

CORPORATE GOVERNANCE AND THE RETURNS ON INVESTMENT*

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ABSTRACT

We analyze the impact of corporate governance institutions and ownership structures on company returns on investment by using a sample of more than 19,000 companies from 61 countries across the world. We show that the origin of a country's legal system proves to be the most important determinant of investment performance. Companies in countries with a legal system of English origin earn returns on investment that are at least as large as their costs of capital. Companies in all countries with civil-law systems earn on average returns on investment below their costs of capital. Furthermore, differences in investment performance that are related to a country's legal system dominate differences that are related to ownership structure. We also present considerable evidence that managerial entrenchment worsens a company's investment performance.

I. INTRODUCTION

CONSIDERABLE interest has been shown in recent years in differences in corporate governance systems across countries. As recently as 10 years ago, some authors were claiming that the German and Japanese corporate governance systems were superior to the Anglo-Saxon systems of the United Kingdom and United States.¹ However, more recent evaluations have claimed

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¹ See, for example, Mark Roe, *Some Differences in Corporate Structure in Germany, Japan, and the United States*, 102 *Yale L. J.* 1927 (1993); and Jonathan Charkham, *Keeping Good Company* (1994).

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superiority for the Anglo-Saxon model of corporate governance.² One recent study has even claimed that corporate governance structures in Asian countries are so weak that they contributed significantly to the “Asian crisis” of the late 1990s.³

A focal point of much of the literature has been on the extent to which corporate governance institutions reduce agency problems in companies and thereby align the interests of managers and shareholders.⁴ Weak corporate governance systems allow managers to pursue their own goals at the shareholders’ expense. Although a variety of managerial goals have been put forward, much of the literature has emphasized the pursuit of growth or empire building by managers.⁵ Growth-oriented managers will overinvest and pay out less than the share-price-maximizing level of dividends. Accordingly, many tests for the effectiveness of corporate governance in aligning managers’ and shareholders’ interests have compared measures of performance such as dividend payouts and Tobin’s q that are related to investment decisions.⁶

Both dividend payments and Tobin’s q have disadvantages, however, as measures of the magnitude of agency problems. The optimal dividend payout depends on both the cash flows of a firm and its investment opportunities. The optimal payout for a firm with very attractive investment opportunities could be zero, while for another firm with similar size and cash flows but modest investment opportunities, a positive payout maximizes share price. Tobin’s q equals the ratio of the return on a firm’s total capital to its cost

² Rafael La Porta *et al.*, Agency Problems and Dividend Policies around the World, 55 J. Fin. 1 (2000).

³ Simon Johnson *et al.*, Corporate Governance in the Asian Financial Crisis, 58 J. Fin. Econ. 141 (2000).

⁴ For surveys of the corporate governance literature, see Andrei Shleifer & Robert Vishny, A Survey of Corporate Governance, 52 J. Fin. 737 (1997); and Klaus Gugler, Dennis C. Mueller, & B. Burcin Yurtoglu, Corporate Governance and Globalization, 20 Oxford Rev. Econ. Pol’y 129 (2004).

⁵ See, for example, William J. Baumol, Business Behavior, Value and Growth (1959); Robin Marris, The Economic Theory of Managerial Capitalism (1964); Robin Marris, Managerial Capitalism in Retrospect (1998); and Dennis C. Mueller, A Theory of Conglomerate Mergers, 83 Q. J. Econ. 643 (1969). For recent applications of this hypothesis, see René Stulz, Managerial Discretion and Optimal Financing Policies, 26 J. Fin. Econ. 3 (1990); and David J. Denis, Diane K. Denis, & Atulya Sarin, Agency Problems, Equity Ownership, and Corporate Diversification, 52 J. Fin. 135 (1997).

⁶ See, for example, La Porta *et al.*, *supra* note 2; Mara Faccio, Larry H. P. Lang, & Leslie Young, Dividends and Expropriation, 91 Am. Econ. Rev. 54 (2001); Klaus Gugler & B. Burcin Yurtoglu, Corporate Governance and Dividend Pay-out Policy in Germany, 47 Eur. Econ. Rev. 731 (2003); Randall Morck, Andrei Shleifer, & Robert Vishny, Management Ownership and Market Valuation: An Empirical Analysis, 20 J. Fin. Econ. 293 (1988). Other studies of corporate governance have used more macroeconomic measures of economic performance such as economic growth. Asli Demirgüç-Kunt & Vojislav Maksimovic, Law, Finance, and Firm Growth, 53 J. Fin. 2107 (1998); Raghuram Rajan & Luigi Zingales, Financial Dependence and Growth, 88 Am. Econ. Rev. 559 (1998).

of capital and as such is a measure of average performance.⁷ It thus confounds inframarginal and marginal returns and is less than ideal for testing hypotheses regarding managerial behavior. Tobin's q might be high, for example, because a firm has considerable market power, which in turn could provide its managers the "free cash flow" to pursue their own goals. An ideal measure of investment performance for testing hypotheses about agency problems should identify marginal returns. We employ such a measure—the ratio of a firm's returns on investment to its costs of capital, which we call marginal q . Marginal q correctly identifies overinvestment whatever a firm's investment opportunities and cash flows are.

In testing for the effects of corporate governance institutions on investment performance, we focus on two sets of institutions: (1) the corporate governance structure of a country as defined by its legal system, for example, rules governing takeovers, the composition and election of boards of directors, and so on, and (2) the ownership structure of a company. These institutions determine how closely a manager's goals are aligned with those of the owners of a firm and thus the extent to which a firm's investment performance may suffer from agency problems. We present evidence that both sets of institutions can affect the investment performance of companies in a given country.

We proceed as follows: The main hypotheses tested are developed in Section II. Section III describes the methodology employed to measure returns on investment and test the different hypotheses. The data used in these tests are discussed in Section IV. The results regarding the effects of corporate governance and ownership structures are presented in Section V. Section VI presents tests of the impact of capital market constraints on the returns on investment from different sources of finance. Here we also analyze the effects of accounting standards and creditor rights on investment performance. We check the robustness of our measure of marginal q in Section VII. Conclusions are drawn in Section VIII.

II. MAIN HYPOTHESES

A. *Legal Institutions and Returns on Investment*

A firm that maximizes shareholder wealth invests up until the point at which the marginal return on investment equals its cost of capital. In our empirical work, we measure a marginal Tobin's q , q_m , where $q_m = r/i$ with r the return on a firm's investment and i its cost of capital. Since the average return on investment should be equal to or greater than the marginal return, we predict $q_m \geq 1$ for a firm that maximizes shareholder wealth.

⁷ Let k be a permanent return on a firm's total assets K and i be its cost of capital. Then its profits in any year are $\pi = kK$, and its market value is $M = \pi/i$. Tobin's q is thus $q = M/K = (\pi/i)/K = (kK/i)/K = k/i$.

We define a strong corporate governance system as one that aligns managerial and shareholder interests and thus leads managers to maximize shareholder wealth. Managerial and shareholder interests are more likely to be aligned when it is easy to monitor managers and initiate proxy fights or hostile takeovers. Rafael La Porta and his coauthors have categorized the legal environments of countries according to the protections of this sort that they give to shareholders.⁸ We employ their categorization as a measure of the strength of a country's corporate governance system and use it to test the following:

HYPOTHESIS 1. For companies located in countries with strong corporate governance systems, $q_m \geq 1$.

Weak corporate governance systems allow managers to pursue their own goals. If these include the pursuit of size and growth instead of shareholder wealth, the firm invests too much, and we expect $q_m < 1$. Some firms have attractive investment opportunities and limited financial resources, however, and both their managers and their shareholders benefit from their achieving high investment rates and rapid growth. For these companies, no conflict exists between managers and shareholders over dividend and investment policies. This consideration leads us to qualify our prediction for weak corporate governance systems.

HYPOTHESIS 2. For companies with limited investment opportunities that are located in countries with weak corporate governance systems, $q_m < 1$.

B. Legal Institutions, Ownership Structures, and Returns on Investment

Of necessity, a manager's interests are aligned with those of a shareholder if the shareholder and manager are one and the same. Thus, a necessary condition for a conflict of interest between managers and shareholders is for there to be a separation of ownership from control, and all early contributions to the managerial discretion literature cited Adolf Berle and Gardener Means⁹ to this effect. This literature implicitly assumed that when ownership was concentrated, either the managers themselves or an outside family held the controlling stake in the firm. In either case, the owners were assumed to want the managers to maximize their wealth, and thus manifestations of managerial discretion, such as low returns on investment, would be observed only when share ownership was widely dispersed. This hypothesis is tested by comparing q_m for companies with widely dispersed ownership with q_m for other companies in countries with strong corporate governance structures.

HYPOTHESIS 3. In countries with strong corporate governance systems,

⁸ Rafael La Porta *et al.*, Legal Determinants of External Finance, 52 J. Fin. 1131 (1997); and Rafael La Porta *et al.*, Law and Finance, 106 J. Pol. Econ. 1113 (1998).

⁹ Adolf A. Berle & Gardener C. Means, *The Modern Corporation and Private Property* (1932).

companies with widely dispersed shareholdings have lower q_m than the other companies in their country group.

Joseph Schumpeter¹⁰ was perhaps the first economist to postulate that managers are empire builders. Schumpeter did not put forth this assumption to explain the actions of Berle-Means managers who own small fractions of shares, however, but as a description of the goals of the owner-entrepreneurs who founded the giant enterprises that appeared in the late nineteenth and early twentieth centuries, individuals whom he likened to “medieval knights” seeking to found “dynasties.” The intrinsic rewards from running a giant enterprise may appeal to professional and owner-managers alike. Moreover, the persons typically classified as owner-managers do not own all of the company’s outstanding shares. Thus, a manager/shareholder conflict still is possible with respect to the interests of minority shareholders. In addition, in countries where takeovers and proxy contests are relatively easy to initiate, a manager’s immunity to such attacks increases with her shareholdings.¹¹ Thus, a priori it would seem that managers’ incentive to maximize shareholder wealth might increase or decline with their shareholdings. Consistent with this ambiguity, the literature has produced a wide range of estimates of the relationship between company performance and both shareholder identities and the size of their shareholdings.¹² These considerations lead us to conclude that no simple predictions can be made about the values for q_m for companies controlled by individuals or families in countries with strong institutional protections of minority shareholders.

In countries with weak protections, the situation is somewhat different. First of all, in these countries we do not expect to observe as many companies with dispersed share ownership as we do in countries with strong protection of minority shareholders. Investors will be unwilling to bid large sums for shares when they know that they can be exploited by the dominant shareholders, and the owner-founders will therefore not issue many shares.¹³ When one observes a company with widely dispersed ownership in a country whose legal institutions do not protect minority shareholders, one must assume that the company had sufficiently attractive investment opportunities or that the original dominant owners were somehow able to bond themselves not to

¹⁰ Joseph Schumpeter, *Theorie der Wirtschaftlichen Entwicklung* (1911); and Joseph Schumpeter, *The Theory of Economic Development* (1934).

¹¹ See Eugene Fama & Michael Jensen, Separation of Ownership and Control, 26 *J. Law & Econ.* 301 (1983).

¹² For surveys, see George Benston, The Self-Serving Management Hypothesis: Some Evidence, 7 *J. Acct. & Econ.* 67 (1985); and Helen Short, Ownership, Control, Financial Structure and the Performance of Firms, 8 *J. Econ. Surveys* 203 (1994).

¹³ For further discussion and evidence, see Franco Modigliani & Enrico Perotti, Protection of Minority Interest and the Development of Security Markets, 18 *Managerial & Decision Econ.* 519 (1997); Stijn Claessens, Simeon Djankov, & Larry H. P. Lang, The Separation of Ownership and Control in East Asian Corporations, 58 *J. Fin. Econ.* 81 (2000); and Gugler & Yurtoglu, *supra* note 6.

exploit minority shareholders so that they were able to issue many shares. These firms can be expected to earn relatively high returns on investment, and thus we obtain the following:

HYPOTHESIS 4. In countries with weak corporate governance systems, companies with widely dispersed shareholdings have higher q_m values than the other companies in their country group.

Although the existing literature leads to the prediction that individually controlled companies have higher returns on investment than other companies in countries with strong corporate governance systems, no similar prediction can be made for individually controlled companies in countries with weak corporate governance systems. All companies in our sample have issued common shares that are traded on organized securities markets. The individual or family who controls a company that we have categorized as individually controlled owns the largest block of the company's shares, but not all of them. Any funds distributed to all shareholders must thus be shared with other shareholders. Thus, if it is possible, the individual or family who controls a company may try to appropriate company funds in ways that do not add value to the company's shares. Weak corporate governance systems provide greater scope for the exploitation of minority shareholders by the dominant shareholder and make it impossible to predict whether individually controlled companies in countries with weak corporate governance systems will exhibit superior investment performance.¹⁴

Similar difficulties arise in trying to hypothesize about the relative performance of companies falling into the remaining three ownership categories that we identified: firm controlled, finance controlled, and state controlled, where by finance controlled we mean controlled by a bank, insurance company, or some other financial institution. For example, it is reasonable to expect that those in control of any firm A, even if they are empire builders, will want the managers of any firm B that A controls to maximize its profits because this provides more funds for A to pursue the goals of those who control it, whatever they may be. Thus, we might expect higher returns on investment for firms that are controlled by other companies.

On the other hand, there are several reasons why companies lower down in a pyramid may exhibit poor investment performance: (1) the families standing behind these pyramids are empire builders who are willing to sacrifice profits at all levels of the pyramid in pursuit of their goals, (2) the pyramid's size makes careful monitoring of lower-level firms difficult, and (3) the performance of lower-level firms is sacrificed to benefit the firm at

¹⁴ For evidence that dominant owners do exploit minority shareholders in countries with weak corporate governance systems, see Craig Doidge, Andrew G. Karolyi, & René M. Stulz, *Why Are Foreign Firms Listed in the U.S. Worth More?* 71 *J. Fin. Econ.* 205 (2004).

the top of the pyramid.¹⁵ Given these conflicting possibilities, we think that it is impossible to make specific predictions regarding the investment performance of companies controlled by other companies. We do, however, test whether this ownership category is associated with systematic differences in investment performance by examining the effects of cross ownership and corporate pyramids separately.

Predicting the effects of financial control on investment performance is equally difficult. Banks and other financial institutions are also susceptible to agency problems between their managers and ultimate owners. Merger activity in the banking sector of the United States and Europe in recent years suggests that some bank managers also find empire building attractive. Bank managers may condone and even finance the aggressive expansion programs of firms they control so long as they can pay the interest on debt owed to the bank, since the bank's growth is positively linked to that of these firms. Thus, companies controlled by financial institutions might not perform any better than other companies. Germany's strong economic performance during the first quarter-century following World War II has often been attributed to wise advice and careful monitoring of the private sector provided by its major banks and other financial institutions. However, many observers now think that the role of banks in Germany has been exaggerated.¹⁶ Some observers even blame major banks in Asia for making the "crisis" of the late 1990s worse than it would have been.¹⁷ We shall test for any systematic effects of control by financial institutions on company investment performance but make no predictions as to what this effect should be.

A double principal-agent problem exists for state-controlled firms. Their ultimate owners are the citizens. The same free-rider logic that makes shareholders poor monitors of managers when shares are widely dispersed makes citizens poor monitors of politicians. Thus, citizens are unlikely to hold politicians accountable for the poor investment performance of a state-owned company, and elected politicians may not exert great effort in monitoring these companies. On the other hand, state-controlled firms are often located in key economic sectors and possess dominant market positions. These favorable circumstances might create sufficiently attractive investment opportunities for state-controlled companies to offset the inefficiencies caused by agency problems. We again leave it to the data to sort out these conflicting tendencies.

¹⁵ For examples and discussion, see Klaus Gugler, ed., *Corporate Governance and Economic Performance* (2001).

¹⁶ See Jeremy S. S. Edwards & Klaus Fischer, *Banks, Finance and Investment in Germany* (1994); and Ekkehart Boehmer, *Germany*, in Gugler ed., *supra* note 15, at 110.

¹⁷ See Michael Backman, *Asian Eclipse: Exposing the Dark Side of Business in Asia* (1999); and *Why Did Asia Crash?* *Economist*, January 10, 1998, at 66.

C. *Returns on Investment out of Different Sources of Finance*

Consider Figure 1. Investment outlays are given along the horizontal axis and marginal returns on investment (mrr) and the cost of capital, i , along the vertical axis. A firm with marginal returns on investment of mrr_H and internal cash flows (CF) maximizes shareholder wealth by investing I_H and raising $(I_H - CF)$ on the external capital market. Its $mrr = i$, and its average return on investment, r , will be greater than i , making $q_m = r/i > 1$.

Thus, for firms that maximize shareholder wealth, their returns on total investment should be greater than their costs of capital, and this relationship should hold regardless of the source of investment funds. We shall use subscripts to designate sources of investment funds: $q_{m,I}$ is the ratio of r to i for total investment, $q_{m,CF}$ is the ratio of r to i for investment out of cash flow, $q_{m,D}$ is the ratio of r to i for investment out of new debt, and $q_{m,E}$ is the ratio of r to i for investment out of new equity.

We then have the following:

HYPOTHESIS 5. For companies with $q_{m,I} \geq 1$, it is also true that $q_{m,CF} \geq 1$, $q_{m,D} \geq 1$, and $q_{m,E} \geq 1$.

Now consider a firm with the marginal returns on investment schedule mrr_L . It maximizes shareholder wealth by investing I_L and paying $(CF - I_L)$ in dividends. If its managers wish to grow faster than the rate implied by this investment, they of course invest more than I_L . As I increases, mrr falls below i . If the firm were to invest all of its cash flow, its return on investment would be k , which could also be regarded as the implicit cost of internal capital. Should it wish to invest still more, it would have to enter the external capital market. Should it choose to issue equity to finance additional investment, under the assumption of capital market efficiency, its share price will fall as soon as it announces the sale of equity to reflect the fact that it is investing at an r less than i .¹⁸ Thus, the change in market value from the sale of equity will be less than the value of the equity sold, and $q_{m,E} < 1$.

The use of debt to finance investments with $r < i$ should also result in an immediate fall in share price as the market realizes that the fixed commitment to pay interest on the debt will reduce the funds available for future dividends when $r < i$. Since a bank loan or bond constitutes a more specific commitment with ostensibly greater penalties for breaking this commitment, we expect that firms will prefer to issue equity rather than debt to finance investments with low expected returns. This leads to the following predictions:

HYPOTHESIS 6. For companies with $q_{m,I} < 1$, $1 > q_{m,D} > q_{m,CF}$ and $q_{m,D} > q_{m,E}$.

Thus, in countries with weak capital market discipline, we predict a hi-

¹⁸ The announcement of new equity issues is often accompanied by immediate share-price declines; see, for example, Ronald W. Masulis & Ashok N. Korwar, *Seasoned Equity Offerings: An Empirical Investigation*, 15 *J. Fin. Econ.* 91 (1986).

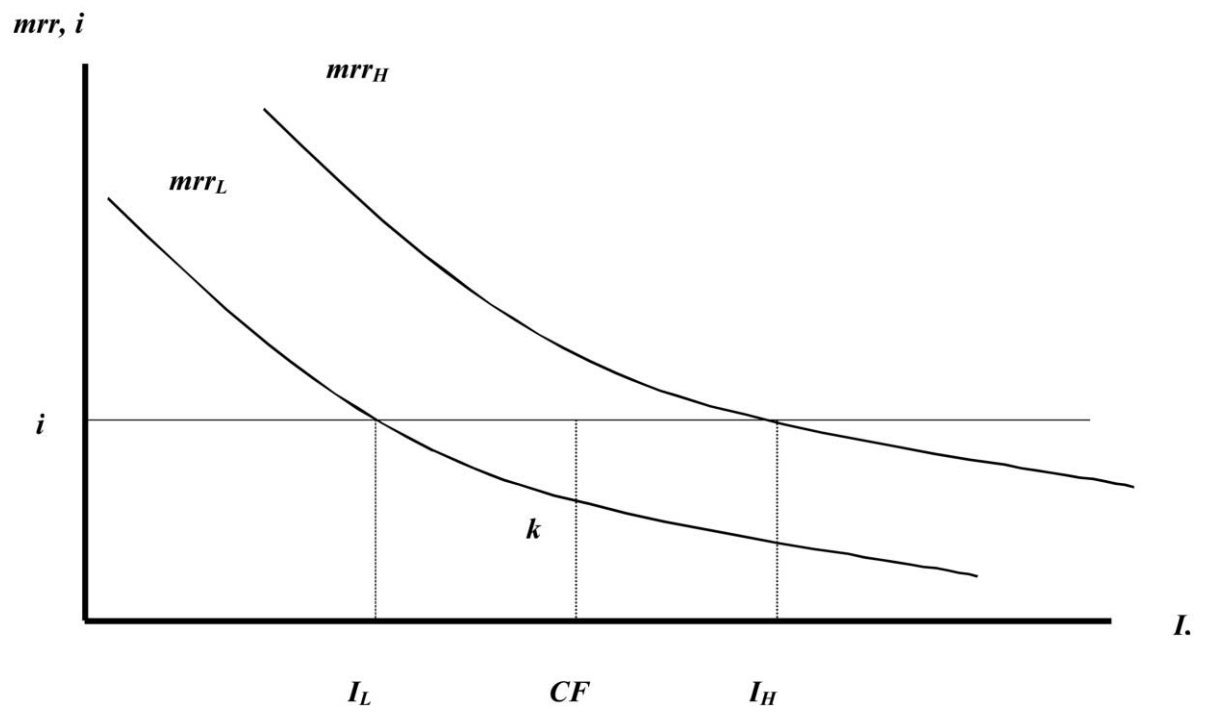


FIGURE 1.—Investment consistent with shareholder wealth maximization

erarchy in the returns on investment that differs from that usually assumed to hold for the costs of capital. The weakness of the implicit contract between managers and equity holders compared with the contractual relationship between debt holders and managers produces higher returns for investments out of new debt issues than for those made out of new equity issues and cash flows.

III. METHODOLOGY¹⁹

Let I_t be a firm's investment in period t , CF_{t+j} be the cash flow this investment generates in $t+j$, and i_t be the firm's discount rate in t . The present value (PV) of this investment is then given by

$$PV_t = \sum_{j=1}^{\infty} \frac{CF_{t+j}}{(1+i_t)^j}. \quad (1)$$

For example, a given investment of 100 might produce a future stream of cash flow with a present value of 129.43. We can then take this value for PV_t from equation (1) and the investment I_t that created it and calculate the ratio of pseudopermanent return r_t to i_t , which we call $q_{m,t}$:

$$PV_t = \frac{I_t r_t}{i_t} = q_{m,t} I_t. \quad (2)$$

If the firm had invested the same amount I_t in a project that produced a permanent return r_t , this project would have yielded the exact same present value as the one actually undertaken. The ratio of r_t to i_t is the key statistic in our analysis. If a firm maximizes shareholder wealth, then it undertakes no investment for which $q_{m,t} < 1$.

The market value of the firm at the end of period t can be defined as

$$M_t = M_{t-1} + PV_t - \delta_t M_{t-1} + \mu_t, \quad (3)$$

where δ_t is the depreciation rate for the firm's total capital as evaluated by the capital market and μ_t is the market's error in evaluating M_t . Subtracting M_{t-1} from both sides of equation (3) and replacing PV_t with $q_{m,t} I_t$ yields

$$M_t - M_{t-1} = q_{m,t} I_t - \delta_t M_{t-1} + \mu_t. \quad (4)$$

That $q_{m,t}$ is a marginal q can easily be seen from equations (2) and (4) by contrasting it with Tobin's q . Tobin's q is the market value of the firm divided by its capital stock and thus is an average return on capital. Marginal q is the change in the market value of a firm divided by the change in the capital stock (investment) that caused it.

If $\delta_t = 0$ and a firm invests 100 at an r_t greater than i_t , then equation (4)

¹⁹ The methodology was developed by Dennis C. Mueller & Elizabeth Reardon, Rates of Return on Corporate Investment, 60 S. Econ. J. 430 (1993).

implies that its market value increases by more than 100. (With $I_t = 100$ and $PV_t = 129.43$, $q_{m,t} = 1.2943$.) Conversely, if $\delta_t = .05$ and $M_{t-1} = 1,000$, then the firm must invest 50 at an r_t equal to i_t just to keep its market value unchanged.

Two additional features of $q_{m,t}$ are worth noting. First, its use as a measure of performance obviates the need to calculate company costs of capital. Equations (2) and (4) define the ratio of a company's return on investment to its cost of capital, which is precisely the statistic needed to test hypotheses about agency problems and the effects of corporate governance on investment performance. Second, the procedure for calculating $q_{m,t}$ allows for different degrees of risk across companies. The stock market will demand a greater future stream of cash flows from an investment of 100 before it raises the market value of a high-risk company by 100 than it demands of a low-risk company.

The assumption of capital market efficiency implies that the error term in equation (4) has an expected value of zero and thus that equation (3) can be used to estimate both δ_t and $q_{m,t}$ under the assumption that they are either constant across firms or over time or both. Dividing both sides of equation (4) by M_{t-1} yields

$$\frac{M_t - M_{t-1}}{M_{t-1}} = -\delta + q_m \frac{I_t}{M_{t-1}} + \frac{\mu_t}{M_{t-1}}. \quad (5)$$

Equation (5) is favored over other possible rearrangements of equation (4) because it does not involve a lagged dependent variable and in cross-section regressions is less likely to be subject to heteroskedasticity owing to the deflation of the error terms by M_{t-1} .²⁰

To estimate equation (5), we need data on the market value of each firm and its investments. A firm's market value at the end of year t , M_t , is defined as the market value of its outstanding shares at the end of t plus the value of its outstanding debt. Since this number reflects the market's evaluation of

²⁰ Although both the market value of the firm, M , and its investment, I , carry a t subscript, equation (5) does not suffer from a simultaneous equation bias; M_t is a company's market value at the end of year t , while I_t is the investment flow over year t . Thus, I_t is measured before M_t and can be treated as exogenous. A possible bias in estimating the returns on investment relative to the cost of capital using equation (5) arises if the market anticipates the investments to be made in the future and the returns on them. Equation (5) accurately estimates q_m , even if the market correctly anticipates these investments at $t - 1$, if the expected returns on future investments equal a company's cost of capital ($r = i$). The methodology will yield lower (higher) estimates of q_m and δ if at $t - 1$ the market correctly anticipates investment at t with returns $r > i$ ($r < i$). See Dennis C. Mueller & B. Burcin Yurtoglu, Country Legal Environments and Corporate Investment Performance, 1 German Econ. Rev. 187 (2000), for a detailed discussion and evidence that there is no systematic bias in our estimates.

the firm's total assets, we wish to use an equally comprehensive measure of investment. Accordingly, we define investment as

$$I = \text{after-tax profits} + \text{depreciation} - \text{dividends} \\ + \Delta D + \Delta E + \text{R\&D} + \text{ADV},$$

where ΔD and ΔE are funds raised using new debt and equity issues. Since research and development (R&D) and advertising expenditures (ADV) are also forms of investment that can produce "intangible capital" that contributes to a company's market value, we add them to investment to obtain a measure of the firm's additions to its total capital.

IV. THE DATA

The financial data are taken from the 1996–2001 versions of the Global Vantage and 1997 version of the Compustat databases of Standard and Poor's. These data sets contain accounting and stock price data on companies with listed stocks from virtually every country in the world starting in 1985. We exclude banks and financial companies and some service industries (Standard Industrial Classifications (SICs) 6000 through 6999 and above 8100) because the nature of capital and investment in these industries is not comparable to those of nonfinancial firms. To minimize the weight of outliers, we cap our basic variables at both the first and 99th percentiles of each country sample. After this procedure, we are left with 19,010 companies. In many countries and for many companies, data were not available for all 16 years. Table 1 reports the number of firms, time period coverage, and total number of observations for each of the 46 countries, which we group according to the classification of La Porta and coworkers,²¹ and for China, nine transition countries, and five African countries. It also reports the means and standard deviations of the main variables that were used in our analysis. In an appendix (which is available on request from the authors), we detail the construction of the variables.

Our ownership data come mainly from three sources: the AMADEUS database for the European companies, Compact Disclosure for the United States, and the *Asian (Japanese) Company Handbook* for Asia. The remaining data sources on ownership structure are listed in the Appendix.

V. TESTS OF HYPOTHESES REGARDING CORPORATE GOVERNANCE AND OWNERSHIP STRUCTURES

A. *The Effects of Country Legal Systems*

Our model assumes that the stock market makes unbiased estimates of the value of a firm's total assets at the end of $t - 1$ and t . All changes in the

²¹ La Porta *et al.*, *supra* note 8.

firm's market value during year t are therefore due to either its investment during this year or the depreciation in the value of its total assets. Stock markets are notoriously volatile, however,²² and it is thus possible that annual changes in company market values are affected by general shifts in market sentiment that change the market's estimation of the value of assets in place. To correct for these swings in sentiment, we use yearly deviations from country sample means for each variable in the regression, a procedure that removes country-specific year effects from the equation.

The intercept in equation (5), δ , is an estimate of the depreciation rate, that is, the expected fall in a company's market value in any given year when no investment takes place. Depreciation rates vary across companies depending on the kinds of capital they possess. To allow for these differences, each company is assigned to a two-digit SIC industry, and separate intercepts (depreciation rates) are estimated for each industry. As a group, the industry intercepts were statistically significant but provided no interesting economic insights and are not reported in any of the tables.

Table 2 presents the results for our tests of hypotheses 1 and 2 using all available data for each country from 1985 through 2000. There are 112,590 observations, and the model explains about 25 percent of the variation in annual changes in company market values. La Porta and coauthors²³ argue that countries with Anglo-Saxon legal systems have the strongest corporate governance systems, followed in order by countries with legal systems of Scandinavian, German, and French origin. Our estimates of returns on investment as a fraction of costs of capital, our \hat{q}_m values, match this prediction. Countries with Anglo-Saxon legal systems have a \hat{q}_m of 1.02, the highest value of any country group. The average firm in every other country group earned a return on investment significantly less than its cost of capital with the estimates falling in line with La Porta and his coauthors'²⁴ predictions. The best performers were the Scandinavian countries, with a \hat{q}_m of .78, followed by the Germanic group ($\hat{q}_m = .74$), with the average firm in a country with a French legal system having a return on investment of only 59 percent of its cost of capital. The differences in estimated q_m values across the four legal systems are highly significant ($F(3, 112,558) = 148.16$).

We also report \hat{q}_m values for pooled groups of transition and African countries. The estimated returns on investment are 64 percent of company costs of capital for transition countries. This low figure is consistent with the general impression that corporate governance structures in transition countries do not afford shareholders much protection against managers but

²² See Robert J. Shiller, Do Stock Prices Move Too Much to Be Justified by Subsequent Movements in Dividends? 71 *Am. Econ. Rev.* 421 (1981); and Robert J. Shiller, *Irrational Exuberance* (2000).

²³ La Porta *et al.*, *supra* note 8.

²⁴ *Id.*

TABLE 1
SUMMARY STATISTICS AND SAMPLE COMPOSITION BY COUNTRY, 1985– 2000

Country	Sample Period	Number of Firms	$(M_t - M_{t-1})/M_{t-1}$		Investment/ M_{t-1}		CF_t/M_{t-1}		$\Delta Debt_t/M_{t-1}$		$\Delta Equity_t/M_{t-1}$	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
English origin:												
Australia	1985–2000	346	.127	.508	.154	.250	.040	.128	.015	.147	.060	.152
Bermuda	1985–2000	215	.087	.519	.148	.264	.048	.149	.008	.172	.040	.109
Canada	1985–2000	1,478	.165	.528	.165	.244	.050	.121	.025	.164	.057	.137
Cayman Islands	1985–2000	42	.169	.602	.154	.273	.058	.202	.019	.193	.049	.131
Great Britain	1985–2000	1,331	.116	.434	.180	.241	.063	.087	.016	.122	.049	.159
Hong Kong	1985–2000	127	.090	.464	.132	.232	.045	.104	.020	.159	.042	.127
India	1988–2000	246	.084	.487	.152	.211	.057	.058	.002	.103	.041	.131
Ireland	1985–2000	63	.183	.512	.201	.276	.061	.086	.038	.166	.057	.144
Israel	1985–1999	56	.271	.708	.171	.228	.028	.122	.033	.153	.042	.114
Malaysia	1985–2000	381	.192	.564	.137	.237	.045	.083	.024	.145	.034	.135
New Zealand	1985–2000	66	.058	.361	.110	.246	.053	.077	.000	.169	.023	.101
Pakistan	1993–2000	46	-.047	.302	.236	.349	.097	.135	-.013	.168	.013	.060
Singapore	1985–2000	208	.125	.504	.126	.188	.049	.070	.014	.127	.031	.100
South Africa	1985–2000	118	.098	.511	.1541	.1845	.091	.089	.007	.101	.025	.089
Thailand	1986–2000	243	.054	.463	.181	.285	.068	.124	.017	.162	.047	.176
United States	1985–2000	8,591	.124	.510	.149	.234	.040	.129	.023	.156	.026	.115
Total	1985–2000	13,557	.127	.504	.155	.237	.046	.122	.022	.152	.035	.127
Scandinavian origin:												
Denmark	1985–2000	101	.055	.371	.199	.249	.085	.073	.006	.118	.032	.149
Finland	1985–2000	79	.107	.414	.159	.210	.089	.076	-.004	.141	.024	.102
Norway	1985–1999	103	.113	.464	.178	.243	.070	.090	.017	.158	.039	.120
Sweden	1985–2000	156	.136	.437	.192	.271	.078	.067	.004	.141	.052	.192
Total	1985–2000	439	.104	.424	.184	.248	.080	.077	.006	.140	.038	.150

German origin:												
Austria	1985–2000	82	.024	.368	.215	.287	.107	.105	.019	.165	.031	.149
Germany	1985–2000	425	.056	.350	.233	.263	.107	.112	.011	.133	.026	.111
Japan	1985–2000	2,219	.064	.343	.111	.147	.035	.046	.022	.102	.018	.061
South Korea	1988–1999	82	.310	.487	.316	.329	.066	.152	.138	.277	.032	.058
Switzerland	1985–2000	160	.109	.375	.205	.260	.099	.092	.003	.140	.025	.127
Taiwan	1988–1999	126	.067	.453	.154	.190	.041	.047	.026	.089	.062	.148
Total	1985–2000	3,094	.067	.351	.138	.188	.050	.071	.021	.114	.021	.080
French origin:												
Argentina	1989–2000	24	.046	.361	.257	.318	.128	.188	.055	.154	.030	.180
Belgium	1985–2000	79	.082	.359	.234	.319	.101	.078	.012	.153	.020	.095
Brazil	1989–2000	133	.127	.624	.120	.317	.058	.203	-.006	.107	.021	.156
Chile	1988–1999	73	.082	.426	.160	.167	.086	.074	.030	.106	.028	.090
Colombia	1989–1999	15	-.009	.530	.175	.215	.100	.119	.017	.119	.031	.105
France	1985–2000	495	.085	.370	.227	.271	.101	.094	.005	.147	.032	.115
Greece	1988–1999	49	.560	.679	.443	.453	.086	.065	.038	.139	.286	.433
Indonesia	1989–1999	132	.136	.551	.185	.305	.044	.134	.044	.181	.055	.182
Italy	1985–2000	150	.066	.351	.183	.252	.096	.082	.006	.170	.027	.105
Luxembourg	1986–2000	12	.126	.450	.190	.185	.094	.088	.046	.144	.028	.120
Mexico	1986–1999	81	.094	.464	.198	.247	.105	.125	.025	.136	.029	.121
Netherlands	1985–2000	174	.101	.373	.221	.233	.101	.075	.018	.124	.036	.143
Netherlands Antilles	1985–2000	19	.083	.392	.134	.206	.050	.099	.028	.128	.029	.099
Panama	1985–2000	4	.100	.356	.072	.117	.052	.038	.002	.115	.001	.024
Peru	1992–2000	20	.073	.522	.279	.376	.239	.304	-.005	.126	.014	.057
Philippines	1985–1999	83	.079	.526	.140	.259	.057	.126	.022	.220	.036	.097
Portugal	1988–1999	49	.115	.413	.248	.327	.100	.083	.023	.159	.044	.165
Spain	1985–1999	117	.099	.390	.207	.298	.087	.087	.010	.153	.064	.210
Turkey	1990–1999	29	.402	.814	.415	.418	.216	.212	.038	.121	.128	.274
Venezuela	1991–2000	10	-.121	.323	.106	.200	.085	.129	-.039	.164	.024	.063
Total	1985–2000	1,748	.100	.429	.210	.281	.093	.109	.014	.150	.039	.150
China	1994–1999	70	.034	.498	.279	.368	.125	.167	.046	.218	.022	.124
Transition countries ^a	1994–1999	85	.015	.473	.268	.320	.128	.157	.033	.203	.019	.069
African countries ^b	1994–1999	17	-.047	.373	.090	.266	.032	.143	.029	.173	.020	.070
All	1985–2000	19,010	.113	.474	.156	.234	.051	.114	.021	.146	.033	.122

^a The group of transition countries includes 85 firms from Czech Republic, Estonia, Croatia, Hungary, Lithuania, Poland, Romania, Russia, and Slovakia.

^b The group of African countries includes 17 firms from Gabon, Ghana, Kenya, Liberia, and Zambia.

TABLE 2
ESTIMATES OF RETURNS ON INVESTMENT (q_m) BY LEGAL SYSTEM AND COUNTRY

Country	\hat{q}_m	t -Value	$\hat{q}_m \neq 1^a$	N	Firms
A. Legal systems:					
English origin	1.02	111.34	.03	82,463	13,557
Scandinavian origin	.78	13.67	.00	2,120	439
German origin	.74	35.51	.00	19,496	3,094
French origin	.59	29.23	.00	8,246	1,818
Transition countries ^b	.64	4.3	.01	194	85
African countries ^c	.77	10.9	.00	71	17
B. Countries:					
English origin:					
Australia	.94	22.01	.20	2,342	346
Bermuda	.91	11.08	.27	821	215
Canada	1.16	46.27	.00	9,536	1478
Cayman Islands	.58	3.13	.02	161	42
Great Britain	.85	33.44	.00	9,402	1,331
Hong Kong	.78	8.92	.01	660	127
India	.8	8.2	.04	906	246
Ireland	1.1	13.87	.21	362	63
Israel	1.27	6.29	.18	179	56
Malaysia	.86	17.98	.00	1,809	381
New Zealand	.86	12.36	.05	328	66
Pakistan	.4	4.67	.00	105	46
Singapore	.97	10.31	.75	1,182	208
South Africa	1.07	5.11	.72	549	118
Thailand	.64	10.53	.00	1,328	243
United States	1.05	89.39	.00	52,793	8,591
Scandinavian origin:					
Denmark	.65	6.22	.00	532	101
Finland	.96	9.91	.69	420	79
Norway	1.04	12.64	.63	511	103
Sweden	.65	6.01	.00	657	156
German origin:					
Austria	.71	5.82	.02	461	82
Germany	.57	16.58	.00	2,740	425
Japan	.86	32.24	.00	14,874	2,219
South Korea	.7	9.01	.00	199	82
Switzerland	.64	7.79	.00	868	160
Taiwan	1.26	12.32	.01	354	126
French origin:					
Argentina	.78	5.09	.16	86	24
Belgium	.51	7.65	.00	467	79
Brazil	.25	4.09	.00	379	133
Chile	1.24	5.38	.29	214	73
Colombia	.43	2.66	.00	44	15
France	.57	16.51	.00	2,591	495
Greece	.54	4.5	.00	113	49
Indonesia	.84	9.5	.06	516	132
Italy	.64	13.27	.00	810	150
Luxembourg	.7	1.5	.52	56	12
Mexico	.5	5.01	.00	312	81
Netherlands	.69	9.83	.00	1,068	174
Netherlands Antilles	1.19	8.54	.17	88	19
Panama	1.25	6.09	.23	36	4
Peru	.11	.88	.00	45	20

TABLE 2 (Continued)

Country	\hat{q}_m	<i>t</i> -Value	$\hat{q}_m \neq 1^a$	<i>N</i>	Firms
Philippines	1	5.26	.98	249	83
Portugal	.46	4.43	.00	180	49
Spain	.54	10.1	.00	764	117
Turkey	.52	3.89	.00	75	29
Venezuela	.58	2.79	.04	32	10
Other origin:					
China	.45	3.96	.00	121	70

NOTE.—The table presents the results of estimating equation (5) by constraining (1) all companies in a country and (2) all companies in a country group defined by legal system to have the same return on investment relative to the cost of capital (q_m). We estimate (but do not report) 25 depreciation rates defined by two-digit Standard Industrial Classification codes. The first and second equations have adjusted R^2 values of .23 and .24, respectively. There are 112,590 observations. All *t*-values are robust to heteroskedasticity.

^a Significance level of a Wald test that the estimated q_m is different from 1.00.

^b The group of transition countries includes 85 firms from the Czech Republic, Estonia, Croatia, Hungary, Lithuania, Poland, Romania, Russia, and Slovakia.

^c The group of African countries includes 17 firms from Gabon, Ghana, Kenya, Liberia, and Zambia.

also suggests that corporate governance in transition countries is no weaker than in countries with French legal systems.

Most students of development would also probably not expect that corporate governance structures are particularly strong in Africa. The \hat{q}_m of .77 for the African countries, roughly the same as for the Scandinavian countries, is therefore somewhat surprising. Since most of the African countries in our sample are former British colonies, this result might be interpreted as indicating that the remnants of British legal institutions left from colonization offer shareholders some protection even in an otherwise unfriendly environment for capitalist firms.

In part B of Table 2, we present separate estimates of q_m for individual countries grouped again according to the La Porta and his colleagues'²⁵ categorization. Roughly the same picture emerges when we observe the \hat{q}_m values for the individual countries, as was seen for the entire groups. The countries with the strongest corporate governance systems—those with English origin and Scandinavian countries—have the lowest fractions of \hat{q}_m values significantly less than 1.0 (8/16 and 2/4).²⁶ In contrast, five of the six \hat{q}_m values for the German-origin and 14 of 20 for the French-origin countries are significantly less than 1.0.

The effects of the “Asian crisis” can also be seen when the results in part B are compared with earlier estimates of q_m by Dennis Mueller and Burcin Yurtoglu.²⁷ Using data up through 1996, they estimated $\hat{q}_m > 1.0$ for Hong Kong, Malaysia, Thailand, and Japan, while these countries all have values

²⁵ *Id.*

²⁶ We have added Bermuda and the Cayman Islands to the set of English-origin countries and Luxembourg to the French-origin group.

²⁷ Mueller & Yurtoglu, *supra* note 20.

of $\hat{q}_m < 1.0$ in our data. A split among the three Asian countries in the German-origin group and the three European ones was observed in the Mueller-Yurtoglu study and can still be seen in our results, despite the Asian crisis. Taiwan's \hat{q}_m is significantly greater than 1.0, and Japan's is much higher than either Switzerland's or Germany's \hat{q}_m . These differences might imply significant differences in legal institutions within the German-origin countries or differences in investment opportunities across these countries.²⁸

Other than this division within the German-origin group, we have not been able to discern any obvious geographic pattern to our estimates of investment performance besides that related to country legal systems. Many of the countries with low \hat{q}_m values are in Europe, but the differences in \hat{q}_m values in part B of Table 2 cannot be explained by a simple Europe/non-Europe dichotomy. Within Europe, the only three countries with \hat{q}_m values insignificantly different from 1.0 (Ireland, Norway, and Finland) are in La Porta and his colleagues'²⁹ two categories with the strongest corporate governance systems. Great Britain has the fourth highest \hat{q}_m values of the European countries. The nine lowest \hat{q}_m values for Europe belong to countries in the two lowest categories of La Porta and his colleagues'³⁰ (Germany, Switzerland, Belgium, France, Greece, Italy, Portugal, Spain, and Turkey).

Differences in investment opportunities may also explain why some of the \hat{q}_m values in countries with weak corporate governance systems (for example, Chile and Taiwan) are both greater than 1.0 and much higher than for other countries in these groups. It is perhaps worth pointing out that differences in investment opportunities cannot explain estimates of q_m that are significantly less than 1.0 in members of the Anglo-Saxon group such as Great Britain and New Zealand. If companies in these countries have poor investment opportunities, which is of course quite possible, this should lead to low levels of investment, if managers are maximizing shareholder wealth. Poor investment performance ($\hat{q}_m < 1$) can come about only if managers invest more than the amount that would maximize shareholder wealth.

The bottom of Table 2 presents the \hat{q}_m for China: .45. Corporate governance institutions in Communist China do not appear to do a very good job aligning manager and shareholder interests.

The sample of countries for which we have estimated investment performance is large and heterogeneous. This heterogeneity may lead the reader to question the legitimacy of the assumption of capital market efficiency underlying our methodology for estimating marginal q values. Although there undoubtedly are great differences across countries in the capabilities of in-

²⁸ Indeed, although differences in legal systems explain a respectable 48 percent of the variation in q_m values across the full sample of countries, this still implies that 52 percent of the variation is within-legal-system variation.

²⁹ La Porta *et al.*, *supra* note 8.

³⁰ *Id.*

vestors to estimate future returns on corporate investments, it is not obvious to us why these differences should result in systematic biases in the various capital markets' estimates as opposed to differences in the variances around unbiased estimates. We see no reason to expect that the capital markets in French-origin or transition economies continually underestimate the returns on company investments in these countries and that these biases account for our results. Indeed, if such a bias existed, it should soon disappear as the actual returns on investment become known and investors recognize their mistaken estimates and correct them. Thus, when they pass the usual tests for statistical significance, we believe that the results reported in Table 2 reliably reflect differences in investment performance across countries. Nevertheless, in Section VII, we present additional estimates of marginal q for each country that considerably relax the assumption of capital market efficiency.

B. *The Effects of Ownership Structures*

In Section II, we put forward several hypotheses that related investment performance to the ownership structure of a firm. These hypotheses are tested using equation (5) and allowing q_m to take on different values depending on both a company's country of origin and its ownership structure. Given the differences between the ownership structures for the three European and the three Asian countries with Germanic legal systems, we have divided the German-origin countries into European and Asian subgroups.³¹

Consistent with the existing literature, we have employed two ownership criteria for categorizing companies—the largest shareholder owns 10 percent or more of the company's shares, or 20 percent or more. The differences in results between the two definitions were modest, and thus in Table 3 we report only those for the 10 percent criterion. Under each origin heading are two entries. The first entry for each ownership category represents the point estimate of \hat{q}_m for that category. Thus, family-controlled firms in English-origin countries have a \hat{q}_m of 1.082, which is significantly greater than 1.0, as indicated by the p -value of a two-tailed test below this coefficient. The second entry is the \hat{q}_m for the remaining companies in that country group. Thus, the \hat{q}_m for all English-origin companies that were not family controlled is 1.019. The "greater than" or "less than" symbols separating these two numbers indicates that the first entry is greater than the second or the second is greater than the first, and the number below the inequality is the level of significance of this difference. Entries in square brackets indicate differences significant at the 5 percent level (two-tailed test).

What stands out first in Table 3 is that all \hat{q}_m are greater than 1.0 for the

³¹ The three Asian countries have a much larger fraction of companies with dispersed ownership structures than do the European countries.

TABLE 3
EFFECTS OF OWNERSHIP ON THE RETURNS ON INVESTMENT (q_m) BY COUNTRY GROUP

	English Origin		Scandinavian Origin			European-German Origin			Asian-German Origin			French Origin			
Family	[1.082] [.00]	> [.02]	[1.019] [.22]	.773 .12	> .84	.739 .00	.599 .00	< .66	.636 .00	.987 .92	> .41	.872 .00	.569 .00	< .56	.605 .00
Financial	[1.002] [.92]	< [.03]	[1.061] [.00]	.561 .00	< .13	.812 .00	.561 .00	< .41	.640 .00	.869 .32	< .93	.882 .00	[.692] [.00]	> [.04]	[.579] [.00]
Nonfinancial	1.058 .03	> .59	1.041 .00	.718 .00	< .73	.761 .01	.626 .00	< .98	.628 .00	.896 .00	> .55	.863 .00	.565 .00	< .10	.644 .00
Dispersed	1.001 .91	< .21	1.050 .00	[1.145] [.40]	> [.01]	[.683] [.00]	[1.358] [.15]	> [.00]	[.601] [.00]	.829 .00	< .20	.906 .00	.543 .00	< .50	.605 .00
State	1.014 .91	< .82	1.045 .00	.796 .40	> .83	.743 .00	[.374] [.00]	< [.04]	[.634] [.00]	1.322 .37	> .23	.880 .00	[.952] [.76]	> [.02]	[.588] [.00]

NOTE.—The table presents the results of estimating equation (5) by allowing q_m to take on different values depending on both a company's country of origin and its ownership structure. The first entry for each ownership category gives the point estimate of q_m for that category. The second entry is the q_m for the remaining companies in that country group. The "greater than" ("less than") symbol between the two numbers indicates that the first entry is greater (smaller) than the second one. The number below the inequality is the level of significance of this difference; the numbers below each entry indicate the p -value of a test that the estimated coefficient is equal to 1.0. The number of observations is 70,252, and the adjusted R^2 values are about .23. All t -values are robust to heteroskedasticity. All equations include 25 industry dummies (not reported).

English-origin countries, as opposed to only three for the remaining 40 entries in the table. The origin of a country's legal system overwhelms differences in ownership structures in explaining returns on investment.

Hypothesis 3 predicts that companies with dispersed ownership should have lower \hat{q}_m values than other companies in countries with strong corporate governance systems. The \hat{q}_m for dispersed-ownership companies is less than for the remaining firms in the Anglo-Saxon countries, but the difference is not statistically significant. Thus, we cannot accept hypothesis 3. We note again, however, that q_m is an estimate of a company's average return on investment relative to its cost of capital since the estimate is made using data on total investment in each year. Shareholder wealth maximization requires equating the marginal returns on investment to the cost of capital. Thus, the estimate of q_m of 1.001 for dispersed-ownership firms in Anglo-Saxon countries likely implies a marginal return on investment that is somewhat lower than their costs of capital, which suggests some agency problems for these companies.

The significantly higher \hat{q}_m values for the companies controlled by individuals (families) might also be interpreted as indirect evidence of agency problems when ownership is dispersed. An alternative interpretation would be that family-controlled companies have trouble raising capital externally. This interpretation might also explain the significantly smaller \hat{q}_m values for companies controlled by financial institutions. These companies presumably do not have trouble raising external capital to finance worthy investment projects.

Hypothesis 4 predicts that companies with dispersed ownership have higher returns on investment than other firms in countries with weak corporate governance systems since the owners were able to issue many shares in the first place by credibly committing not to exploit small shareholders. This hypothesis finds support in both the Scandinavian countries and European countries with German-origin legal systems. In both cases, the estimated q_m is above 1.0 and significantly higher than for the other companies in these two country groups. Given that only one other entry in Table 3 for a non-English-origin country is greater than 1.0, these results provide rather strong support for hypothesis 4 in these countries. Companies with dispersed ownership in Scandinavia and Germanic Europe appear to have sufficiently attractive investment opportunities to produce \hat{q}_m values equal to or greater than 1.0. Most of these companies are large, multinational firms and may therefore be subject to the same corporate governance constraints as companies in the Anglo-Saxon countries.³² However, in the three Asian countries with German-origin legal systems and the French-origin countries, no sig-

³² Empirical evidence consistent with that is presented by Doidge, Karolyi, & Stulz, *supra* note 14, which finds that foreign companies listed in the United States have greater Tobin's q ratios than other firms from the same country.

nificant differences were observed in the \hat{q}_m values for dispersed-ownership companies and the rest of the samples.

Neither a priori reasoning nor the existing empirical evidence allowed us to make predictions about the relative performance of companies that are individually controlled in countries with weak corporate governance systems or are finance controlled, firm controlled, or state controlled. Consistent with these ambiguities, we generally find no significant differences between the \hat{q}_m value for companies in one of these ownership categories and for all other firms in its country group. The only significant difference in investment performance for family-controlled companies to be observed in Table 3 is for the English-origin countries.

The \hat{q}_m value for companies that are controlled by financial firms is significantly less than that for other firms in the English-origin group. This \hat{q}_m is greater than 1.0, nevertheless, and also greater than that for each of the other four country groups. It is thus not possible to say that financially controlled firms in English-origin countries do badly in an absolute sense. The only other difference in \hat{q}_m values for finance-controlled firms that is statistically significant occurs for the French-origin sample, where the estimate of .692 is significantly greater than that of .579 for the rest of the sample. Although financial institutions appear to improve the investment performance of companies that they control in countries with French legal systems, they do not bring about a spectacular improvement. Companies that are controlled by financial firms are still predicted to have returns on investment of less than 70 percent of their costs of capital. Their performance looks good only in comparison with other companies in the countries with French legal systems.

In none of the five country groups is there a significant difference between the \hat{q}_m value for firms controlled by other, nonfinancial companies and that of the rest of the sample. Managers of one company are not significantly better at monitoring managers of other companies than are other ownership groups.³³ As discussed above, this may be because the potential advantages managers have as monitors of other firms are dissipated through the construction of large pyramidal structures. (Additional evidence on the performance of companies in corporate pyramids is presented in the following subsection.)

The estimate of \hat{q}_m values for state-controlled companies in the three Germanic European countries is .374, the smallest estimate in Table 3. Within these three countries, the agency problems that are associated with state-control of enterprises clearly seem to dominate. In three of the remaining four country groups, the \hat{q}_m value for state-controlled companies is larger

³³ In the French-origin countries, companies controlled by other nonfinancial firms have significantly lower returns on investment than other ownership groups, when a 10 percent cutoff for significance is used.

than for other firms, with the \hat{q}_m values for state-controlled companies in the three Asian countries with German-origin systems and the countries with French-origin systems both being insignificantly different from 1.0. In these two country groups, state firms actually exhibit the best investment performance of any ownership category. One explanation for this superior performance might be that state-controlled companies in these countries are located in industries with particularly attractive investment opportunities. Another possible explanation, of course, is that the state in these countries is an adept monitor of the firms that it controls.³⁴

The results in Table 3 imply that ownership structures are less important determinants of investment performance than are legal institutions. In the three Asian countries with German-origin legal systems, none of the \hat{q}_m values for any ownership category is significantly different from that for the remaining firms. In the four other country groups, only seven of the 20 \hat{q}_m values for particular ownership categories are significantly different from those for the remaining firms. The most consistent differences in \hat{q}_m values that are visible in Table 3 are across country legal systems rather than across ownership categories.³⁵ These findings are consistent with those of other recent studies. Although honest and effective legal institutions are consistently associated with good performance, the link between corporate performance and owner identities seems more tenuous.³⁶

³⁴ It is worth noting that the standard error of the estimate of q_m is larger for state-controlled companies than for other ownership categories in all five country groups. Thus, the investment performance of state-controlled companies appears to be much more heterogeneous than for other ownership categories.

³⁵ When a 20 percent cutoff is used to define control, 17 of the 25 possible comparisons across ownership categories retain the same sign as in Table 3. All significant differences carry over, albeit with a lower level of significance. State-owned firms in English-origin countries perform much worse than the remaining firms (.697 versus 1.041, significant at the 1 percent level) using the 20 percent cutoff. The difference in the investment performance of firms owned by nonfinancial companies in the French-origin countries becomes more pronounced (.555 versus .650, significant at the 5 percent level).

³⁶ Studies that find positive associations between corporate performance and some measure of the strength of legal institutions include Demirgüç-Kunt & Maksimovic, *supra* note 6; La Porta *et al.*, *supra* note 2; Mueller & Yurtoglu, *supra* note 20; Davide Lombardo & Marco Pagano, Legal Determinants of the Return on Equity (Working paper, Univ. Salerno 2000); and Klaus Gugler, Dennis C. Mueller, & B. Burcin Yurtoglu, The Impact of Corporate Governance on Investment Returns in Developed and Developing Countries, 113 *Econ. J.* 511 (2003). In contrast, relationships between company performance and the identity of owners are much weaker and often contradictory. Clifford G. Holderness & Denis P. Sheehan, The Role of Majority Shareholders in Publicly Held Corporations, 20 *J. Fin. Econ.* 317 (1988); David J. Denis & Diane K. Denis, Majority Owner-Managers and Organizational Efficiency, 1 *J. Corp. Fin.* 91 (1994); Carmen G. Górriz & Vicente S. Fumás, Ownership Structure and Firm Performance: Some Empirical Evidence from Spain, 17 *Managerial & Decision Econ.* 575 (1996); Claudio Loderer & Kenneth Martin, Executive Stock Ownership and Performance: Tracking Faint Traces, 45 *J. Fin. Econ.* 223 (1997); Stephen Nickell, Daphne Nicolitis, & Neil Dryden, What Makes Firms Perform Well? 41 *Eur. Econ. Rev.* 783 (1997); and Marc Goergen, Corporate Governance and Financial Performance: A Study of German and UK Initial Public Offerings (1998).

TABLE 4
EFFECTS OF INSIDER OWNERSHIP
CONCENTRATION ON q_m IN
THE UNITED STATES

	Coefficient	<i>t</i> -Value
\hat{q}_m	.95	24.91
IO	2.71	5.25
IO ²	-8.23	4.80
IO ³	6.14	3.99

NOTE.—A nonlinear relationship between q_m and insider ownership (IO) is reported for U.S. companies. The coefficient of IO, IO², and IO³ are multiplied by 100, 100², and 100³, respectively. All *t*-tests are robust to heteroskedasticity. All equations include 25 industry dummies (not reported). $N = 31,698$; adjusted $R^2 = .25$. Summary statistics on insider ownership are available from the authors on request.

C. *The Effects of Insider Ownership Concentration, Pyramiding, Cross Shareholding, and Voting Rights*

In this section, we present some additional tests of the effects of ownership structure for countries where we have a richer data set on ownership structures.

1. The Effects of Insider Ownership in the United States

As noted in Section II, when ownership is concentrated in the hands of managers, it can have two opposing effects on a company's investment performance. As a manager's ownership stake rises, the manager may identify more closely with other shareholders and thus try to increase the market value of the firm. Alternatively, a larger ownership stake reduces the threat of dismissal, thus freeing a manager to pursue goals that conflict with the other shareholders' interests. Thus, a priori, rising ownership concentration in the hands of insider managers has an ambiguous impact on firm performance.

We use data on the shareholdings of managers of U.S. corporations to test for the effects of inside-ownership concentration on investment performance. We do this by interacting inside-ownership variables with the investment term on the right-hand side of equation (5). The results are presented in Table 4. The value for q_m is the coefficient on investment by itself, and the value for IO is the coefficient on investment multiplied by the fraction of shares owned by insiders; IO² represents an interaction term with the square of IO, and IO³ its cube. The estimated coefficients imply a similar nonlinear relationship between q_m and inside-ownership concentration as Randall Morck,

Andrei Shleifer, and Robert Vishny³⁷ observed for Tobin's q . The predicted q_m rises from .95 as inside ownership increases from zero, reaching a peak of 1.21 at a shareholding of 22 percent. From there, q_m falls, reaching a low of .92 at a shareholding of 68 percent, where it begins to rise again. Thus, the entrenchment of management due to their possessing concentrated shareholdings results in a significant deterioration in their companies' investment performance over the range of ownership concentration levels from 22 to 68 percent.

Several additional studies have examined the relationship between various measures of corporate performance and ownership concentration. Three of these³⁸ come up with the same sort of nonlinear relationship between performance and ownership concentration that Morck, Shleifer, and Vishny³⁹ and we do. John McConnell and Henri Servaes⁴⁰ observe only the first part of the curve—an inverted parabola—in their U.S. data, as do Steen Thomsen and Torbin Pedersen⁴¹ for European corporations.⁴² The turning points observed by Morck, Shleifer, and Vishny were at ownership concentration levels of 5 and 25 percent. These are much lower than the 22 and 68 percent that we observe and the 40–50 percent range at which McConnell and Servaes record corporate performance peaking. One explanation for this difference is that Morck, Shleifer, and Vishny's sample of 371 Fortune 500 companies contains on average much larger firms than do the McConnell and Servaes (over 1,000) and our (3,671) samples.⁴³ Managers of smaller firms must hold larger fractions of their companies' shares before they feel safe enough in their jobs to pursue policies that destroy their shareholders' wealth. When we restrict our sample to Fortune 500 firms as Morck, Shleifer, and Vishny did, the turning points come at concentration levels of 11.6 and 40.3 percent. A second possible explanation for the difference in turning points is that our data are from the late 1980s and 1990s, while Morck, Shleifer, and Vishny

³⁷ Morck, Shleifer, & Vishny, *supra* note 6.

³⁸ Myeong-Hyeon Cho, Ownership Structure, Investment, and the Corporate Value: An Empirical Analysis, 47 *J. Fin. Econ.* 103 (1998); Helen Short & Kevin Keasey, Managerial Ownership and the Performance of Firms: Evidence from the UK, 5 *J. Corp. Fin.* 79 (1999); Andrew Cosh, Paul Guest, & Alan Hughes, Managerial Discretion and Takeover Performance (Working paper, Cambridge Univ. Econ. & Soc. Res. Council, Ctr. Bus. Res. 2001).

³⁹ Morck, Shleifer, & Vishny, *supra* note 6.

⁴⁰ John McConnell & Henri Servaes, Additional Evidence on Equity Ownership and Corporate Value, 27 *J. Fin. Econ.* 595 (1990); John McConnell & Henri Servaes, Equity Ownership and the Two Faces of Debt, 39 *J. Fin. Econ.* 131 (1995).

⁴¹ Steen Thomsen & Torben Pedersen, Ownership Structure and Economic Performance in the Largest European Companies, 21 *Strategic Mgmt. J.* 689 (2000).

⁴² Eric R. Gedajlovic & Daniel M. Shapiro, Management and Ownership Effects: Evidence from Five Countries, 19 *Strategic Mgmt. J.* 533 (1998), is difficult to compare with the other studies, since the authors do not distinguish among the identities of owners and also interact ownership with diversification.

⁴³ See Stacey Kole, Measuring Managerial Equity Ownership: A Comparison of Sources of Ownership Data, 1 *J. Corp. Fin.* 413 (1995).

use data from 1980. The late 1980s merger wave, with its many highly visible hostile takeovers, may have raised the levels of share ownership that managers perceive to be necessary to protect them from hostile takeovers. Our data also imply that the level of ownership concentration at which managers' and shareholders' interests become realigned is much higher than suggested by Morck, Shleifer, and Vishny.

2. Exogeneity of Ownership

Several authors have questioned the results by Morck, Shleifer, and Vishny on the grounds that ownership concentration may not be an exogenous variable.⁴⁴ This criticism might also be directed against our results in Section VC2 and more generally against the results reported in Table 3 with respect to ownership identity and investment performance. It is necessary, therefore, that we take up the issue of the possible endogeneity of ownership.

Let us begin with the more general issue of whether the relationships between owner identities and q_m values presented in Table 3 could be misinterpreted because of reverse causality. Such a misinterpretation seems much more likely if we were to use a measure of average performance as most other studies have, say, Tobin's q , than with our measure of marginal q .⁴⁵ For example, low Tobin's q values for state-controlled companies might not indicate that the state is a poor monitor of managers but rather that the state has chosen to concentrate its shareholdings in low-profit industries. The estimated q_m of .374 for state-controlled companies in the European Germanic countries that are reported in Table 3, on the other hand, must be interpreted as a management failure at least in so far as the other shareholders of the firm are concerned. If state-controlled firms in the European Germanic countries are located in low-profit industries and their managers are maximizing the wealth of their shareholders, they will invest little, and the returns on this investment will equal their cost of capital. The fact that these returns fall far short of the costs of capital implies overinvestments or poor investments and poor monitoring of managers. Although the investment opportunities that a firm faces may legitimately be considered as exogenous, the managers determine what is to be made of these opportunities and thus the realized returns on investment. Managers decide the nature and amounts of investment; the investments do not determine the identity of owners or managers. The returns on investment are then determined by the nature of

⁴⁴ See Claudio Loderer & Kenneth Martin, Executive Stock Ownership and Performance: Tracking Faint Traces, 45 J. Fin. Econ. 223 (1997); Cho, *supra* note 38; Charles Himmelberg, Glenn Hubbard, & Darius Palia, Understanding the Determinants of Managerial Ownership and the Link between Ownership and Performance, 53 J. Fin. Econ. 353 (1999); and Xianming Zhou, Understanding the Determination of Managerial Ownership and Its Relationship to Firm Performance: Comment, 62 J. Fin. Econ. 559 (2001).

⁴⁵ See also Klaus Gugler & B. Burcin Yurtoglu, Average Q , Marginal Q and the Relation between Ownership and Performance, 78 Econ. Letters 379 (2003).

the investments made. Since the returns on investment follow from the nature of the investments made, these too must be regarded as endogenous.⁴⁶

Similar arguments apply with respect to the relationship between q_m and insider ownership concentration. It might be reasonable to assume that insider shareholdings vary across firms as a function of the height of investment opportunities, the riskiness of investment, and so on.⁴⁷ But the returns that are realized on investment depend on the investments actually made, and these are the result of the decisions of the managers at the time they are made. One might argue that very high shareholdings in the hands of managers are present only in very young firms, which are still managed by their entrepreneurial founders. These firms may have very attractive investment opportunities and be cash constrained, which leads to underinvestment. High levels of manager shareholdings might then be associated with returns on investment that exceed company costs of capital and are higher than for more mature companies. Under this reasoning, managerial shareholdings would proxy for the youth of the firm and be positively associated with q_m values. Such reasoning cannot explain why q_m values would fall below 1.0, however, or a negative relationship between q_m and managerial holdings over middle ranges of holdings. A q_m less than 1.0 must be interpreted as indicating agency problems, and decreasing q_m values with increasing management holdings as indicating increasing agency problems due to entrenchment.

3. The Effects of Pyramiding, Cross Shareholding, and Voting Rights in Europe

Corporate pyramids, in which company A owns a controlling interest in company B, B owns a controlling interest in C, and so on, are quite common in Western Europe. As noted in Section II, companies in the lower levels of a pyramid can be expected to exhibit poor performance for several reasons: (1) the managers/families at the top of the pyramid are empire builders, (2) the managers at the top of the pyramid transfer resources from lower-level companies up to the top, or (3) the distance between the top and a given company in the pyramid becomes too great for the managers at the top to monitor this company effectively. These considerations lead us to predict poorer investment performance for companies at lower levels in corporate pyramids.

⁴⁶ A partial qualification of this point is necessary with respect to hypothesis 4 and our interpretation of the results for companies with dispersed ownership in civil-law countries. Here we argued that the existence of dispersed shareholdings implied that the managers were somehow able to bond themselves not to exploit minority shareholders, and thus the prediction that dispersed shareholdings are associated with relatively high returns on investment in civil-law countries. In this case, both the relatively high returns on investment and the companies' dispersed ownership are determined by some third variable.

⁴⁷ See Harold Demsetz & Kenneth Lehn, *The Structure of Corporate Ownership: Causes and Consequences*, 93 *J. Pol. Econ.* 1155 (1985).

TABLE 5
EFFECTS OF PYRAMIDING, CROSS
SHAREHOLDINGS, AND SHAREHOLDER
VOTING RIGHTS IN EUROPE

	Coefficient	<i>t</i> -Value
\hat{q}_m	.68	24.74
PYRM	-.09	-2.03
CROSS	-.25	-2.76
VR	.12	2.50

NOTE.—The effect of pyramiding (PYRM), cross shareholdings (CROSS), and deviations of control and cash flow rights (VR) is reported. We interact these three variables with the investment term on the right-hand side of equation (4) and include them along with investment in the equation. All *t*-tests are robust to heteroskedasticity. The equation includes 25 industry dummies (not reported). $N = 10,993$; adjusted $R^2 = .22$. Summary statistics on PYRM and VR are available from the authors on request.

Corporate pyramids can lead to a diversion of a dominant owner's interests and those of minority shareholders by allowing the dominant holder to lever the voting rights in her shares. When this occurs, the dominant shareholder's control rights exceed her cash flow rights, which allows her to exploit minority shareholders. We thus predict poorer investment performance for companies for which the dominant shareholder's control and cash flow rights are unequal.

Cross shareholdings, in which company A owns shares in companies B and C, B owns shares in A and C, and so on, are also frequently observed in Western Europe. Such interlocking shareholdings can entrench the managers of all of the companies so joined and thus free them to pursue their personal goals at the expense of outside shareholders.

To test these hypotheses, three dummy variables were created: PYRM equals one if a company is two or more levels down in a corporate pyramid and zero otherwise, VR equals one if the control and cash flow rights of the dominant shareholder are equal and zero otherwise, and CROSS equals one if a company is part of a group of firms with cross shareholdings and zero otherwise. We again interact these three variables with the investment term on the right-hand side of equation (5). The results from this exercise are given in Table 5. All coefficients on the three interaction terms are statistically significant and of the predicted signs. They also imply economically significant impacts on investment performance due to differences in corporate governance structures. If the control and cash flow rights of a company's dominant shareholder are equal and it is not part of a corporate pyramid or linked by cross shareholdings of other firms, then the company's return on investment is predicted to be 80 percent of its cost of capital (.68 + .12). In contrast, a company for which control rights exceed cash flow rights and is

TABLE 6
EFFECT OF BUSINESS GROUPS ON THE RETURNS ON
INVESTMENT IN JAPAN

	1985–2000	1985–95	1996–2000
\hat{q}_m	.94	1.07	.59
<i>t</i> -value	42.27	40.09	15.30
$\hat{q}_m \times \text{BG}$	-.11	-.15	-.02
<i>t</i> -value	-3.32	-3.73	-.43
<i>N</i>	12,855	9,388	3,497
Adjusted R^2	.17	.20	.14

NOTE.—The information on the business group membership is gathered from Industrial Groupings in Japan (1990/91, 1992/93, 1995/96, 1996/97), which rate the degree of inclination of companies to eight of the major business groups in Japan (Mitsubishi, Mitsui, Sumitomo, Fuyo, DKB, Sanwa, Tokai, and IBJ). We categorize 1,047 of the 2,219 Japanese firms as affiliated with groups (47.2 percent). All *t*-tests are robust to heteroskedasticity. The equation includes 25 industry dummies (not reported).

lower down in a pyramid and linked to other companies by cross shareholdings is predicted to have a return on its investment of only 34 percent of its cost of capital (.68 – .09 – .25).

4. The Effects of Cross Shareholding in Japan

Cross shareholdings are also common in Japan, where members of the so-called *keiretsu* hold shares in each other's companies. The same entrenchment of managers and negative effects on investment performance can be expected for members of these corporate groups. The first two entries in Table 6 report the \hat{q}_m values for independent firms (.94) and the difference in \hat{q}_m values for group firms, both estimated over the entire sample period from 1985 through 2000. Members of corporate groups in Japan⁴⁸ can be seen to have a predicted q_m value that is .11 lower than that for independent firms (significant at the 1 percent level). The effect of cross shareholdings in Japan is not as large as for European companies, but it goes in the same direction. Group firms in Japan have significantly lower returns on investment relative to their costs of capital than do independent companies.

As in most Asian countries, Japanese companies were hit hard by the Asian crisis. Our sample also expands dramatically over the last few years of the sample period through the addition of a large number of independent companies. To gauge the effects of these events, we reestimated the equation for the periods 1985–95 and 1996–2000, roughly before and after the crisis. Over the first period, the group firms still performed significantly worse than the independent companies. Following the advent of the crisis, both the

⁴⁸ We use the classification contained in Industrial Groupings in Japan (1990/91–1996/97). Details are available from the authors on request.

independent and group firms exhibited much poorer investment performance, and the difference between independent and group firms disappears. Our results imply, however, that when economic conditions are normal, cross holdings of shares among companies in Japan have an effect on returns on investment similar to that observed in Europe, if less deleterious.⁴⁹

VI. TESTS OF HYPOTHESES REGARDING THE EFFECTS OF CAPITAL MARKET CONSTRAINTS ON THE RETURNS ON INVESTMENTS FROM DIFFERENT SOURCES OF FINANCE

In this section, we test for the effects of legal institutions on the returns on investment from different sources of finance. We first conduct these tests using our country group categories and then using two specific types of legal institutions.

A. *The Effects of Country Legal Systems*

The differences in legal institutions that have been used to distinguish among corporate governance systems also have implications with respect to the returns on investment that one expects from different sources of finance. To the extent that strong corporate governance structures protect shareholders' interests, we can expect the returns on investments out of cash flows and new equity issues to be positively related to the strength of a country's corporate governance structure. This leads us to predict that the returns on investments out of cash flows and new equity issues correspond to those observed for total investment across the different country legal environments. Since the contractual protections associated with debt are more specific and easier to enforce, a weaker or nonexistent relationship between corporate governance systems and returns on investment out of new debt is expected. For the same reason, we also predict that the returns on debt are the highest of the three sources of funds for companies with returns on total investment that are less than their costs of capital.

These predictions are tested using equation (5) by breaking total investment into the three sources of finance and estimating separate coefficients on investment from each source. The results are presented in Table 7. Consider initially the first four country categories.⁵⁰ The first row in each country

⁴⁹ For additional evidence of poorer performance by *keiretsu* companies, see Frank Lichtenberg & George M. Pushner, Ownership Structure and Corporate Performance in Japan, 6 *Japan & World Econ.* 239 (1994); Iwao Nakatani, The Economic Role of Financial Corporate Grouping 227 (Masahiko Aoki ed. 1984); and David Weinstein & Yishay Yafeh, On the Costs of a Bank-Centered Financial System: Evidence from the Changing Main Bank Relations in Japan, 53 *J. Fin.* 635 (1998).

⁵⁰ Since we control for returns on total investment in Tables 7 and 8, we do not separate the German-origin countries into the three European and three Asian countries. In the German-origin group, most of the companies with $\hat{q}_m \geq 1$ come from the Asian countries, however.

TABLE 7
ESTIMATED \hat{q}_m VALUES BY SOURCE OF FUNDS, BY LEGAL SYSTEM

SAMPLE	FIRMS		MEDIAN q_m	CF_t/M_{t-1}	$\Delta Debt_t/M_{t-1}$	$\Delta Equity_t/M_{t-1}$
	N	%				
English:						
All	11,311		1.09	.86	1.09	1.37
				.00	.00	.00
$\hat{q}_{m,t} \geq 1$		55	1.74	1.48	1.35	1.99
				.00	.00	.00
$\hat{q}_{m,t} < 1$		45	.51	.36	.77	.63
Scandinavian:						
All	350		.85	1.31	1.08	.55
				.04	.22	.00
$\hat{q}_{m,t} \geq 1$		42	1.56	2.29	1.42	1.37
				.00	.00	.00
$\hat{q}_{m,t} < 1$		58	.55	.71	.86	.21
German:						
All	2,476		.84	.70	.98	1.09
				.00	.13	.13
$\hat{q}_{m,t} \geq 1$		39	1.45	1.57	1.27	1.59
				.00	.00	.00
$\hat{q}_{m,t} < 1$		61	.55	.47	.83	.55
French:						
All	1,433		.78	.64	1.02	.52
				.00	.50	.00
$\hat{q}_{m,t} \geq 1$		38	1.67	1.39	1.41	1.10
				.00	.00	.27
$\hat{q}_{m,t} < 1$		62	.46	.46	.84	.37
				.00	.00	.00
Transition	78		.76	.39	1.25	1.29
				.00	.04	.34
Africa	17		.71	.45	.90	1.05
				.00	.32	.78
China	48		.6	.28	1.14	-.46
				.00	.29	.00

NOTE.—We use equation (5) by estimating separate coefficients on investment for each source of finance. The first row in each country group gives the estimates for the full sample of companies. The second and third rows present the estimates with the sample divided into companies for which (firm-level) $\hat{q}_{m,t} \geq 1$ and for which $\hat{q}_{m,t} < 1$ in each country group. The number of observations (adjusted R^2) is 103,722 (.25) for the full sample and 54,051 (.34) and 49,671 (.18) for the $\hat{q}_{m,t} \geq 1$ and $\hat{q}_{m,t} < 1$ samples, respectively. The p -value of a Wald test that the estimated coefficient is different from 1.0 is provided below the estimates. All equations include 25 industry dummies (not reported).

group gives the estimates for the full sample of companies. The returns on investments out of cash flows follow La Porta and his coauthors'⁵¹ rankings of corporate governance systems except that the Scandinavian countries are ahead of the Anglo-Saxon countries. The lowest returns on reinvested cash flows occur for the countries with French legal systems, as predicted.

Companies in the Anglo-Saxon countries obtain the highest returns on

⁵¹ La Porta *et al.*, *supra* note 8.

investments out of new equity issues. The second highest returns are not observed in the Scandinavian countries, however, but in the Germanic group. The average returns on new equity issues in both the Scandinavian- and French-origin legal system countries are significantly less than 1.0. Consistent with the prediction that debt is a more binding commitment on managers than is equity, the returns on investments financed by new debt are nearly equal to costs of capital across all legal systems.

One reason that the returns on reinvested cash flows and new equity reported in the first row of each country group do not correspond to differences in the strength of legal systems across the groups is that there may be important differences in investment opportunities across the groups. Companies that issue equity in some Germanic countries, such as Japan and Taiwan, may have more attractive investment opportunities than companies in the Scandinavian countries. Accordingly, the second and third sets of results in each group present estimates with the sample divided into companies for which $\hat{q}_{m,I} \geq 1$ and for which $\hat{q}_{m,I} < 1$.⁵²

Hypothesis 5 predicts that for companies with $q_{m,I} \geq 1$, $q_{m,CF}$, $q_{m,D}$ and $q_{m,E}$ are also greater than or equal to 1.0. This hypothesis is supported in each of the four country groups. For companies with attractive investment opportunities, no conflict between managers and shareholders exists over investment policies, regardless of a country's legal institutions. Indeed, the very high \hat{q}_m values estimated for some sources of funds for companies with $\hat{q}_{m,I} \geq 1$ suggests that these companies are cash/equity constrained and that their shareholders would benefit from even greater amounts of investment.

The same cannot be said for the companies with $\hat{q}_{m,I} < 1$. As predicted by hypothesis 6, all 12 \hat{q}_m values estimated for the different sources of funds are less than 1.0 for these companies. Hypothesis 6 further asserts that $(q_{m,I} < 1) \Rightarrow (q_{m,D} > q_{m,CF} \text{ and } q_{m,D} > q_{m,E})$. This hypothesis is fully supported in all four country groups. In the Anglo-Saxon and Germanic countries, reinvested cash flows earn the lowest returns, while in the Scandinavian- and French-origin countries, it is new equity issues that have the lowest returns. The last three entries in Table 7 present separate estimates of q_m for the three sources of investment funds for our samples of transition and African countries and China. The weakness of the corporate governance systems in each category is again revealed by the very low returns on investments made out of cash flows. Somewhat surprisingly perhaps, the hypothesis that $\hat{q}_{m,D} \geq 1$ could not be rejected at the 5 percent level, in all three cases, and $\hat{q}_{m,E} \geq 1$ for both the transition and African countries. We suspect that this finding occurs because companies in transition and African countries that raise external capital do so abroad or from foreign investors trading in their countries, and are able to do so only if they have attractive investment opportunities.

⁵² These firm-level \hat{q}_m values are obtained by estimating an equation that includes 25 industry dummies and investment-firm dummy interactions.

Corporate governance institutions in China do not appear to offer much protection to purchasers of new equity issues. Our samples are so small and contain so few companies for which $q_{m,1} \geq 1$ that we have not undertaken any further analysis of these three country groups.

B. The Effects of Accounting Standards

The results reported so far imply the existence of significant differences in investment performance across countries that are related to their legal institutions. They raise the further questions of which specific legal institutions account for these differences and whether the differences observed might be perhaps related to other institutions that just happen to be correlated with differences in legal institutions. Considerations of space preclude an exhaustive search for specific legal and other institutional factors that lead to differences in investment performance. Before closing, however, we examine the effects of two types of institutions that seem a priori particularly likely to be related to agency issues—the strengths of accounting standards and creditor rights.

Shareholders should be able to protect themselves better against self-serving managers and to make better decisions regarding the purchase of new equity issues, the better the quality of accounting information at their disposal. The Center for International Financial Analysis and Research⁵³ has examined the accounting practices in a large sample of countries and ranked them according to the number of desirable pieces of information each country's standards require to be published. The scale of this index for the countries in our study runs from a low of 36 for Portugal to a high of 83 for Sweden, with a median of 64. We classified any country with a score of 64 or more as having strong accounting standards, with a score of 63 or less as having weak standards.⁵⁴ Our expectation is that returns on cash flows and new equity are higher in countries with strong accounting standards. It is possible, of course, that an improvement in equity's performance comes to some extent at the expense of debt holders and not simply from a reduction of managerial discretion and an improvement in investment performance. We shall also be interested, therefore, in whether strong accounting systems are associated with lower returns on investment financed through new debt.

Our estimates of the returns on investments from the three sources of funds for the two categories of accounting standards are presented in Table 8. The number under a coefficient estimate is the p -value of a test that the coefficient is equal to one, with significance values as noted. An entry for strong stan-

⁵³ Vinod B. Bavishi, ed., *International Accounting and Auditing Standards* (1993).

⁵⁴ The index is based on the inclusion or omission of 90 items in 1990 annual reports. These fall into seven categories: general information, income statements, balance sheets, funds flow statement, accounting standards, stock data, and special items. Our breakdown of the countries into the two categories is available on request.

dards is in square brackets whenever it is significantly greater than weak standards at the 5 percent level.

The results for all four country groups are in line with our expectations. Eleven of the 12 $\hat{q}_{m,CF}$ values for countries with strong accounting standards are larger than the $\hat{q}_{m,CF}$ values for countries with weak standards, five of them significantly so. Eleven of the 12 $\hat{q}_{m,E}$ values for countries with strong accounting standards are larger than the $\hat{q}_{m,E}$ values for countries with weak standards, five again significantly so. Thus, strong accounting standards appear to strengthen the hand of shareholders, resulting in higher returns on both reinvested cash flows and new equity issues, and this holds more or less regardless of a country's legal origin.⁵⁵ There is also a suggestion that the improvement in performance for equity holders comes to a degree at the expense of debt holders. Nine of the 12 $\hat{q}_{m,D}$ values for countries with strong accounting standards are smaller than the $\hat{q}_{m,D}$ values for countries with weak standards; one of these differences is significant at the 5 percent level, two others at the 10 percent level.

C. *The Effects of Creditors' Rights*

La Porta and his colleagues⁵⁶ have ranked the rights of creditors in different countries on a scale of 1 to 4, with 4 representing the strongest rights. Using this index, we have classified a country with a score of 3 or 4 as having strong creditor rights and a score of 1 or 2 as having weak creditor rights.⁵⁷ We anticipate superior performance on investments made out of new debt in countries with strong creditor rights.

Our tests are also presented in Table 8. The results are again in line with expectations. Nine of the 12 $\hat{q}_{m,D}$ values for countries with strong creditors' rights are larger than the corresponding $\hat{q}_{m,D}$ values for countries with weak creditors' rights. The fact that only two of these nine differences are statistically significant can be attributed to the $\hat{q}_{m,D}$ values already being equal to or greater than 1.0 in several cases, even in the countries with weak creditors' rights.⁵⁸ There is also evidence that improved protection for debt holders

⁵⁵ In the French-origin countries, strong accounting standards appear to benefit new equity holders a bit more than they do existing holders.

⁵⁶ La Porta *et al.*, *supra* note 8.

⁵⁷ Four creditor rights variables are used by La Porta *et al.*, *supra* note 8. These are based on (1) automatic stay on assets in reorganization, (2) whether secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm, (3) restrictions for going into reorganization, and (4) whether management stays in reorganizations. Our breakdown of the countries into the two categories is available from the authors on request.

⁵⁸ Here it is perhaps worth noting that the use of the book value of debt to measure a firm's market value does not bias the coefficient on the change in debt toward 1.0. Although the change in debt on the right-hand side of the equation is identical to the change in debt in the firm's market value on the left-hand side, if the firm's investment with these funds yields an expected return $r < i$, the market value of the firm's equity will fall when it issues the debt,

harms new equity holders. Eleven of the 12 $\hat{q}_{m,E}$ values for countries with strong creditors' rights are smaller than the $\hat{q}_{m,E}$ values for weak rights, with six differences being statistically significant. No systematic differences in the patterns of returns on investments out of cash flows were observed, however. We conclude that strong creditor rights tend to benefit debt holders and harm purchasers of new equity in all four country groups.

VII. ROBUSTNESS CHECK

Our methodology for estimating marginal q values rests on the assumption of capital market efficiency. At the time that a firm makes an investment, the market makes an unbiased estimate of the returns on this investment. In countries with unsophisticated capital markets, one might question the market's ability to make accurate assessments of the returns on a company's investment in the year it is made. Such inaccuracies should not introduce any systematic biases into our estimates, however, but instead will only reduce the fit to our model. An examination of Table 2 reveals that all of our estimates of q_m are significant at the 1 percent level save those for Luxembourg and Peru, where we have very small samples. Most t -statistics for our estimates of q_m are well over 10. Nevertheless, one might be more confident about our results if they rested on a weaker assumption. In this section, we reconfirm our results assuming a much weakened form of capital market efficiency.

A slight rearrangement of equation (4) from Section III yields

$$M_t = M_{t-1} + q_{m,t} I_t - \delta M_{t-1} + \mu_t. \quad (6)$$

The market value of a firm at the end of period t equals its market value at the end of $t - 1$, plus the investment made in t times the marginal q for that period, minus the adjustment for depreciation, plus the error that the market makes in estimating the firm's market value at the end of t , an error that we assume has an expected value of zero. Assuming that this relationship also holds in $t + 1$ gives

$$M_{t+1} = M_t + q_{m,t+1} I_{t+1} - \delta_{t+1} M_t + \mu_{t+1}. \quad (7)$$

Using equation (6) to replace M_t in equation (7) produces

$$M_{t+1} = M_{t-1} + q_{m,t} I_t + q_{m,t+1} I_{t+1} - \delta_t M_{t-1} - \delta_{t+1} M_t + \mu_t + \mu_{t+1}. \quad (8)$$

Repeated substitution up through period $t + n$ yields

$$M_{t+n} = M_{t-1} + \sum_{i=0}^n q_{m,t+i} I_{t+i} - \sum_{i=0}^n \delta_{t+i} M_{t-1+i} + \sum_{i=0}^n \mu_{t+i}. \quad (9)$$

The market value of a firm at the end of period $t + n$ equals its market

and the change in the market value of the firm will be less than the change in debt, leading to a coefficient for ΔD less than one.

TABLE 8
ESTIMATED \hat{q}_m VALUES BY SOURCE OF FUNDS, BY ACCOUNTING
STANDARDS AND CREDITOR RIGHTS

SAMPLE	ACCOUNTING STANDARDS			CREDITOR RIGHTS		
	CF _t /M _{t-1}	ΔDebt _t /M _{t-1}	ΔEquity _t /M _{t-1}	CF _t /M _{t-1}	ΔDebt _t /M _{t-1}	ΔEquity _t /M _{t-1}
English:						
All:						
Weak	.83**	1.02**	1.07**	1.32**	1.05**	2.06**
	.23	.74	.60	.00	.00	.00
Strong	[1.32]**	1.04	[1.86]**	1.34	1.03	1.06**
	.00	.00	.00	.00	.29	.20
$\hat{q}_{m,1} \geq 1$:						
Weak	1.65**	1.49**	1.69**	1.87**	1.31**	2.54**
	.04	.00	.00	.00	.00	.00
Strong	1.86	1.30	[2.37]**	[2.07]*	1.34	1.57**
	.00	.00	.00	.00	.00	.00
$\hat{q}_{m,1} < 1$:						
Weak	.37**	.69**	.58**	.65**	.70**	1.06**
	.00	.00	.00	.00	.00	.13
Strong	[.65]*	.69	[.91]*	[.78]*	.71	.58**
	.00	.00	.01	.00	.00	.00
Scandinavian:						
All:						
Weak	1.28**	1.04**	.64**	1.40**	.97**	1.01**
	.26	.73	.00	.01	.71	.96
Strong	1.39	.97	1.01	1.29	1.04	.64
	.01	.72	.01	.26	.73	.75
$\hat{q}_{m,1} \geq 1$:						
Weak	1.47*	1.48**	.69*	2.37**	1.21**	2.19**
	.42	.08	.34	.00	.14	.00
Strong	2.38	1.22	[2.19]**	1.46	1.47	.69**
	.00	.14	.00	.42	.08	.00
$\hat{q}_{m,1} < 1$:						
Weak	1.23**	.99**	.56**	.72**	.76**	.48**
	.26	.91	.00	.05	.00	.00
Strong	.72*	1.75 ⁺	1.03	[1.74]*	[1.75] ⁺	1.05
	.05	.00	.00	.26	.91	.09
German:						
All:						
Weak	.59**	.99**	1.03**	1.09**	.94**	1.33**
	.00	.80	.69	.08	.04	.00
Strong	[1.09]**	.95	[1.33]**	.59**	.98	1.03**
	.07	.04	.00	.00	.80	.69
$\hat{q}_{m,1} \geq 1$:						
Weak	.81**	1.10**	1.58**	2.01**	1.26**	1.77**
	.14	.22	.00	.00	.00	.00
Strong	[2.01]**	1.27 ⁺	1.77	.81**	1.10 ⁺	1.58
	.00	.00	.00	.13	.22	.00

TABLE 8 (Continued)

	ACCOUNTING STANDARDS			CREDITOR RIGHTS		
	CF _t /M _{t-1}	ΔDebt _t /M _{t-1}	ΔEquity _t /M _{t-1}	CF _t /M _{t-1}	ΔDebt _t /M _{t-1}	ΔEquity _t /M _{t-1}
$\hat{q}_{m,1} < 1$:						
Weak	.58**	.89**	.66**	.62**	0.72**	.72**
	.00	.01	.00	.00	.00	.00
Strong	.62	.72**	.72	.58	[.89]**	.66
	.00	.01	.00	.00	.01	.00
French:						
All:						
Weak	.68**	1.05**	.65**	.78**	1.04**	.78**
	.00	.29	.00	.00	.23	.00
Strong	[.87] ⁺	1.05	.70	.85	1.18	.42
	.09	.27	.01	.47	.13	.02
$\hat{q}_{m,1} \geq 1$:						
Weak	1.38**	1.48**	.88**	1.45**	1.41**	1.08**
	.02	.00	.54	.00	.00	.48
Strong	1.56	1.48	1.16	2.04	1.83	.30**
	.00	.00	.20	.05	.00	.43
$\hat{q}_{m,1} < 1$:						
Weak	.47**	.83**	.52**	.55**	.85**	.54**
	.00	.00	.00	.00	.00	.00
Strong	.58	.86	.52	.41	.84	.36
	.00	.00	.00	.00	.13	.00

NOTE.—The number under the coefficients for accounting standards and creditor rights countries is the p -value of a Wald test against 1.0. The usual t -tests against zero are also provided. The number of observations for the full sample is 103,722. The adjusted R^2 values of the $\hat{q}_{m,1} \geq 1$ and $\hat{q}_{m,1} < 1$ accounting standards samples are .28 and .14, respectively. The adjusted R^2 values of the $\hat{q}_{m,1} \geq 1$ and $\hat{q}_{m,1} < 1$ creditor rights samples are .29 and .15, respectively. All t -tests are based on Halbert White (A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity, 48 *Econometrica* 817 (1980)) standard errors. All equations include 25 industry dummies (not reported). Square brackets indicate that the entry for strong standards is significantly greater than the entry for weak standards at the 5% level.

⁺ Significant at the 10% level.

* Significant at the 5% level.

** Significant at the 1% level.

value at the end of period $t - 1$, plus the sum of all of the investments made in the n periods times their marginal q values, minus the sum of all adjustments for depreciation, plus the sum of the n error terms.

A weighted average of the q_{mt+i} values using each year's investment as the weight is defined as

$$\bar{q}_m = \frac{\sum_{i=0}^n q_{mt+i} I_{t+i}}{\sum_{i=0}^n I_{t+i}}. \quad (10)$$

Dividing equation (9) by the summation of investments over the n years and rearranging gives

$$\bar{q}_m = \frac{\sum_{i=0}^n q_{mt+i} I_{t+i}}{\sum_{i=0}^n I_{t+i}} = \frac{M_{t+n} - M_{t-1}}{\sum_{i=0}^n I_{t+i}} + \frac{\sum_{i=0}^n \delta_{t+i} M_{t-1+i}}{\sum_{i=0}^n I_{t+i}} - \frac{\sum_{i=0}^n \mu_{t+i}}{\sum_{i=0}^n I_{t+i}}. \quad (11)$$

The assumption of capital market efficiency implies that each year's error has an expected value of zero, and the sum of the errors divided by the sum of investments should vanish as n increases. If we ignore the summation of the δ terms momentarily, equation (11) states that a firm's weighted average marginal q value equals 1.0, if the change in its market value over an n -year period just equals the sum of its investments over this period. Setting the first term on the right-hand side of equation (11) equal to zero, equation (11) implies that to keep its market value unchanged, a firm must make a cumulative investment at a \bar{q}_m value equal to 1.0, which just equals the decline in its market value due to depreciation.

Using equation (11) to calculate a weighted average q_m value greatly weakens the force of the assumption of capital market efficiency. The change in market value between $t - 1$ and $t + n$ is compared with the cumulative investments made over the n years. If the market makes an error in estimating q_m in a given year but corrects it before year $t + n$, then this error will not affect our estimate of \bar{q}_m because we use only the change in market value over the whole time interval and the sum of the investments made to calculate \bar{q}_m .

Estimates of q_m values made with balanced panels of 19 and 15 years of data have revealed a very close match between the \bar{q}_m values calculated using equation (11) and the q_m values estimated using equation (5).⁵⁹ To maximize the number of observations and firms in our samples, we have not chosen to work with balanced panels in this study. For companies with only a couple of years of data, the assumption that the last term in equation (11) is near zero cannot be sustained, and we can expect errors in our calculations of \bar{q}_m . For the major countries, however, we have long time series for most companies, and the estimates should be quite accurate.

To check the reliability of our inferences from the regression estimates of q_m , we have calculated \bar{q}_m values for every firm in our sample for which we have at least 3 years of data. To do so, we need to assume a depreciation rate for each firm. Recall that our results for Table 2 and all subsequent tables were obtained from regressions in which each firm was assigned to a two-digit industry and separate intercepts (depreciation rates) were estimated for each industry. We have used these estimates of depreciation to calculate a \bar{q}_m value for each firm. The match between these calculated \bar{q}_m values and our estimated q_m values from the regression analysis is quite close. When we regress each country's \hat{q}_m value on its mean \bar{q}_m value and weight each observation by the number of firms in the country sample, the regression coefficient is 1.03 and the adjusted R^2 is .98. Thus, the predicted q_m value for a country based on its \bar{q}_m value is almost identical to its estimated q_m value from the regression analysis.

Table 9 reproduces the estimates of q_m from Table 2 and both the simple

⁵⁹ See Mueller & Reardon, *supra* note 19; and Mueller & Yurtoglu, *supra* note 20.

TABLE 9
COMPARISON OF ESTIMATED (\hat{q}_m) AND CALCULATED (\bar{q}_m)
RETURNS ON INVESTMENT

LEGAL SYSTEM ORIGIN	\hat{q}_m	\bar{q}_m	
		Mean	Weighted Mean
English	1.02	1.04	1.01
Scandinavian	.78	.87	.74
German	.74	.83	.66
French	.59	.58	.62

NOTE.—The estimates of returns on investment by legal system from Table 2 are reproduced and compared with means of calculated returns on investment using equation (11).

and weighted mean \bar{q}_m values for the four country groups defined by legal origin. The weighted means are obtained using the number of years over which the individual \bar{q}_m values are calculated. We have only very short time series for the African and transition countries and thus did not calculate \bar{q}_m values for them. The two mean \bar{q}_m values differ slightly from the estimated q_m values, but they imply the same ranking of the four country groups. If we were to redo all of our tests using weighted average q_m values instead of estimates from the regression models, we would obtain the same set of conclusions.

The close relationship between our estimated q_m values and those calculated with equation (11) also implies that the assumption underlying our regression analysis that investment is exogenous has not introduced any biases into our results. The calculation of \bar{q}_m using equation (11) is valid independent of what the determinants of investment are and how they might or might not be related to changes in the firms' market values.

VIII. CONCLUSIONS

Our study holds differences in legal institutions and ownership structures to be important in explaining differences in company returns on investment relative to their costs of capital, q_m . Of these two sets of institutions, the origins of a country's legal system proved to be the most important. The hypothesis that English-origin legal systems produce corporate governance systems that better protect shareholders against managers found support in our data. The null hypothesis that returns on investment were at least as great as company costs of capital failed to be rejected for the English-origin countries but was rejected for every other country group. The null hypothesis was rejected for more than half of the individual countries examined. However, the rejection rate was much lower for the two strongest corporate gov-

ernance systems (10 of 20 countries) than for the weakest systems (20 of 27, including China).

In general, differences in investment performance related to country legal systems dominated differences related to ownership structure. In each of the five ownership categories, companies in countries with English-origin legal systems earned returns on investment equal to or greater than their costs of capital. The same can be said for only three of 20 estimates of investment returns by ownership category in the four country groups with non-English-origin legal systems. In the three Asian countries with German-origin legal systems, no ownership category had a significantly better investment performance than the other firms in these countries. In the countries with non-English-origin legal systems, neither control by a financial firm nor control by a nonfinancial company sufficed to ensure that returns on investment equalled company costs of capital. Nor did control by a family raise q_m to 1.0 in the Scandinavian, Germanic European, and French-origin countries.⁶⁰ In contrast, within the English-origin countries, the estimate of q_m values for family-controlled firms was both greater than 1.0 and higher than for any other ownership category in this country group. This result also illustrates the importance of a country's corporate governance legal institutions in determining its investment performance. Strong corporate governance institutions help to align managerial and shareholder interests and prevent dominant individual or family shareholders from exploiting minority shareholders.

Although differences in ownership structures appear to be less important in determining investment performance than differences in the legal environments in which corporations operate, we did find some differences in performance related to ownership structures that exceeded those linked to legal systems. The difference in estimated q_m values between the English- and French-origin legal systems was .43 (1.02 - .59). The differences between companies with widely dispersed shareholdings and other companies in the Scandinavian and Germanic European countries were, respectively, .46 and .76. We hypothesized that this occurred because companies in countries with weak corporate governance institutions will not issue large numbers of shares to outsiders unless they can convince them that they will earn attractive returns. Companies with widely dispersed shareholdings in the Scandinavian and Germanic European countries may also earn higher returns on investment because they have extensive operations in countries such as Great Britain and the United States and thus are effectively subject to English-origin legal systems.

Control by the state was also found to have dramatically different effects on investment performance between the three Germanic European and

⁶⁰ The \hat{q}_m value for the three Asian countries with German legal system origins is insignificantly different from 1.0, however. As noted above, the \hat{q}_m value for family-controlled companies in these countries is not significantly greater than for other firms.

French-origin countries. State-controlled companies in Austria, Germany, and Switzerland earned returns on their investment of only 37 percent of their cost of capital, while state-controlled companies in French-origin countries had estimated returns insignificantly different from their costs of capital.

We also presented considerable evidence that the entrenchment of managers in companies worsened their investment performance. Returns on investment relative to costs of capital for U.S. companies fell as management's shareholdings increased over a range of concentration levels running from 22 to 68 percent. Cross shareholdings were associated with significantly worse investment performance in both Europe and Japan.

We have also provided considerable evidence that the more explicit contractual relationship between firms and debt holders than between firms and equity holders and the greater scope for debt holders to penalize managers who renege on these contracts leads to higher returns on investments made out of new debt than out of either reinvested cash flows or new equity issues for companies with $q_{m,1} < 1$. A hierarchy of finance with respect to the returns on investment exists for these companies that differs from that usually postulated in the determinants of investment literature: that new debt earns the highest returns. Because of the explicit nature of the contractual relationship between firms and debt holders, the returns on debt were only modestly higher in countries with strong creditors' rights than in countries with weak creditors' rights. Strengthening accounting standards, on the other hand, often had a significant impact on the returns on cash flows and new equity issues almost regardless of a country's other legal institutions. The estimated q_m values for investments out of cash flows were roughly .50 higher in the full samples of companies in the English- and German-origin countries and was also significantly higher for investments out of new equity issues in these and the French-origin countries.

One important conclusion that can be drawn from this study is obviously that agency problems exist in all countries and can have significant impacts on the investment performance of companies. A second, more comforting conclusion is that agency problems can be mitigated by the institutional structures of a country. Legal institutions that strengthen shareholder rights do bring about superior investment performance.

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