(0.005)	(0.011)	(0.006)	(0.006)
NFA/TA	0.297***	0.275	0.265	0.463***
	(0.098)	(0.194)	(0.169)	(0.147)
GDP/CAP	−0.010**	−0.012**	−0.012**	−0.006
	(0.004)	(0.005)	(0.005)	(0.005)
PERLTD				0.505***
				(0.138)
PEREQ				0.524***
				(0.164)
Adj. R^2	0.48	0.24	0.29	0.43
No. of Obs.	26	24	26	26

***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

internally and by realized levels of short-term debt. This evidence is consistent with the hypothesis that subsidies may divert resources from firms in general to a smaller number of targeted firms. The level of subsidies may also be an indicator of more generalized intervention that decreases the efficient allocation of capital.

Our two macroeconomic control variables are GDP per capita and the mean rate of inflation. GDP per capita proxies for institutional determinants of external financing not explicitly captured by our independent variables. We include the mean rate of inflation in each country to control for the possibility that the level of inflation may affect firms' ability to obtain long-term debt financing. In all three specifications the coefficient of GDP per capita is negative and significant at the five percent level. Thus, controlling for the development of legal and financial systems, there is no evidence that a higher proportion of firms in richer countries rely on external financing to fund growth. The coefficient of inflation is significant, at the five percent level, in specifications (2) and (3).[24]

The coefficient of the ratio of net fixed assets to total assets, NFA/TA, is positive in all three specifications, but is significant only in specification (1). Thus, there is limited evidence that capital-intensive firms are more likely to grow at rates that require long-term external financing than firms that do not invest significantly in fixed assets. When controlling for institutional and market development, we do not find significant associations between long-term external financing and the mean level of investment, average firm-size, the dividends paid out by firms, and the ratio of sales to assets. To economize on degrees of freedom, these variables are dropped from Table V.

Of the two variables controlling for firms' growth opportunities, GROWTH and market value to book value, only the former is significant. However, the principal results reported above are not sensitive to the choice of the variable controlling for growth, and, in the case of specification (3), are unaffected if the variable is dropped.

In the last specification in Table V we explore the relation between legal efficiency and long-term financing in more detail. We augment the explanatory variables in specification (3) with both PERLTD and PEREQ. These variables directly measure the amount of external financing obtained by firms over the sample period. As expected, the coefficients of both are positive and highly significant at the one percent level. Further, their inclusion results in a loss of significance for the coefficients of both the law and order index and the turnover ratio. These losses of significance support our interpretation that the law and order index and the turnover ratio are indicators of the ability of firms to obtain external financing.

In addition to the direct effects of financial market development and legal system efficiency on the financing of individual firms, there may also be indirect effects. Developed financial and legal systems that make external financing feasible may affect both the total capital stock in the economy and

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[24] We also discuss inflation adjustment and present estimates using a specific adjustment below.

the level of competition in product markets. Efficient capital markets facilitate investment by new or small firms.[25] Even in the absence of new entry, access to external financing may intensify competition in imperfectly competitive industries. Either of these effects (an increase in capital stock or an increase in product market competition) will tend to decrease the return on capital and hence the ability of firms to finance projects internally.

To investigate this relation between return on capital and institutional development, we regress the return on assets financed by long-term capital (ROLTC)[26] in each country on our indicators of market and institutional development. As before, we regress the dependent variable on prior subperiod regressor variables. The estimated regression, with White-corrected standard errors in parentheses, is

$$ROLTC = \underset{(0.034^{***})}{0.291} - \underset{(0.015)}{0.003} \; MCAP/GDP - \underset{(0.026^{***})}{0.143} \; TOR$$
$$+ \underset{(0.023^{**})}{0.045} \; INFLATION + \underset{(0.019)}{0.016} \; BANK/GDP$$
$$- \underset{(0.008^{***})}{0.030} \; LAW \; AND \; ORDER - \underset{(0.002)}{0.002} \; GOV. \; SUBS./GDP$$
$$- \underset{(0.049^{***})}{0.133} \; NFATA + \underset{(0.000)}{0.00} \; GDP/CAP,$$

where two asterisks denote significance at the five percent level and three asterisks denote significance at the one percent level or better. The adjusted R^2 is 0.6.

The significant negative coefficients of Law and Order and TOR indicate that a high degree of legal efficiency and a high stock turnover ratio are both associated with a low realized return on capital. In unreported regressions, we also investigate whether there exists a relation between the growth of firms' sales, unadjusted for internal financing, and our legal and financial system variables. In our sample we do not find a statistically significant relation.

Thus, in addition to the direct effect explored in Table V, there exists an indirect relation between the legal and financial systems and external financing. In countries with efficient legal and financial systems, the return on capital of established firms tends to be lower, and, on average, more external financing is required to fund equivalent rates of growth.

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[25] See de Soto (1989) for an interesting example of legal impediments to business formation. In an experiment to test obstacles facing an entrepreneur without special connections in setting up a business, he had a team of students obtain the necessary permits to set up a small garment factory both in Peru and in Florida. In Peru the listing of all the required steps was 30 meters long and required 289 man-days to complete. In Florida the paperwork required only a few hours to complete and the business was set up in a matter of days. One interpretation of the difference is that inefficient legal and regulatory systems protect established firms against entry by entrepreneurs.

[26] Very similar results are obtained using return on equity as the measure of the return on assets.

<div align="center">

Table VI

External Financing of Firms—Cross Country Results

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The regression equation estimated is: PERLTD$_{[Country=i]}$ or PEREQ$_{[Country=i]}$ = α + β_1 MCAP/GDP$_i$ + β_2 TOR$_i$ + β_3 INFLATION$_i$ + β_4 BANK/GDP$_i$ + β_5 LAW AND ORDER$_i$ + β_6 GOV. SUBS./GDP$_i$ + β_7 NFA/TA$_i$ +β_8 GDP/CAP$_i$ + ϵ_i. The sample consists of all the countries in the IFC's Corporate Finance database, and all the countries in the Global Vantage database having data on more than thirty-five firms. The dependent variable is the proportion of a firm's investment financed by long-term debt (PERLTD) or by equity (PEREQ). MCAP/GDP is the stock market capitalization of the country divided by its GDP. TOR is stock market turnover defined as the total value of shares traded divided by market capitalization. INFLATION is the inflation rate of the GDP deflator. BANK/GDP is the domestic assets of the deposit banks divided by GDP. LAW AND ORDER, scored 0 to 6, is an indicator of the degree to which the citizens of a country are able to utilize the existing legal system to mediate disputes and enforce contracts. GOV. SUBS./GDP are the grants on current account by the public authorities to (i) private industries and public corporations and (ii) government enterprises, divided by GDP. NFA/TA is net fixed assets divided by total assets. GDP/CAP is the real GDP per capita. Dependent variables are averaged over the 1986 to 1991 period, whereas all independent variables are averaged over the 1980 to 1985 period to the extent available. White's heteroskedasticity-consistent standard errors are given in parentheses.

	PERLTD	PEREQ
INTERCEPT	0.006	0.095
	(0.092)	(0.120)
MCAP/GDP	−0.020	0.051
	(0.059)	(0.053)
TOR	−0.079	0.335***
	(0.094)	(0.080)
INFLATION	−0.220**	0.403***
	(0.074)	(0.008)
BANK/GDP	−0.141**	0.006
	(0.055)	(0.007)
LAW AND ORDER	0.016	0.078***
	(0.019)	(0.023)
GOV. SUBS./GDP	0.010**	−0.028***
	(0.005)	(0.004)
NFA/TA	0.122	−0.496**
	(0.097)	(0.178)
GDP/CAP	0.013***	−0.024***
	(0.004)	(0.005)
Adj. R^2	0.58	0.65
No. of Obs.	26	26

***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

B. External Financing and the Legal and Financial Systems

We regress PERLTD and PEREQ on our indicators of development to examine how the proportions of investment financed by external equity and long-term debt are affected by the development of the legal and financial systems. These regressions are shown in Table VI, and measure the gross relation between investment and external financing. They do not adjust for the cases in which external financing is a substitute for internal financ-

ing.[27] As before, the dependent variables are averaged over the 1986 to 1991 period, whereas all the independent variables are averaged over the period from the beginning of the sample to 1985.

As inspection of Table VI reveals, the proportion of investment financed by equity in our sample is positively related to the efficiency of the legal system, the level of inflation, and the activity of the stock market, measured by the turnover ratio. High GDP per capita and a high level of government subsidies are associated with a lower proportion of investment funded by equity. Finally, a high ratio of net fixed assets to total assets is also associated with lower levels of equity financing.

We find that the proportion of investment financed with long-term debt is related to fewer of our explanatory variables. It is negatively associated with inflation and the size of the commercial banking sector. It is positively associated with government subsidies and GDP per capita. The coefficient of the legal efficiency is positive, but not significant.

IV. Robustness Tests

We perform several checks on the robustness of the principal results reported in Section II. In the first test we check the consistency of the results when extreme observations are dropped and the estimations are repeated. We also recompute the firms' predicted growth rates under alternative assumptions about the profits from marginal sales and use these new predicted rates in estimations. We repeat the main analysis of Section II using an alternative definition of firm growth. Finally, we reestimate the reported regressions after making a within-year inflation adjustment on the dependent variable.

A. Outlier Analysis

The specifications in Table V are repeated, dropping outliers for specific variables. Since the number of observations is small, this procedure is performed serially: The countries with extreme values of a variable are omitted from the estimations when that specific variable is analyzed, and they are included in the sample when subsequent variables are analyzed. In each case the aim is to exclude obvious outliers. Hence, the number of countries dropped in each test depends on the particular variable.

In the first outlier test we drop the three countries with the highest rates of inflation: Brazil, Mexico, and Turkey. Subsequent tests involve dropping the country with the highest stock market turnover ratio (Germany), countries whose economies are not growing (Jordan and South Africa), countries in which the fewest firms grow at a rate exceeding the predicted rate (South

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[27] Thus, PERLTD and PEREQ do not control for whether or not firms that obtain external financing have an external financing need as defined in equation (1).

Africa and Turkey), and the country with the greatest government subsidies as a proportion of GDP (Brazil). The results are not affected when these countries are dropped from the analysis. Thus, they suggest that the statistical model fits countries that may appear as outliers.

B. Predicted Growth and the Profits on Marginal Income

The growth estimates used in the above regressions are based on the assumption that the firm's profit rate on marginal sales equals its average profit rate. Thus, revenues from new growth are assumed to provide as much of the resources for investment as do sales to established customers. To test whether this assumption is critical to our findings, we generalize the estimates of SFG to allow a lower rate of earnings on new growth. Specifically, we modify the financial planning model by introducing a parameter, z, that measures the ratio of the profit rate on the new sales to the firm's average profit rate. Thus, the modified predicted rate is now given by

$$SFG_t = ROLTC_t/(1 - z * ROLTC_t). \tag{5}$$

As a sensitivity check we reestimate the specifications in Table V for $z = 0, 0.25, 0.5,$ and 0.75. Our conclusions remain unchanged. Table VII presents a sample specification, specification (3), for the given values of z. As inspection of the table reveals, the assumption that marginal earnings equal average earnings is not critical for our results on the relation between institutional development and external financing.

C. Asset Growth and Inflation Adjustment

The financial planning model on which the tests are based assumes an equivalence between the rates at which firms' assets and sales grow. Technical progress may permit sales to grow faster than assets. As a result, sales growth attributable to increased productivity may be ascribed to the availability of external finance. As a specification test, we reestimate the regressions in Table V. The results pertaining to the relationship of external financing to the efficiency of the legal system and the activity of the stock market remain unaffected. Sample regressions are shown in Table VIII, in which column (1) repeats specification (3) of Table V, in which the dependent variable is the proportion of firms whose realized growth rate in sales exceeds the predicted rate. In column (2) of Table VIII the realized growth rate of assets is used instead to form the dependent variable replacing the realized growth rate of sales. There are two differences between the results reported in columns (1) and (2). The coefficient on inflation loses significance, although its value does not change materially. The coefficient on the ratio of the size of the commercial banking sector to GDP, which is significant in column (1), becomes insignificant in column (2).

Sensitivity Tests Allowing Different Marginal Profit Rates

The regression equation estimated is: Excess Growth$_{[Country=i]}$ = α + β_1 MCAP/GDP$_i$ + β_2 TOR$_i$ + β_3 Inflation$_i$ + β_4 BANK/GDP$_i$ + β_5 LAW AND ORDER$_i$ + β_6GOV. SUBS./GDP$_i$ + β_7NFA/TA$_i$ + β_8GDP/CAP$_i$ + ϵ_i. The sample consists of all the countries in the IFC's Corporate Finance database, and all the countries in the Global Vantage database having data on more than thirty-five firms. The dependent variable is the proportion of firms that grow faster than their predicted growth rate. These are firms whose mean growth in sales exceeds their mean maximum short-term financed growth rate (SFG). For each firm the SFG is defined as ROLTC/$(1 - z * ROLTC)$, where ROLTC is the ratio of earnings, after tax and interest, to long-term capital and z is a parameter that measures the ratio of the profit rate on the new sales to the firm's average profit rate. Estimation results assuming different values of z are given below. MCAP/GDP is the stock market capitalization of the country divided by its GDP. TOR is stock market turnover defined as the total value of shares traded divided by market capitalization. INFLATION is the inflation rate of the GDP deflator. BANK/GDP is the domestic assets of the deposit banks divided by GDP. LAW AND ORDER, scored 0 to 6, is an indicator of the degree to which the citizens of a country are able to utilize the existing legal system to mediate disputes and enforce contracts. GOV. SUBS./GDP are the grants on current account by the public authorities to (i) private industries and public corporations and (ii) government enterprises, divided by GDP. NFA/TA is the net fixed assets divided by total assets. GDP/CAP is the real GDP per capita. The dependent variable is averaged over 1986 to 1991, whereas all independent variables are averaged over the 1980 to 1985 period when available. White's heteroskedasticity-consistent standard errors are given in parentheses.

	$z = 1$	$z = 0.75$	$z = 0.5$	$z = 0$
INTERCEPT	0.057	0.073	0.103	0.155
	(0.085)	(0.086)	(0.086)	(0.086)
MCAP/GDP	−0.028	−0.028	−0.029	−0.025
	(0.036)	(0.036)	(0.036)	(0.037)
TOR	0.312***	0.304***	0.281***	0.258**
	(0.101)	(0.100)	(0.101)	(0.102)
INFLATION	−0.198**	−0.194**	−0.196**	−0.206**
	(0.087)	(0.087)	(0.088)	(0.091)
BANK/GDP	0.148***	0.148***	0.149***	0.141***
	(0.047)	(0.048)	(0.047)	(0.045)
LAW AND ORDER	0.054***	0.054**	0.051**	0.046**
	(0.019)	(0.020)	(0.020)	(0.020)
GOV. SUBS./GDP	−0.004	−0.005	−0.005	−0.005
	(0.006)	(0.006)	(0.006)	(0.007)
NFA/TA	0.265	0.252	0.241	0.226
	(0.169)	(0.170)	(0.167)	(0.171)
GDP/CAP	−0.012**	−0.012**	−0.012**	−0.012**
	(0.005)	(0.005)	(0.006)	(0.005)
Adj. R^2	0.29	0.28	0.25	0.22
No. of Obs.	26	26	26	26

***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

The variables used in the regressions are derived from accounting data and, except in the case of Brazil and Mexico, are based on historical acquisition costs. In periods of inflation, historical costs may not reflect the value of the firm's assets with sufficient accuracy. As a sensitivity test, we reesti-

Table VIII

Sensitivity Tests—Replacing Sales Growth with Asset Growth and Adjusting for Inflation

The regression equation estimated is: Excess Growth$_{[Country=i]}$ = α + β_1 MCAP/GDP$_i$ + β_2 TOR$_i$ + β_3 INFLATION$_i$ + β_4 BANK/GDP$_i$ + β_5 LAW AND ORDER$_i$ + β_6 GOV. SUBS./GDP$_i$ + β_7 NFA/TA$_i$ + β_8 GDP/CAP$_i$ + ϵ_i. The sample consists of all the countries in the IFC's Corporate Finance database, and all the countries in the Global Vantage database having data on more than thirty-five firms. The dependent variable of the specification reported in column (1) is the proportion of firms that grow faster than their predicted growth rate. These are firms whose mean growth in sales exceeds their mean maximum short-term financed growth rate (SFG). For each firm SFG is defined as ROLTC/(1 − ROLTC) where ROLTC is the ratio of earnings, after tax and interest, to long-term capital. In the specification reported in column (2), mean growth in sales is replaced by mean growth in assets. In column (3) the specification in column (1) is reestimated after dropping high inflation countries—Brazil, Mexico, and Turkey— and using an adjustment for the effect of inflation on firms' assets and earnings for the rest of the countries. The value of the firms' total assets (TA) required to support sales at time $t + 1$ in time t dollars is given by (TA$(t + 1)/1 + \pi$) + ($\pi/1 + \pi$) × (TA(t) − DEP$(t + 1)$) where π is the rate of inflation between time t and $t + 1$ and DEP(t) is the depreciation of the firm's long-term assets between t and $t + 1$. MCAP/GDP is the stock market capitalization of the country divided by its GDP. TOR is stock market turnover defined as the total value of shares traded divided by market capitalization. INFLATION is the inflation rate of the GDP deflator. BANK/GDP is the domestic assets of the deposit banks divided by GDP. LAW AND ORDER, scored 0 to 6, is an indicator of the degree to which the citizens of a country are able to utilize the existing legal system to mediate disputes and enforce contracts. GOV. SUBS./GDP are the grants on current account by the public authorities to (i) private industries and public corporations and (ii) government enterprises, divided by GDP. NFA/TA is the net fixed assets divided by total assets. GDP/CAP is the real GDP per capita. The dependent variable is averaged over 1986 to 1991, whereas all independent variables are averaged over the 1980 to 1985 period when available. White's heteroskedasticity-consistent standard errors are given in parentheses.

	(1)	(2)	(3)
INTERCEPT	0.057	0.234**	0.156
	(0.085)	(0.100)	(0.145)
MCAP/GDP	−0.028	−0.047	−0.075
	(0.036)	(0.051)	(0.046)
TOR	0.312***	0.334**	0.271*
	(0.101)	(0.137)	(0.149)
INFLATION	−0.198**	−0.188	−0.579
	(0.087)	(0.104)	(0.587)
BANK/GDP	0.148***	0.050	0.139***
	(0.047)	(0.064)	(0.043)
LAW AND ORDER	0.054***	0.062**	0.043**
	(0.019)	(0.024)	(0.020)
GOV. SUBS./GDP	−0.004	−0.012	−0.005
	(0.006)	(0.008)	(0.008)
NFA/TA	0.265	−0.005	0.317**
	(0.169)	(0.174)	(0.147)
GDP/CAP	−0.012**	−0.011**	−0.009*
	(0.005)	(0.006)	(0.005)
Adj. R^2	0.29	0.12	0.10
No. of Obs.	26	26	23

***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

mate the regressions, excluding the three highest inflation countries, Brazil, Mexico, and Turkey, and adjust for the effect of inflation on firms' assets and earnings for the remaining countries. Because we use ratios and not time series of levels data, we adjust for inflation that occurs within any year so that the firm's total assets and earnings at the beginning and at the end of a year can be compared. Thus, the value of the firm's total assets required to support sales at time $t + 1$ in time t dollars is given by

$$(\text{TA}_{t+1}/(1 + \pi) + \pi/(1 + \pi) * (\text{TA}_t - \text{DEP}_{t+1}), \tag{6}$$

where π is the rate of inflation between time t and $t + 1$ and DEP_t is the depreciation of the firm's long-term assets between t and $t + 1$. The second term is an adjustment for the fact that the firm's undepreciated assets continue on the firm's books at historical cost. Similarly, the firm's earnings between time t and $t + 1$ are reduced by π times DEP_{t+1} to account for the fact that the replacement value of assets is higher than their historical cost.

The inflation adjustments do not materially change the results obtained in Table V. The major difference is that the coefficient on the inflation variable is now no longer significant and the coefficient on NFA/TA, though not substantially changed in magnitude, becomes significant. A sample equation is shown in column (3) of Table VIII, where the equation reported in column (3) of Table V is reestimated using inflation-adjusted data.

V. Conclusion

In this paper we investigate whether specific differences in financial systems and legal institutions constrain firms to grow at rates no greater than those they could attain by relying on their internal resources or short-term borrowing.

Using a sample drawn from thirty developing and developed countries, we estimate a predicted rate at which each firm can grow if it relies on retained earnings and short-term credit only. We show that the proportion of firms that grow at rates exceeding this predicted rate in each country is associated with specific features of a country's legal and financial systems.

Our results show that both an active stock market and a well-developed legal system are important in facilitating firm growth. Firms in countries that have active stock markets and high ratings for compliance with legal norms are able to obtain external funds and grow faster. These findings are robust and provide firm-level support for the proposition that the development of financial markets and institutions facilitates economic growth, as advanced by King and Levine (1993) and Levine and Zervos (1998). Consistent with Levine and Zervos, we find that the size of the stock market by itself is not as important in mobilizing financing as is the level of activity of the market.

We also find that the reported return on capital is lower in countries with active stock markets and well-functioning legal systems. Thus, developed institutions not only permit firms to fund growth externally, but also may indirectly increase dependence on external financing by reducing firms' profits.

In our sample, we find no evidence that government subsidies to firms are associated with increases in the number of firms growing at rates that exceed the predicted rate. Government subsidies do not appear to promote economic environments in which firms obtain resources for financing growth from financial markets.

Appendix

The firm-level data source, number of firms, and sample period are given in Table A1.

Variable Definitions and Sources

Global Vantage

The variables are from the industry/commercial tape of the Global Vantage database, dated December 1995. Countries are selected for the sample if there are data on at least thirty-five firms. The data definitions and item numbers are:

$$\text{Investment}_t = \text{Total Assets}_t - \text{Total Assets}_{t-1} + \text{Depreciation}_t = \text{DA89}_t - \text{DA89}_{t-1} + \text{DA11}_t$$

$$\text{PERLTD}_t = ((\text{DA118} - \text{DA104})_t - (\text{DA118} - \text{DA104})_{t-1}/\text{Investment}_t$$

$$\text{PEREQ}_t = (\text{Investment}_t - (\text{DA21} - \text{DA23} - \text{DA34} + \text{DA11})_t - ((\text{DA118} - \text{DA104})_t - (\text{DA118} - \text{DA104})_{t-1}) - (\text{DA104}_t - \text{DA104}_{t-1}))/\text{Investment}_t$$

$$\text{LTD/TA}_t = (\text{Total Liabilities}_t - \text{Current Liabilities}_t)/\text{Total Assets}_t = (\text{DA118}_t - \text{DA104}_t)/\text{DA89}_t$$

$$\text{NFA/TA}_t = \text{Net Fixed Assets}_t/\text{Total Assets}_t = \text{DA76}_t/\text{DA89}_t$$

$$\text{PROFIT}_t = (\text{EBIT}_t + \text{Interest Expense}_t)/\text{Total Assets}_t = (\text{DA21}_t + \text{DA15}_t)/\text{DA89}_t$$

$$\text{DIVTA}_t = \text{Total Dividends}_t/\text{Total Assets}_t = \text{DA34}_t/\text{DA89}_t$$

$$\text{NS/NFA}_t = \text{Total Sales}_t/\text{Net Fixed Assets}_t = \text{DA1}_t/\text{DA76}_t$$

IFC's Corporate Database

We used all the countries in the IFC's corporate finance database. For firms in these countries variables were created according to the definitions given above.

Other Data Sources

Inflation is the annual inflation of the GDP deflator and is obtained from World Bank National Accounts.

Real GDP per capita and its growth rate are obtained from World Bank National Reports.

BANK/GDP is the ratio of domestic assets of deposit banks to GDP, obtained from the IMF, *International Financial Statistics*, various years. Do-

Table AI

Number of Firms and the Sample Period

Data are from the Global Vantage database, except the data for countries marked with an asterisk which are from IFC's Corporate Finance database.

	No. of Firms	Time Period		No. of Firms	Time Period
Australia	401	1983–91	Netherlands	165	1983–91
Austria	44	1983–91	New Zealand	41	1983–91
Belgium	89	1983–91	Norway	52	1983–91
Brazil*	100	1985–91	Pakistan*	100	1980–88
Canada	494	1983–91	Pakistan*	100	1980–88
Finland	55	1983–91	Singapore	213	1983–91
France	544	1983–91	Pakistan*	100	1980–88
Germany	359	1983–91	South Africa	67	1983–91
Hong Kong	173	1983–91	Spain	116	1983–91
India*	100	1980–90	Sweden	68	1983–91
Italy	81	1983–91	Switzerland	150	1983–91
Japan	1104	1983–91	Thailand	137	1983–91
Jordan*	38	1980–90	Turkey*	45	1982–90
Korea*	100	1980–90	United Kingdom	1275	1983–91
Malaysia	143	1983–91	United States	3247	1983–91
Mexico*	100	1984–91	Zimbabwe*	48	1980–88

mestic assets of deposit banks are given by the summation of IFS lines 22a through 22f.

The Law and Order indicator is obtained from ICRG, International Country Risk Guide.

Data on government subsidies to private and public enterprises are obtained from various issues of the *World Competitiveness Report*, The World Economic Forum & IMD International, Geneva, Switzerland.

The number of firms for each of the thirty sample countries and the time period studied for each country are presented in Table A1.

REFERENCES

Allen, Franklin, 1993, Stock markets and resource allocation; in Colin Mayer and Xavier Vives, eds.: *Capital Markets and Financial Intermediation* (Cambridge University Press, Cambridge, England).

Ball, Ray, 1995, Making accounting more international, *Journal of Applied Corporate Finance* 8, 19–29.

Brander, James A., and Tracy R. Lewis, 1986, Oligopoly and financial structure: The limited liability effect, *American Economic Review* 76, 956–970.

Demirgüç-Kunt, Asli, and Ross Levine, 1996, Stock market development and financial intermediaries: Stylized facts, *World Bank Economic Review* 10, 291–321.

Demirgüç-Kunt, Asli, and Vojislav Maksimovic, 1996a, Institutions, financial markets and firm debt maturity, *Journal of Financial Economics*, forthcoming.

Demirgüç-Kunt, Asli, and Vojislav Maksimovic, 1996b, Stock market development and firms' financing choices, *World Bank Economic Review* 10, 341–369.

de Soto, Hernando, 1989, *The Other Path: The Invisible Revolution in the Third World* (Harper and Row, New York).

Diamond, Douglas W., 1993, Bank loan maturity and priority when borrowers can refinance; in Colin Mayer and Xavier Vives, eds.: *Capital Markets and Financial Intermediation* (Cambridge University Press, Cambridge, England).

Diamond, Douglas W., 1996, Liquidity, banks and markets, Policy Research Working paper No. 1566, The World Bank.

Donaldson, Gordon, 1961, *Corporate Debt Capacity* (Division of Research Graduate School of Business, Harvard University, Boston, Mass.).

Fazzari, Steven M., R. Glenn Hubbard, and Bruce C. Petersen, 1988, Financing constraints and corporate investment, *Brookings Papers on Economic Activity* 19, 141–195.

Fitzgerald, Richard D., Alan D. Stickler, and Thomas R. Watts, 1979, *International Survey of Accounting Principles and Reporting Practices* (Price Waterhouse International, Butterworths, Ontario).

Higgins, Robert C., 1977, How much growth can a firm afford? *Financial Management* 6, 3–16.

Holmstrom, Bengt, and Jean Tirole, 1993, Market liquidity and performance monitoring, *Journal of Political Economy* 101, 678–709.

Kaplan, Steven N., and Luigi Zingales, 1996, Do investment-cashflow sensitivities provide useful measures of financing constraints, *Quarterly Journal of Economics* 112, 169–217.

King, Robert G., and Ross Levine, 1993, Finance and growth: Schumpeter might be right, *Quarterly Journal of Economics* 108, 717–738.

Knack, Stephen, and Phillip K. Keefer, 1995, Institutions and economic performance: Cross-country tests using alternative institutional measures, *Economics and Politics* 7, 207–227.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny, 1996, Law and finance, NBER Working paper 5661.

Levine Ross, and Sarah Zervos, 1998, Stock markets, banks, and economic growth, *American Economic Review* 88, 537–559.

Maksimovic, Vojislav, 1986, Optimal capital structure in a stochastic oligopoly, Unpublished doctoral dissertation, Harvard University.

Maksimovic, Vojislav, 1990, Product market imperfections and loan commitments, *Journal of Finance* 45, 1641–1653.

Myers, Stewart C., and Nicholas S. Majluf, 1984, Corporate financing and investment decisions when firms have information that investors do not have, *Journal of Financial Economics* 13, 187–221.

Price Waterhouse, 1993, *Doing Business in Turkey* (Price Waterhouse, Istanbul, Turkey).

Rajan, Raghuram, and Luigi Zingales, 1995, What do we know about capital structure? Some evidence from international data, *Journal of Finance* 50, 1421–1460.

Rajan, Raghuram, and Luigi Zingales, 1998, Financial dependence and growth, *American Economic Review* 88, 559–587.

Ross, Stephen A., Randolph W. Westerfield, and Bradford D. Jordan, 1995, *Fundamentals of Corporate Finance* (Richard D. Irwin, Chicago, Ill.)

Shleifer, Andrei, 1994, Establishing property rights, *World Bank Economic Review* 8, 93–117.

Williamson, Oliver E., 1988, Corporate finance and corporate governance, *Journal of Finance* 43, 567–91.

Williamson, Oliver E., 1994, The institutions and governance of economic development and reform, *World Bank Economic Review* 8, 171–197.

LINKED CITATIONS

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[3] Financial Dependence and Growth
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Stable URL:
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References

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James A. Brander; Tracy R. Lewis
The American Economic Review, Vol. 76, No. 5. (Dec., 1986), pp. 956-970.
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