

Corporate Governance, Risk and Cost of Equity

HOLLIS ASHBAUGH-SKAIFE, *University of Wisconsin – Madison*

DANIEL W. COLLINS, *University of Iowa*

RYAN LAFOND, *Algert Coldiron Investors, LLC*

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Abstract

Separation of ownership and control in firms creates information asymmetry problems between shareholders and managers that expose shareholders to a variety of agency risks. This paper investigates the extent to which governance attributes affect risk by examining the relation between a broad set of governance attributes and idiosyncratic risk, beta, and cost of equity. We find that firms reporting higher quality working capital accruals and more transparent earnings have lower idiosyncratic risk, smaller betas, and lower cost of equity. We also find that firms with a greater proportion of their shares held by activist institutions exhibit lower idiosyncratic risk and smaller betas. Firms with more blockholders exhibit greater risk, whereas firms with more independent boards and more board stock ownership exhibit less risk resulting in a lower cost of equity. Our results support the general hypothesis that firms with better governance present less agency risk to shareholders resulting in a lower cost of equity.

Keywords Corporate Governance, Cost of Capital, Systematic Risk

JEL Descriptors L15; L84; M4; O16

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1. Introduction

Separation of ownership and control in corporations creates information asymmetry problems between shareholders and managers that expose shareholders to agency risk. Information asymmetry creates a moral hazard problem when managers have incentives to pursue their own interests at shareholder expense. Self-interested managerial behavior can take several forms including shirking, consumption of perquisites, over compensation, and empire building, all of which increase agency risk. Information asymmetry also creates an adverse selection problem when investors cannot discern the true economic value of the firm that is partially a function of the indistinguishable quality of management. Imperfect information on management quality and a firm's economic value results in greater agency risk being imposed on the shareholder. Corporate governance encompasses a broad spectrum of mechanisms intended to mitigate moral hazard and adverse selection problems, that is, agency risk, by increasing the monitoring of managements' actions and limiting managers' opportunistic behavior. This paper investigates the extent to which governance attributes that are intended to mitigate agency risk affect firms' idiosyncratic risk, beta, and cost of equity.

The cost of equity is the expected return that rational investors demand for the risk they bear including a premium for agency risk. Lambert, Leuz, and Verrecchia (2007) develop a single period, multi-asset CAPM model where the ratio of the expected future cash flows to shareholders to the covariance of the firm's cash flows with the market's cash flows is a key determinant of a firm's cost of equity. In their model, accounting information system quality and other governance mechanisms designed to mitigate opportunistic management actions have both direct and indirect effects on a firm's cost of equity. Specifically, accounting information system quality and other governance mechanisms influence investors' assessments of the variances and covariances of firm

cash flows (direct effect) and the expected value of firm cash flows after considering firm assets appropriated by the manager (indirect effect).¹ To the extent governance mechanisms attenuate the problems of adverse selection and moral hazard, we predict that stronger governance will lower a firm's risk resulting in lower idiosyncratic risk, smaller betas, and lower cost of equity. Weak governance, on the other hand, exposes shareholders to greater agency risk leading to higher idiosyncratic risk, larger betas, and higher cost of equity.

We structure our analysis of the effects of governance on risk based on prior literature that identifies and links specific elements of governance to a reduction in agency problems (see Bushman and Smith 2001 and Shleifer and Vishny 1997 for overviews). Unlike prior literature that tends to focus on one or two governance attributes, however, we examine the risk effects of a broad set of governance attributes that relate to (1) financial information quality, (2) ownership structure, (3) shareholder rights, and (4) board structure.

We use the quality of working capital accruals and the timeliness of earnings to proxy for the quality of firms' financial information and expect firms with higher quality financial information to exhibit lower risk. The level of institutional ownership by large public pension funds, which are known for their oversight of corporate behavior, the number of blockholders and the ownership stake of insiders are used to capture the effects of firms' ownership structure on agency risk. These elements of governance can lower agency risk by increasing the external monitoring of management by activist institutional investors and blockholders and by increasing the incentive alignment between management and shareholders through insider share ownership. However, large blockholders can also increase the agency risk faced by minority shareholders by using their voting power to extract benefits that are not available to all shareholders, for example, engage in rent extraction through targeted share repurchases or greenmail (Dann and DeAngelo 1983).

We employ the management entrenchment index of Bebchuk, Cohen and Ferill (2004) to proxy for shareholder rights, where firms with more entrenched management are posited to have weaker shareholder rights. When management is entrenched it is difficult for shareholders to bring about changes in management or to transfer control of assets that are in the best interest of shareholders. Idiosyncratic risk, beta, and cost of equity are expected to be higher for firms with weaker shareholder rights. The independence of the board and the percentage of directors that own stock are used to capture the board structure dimension of governance. This dimension of governance is relevant to assessing the degree of objectivity and attentiveness the board exercises in providing oversight of management performance and the degree to which they hold management accountable to shareholders for its actions. We expect more independent boards and greater percentage of directors that own stock to be associated with lower idiosyncratic risk, smaller betas, and lower cost of equity.

Our analysis yields several key findings. First, we document a significant association between a number of governance attributes and the two risk measures and cost of equity. Specifically, we find that firms reporting higher quality working capital accruals and more transparent (timely) earnings have lower idiosyncratic risk, smaller betas, and lower cost of equity. We find that concentrated ownership in the form of the number of blockholders owning at least a 5% ownership stake is positively related to the two risk measures as well as the cost of equity. These findings are consistent with blockholders extracting rents from other capital suppliers and increasing agency problems faced by dispersed minority shareholders. In addition, we find a negative relation between idiosyncratic risk, beta, and cost of equity, and board independence. In isolation, the governance attributes we examine explain roughly 38%, 20%, and 10% of the cross-sectional variation in firms' idiosyncratic risk, beta, and cost of equity, respectively. After controlling for operating and financing risk characteristics, the set of governance attributes continue to be significant determinants of idiosyncratic risk, beta, and cost of equity.

To provide some indication of the economic importance of governance on firms' cost of equity, we construct a composite governance score based on our set of governance attributes, and incorporate the governance score in rank regressions along with idiosyncratic risk, beta, size, and market-to-book. The results indicate that firms with better governance have a lower cost of equity. Better governed firms, on average, have a cost of equity that is 152 basis points lower than firms with weaker governance when the governance attributes are considered in isolation. After controlling for idiosyncratic risk, beta, size, and market-to-book, better governed firms exhibit a cost of equity capital that, on average, is 40 basis points lower than firms with weak governance. Furthermore, to address endogeneity concerns, we conduct a change analysis and find that the change in the governance score is negatively related to the change in the cost of equity.

The primary contributions of our study are twofold. First, much of the prior accounting research that investigates governance effects on the cost of capital focuses on information transparency and disclosure quality, and measures these effects on expected return after controlling for the effects of beta risk (Botosan 1997, Botosan and Plumlee 2002, Bhattacharya, Daouk and Welker 2003, Francis, Olsson, LaFond and Schipper 2004, and Francis, Olsson, LaFond and Schipper 2005). Interestingly, we find that all of the governance attributes that we study are significantly associated with beta, and collectively, governance attributes explain 20 percent of the variation in beta. These findings lend support to Lambert et al. 2007 and Garmaise and Liu 2004 who model firms' exposure to market risk as a function of the quality of firms' governance. More importantly, our findings provide evidence largely overlooked in the prior literature that governance affects firms' cost of equity directly as well as indirectly via beta. Thus, studies that investigate the effect of information or disclosure quality, as well as other governance attributes, on cost of equity after controlling for the effects of market risk are removing part of the governance effect they seek to document.

The work of Bhojraj and Sengupta 2003, Klock, Mansi, and Maxwell 2004 and Ashbaugh-Skaife, Collins, and LaFond 2006 investigate the relation between governance and credit risk to draw inferences on the benefit of governance to debt stakeholders. Equity and debt stakeholder interests are generally aligned when better monitoring of management occurs. However, the interests of equity versus debt stakeholders can diverge when there are differing claims to firm resources. Thus, it is important to document whether governance attributes are valued differently by equity versus debt stakeholders. In this study, we document that the presence of insider ownership reduces the agency risk to the shareholder whereas other work suggests that insider ownership increases the risk of debt stakeholders (Ashbaugh-Skaife, Collins, and LaFond 2006). The results of this study support the notion that good governance lessens agency risks faced by shareholders, thereby lowering the cost of equity.

The remainder of the paper is organized as follows. Section 2 describes the role of governance in mitigating agency conflicts between shareholders and managers, and how the reduction in agency conflicts is expected to reduce firms' risk and ultimately firms' cost of equity. Section 3 develops empirical proxies to capture the governance attributes that we study. Section 4 describes our sample, data sources, and provides descriptive statistics. Section 5 presents our empirical results on the relation between idiosyncratic risk, beta, and cost of equity capital and governance attributes, and discusses endogeneity concerns. Section 6 concludes and offers suggestion for future research.

2. Why Governance Affects Risk and Cost of Capital

Information asymmetries arise in the equity market because dispersed shareholders cannot directly observe managers' efforts, or know the true economic value of the firm or the quality of management, which creates moral hazard and adverse selection problems for shareholders. Moral hazard and adverse selection problems result in agency risk that rational investors price in determining firms' cost of equity (Jensen and Meckling 1976). Corporate governance represents a

set of mechanisms that is intended to reduce agency risk that results from information asymmetries. Governance mechanisms that provide independent monitoring of management promote effective managerial decision making that increases firm value and guard against opportunistic management behavior that decreases firm value. Furthermore, more transparent financial information and more public disclosure of private information, as attributes of strong governance, reduce information risk faced by shareholders resulting in an increase in shareholder value. We posit that better governance mitigates agency risks driven by the problems of moral hazard and adverse selection. Weak governance, on the other hand, exposes shareholders to greater agency risk.

Recent theoretical work by Lambert et al. 2007 investigates the direct effects (i.e., investor assessment of the firm's future cash flow distribution) and indirect effects (i.e., firms' operating, financing and investing decisions) of accounting information system quality on cost of equity in a single period multi-security CAPM setting. In the Lambert et al. 2007 framework, accounting information system quality is broadly defined to include not only the disclosures the firm makes to outsiders, but also the internal control systems and corporate governance policies that a firm has in place. With respect to the direct effects, they show that higher quality information reduces market participants' assessed variances of a firm's cash flows and the assessed covariances with other firms' cash flows leading to a lower cost of equity. Moreover, they show that the quality of corporate governance has an effect on a firm's real decisions, including the amount of firm cash flows that managers appropriate for themselves. Stronger governance decreases a manager's appropriation of firm resources, which increases the ratio of expected cash flows available to investors relative to the covariance of firm cash flows with the market leading to a lower cost of equity capital.

In the Lambert et al. 2007 framework, it is important to note that the cost of capital effect of higher quality information is fully captured by an appropriately specified *forward-looking beta*,

i.e., the covariance of *expected* end of period cash flows. Thus, if one could properly measure forward-looking betas there would be no role for governance variables in explaining differences in cost of equity because all governance effects would be subsumed by forward-looking beta. However, betas estimated using *historical return data* do not fully capture all information quality effects and other governance effects. Because historical beta estimates provide a noisy estimate of the forward-looking beta in the Lambert et al. 2007 model, we posit that governance variables that proxy for financial transparency and monitoring of management will have incremental explanatory power beyond beta with respect to cost of equity.

The theoretical work of Garmaise and Lui 2004 posits that ineffective governance increases a firm's covariance of cash flows with the market leading to higher systematic risk. They demonstrate that the transfer of investment decision rights to management exposes shareholders to higher operating leverage because managers have a preference for actions such as empire building or over-investment (Jensen 1986) that increases payoffs in good economic times, but exaggerates losses in bad economic times leading to higher market betas.²

Similar to Garmaise and Lui 2004, Albuquerque and Wang (2005) posit that weaker investor protection increases managers' incentives to over invest. In their model, overinvestment increases the volatility of the stock price (idiosyncratic risk) and increases the covariation between firm stock returns and consumption (systematic risk). Stronger governance increases the monitoring of management and creates a more balanced power structure within the firm limiting the scope of managerial actions. Consistent with this idea, Adam, Almeida and Ferreira (2005) posit and provide empirical evidence that the variability of firm outcomes is a function of CEO power. The outcomes of firms with more powerful CEOs are less likely to be reached by consensus, leading to greater idiosyncratic errors and increased variability (idiosyncratic risk). Finally, Lombardo and Pagano (2002) develop a model in which the monitoring cost incurred by investors is a function of the quality of firms' governance. In their model investors incur lower

monitoring costs for firms with higher quality governance, and thus demand a lower rate of return, i.e. a lower cost of equity.

To empirically test the implications of these theoretical studies, we assess the relation between governance and two common measures of risk—idiosyncratic risk³ and market beta—as well as the effect of governance on the cost of equity. In a CAPM setting, the linkage between a firm’s market beta and expected return (cost of capital) is well established. Whether idiosyncratic risk matters to investors is subject to considerable debate (Bali, Cakici, Yan and Zhang 2005 and Goyal and Santa-Clara 2003). If investors hold “well diversified” portfolios, idiosyncratic risk does not matter because individual firm risk can be diversified away. Empirical research, however, is mixed on whether individual investors can hold enough stocks in their portfolios to fully diversify idiosyncratic risk. Fama and MacBeth (1973) fail to find an association between idiosyncratic risk and expected returns. However, a number of studies provide evidence consistent with idiosyncratic risk being priced (Lehmann 1990, Lintner 1965 and Douglas 1969). Goyal and Santa-Clara (2003) report that idiosyncratic risk, as measured by the volatility of the average stock in the market, is positively related to market returns. Furthermore, Fu (2005), Malkiel and Xu (2006), and Spiegel and Wang (2005) find a positive and significant association between idiosyncratic risk and firm-level expected returns.⁴

In summary, the theoretical and empirical studies cited above suggest that better quality information as well as other attributes of governance that proxy for better monitoring of management can impact a firm’s cost of equity in three ways: (1) by reducing the market’s assessed covariance of a firm’s future cash flows; (2) by reducing the assessed variance of future cash flows (idiosyncratic risk); and (3) by lowering managers’ consumption of firm assets that increases current period price, thereby lowering expected return. Our general hypothesis is that better governance mitigates agency risks leading to lower idiosyncratic risk, smaller betas, and lower cost of equity. In the next section, we identify and motivate the eight governance attributes

that we elect to study because of their documented importance in the prior literature and their linkages to mitigating firms' agency risk.

3. Governance Attributes

Quality Financial Information

Quality financial information can be viewed as an element of corporate governance in that greater disclosure and financial transparency reduces information asymmetries between the firm and its shareholders. The theoretical work of Lambert et al. 2007 predicts that higher quality financial information will lead to lower idiosyncratic risk, lower betas and lower cost of equity. Prior theoretical work in finance posits that quality financial information reduces firm risk and, consequently, the cost of equity in one of two ways: either by (1) increasing market liquidity, thereby reducing transactions costs or increasing the demand for a firm's securities (Copeland and Galai 1983, Glosten and Milgrom 1985, Amihud and Mendelson 1986 and Diamond and Verrecchia 1991); or by (2) reducing investors' information risk (Klein and Bawa 1976, Barry and Brown 1985, Coles and Lowenstein 1988, Coles, Lowenstein and Suay 1995, Easley and O'Hara 2004, and Lambert et al. 2007). Consistent with these theoretical predictions, there is considerable empirical evidence that disclosure quality or earnings transparency lowers firms' cost of capital. Botosan (1997), Botosan and Plumlee (2002), Bhattacharya, Daouk and Welker (2003), and Francis, LaFond, Olsson and Schipper (2004) find a negative relation between various proxies for disclosure quality or earnings transparency and cost of equity. Note, however, that all of these studies measure the effects of disclosure quality on cost of equity after controlling for the effects of beta risk. In effect, this approach ignores the effect that the disclosure quality aspect of governance can have on cost of capital through beta risk.

We use two proxies for financial information or disclosure quality.⁵ Our first proxy, *FIN_TRANS*, captures the timeliness or transparency of accounting earnings. The more transparent earnings are, the more *current* earnings reflect information about the firm's *current* economic

activities (Bushman, Chen, Engel and Smith 2004). More transparent earnings result in less information asymmetry between the firm and its shareholders, leading to less information risk for shareholders, which in turn should lead to lower cost of equity (Easley and O'Hara 2004). *FIN_TRANS* is measured as in Gu 2002 and Ashbaugh-Skaife et al. 2006 and is equal to the squared residual from regressing returns on earnings levels and changes allowing for separate intercepts and slopes for profit and loss firms. Earnings that better articulate with market returns are deemed to be more transparent in that they better reflect the economic events that are priced by the market. A high squared residual indicates that earnings are less transparent. To facilitate the interpretation of this variable, we multiply the squared residual by negative one and predict a negative relation with idiosyncratic risk, beta, and cost of equity (i.e., more transparent earnings are associated with lower cost of equity).

The second measure of financial information quality, *WCAQ*, is a measure of working capital accrual quality based on the work of Dechow and Dichev 2002. Briefly, *WCAQ* is the standard deviation of the firm-specific residual from regressing working capital accruals on past, contemporaneous, and future operating cash flows, where smaller residuals reflect a better mapping of working capital accruals to cash flows (Dechow and Dichev 2002). Again, to facilitate the interpretation of this variable, we multiply it by negative one and predict a negative relation between this variable and firms' idiosyncratic risk, beta, and cost of equity.

Ownership Structure

The original premise that explains the existence of corporate governance is that dispersed shareholders demand that the firm have mechanisms in place to monitor management because no one shareholder has the incentive to monitor management on his own (i.e., there exists a free rider problem). As shareholders accumulate more shares, however, their incentives for monitoring management increase. Jensen (1993) and Shleifer and Vishny (1997) argue that institutional investors and blockholders are important to a well-functioning governance system because they

have the financial interest and independence to monitor management actions in an unbiased way and they have the voting power to effect change when management is deemed to be ineffective.

Cremers and Nair (2005) argue that public pension funds face fewer conflicts of interest than other institutional investors and they tend to be aggressive shareholder activists that are effective in monitoring the activities of management.⁶ Consistent with this view, Nesbitt (1994) finds that firms targeted by the California Public Employees' Retirement System (CalPERS) experience positive long-run stock returns and Opler and Sokobin (1997) find that firms experience above-market performance the year after being targeted by the Council of Institutional Investors. Following Cremers and Nair 2005, we use the percentage of shares held by the eighteen largest pension funds, *%INST_ACT*, to capture the potential benefits that accrue from the monitoring role that activist institutional shareholders play in corporate governance.⁷ We use the number of blockholders that own 5 percent or more of a firm's outstanding voting stock, *BLOCK*, to capture concentrated ownership. To the extent blockholders and activist institutional investors provide effective monitoring of management that reduces opportunistic behavior thereby reducing agency risk, we expect a negative relation between our risk measures and *%INST_ACT* and *BLOCK*.

A competing view in the literature suggests that concentrated ownership allows blockholders to exercise undue influence over management and that blockholders will use this influence to secure private benefits that are detrimental to other shareholders (e.g., Barclay and Holderness 1989).⁸ To the extent that blockholders use their voting power to extract private benefits, we expect a positive relation between blockholders and idiosyncratic risk, beta, and the cost of equity. Given the uncertainty as to the relation between our risk measures and block ownership, we leave the prediction on this variable unsigned.

There is one other important ownership group that potentially diminishes firms' agency risk. *%INSIDE* is the percentage of shares held by officers and directors. We predict that

%INSIDE will be negatively related to the three risk measures under the assumption that as officers and directors hold greater ownership in the firm, their interests are more aligned with outside shareholder interests, thereby lowering the agency conflicts between managers and outside shareholders. Moreover, greater board shareholdings encourages better monitoring of management that reduces moral hazard problems, and consequently less agency risk, leading to a lower idiosyncratic risk, smaller betas, and lower cost of equity.

Shareholder Rights

Shareholder rights reflect the ability of voting shareholders to exercise their control over firm assets, remove ineffective or opportunistic management, or effect ownership changes that increase shareholder value. One benefit of common stock ownership of U.S. firms is that voting shareholders can effectuate changes in management and corporate assets in the expectation of increasing firm value. Moreover, firms with stronger shareholder rights are expected to provide better monitoring of management and better control over opportunistic actions.

However, takeover defenses and other restrictions of shareholder rights can limit the extent to which a majority of shareholders can impose their will on management. Building on the work of Gompers, Ishii and Metrick (2003), Bebchuk et al. (2004) develop an entrenchment index comprised of six provisions that measure the extent to which management is insulated from intervention or removal by shareholders. Such insulation can harm shareholders by weakening the disciplinary threat of removal, thereby increasing management shirking, empire building and extraction of private benefits (e.g., over-compensation) at the expense of shareholders. The six provisions include four elements that place constitutional limits on shareholders' voting power [(1) whether the firm has staggered terms of directors (classified board); (2) limits to shareholder amendments of the bylaws; (3) supermajority voting requirements for approval of mergers; (4) supermajority voting requirements for charter amendments] and two that insulate management from a hostile bid or its consequences [(5) poison pills and (6) golden parachutes].

Bebchuk et al. (2004) posit that high entrenchment adversely affects shareholder value and find evidence to support this conjecture. Using a sample of firms on the Institutional Investors Research Center (IRRC) data base, they find that a strategy of buying firms with low entrenchment index scores and simultaneously selling short firms with high entrenchment index scores yields significantly positive abnormal returns of roughly 7 percent over the period 1990 to 2003. We conjecture that entrenchment increases agency risks faced by shareholders and, therefore, are factored into firms' idiosyncratic risk, market risk, and shareholders' expected returns. We construct an *E_SCORE* by assigning a one to each of the six provisions in the Bebchuk et al. (2004), entrenchment index yielding *E_SCORES* that range from 0 to 6, and predict a positive relation between *E_SCORE* and the two risk measures and firms' cost of equity.⁹

Board Structure

The board of directors' role is to provide independent oversight of management and hold management accountable to shareholders for its actions. A widely held view is that boards are more effective in their monitoring of management when there is a strong base of independent directors on the board (Federal Register 2003a and 2003b). Prior research examining the effects of board composition is inconclusive on whether board independence is positively related to firm performance. Baysinger and Butler (1985), Hermalin and Weisbach (1991), and Brown and Caylor (2006) find no relation between overall board independence and firm performance. While the link between board structure and firm performance is unclear, there is considerable evidence that board structure can affect agency risks faced by shareholders. Richardson (2004) finds that firms with positive free cash flows exhibit less evidence of over-investment when their boards are made up of a higher percentage of independent directors. Core, Holthausen, and Larcker (1999) show firms with more independent boards exhibit less evidence of CEO over-compensation.

Based on the literature reviewed above, we use *%BRD_IND* to capture the effects of board structure on firm risk, where *%BRD_IND* reflects the percentage of the board made up of

independent outside (nonaffiliated) directors. To the extent better monitoring of management leads to less managerial opportunism, governance risk is attenuated and the firm's risk should be lower. Therefore, we predict a negative relation between *%BRD_IND* and idiosyncratic risk, beta, and the cost of equity.

Another element of board structure that reflects the incentives for directors to actively monitor management is board compensation. The key issue is whether board members are remunerated in ways that promote monitoring of management to enhance the long-term success of the firm. Yermack (2004) finds that director stock and option awards are positively related to firms' investment opportunities and subsequent firm performance, suggesting that tying directors' pay more closely to stock performance through the use of options and other equity awards generally leads to increased monitoring. We use *%BRD_STOCK* to measure the percentage of outside directors that hold stock in the company. As board member stockholdings increase, we expect directors' interests to better align with shareholder interests and we expect the board to more carefully monitor the actions of management. This should lead to shareholders facing less agency risk. Therefore, we predict a negative relation between *%BOARD_STOCK* and idiosyncratic risk, beta, and cost of equity.

4. Research Design Choices

Data, Variables, and Sample

We begin by describing the data sources for the eight key governance attributes we choose to study. Data for computing our measures of financial information quality, the quality of working capital accruals (*WCAQ*) and the degree to which earnings are transparent in capturing economic events (*FIN_TRANS*), are obtained from Compustat and CRSP. *WCAQ* and *FIN_TRANS* are estimated following the methods described in Ashbaugh-Skaife et al. 2006. We use CDA/Spectrum to identify the proportion of shares held by activist institutional investors (*%INST_ACT*), where, following Cremers and Nair 2005, the 18 largest public pension funds are

classified as activist institutions. Ownership data related to blockholders that hold 5 percent or more of a firm's outstanding stock (*BLOCK*), and inside ownership by officers and directors (*%INSIDER*) are obtained from Compact Disclosure.

The data for computing *E_SCORE*, our measure of management entrenchment, are taken from IRRC. *E_SCORE* is a discrete measure ranging in value from zero to six representing the presence of six provisions that Bebchuk et al. (2004) identify as indicators of management entrenchment. As noted above, the six provisions comprising *E_SCORE* are staggered boards, limits to shareholder bylaw amendments, supermajority requirements for mergers, and supermajority requirements for charter amendments, poison pills and golden parachutes.

We use governance data compiled by the IRRC and the Corporate Library to measure board independence (*%BRD_IND*) and the portion of the board that own stock (*%BRD_STOCK*). The IRRC data base contains detailed governance data on the S&P 1500 while the Corporate Library's Board Analyst data base contains governance data for over 2000 U.S. companies and profiles on over 22,000 individual directors. The data used in our analysis covers eight fiscal years from 1996 to 2003. We use IRRC data for the 1996-1999 time frame because Board Analyst did not exist prior to 2000. We also use IRRC data for 2000 because, while in existence in 2000, Board Analyst did not provide the necessary board structure data in 2000 that are comparable to IRRC. We convert to Board Analyst's board and committee structure data for 2001, 2002, and 2003 because Board Analyst is more comprehensive than IRRC and covers a broader sample of firms.¹⁰

Two measures of risk, idiosyncratic risk (*I_RISK*), systematic risk (*BETA*), and the cost of equity capital (*IMPIED_CC*) are used to assess the implications of governance and are calculated as follows. *I_RISK* is the standard deviation of the residuals from the following OLS regression model:

$$RET = \beta_0 + \beta_1 MKTRET + \varepsilon \quad (1),$$

where *RET* is the firm return and *MKTRET* is equal to the value-weighted return on the market. Model (1) is estimated using daily returns over the firm's fiscal year.

BETA is equal to the coefficient on the *RMRF* term from the following OLS regression model:

$$EXRET = \beta_0 + \beta_1 RMRF + \varepsilon \quad (2),$$

where *EXRET* is the firm's monthly return minus the risk free rate and *RMRF* is the excess return on the market. Model (2) is estimated using monthly returns over the past 60 months requiring at least 18 monthly observations.

Our cost of equity measure is based on Value Line forecasts. Value Line's expected return is the discount rate that equates their three to five year target price forecasts and dividend forecasts to a firm's current stock price. Value Line reports target prices quarterly, but updates the current prices throughout the year, and, as a result, updates firms' expected returns between Value Line report dates. Our cost of equity capital measure, labeled *IMPLIED_CC*, is the average expected return over the firm's fiscal year. Averages are comprised of a minimum of four and maximum of twelve expected return measures.¹¹

Our measure of the cost of equity capital, *IMPLIED_CC*, is similar to those used by Brav, Lehavy and Michaely 2005, Botosan and Plumlee 2002, 2005, and Francis et al. 2004. These studies use Value Line's target prices and dividend forecasts to derive a measure of a firm's expected return based on valuation models incorporating these forecasts. *IMPLIED_CC* and the measures of expected return derived in these papers arise due to variation in the assumptions of how expected dividends and dividend growth are incorporated into the expected return calculations. The advantage of our approach over those used in Brav et al. 2005 and Botosan and Plumlee 2005 is that we place no restrictions on how dividends and dividend growth enter into Value Line's expected return calculation. Instead, we allow Value Line to incorporate expected

future prices and expected future dividends into forecasts of expected return using their valuation model and we use these values directly.¹²

The last set of variables used in our study we label firm characteristics. This set of variables represents control variables demonstrated in prior research to affect firm risk (see e.g., Fama and French 1993, Rajgopal and Venkatachalam 2005). Specifically we control for the standard deviation of cash flow from operations (*STDCFO*), leverage (*LEV*), cash flow from operations (*CFO*), market-to-book (*MB*) and firm size (*SIZE*). Data necessary to calculate these variables are extracted from Compustat.

The specific definitions of our key governance attributes, the alternative risk measures, the cost of equity capital, and the firm characteristics that comprise the control variables are summarized in Table 1.

[Insert Table 1 here]

The sample sizes for each year are determined by firms that satisfy the data requirements outlined above. We exclude financial firms because the regulatory reporting and oversight of banks potentially results in banks having governance structures different from non-financial firms. The sample sizes vary from 494 firms in 1996 to 1005 firms in 2003 as shown in Table 2.

[Insert Table 2 here]

Descriptive Statistics and Correlations

Panel A of Table 3 provides descriptive statistics for the three sets of variables used in our analysis. As shown, the mean (median) of *IMPLIED_CC* is 18.3% (16.1%) with an interquartile range of 11.4% to 22.9%.¹³ The mean (median) *BETA* is .947 (.831) and *I_RISK*, on average, is 2.504. The descriptive statistics on the control variables suggest that our sample is comprised of large firms with equity being the primary source of capital as the medians of *SIZE* (in billions of \$) and *LEV* are 1.857 and 0.258, respectively. The difference between the mean (8.523) and

median (1.857) values of *SIZE* indicates that the variable is highly skewed, and thus we use the natural log of *SIZE* in our empirical tests. The descriptive statistics also indicate that our sample firms have relative stable cash flows (scaled by total assets) as the mean (median) *STD_CFO* is 0.046 (0.036). Overall, these statistics reflect the fact that the IRRC, Board Analyst and Value Line databases tend to be populated by large, more established firms with somewhat lower risk profiles than the average firm in the market.

[Insert Table 3 here]

Turning to our governance attributes, the descriptive statistics indicate that the largest public pension funds (*%INST_ACT*) hold, on average, almost three percent of firms' shares. For our sample, the mean (median) percentage of shares held by insiders is 6.1 percent (1.5 percent) and the average number of blockholders that own 5 percent or more of the firm's stock is four. For the management entrenchment index, the average *E_SCORE* of our sample is 2.20, which is somewhat lower than the average *E_SCORE* of 2.58 for the sample studied in Bebchuk et al. (2004).

The composition of the board and stock ownership of board members is also described in Panel A of Table 3. The average (median) percentage of outsiders on the board is 66.9% (70.0%) and the lower quartile is 55.6%. Finally, the average (median) percentage of board members holding stock in the company is 78.5% (85.7%).

Panel B of Table 3 provides correlations among the risk measures and the governance variables. The upper right hand portion of the table presents Pearson product-moment correlations, while the lower left hand portion presents the Spearman rank-order correlations. To facilitate discussion, we focus on the Pearson correlations, but note that the Spearman rank order correlations are generally consistent with the Pearson results.

Consistent with prior evidence in the finance literature, we find a significant positive correlation between *IMPLIED_CC* and *BETA* (0.28) as well as *I_RISK* (0.29). *SIZE* is negatively

correlated with *IMPLIED_CC* and *I_RISK* (-0.14 and -0.26, respectively) but is not significantly correlated with *BETA*. The relation between the two risk measures, cost of capital, and the governance attributes are consistent with our predictions with the exception of *%INST_ACT* and *%INSIDER*. We also note the numerous significant positive and negative correlations between the various governance variables suggesting that the governance attributes that we study, while related, do not represent perfect compliments or substitutes. Finally, we highlight the correlations between *E_SCORE* and the other variables. *E_SCORE* is negatively correlated to *BETA* and *I_RISK*. In addition, *E_SCORE* is positively correlated with *FIN_TRANS*, *%BRD_IND*, *%BRD_STOCK*, and negatively correlated with *WCAQ*. In line with prior literature, we posit that higher *E_SCORES* reflect weaker governance. However, the signs and significance of these correlations suggest otherwise.

5. Results

Primary Analyses

We test our predictions regarding the effects of governance on risk and cost of equity by conducting four primary analyses. Table 4 presents the results of the first analysis where we examine the relation between *I_RISK*, the governance attributes and various control variables using the following OLS regression model:

$$\begin{aligned}
 I_RISK = & \beta_0 + \beta_1 STDCFO + \beta_2 LEV + \beta_3 CFO + \beta_4 MB + \beta_5 SIZE + \beta_6 WCAQ \\
 & + \beta_7 FIN_TRANS + \beta_8 \%INST_ACT + \beta_9 \%INSIDER + \beta_{10} BLOCK \\
 & + \beta_{11} E_SCORE + \beta_{12} \%BRD_IND + \beta_{13} \%BRD_STOCK + \sum_{t=1997}^{2003} \alpha_t YEAR + \varepsilon
 \end{aligned} \tag{3}$$

where *YEAR* is a series of year indicator variables identifying fiscal years 1997 through 2003, and all variables are as previously defined.

The Model 1 column of Table 4 presents the results of estimating equation (3) with only the five control variables. As predicted, we find significantly positive (negative) coefficients on *STDCFO* and *MB* (*CFO* and *SIZE*). Inconsistent with expectations, we find a negative and

significant coefficient on *LEV*. However, after deleting firm-year observations in which firms have little or no debt in their capital structure (*LEV* less than 0.10), we find the coefficient on *LEV* is positive and significant at the 0.10 level as expected and the signs and significance levels of the other variables remain the same.¹⁴ This reduced model provides a benchmark to assess the effects of governance on *I_RISK* as the control variables explain 34% of cross-sectional variation of firms' idiosyncratic risk.

The second column of Table 4 estimates equation (3) including only the eight governance variables. We estimate equation (3) using only the governance attributes because the correlations reported in panel B of Table 3 indicate that the governance attributes are not only correlated with *I_RISK*, but also with the control variables. Larcker, Richardson and Tuna (2006) suggest that a model that includes only the governance variables is appropriate if governance impacts the control variables, and the control variables as well as the governance variables affect the dependent variable. Thus, by estimating a model that includes only the governance attributes, we capture both the direct and indirect effects of governance on firms' risk.

As predicted, the coefficients on *WCAQ*, *FIN_TRANS*, *%INST_ACT*, *%BRD_IND*, and *%BRD_STOCK* are all negative and significant. Inconsistent with expectations, the coefficient on *E_SCORE* is negative and significant. The significant negative coefficient on *E_SCORE* indicates that firms with greater managerial power have lower *I_RISK* consistent with the findings of Ferreira and Lax 2007. This result suggests that more entrenched management seek to avoid effort by taking on less risky projects (Bertrand and Mullainathan 2003). While we make no directional prediction on *BLOCK*, we find a positive and significant coefficient on *BLOCK* indicating that firms with more concentrated ownership in the form of significant blockholders have higher idiosyncratic risk. When considered collectively, the governance variables explain 38% of the cross-sectional variation of *I_RISK* (incremental *F*-statistic of 293.79, significant at the 0.01 level).

In fact, the adjusted R^2 of the model including only the governance variables (38%) is slightly higher than the model including only the control variables (34%).

Model 3 of Table 4 estimates the full model of I_RISK . Including the control variables increases the adjusted R^2 to 0.46 yet does not change the inferences drawn on governance variables from those in the model without controls. The incremental F -test continues to provide evidence consistent with governance affecting I_RISK beyond that of firm risk characteristics investigated in prior literature (F -statistic 164.59, significant at the 0.01 level).

Lambert et. al. (2007) and Garmaise and Liu (2004) posit that weak corporate governance affects firm value in part by increasing the assessed and real covariation of firm cash flows with the market. To test the extent to which our governance attributes are related to $BETA$, we estimate the following OLS regression model:

$$\begin{aligned}
 BETA = & \beta_0 + \beta_1 STD_CFO + \beta_2 LEV + \beta_3 CFO + \beta_4 MB + \beta_5 SIZE + \beta_6 WCAQ \\
 & + \beta_7 FIN_TRANS + \beta_8 \%INST_ACT + \beta_9 \%INSIDER \\
 & + \beta_{10} BLOCK + \beta_{11} E_SCORE + \beta_{12} \%BRD_IND \\
 & + \beta_{13} \%BRD_STOCK + \sum_{t=1997}^{2003} \alpha_t YEAR + \varepsilon
 \end{aligned} \tag{4}$$

where all variables are as previously defined.

Table 5 reports the results of estimating equation (4). For comparative purposes we first estimate equation (4) including only the control variables. Consistent with the results reported in Table 4, we find the coefficients on STD_CFO , CFO , and MB are significant in the predicted direction (positive, negative, and positive, respectively). As in the I_RISK analysis, the coefficient on LEV is negative when estimating equation (4) using the complete sample. However, when estimating equation (4) using only firm-year observations that include LEV values greater than or equal to 0.10 the relation is positive as expected (not tabled). Contrary to expectations, the association between $BETA$ and $SIZE$, after controlling for other sources of firm risk, is positive

and significant. Overall, the adjusted R^2 from the model including only the control variables is 19%.

The Model 2 column of Table 5 reports the results of estimating equation (4) including only the governance variables. The results indicate that the governance variables as a whole are important determinants of firms' market risk (F -test statistic of 187.50, significant at the 0.01 level). Moreover, the governance attributes alone explain 20% of the cross-sectional variation in $BETA$. Consistent with expectations, we find that firms reporting higher quality working capital accruals and more transparent financial information have lower betas. We also find that firms with a greater proportion of shares held by insiders have lower betas as do firms with more independent boards and boards with a greater proportion of the directors owning stock. As was the case for idiosyncratic risk, we find a significant negative relation between E_SCORE and $BETA$, indicating that more entrenched management seek to avoid effort by taking on less risky projects (Bertrand and Mullainathan 2003). As in the I_RISK analysis, we find a positive relation between $BLOCK$ and $BETA$ indicating that firms with more blockholders hold greater market risk.

Turning to the results of the full model reported in the Model 3 column of Table 5, we find the signs and significance of the coefficients on the governance attributes to be similar to those reported when considering governance in isolation with two exceptions. The coefficients on MB and $\%INST_ACT$ are no longer significantly related to $BETA$. Nevertheless, the governance attributes continue to provide significant incremental explanatory power for $BETA$ beyond that of the control variables (F -statistic 96.40, significant at the 0.01 level). Overall, the results reported in Table 5 lend support to Lambert et al. 2007 and Garmaise and Liu 2004 who posit that the quality of a firm's governance impacts the firm's exposure to market risk.

Based on the results reported in Tables 4 and 5, we conclude that governance affects both idiosyncratic and systematic risk. While I_RISK and $BETA$ are measures of specific risks, we use the cost of equity as a summary measure of risk. Table 6 presents the results of our analysis

investigating the association between governance and *IMPLIED_CC* by estimating the following OLS regression model:

$$\begin{aligned}
 IMPLIED_CC = & \beta_0 + \beta_1 BETA + \beta_2 SIZE + \beta_3 MB + \beta_4 I_RISK + \beta_5 WCAQ \\
 & + \beta_6 FIN_TRANS + \beta_7 \%INST_ACT + \beta_8 \%INSIDER + \beta_9 BLOCK \\
 & + \beta_{10} E_SCORE + \beta_{11} \%BRD_IND + \beta_{12} \%BRD_STOCK \\
 & + \sum_{t=1997}^{2003} \alpha_t YEAR + \varepsilon
 \end{aligned} \tag{5}$$

where all variables are as previously defined.

The first column of Table 6 displays the results of estimating a reduced form of equation (5) that only includes the eight corporate governance attributes and the *YEAR* indicator variables. This simplified model that omits *BETA* and *I_RISK* allows us to measure both the indirect and direct effects of governance on firms' cost of equity through the coefficients on the various governance variables.

We find significantly negative coefficients on *WCAQ* and *FIN_TRANS*. These findings are consistent with prior literature that documents that firms reporting higher quality earnings incur lower costs of equity capital (e.g., see Francis et al. 2005). Table 6 shows a significant positive relation between *IMPLIED_CC* and *BLOCK*. This finding suggests that concentrated owners do not necessarily provide additional monitoring of management that benefits dispersed shareholders. Rather, the positive coefficient on *BLOCK* is consistent with dispersed shareholders facing greater risk that blockholders will use their voting power to extract rents (e.g., targeted share repurchases) or dispersed shareholders facing greater risk when trading with more informed blockholders (Easley and O'Hara 2004). Turning to board structure measures, the results indicate that both variables that we use to capture the monitoring effects of the board, *%BRD_IND* and *%BRD_STOCK*, are negatively related to *IMPLIED_CC*, consistent with our predictions.

Overall, the set of governance attributes in isolation explain ten percent of the variation in the cost of equity. The result of an *F*-test indicates that the governance variables, collectively, have significant explanatory power for *IMPLIED_CC* (*F*-statistic=45.17, significant at the .001 level).

Model 2 of Table 6 introduces *BETA* into the analysis. We introduce *BETA* in isolation to test whether our governance variables have direct effects on cost of equity over and above their effect on market risk.¹⁵ The results for Model 2 indicate that *WCAQ*, *FIN_TRANS*, *BLOCK*, *%BRD_IND* and *%BRD_STOCK* remain as significant explanatory variables for firms' cost of equity after controlling for beta risk. In addition, we find a marginally significant negative coefficient on *%INST_ACT*. The explanatory power of *BETA* and the set of governance attributes is 14%. The incremental *F*-statistic of 17.09 indicates that the governance attributes add significant incremental explanatory power over *BETA*.

Model 3 of Table 6 presents results where the governance variables are added to the three most dominant priced risk factors-- *BETA*, *SIZE* and *MB*. The coefficients on *BETA*, *SIZE* and *MB* are significant with the expected signs. Importantly, *WCAQ*, *FIN_TRANS*, *BLOCK*, and *%BRD_IND* continue to be significant in explaining firms' cost of equity. The adjusted R^2 is 16 percent and the significance of an incremental *F*-test indicates that the governance variables provide additional explanatory power beyond the three well known risk proxies.

The last column of Table 6 presents the results from estimating the full model. The coefficients on *BETA*, *SIZE*, *MB*, and *I_RISK* are significant with the expected signs. *FIN_TRANS*, *BLOCK*, and *%BRD_IND* continue to be significant in explaining firms' cost of equity. The adjusted R^2 is 19%. More importantly, the significance of an incremental *F*-test indicates that the governance variables continue to provide additional explanatory power for firms' cost of equity after controlling for other risk factors.

Based on the results reported in Tables 4, 5, and 6, we conclude that corporate governance affects firms' idiosyncratic risk, systematic risk, and cost of equity. These findings

provide evidence largely overlooked in the prior literature that governance affects firms' cost of capital both directly and indirectly through idiosyncratic and beta risk.

Economic Significance of Governance

To assess the magnitude of the governance effect on the cost of capital we estimate rank regressions. To conduct the rank regressions we first rank the independent variables into quintiles for each fiscal year, designating the quintiles by [0, 4]. We then scale the quintile rank by four so that each variable observation takes on a value between zero and one (Abarbanell and Bushee 1998). By using the scaled quintile ranks, the estimated coefficient on the variable represents the difference in the cost of capital between the highest and lowest ranked firms. We use quintile ranks due to the relatively low variation in the governance variable measures across our sample.

Table 7 presents the results of estimating equation (6):

$$\begin{aligned} \text{IMPLIED_CC} = & \beta_0 + \beta_1 R_BETA + \beta_2 R_SIZE + \beta_3 R_MB + \beta_4 R_I_RISK \\ & + \beta_5 GOV_COMPOSITE + \sum_{t=1997}^{2003} \alpha_t \text{YEAR} + \varepsilon \end{aligned} \quad (6),$$

where R_BETA is the scaled quintile rank of $BETA$; R_SIZE is the scaled quintile rank of $SIZE$; R_MB is the scaled quintile rank of MB and R_I_RISK is the scaled quintile rank of I_RISK . $GOV_COMPOSITE$ is equal to the scaled quintile rank of the following: quintile rank of $WCAQ$ + quintile rank of FIN_TRANS + quintile rank of $\%INST_ACT$ + quintile rank of $\%INSIDER$ + quintile rank of $(BLOCK*-1)$ + quintile rank of $(E_SCORE*-1)$ + quintile rank of $\%BRD_IND$ + quintile rank of $\%BRD_STOCK$. All other variables are as previously defined.¹⁶

We find the overall $GOV_COMPOSITE$ measure to be significant in explaining the cost of equity in isolation, as well as significant when combined with R_BETA , R_SIZE , R_MB and R_I_RISK . The cost of equity effects in terms of basis points is determined by multiplying the estimated coefficient from the rank regression times 4 because there are four quintile differences between the highest and lowest rank, and then multiplying these results times 1000. For example, multiplying the coefficient estimate for beta of 0.069 x 4 x 1000 yields a 276 basis point spread

between the highest and lowest quintile of beta stocks. In isolation, the results indicate that firms in the upper quartile of governance scores enjoy a lower cost of equity of 152 basis points relative to firms in the lower quartile of governance scores. After controlling for the four risk proxies, the benefit of good governance drops to 40 basis points. The results of the incremental *F*-tests, reported at the bottom of Table 7 indicate that *GOV_COMPOSITE* significantly increases the explanatory power of the cost of equity models.¹⁷

Endogeneity

The preceding analysis treats governance attributes as being exogenously determined. Under the assumption of optimal contracting, a firm's governance structure is unique in equilibrium and endogenously determined (Bushman, Chen, Engel and Smith 2004; Hermalin and Weisbach 2003). Endogeneity exists when some of the regressor (or right hand side) variables in an equation are correlated with the true (but unobserved) error term in the equation. If governance provisions are endogenously determined such that there is a factor or set of factors that affect governance and also affect firms' cost of equity, then our study suffers from a potential correlated omitted variable problem. This misspecification can cause the parameter estimates to be biased and inconsistent, which clouds the interpretation of results.

The standard econometric solution for endogeneity is to use two-stage procedures that rely on instrumental variables to generate predicted values of the independent variables (Green 2000; Chenhall and Moers 2007). For the instrumental variable (IV) approach to be viable, the instruments used to predict the explanatory variables must be highly correlated with the explanatory variables deemed to be endogenous (in our case, the governance proxies) but uncorrelated with the disturbance term from the structural model used to explain cost of equity. Unfortunately, instrumental variables that satisfy these conditions are very difficult to identify in most accounting research settings (Ittner and Larcker 2001; Chenhall and Moers 2007). This is

particularly true with respect to governance attributes in that there is no well developed theory or model of the economic determinants of governance (Hermalin and Weisbach 2003).

The lack of theory on the determinants of corporate governance draws into question the adequacy of any instrumental variable approach to deal with potential endogeneity issues in our setting. Past research (Hermalin and Weisbach 1991; Demsetz and Lehn 1985; Ang, Cole and Lin 2000) that attempts to investigate the determinants of board structure and ownership structure of corporations has met with limited success in that the models tested typically explain less than 20% of the variation in these two dimensions of governance. Larcker and Rusticus (2005) demonstrate that when instruments are weak (i.e., the instruments explain less than 20% of the variation in the endogenous variable), or when the selected instrumental variables are not completely exogenous (i.e., the instruments are correlated with the error term in the structural model), IV estimates are likely to be more biased and are more likely to provide the wrong statistical inference than standard estimation procedures that make no correction for endogeneity.

Even if various dimensions of governance are endogenously determined, there are several features of our setting that suggest correlated omitted variables are not driving our results. In Table 4 we show that six of the eight governance variables we consider are significantly related to cost of equity estimates in the predicted direction. Moreover, with few exceptions, there is relatively low correlation among these six governance variables (see correlations in Table 3, Panel B). Thus, there is no single omitted variable that could simultaneously be correlated with all six of these governance variables in such a way as to provide an alternative explanation for our results. Moreover, it is hard to imagine that there would be a set of omitted economic variables that would be highly correlated with our governance variables and simultaneously correlated with cost of equity in a fashion that is consistent with our findings.

To mitigate concerns about endogeneity and to provide further evidence on whether good governance reduces the cost of equity capital, we conduct a change analysis. For the change analysis,

we calculate a firm-specific difference in *GOV_COMPOSITE* and a firm-specific difference in the cost of equity for the 432 firms that have governance data in 1996 and in 2003. We regress the firm-specific change in the cost of equity on the firm-specific change in *GOV_COMPOSITE* and find a significantly negative coefficient (not tabled). This change analysis finding provides corroborating evidence that good governance results in a lower cost of equity.

To summarize, we conduct several analyses to assess the influence of corporate governance on idiosyncratic risk, systematic risk, and expected returns. The results of these analyses support our general hypothesis that firms with better governance present less agency risk to shareholders, which lowers firms' cost of equity.

6. Conclusion

In this paper, we identify key governance attributes related to the quality of firms' financial information, ownership structure, stakeholder rights, and board structure that are intended to reduce moral hazard and adverse selection problems present in publicly traded firms. We posit that since the governance attributes are intended to reduce agency costs, governance attributes should have significant effects on firms' idiosyncratic risk, beta, and cost of equity. We provide evidence that is consistent with this conjecture. Consistent with prior research, we document that the quality of firms' financial information is negatively related to idiosyncratic risk, beta, and the cost of equity. We also document that governance attributes related to ownership structure, stakeholder rights, and board structures affect our three risk measures. We construct a composite governance score and find it to be significant in explaining expected returns. We also find that the change in the governance score is negatively related to the change in the cost of equity. Collectively, the results of our analyses provide evidence that the governance attributes that we study have a significant effect on firms' risk profiles.

Our study suggests several avenues for future research. First, our findings suggest that some governance mechanisms are viewed to be more beneficial to shareholders than other

governance attributes. Future research can explore the cost of equity trade-offs between alternative governance attributes. Second, our results indicate that idiosyncratic risk and market risk captures some portion of the value of governance and the effect of governance on the cost of equity. Future research, both analytical and empirical, can explore how governance attributes articulate with other risk factors that are known to affect the cost of equity.

Appendix

Validation of Cost of Equity Measure

Conceptually, the cost of equity is the discount rate the market applies to a firm's future cash flows to determine current stock price. Botosan and Plumlee (2005) evaluate alternative estimates of the cost of equity derived from various valuation models and conclude that the estimates based on Value Line target prices and dividend forecast (target price method) and Easton's 2004 PEG ratio are superior to other measures of expected return. Their criteria for evaluating the descriptive validity of alternative cost of equity proxies is based on the association between measures of expected return and known risk proxies, such as beta, size (market value of equity), and the market-to-book ratio. Sharpe (1964), Linter (1965) and Black (1972) formalize the prediction that a firm's expected return should be positively related to its beta. Berk (1995) demonstrates that size will exhibit a negative relation with expected returns, as a residual risk factor, in any incomplete model of expected returns. Fama and French (2006) use Ohlson's 1995 residual income framework to formalize the valuation role of the market-to-book ratio in expected returns and predict a negative relation between the market-to-book ratio and expected return. Fama and French (1993) develop a three factor asset pricing model that includes beta, size and market-to-book, and show that this asset-pricing model out performs the capital asset pricing model (CAPM). To summarize, theoretical and empirical research indicates that a good measure of expected return will be positively related to beta and negatively related to size and the market-to-book ratio.

We validate our estimate of firms' cost of equity by documenting the relations between *IMPLIED_CC* and these known risk factors. Consistent with prior literature (e.g., Fama and French 1993), our results (not tabled) indicate a positive relation between *BETA* and cost of equity whereas *SIZE* and *MB* are negatively related to cost of equity. Thus, in terms of Botosan and Plumlee's 2005 evaluation criteria, *IMPLIED_CC* serves as a good proxy for firms' cost of equity.

Guay, Kothari, and Shu (2003) develop an alternative technique for evaluating cost of equity measures. Their evaluation is based on the association between measures of expected return and future realized returns. They posit that regressing future realized returns on an estimate of expected returns should yield a coefficient of one for good estimates of expected returns. Their prediction is based on the premise that expected returns, on average, should equal realized returns if the market's expected returns reflect rational expectations. Specifically, in estimating equation (A1), rational expectations implies that β_1 should equal one.

$$RET_t = \beta_0 + \beta_1 E(RET_t) + \varepsilon \quad (A1),$$

where RET_t is the firms' realized returns in period t , and $E(RET_t)$ is the firms expected returns at the beginning of period t .

Thus, the appropriateness of a cost of equity capital measure is evaluated based on whether the estimated β_1 in equation (A1) is significantly different from one.

We further validate *IMPLIED_CC* using the methodology developed by Guay et al. 2003. Specifically, we perform Fama-MacBeth regressions, regressing future monthly returns on estimated monthly expected returns, calculated as *IMPLIED_CC* divided by 12.¹⁸ The average monthly β_1 coefficient is 0.782, which is significantly different from zero at the 0.001 level. As noted by Guay et al. 2003, if the expected return measure in equation (A1) is a good proxy for the market's rational expectations of future returns, the β_1 coefficient is predicted to be one. The p -value associated with the test of whether 0.782 differs from one is 0.35, two-tailed. Using the a similar evaluation method for alternative cost of capital measures based on the PEG ratio and the residual income model indicates that these measures are in general not associated with future returns and exhibit inconsistent associations with the known risk factors for our sample of firms. Thus, we conclude that *IMPLIED_CC* serves as a reasonably good proxy for firms' cost of equity.

Endnotes

1. Prior theoretical research in agency theory finds that governance increases firm value by reducing the cash flows expropriated by the manager (see Lambert 2001 for a review of this research). In general, this research does not model the influence of governance on firm risk because management expropriation of firm assets is viewed as a one-time event. Lambert et al. (2007) explicitly consider the effect of expropriation of firm assets on firm risk in a multi-period setting and demonstrate that governance can influence both the amount of assets expropriated and the riskiness of the assessed cash flows of the firm.
2. Garmaise and Liu (2004) provide empirical support for this prediction in an international setting.
3. Idiosyncratic risk is the variation in stock returns that is unrelated to aggregate market returns; it is risk that is unique to an individual firm.
4. Makliel and Xu (2005) extend the work of Fama and MacBeth 1973 to a more recent time period, and report that Fama and MacBeth's 1973 results do not hold for more recent time periods.
5. Ideally, it would be desirable to use an independent measure of disclosure quality or financial transparency akin to the AIMR disclosure ratings for a broad cross section of firms. However, the AIMR ratings are not available for the time period covered in our study (1996 - 2002). Standard & Poor's (S&P) assesses firms' financial information quality via its transparency and disclosure (T&D) ratings (Standard & Poor's 2002). However, the T&D rating system was originally designed to capture the variation in disclosure practices across countries, not the variation in disclosure practices within the United States. Bushee (2004) suggests that the items that comprise the T&D score, for the most part, represent mandatory disclosures required of U.S. registrants or a set of voluntary disclosures that are common to the S&P 500. In addition, since the only U.S.

firms that have T&D scores are firms that comprise the S&P 500, using this measure would greatly restrict our sample.

6. Ad hoc evidence supporting this notion can be found in the events surrounding CalPERS identification of Maytag Corporation as one of four publicly traded firms that lacked strong governance. In June 2004, CalPERS publicly revealed its concern over Maytag's weak board structure and processes. In particular, CalPERS called for Maytag to declassify its board and implement a stock ownership program for its directors. On August 12, 2004, Maytag adopted a newly developed governance policy that requires Maytag directors' compensation packages to include equity and states that directors are encouraged to take an ownership interest in Maytag.
7. The following public pension funds are classified as activists (Spectrum management numbers): California Public Employees Retirement System (12000), California State Teachers Retirement (12100 and 12120), Colorado Public Employees Retirement Association (18740), Florida State Board of Administration (38330), Illinois State Universities Retirement System (81590), Kentucky Teachers Retirement System (49050), Maryland State Retirement and Pension System (54360), Michigan State Treasury (57500), Montana Board of Investment (58650), Education Retirement Board New Mexico (63600), New York State Common Retirement Fund (63850), New York State Teachers Retirement System (63895), Ohio School Employees Retirement System (66550), Ohio School Employees Retirement System (66610), Ohio State Teachers Retirement System (66635), Texas Teachers Retirement System (82895 and 83360), Virginia Retirement System (90803), State of Wisconsin Investment Board (93405).
8. An alternative explanation for a positive relation between the number of blockholders and the two risk measures and cost of equity capital is that blockholders can influence

management to invest in riskier projects that demand a higher expected rate of return.

Our research design does not allow us to rule out this alternative explanation.

9. In untabulated analysis we find similar results using the G-Score developed by Gompers et al. 2003.
10. The difference in the 2000 Board Analyst data base versus 2001, 2002, and 2003 Board Analyst data base pertains to the coding of directors. In 2000, Board Analyst used only two directors classifications; inside and outside directors. After 2000, Board Analyst classified directors into one of three groups; inside, grey, and outside. IRRC consistently classifies directors as inside, grey, and outside.
11. There is some variability in the updating of prices within the Value Line database. Some firms are updated each month resulting in 12 expected return estimates for a given calendar year, while others are updated less frequently. Our results are robust to setting *IMPLIED_CC* equal to the median expected return over the firms' fiscal year, and using only the first (or last) expected return for a given Value Line report period. The correlations across various measures of expected return based on different requirements of price updating exceed 0.95.
12. See the appendix for a validation of our measure of firms' cost of equity capital.
13. By way of comparison, Francis et al. (2004) report mean (median) implied cost of capital estimates of 20.83% (20.22%) while Brav et al. (2003) report values of 20.9% (18.8%). The somewhat lower mean (median) cost of capital estimates in our study is due to the fact that the data sources we use (IRRC, Corporate Library and Value Line) follow predominantly S&P 1500 firms, which tend to be larger, less risky firms.
14. The results are available from the authors upon request.
15. As noted above, the reason that governance variables can exhibit a direct effect on firms' cost of equity is because historical beta risk estimates measure the information risk and

monitoring effects of governance variables with error (i.e., they are not based on forward-looking data as specified in the Lambert et al. 2007 framework).

16. Competing hypotheses did not allow us to make a signed prediction on *BLOCK*. Initially, we incorporate *BLOCK* into our *GOV_COMPOSITE* measure based on the results that indicated a positive relation between *BLOCK* and *IMPLIED_CC*. As a robustness check, we calculate *GOV_COMPOSITE* without *BLOCK* and find similar results.
17. As a robustness check, we estimate equation (6) each year rather than pooling observations across fiscal years. The results of this analysis are similar to those tabled. Specifically the coefficient on *GOV_COMPOSITE* is significant at the 0.10 level or better in seven of the eight years.
18. *IMPLIED_CC* represents an annual cost of equity capital estimate. We divide the annual measure by twelve to convert the annual expected return to monthly expected return. Our analysis period runs from April 1997 to December 2004, due to the requirement of future returns and allowing for three months following fiscal year end for data to become known to the market. Specifically, realized returns for fiscal year $t+1$ are regressed on expected returns from fiscal year t which is the expected return for fiscal $t+1$. For example, the monthly realized return over fiscal 1997 is regressed on the estimate of expected return made in fiscal 1996 for fiscal 1997.

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TABLE 1
Variable Definitions

<u>Variable</u>	<u>Definitions and Data Sources</u>
Governance Attributes:	
<i>WCAQ</i>	Negative one times the standard deviation of the firm-specific residual from the prior three to five years, where residuals are from the following cross sectional estimations of Dechow and Dichev's 2002 model: $WCA_t = \beta_0 + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \varepsilon$ where regressions are estimated by three, two, or one-digit SIC codes conditional on having at least 10 firms in each SIC group. <i>WCA</i> =working capital accruals (-(Compustat # 302+ Compustat # 303+ Compustat # 304+ Compustat # 305+ Compustat # 307)); <i>CFO</i> = cash flow from operations (Compustat # 308); all variables are scaled by average total assets (Compustat # 6).
<i>FIN_TRANS</i>	Negative one times the squared residual from the following regression $RET = \beta_0 + \beta_1 NIBE + \beta_2 LOSS + \beta_3 NIBE * LOSS + \beta_4 \Delta NIBE + \varepsilon$ where the regression is estimated by three, two, or one-digit SIC codes conditional on having at least 10 firms in each SIC group. <i>RET</i> = the market adjusted return over the fiscal year (from CRSP); <i>NIBE</i> = net income before extraordinary items (Compustat # 18) scaled by beginning of period market value of equity (Compustat # 25* Compustat # 199); <i>LOSS</i> = one if <i>NIBE</i> is negative, zero otherwise; $\Delta NIBE$ = the change in net income before extraordinary items (Compustat # 18) scaled by beginning of period market value of equity (Compustat # 18* Compustat # 199).
<i>%INST_ACT</i>	% of shares held by activist institutional investors (CDA/Spectrum).
<i>%INSIDE</i>	% of shares held by insiders (officers and directors) (source Compact Disclosure).
<i>BLOCK</i>	Number of blockholders, where block ownership is defined at the 5% ownership level (source Compact Disclosure).
<i>E_SCORE</i>	Entrenchment Index which is a discrete measure ranging in value from zero to six representing the presence of staggered boards, limits to shareholder bylaw amendments, supermajority requirements for mergers, and supermajority requirements for charter amendments, poison pills and golden parachutes (IRRC).
<i>%BRD_IND</i>	% of independent directors on the board (source IRRC and Board Analyst).
<i>%BRD_STOCK</i>	% of the directors that own stock in the company (source IRRC and Board Analyst).
Risk Measures:	

<i>I_RISK</i>	The standard deviation of daily market model residuals over the fiscal year.
<i>BETA</i>	Coefficient on <i>RMRF</i> from the following model: $EXRET = \beta_0 + \beta_1 RMRF + \varepsilon$ estimated over the 60 months prior to a firm-year observation fiscal year end, requiring minimum of 18 months. <i>EXRET</i> is the firm's monthly return minus the risk free rate, <i>RMRF</i> is the excess return on the market (source http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html).
<i>IMPLIED_CC</i>	Average annual Value Line 3 to 5 year expected return over the 12 months encompassing the firm's fiscal year.
Firm Characteristics:	
<i>SIZE</i>	Natural log of fiscal year-end market value of equity (Compustat #25 * Compustat #199).
<i>MB</i>	Fiscal year end market value of equity divided by fiscal year end book value of equity (Compustat #60).
<i>STD_CFO</i>	Standard deviation of cash flow from operations (Compustat #308) divided by total assets (Compustat #6) calculated using the prior five fiscal years, requiring a minimum of three years of data.
<i>LEV</i>	Total debt (Compustat #9 plus Compustat #34) divided by total assets (Compustat #6).
<i>CFO</i>	Cash flow from operations (Compustat #308) divided by total assets (Compustat #6).

TABLE 2
Sample

Number of Observations by Fiscal Year	
<u>Year</u>	<u>N</u>
1996	494
1997	572
1998	653
1999	813
2000	797
2001	904
2002	985
2003	<u>1,005</u>
Total	6,223

Notes:

The sample sizes for each year are determined by firms that satisfy the data requirements necessary to conduct our empirical tests.

TABLE 3
Descriptive Statistics

Panel A: Variable Distributions

<u>Variables</u>	<u>Q1</u>	<u>Mean</u>	<u>Median</u>	<u>Q3</u>	<u>Std.Dev</u>
Governance Attributes:					
<i>WCAQ</i>	-0.051	-0.041	-0.034	-0.022	0.029
<i>FIN_TRANS</i>	-0.127	-0.118	-0.036	-0.007	0.211
<i>%INST_ACT</i>	0.021	0.029	0.027	0.033	0.015
<i>%INSIDER</i>	0.005	0.061	0.015	0.055	0.115
<i>BLOCK</i>	2.000	4.370	4.000	6.000	2.656
<i>E_SCORE</i>	1.000	2.202	2.000	3.000	1.305
<i>%BRD_IND</i>	0.556	0.669	0.700	0.800	0.171
<i>%BRD_STOCK</i>	0.667	0.785	0.857	1.000	0.235
Risk Measures:					
<i>IMPLIED_CC</i>	0.114	0.183	0.161	0.229	0.098
<i>BETA</i>	0.514	0.947	0.831	1.220	0.663
<i>I_RISK</i>	1.683	2.504	2.250	3.036	1.148
Firm Characteristics:					
<i>SIZE</i> (\$ billions) ¹	0.739	8.523	1.857	5.459	28.072
<i>MB</i>	1.531	3.276	2.303	3.796	3.331
<i>STD_CFO</i>	0.022	0.046	0.036	0.058	0.039
<i>LEV</i>	0.120	0.251	0.258	0.363	0.169
<i>CFO</i>	0.062	0.104	0.100	0.146	0.084

Notes:

In this table, we report the untransformed values of market value of equity. We use the natural log of market value of equity in our empirical tests due to the skewness in this variable.

TABLE 3 (Continued)

Panel B: Correlations

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	
<i>IMPLIED_CC</i>	A	0.28	0.29	-0.14	-0.09	0.12	-0.04	-0.08	-0.12	-0.14	0.01	0.03	0.08	-0.05	-0.11	-0.10	
<i>BETA</i>	B	0.30		0.52	0.01	0.06	0.36	-0.20	-0.14	-0.36	-0.22	0.03	0.03	0.10	-0.15	-0.11	-0.18
<i>I_RISK</i>	C	0.31	0.47		-0.26	-0.03	0.38	-0.10	-0.20	-0.36	-0.41	-0.06	0.08	0.18	-0.11	-0.10	-0.16
<i>SIZE</i>	D	-0.18	0.02	-0.27		0.42	-0.15	-0.01	0.19	0.14	0.03	0.03	-0.11	-0.36	-0.14	0.07	0.07
<i>MB</i>	E	-0.14	0.08	-0.09	0.51		0.05	-0.13	0.31	-0.08	-0.09	-0.01	0.01	-0.09	-0.11	-0.03	-0.01
<i>STD_CFO</i>	F	0.15	0.35	0.42	-0.19	0.05		-0.20	-0.13	-0.39	-0.21	0.02	0.05	0.12	-0.08	-0.03	-0.07
<i>LEV</i>	G	-0.05	-0.23	-0.15	0.00	-0.25	-0.30		-0.30	0.22	0.07	-0.06	-0.08	-0.03	0.12	0.11	0.06
<i>CFO</i>	H	-0.07	-0.05	-0.11	0.17	0.40	0.03	-0.34		0.04	0.09	0.01	0.04	-0.01	-0.03	-0.05	0.03
<i>WCAQ</i>	I	-0.18	-0.34	-0.40	0.18	-0.12	-0.51	0.29	-0.02		0.19	-0.02	-0.09	-0.18	0.07	0.05	0.10
<i>FIN_TRANS</i>	J	-0.15	-0.17	-0.34	0.06	-0.03	-0.19	0.07	0.02	0.19		0.00	-0.04	-0.03	0.06	0.04	0.07
<i>%INST_ACT</i>	K	-0.01	0.03	-0.13	0.14	0.07	-0.01	-0.05	0.06	0.00	0.04		-0.11	0.07	0.02	0.07	-0.01
<i>%INSIDER</i>	L	0.13	0.08	0.22	-0.34	-0.01	0.16	-0.13	0.06	-0.20	-0.11	-0.15		0.07	-0.14	-0.27	-0.06
<i>BLOCK</i>	M	0.12	0.14	0.24	-0.33	-0.12	0.23	-0.06	-0.03	-0.27	-0.07	0.04	0.22		0.04	-0.04	-0.02
<i>E_SCORE</i>	N	-0.03	-0.14	-0.12	-0.11	-0.13	-0.07	0.14	-0.04	0.06	0.06	0.05	-0.08	0.04		0.24	0.12
<i>%BRD_IND</i>	O	-0.09	-0.12	-0.12	0.08	-0.05	-0.04	0.14	-0.06	0.06	0.05	0.09	-0.34	-0.04	0.24		0.17
<i>%BRD_STOCK</i>	P	-0.12	-0.22	-0.21	0.08	-0.03	-0.10	0.11	0.01	0.11	0.08	0.03	-0.06	-0.06	0.13	0.20	

Notes:

Bold text indicates significance at the 0.01 level or better.

See Table 1 for variable definitions.

TABLE 4
 OLS Regression Results of the Effects of Corporate Governance Mechanisms on Firms' Idiosyncratic Risk

$$I_RISK = \beta_0 + \beta_1 STDCFO + \beta_2 LEV + \beta_3 CFO + \beta_4 MB + \beta_5 SIZE + \beta_6 WCAQ + \beta_7 FIN_TRANS + \beta_8 \%INST_ACT + \beta_9 \%INSIDER + \beta_{10} BLOCK + \beta_{11} E_SCORE + \beta_{12} \%BRD_IND + \beta_{13} \%BRD_STOCK + \sum_{t=1997}^{2003} \alpha_t YEAR + \varepsilon$$

<u>Variables</u>	<u>Predicted Sign</u>	<u>Estimated Parameters</u>		
		<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>
INTERCEPT	?	3.042***	2.028***	3.117***
Firm Characteristics:				
<i>STDCFO</i>	+	8.182***		5.139***
<i>LEV</i>	+	-0.678***		-0.283***
<i>CFO</i>	-	-2.326***		-1.770***
<i>MB</i>	+	0.027***		0.007**
<i>SIZE</i>	-	-0.160***		-0.119***
Governance Attributes:				
<i>WCAQ</i>	-		-9.718***	-6.289***
<i>FIN_TRANS</i>	-		-1.604***	-1.383***
<i>%INST_ACT</i>	-		-2.696***	-2.405***
<i>%INSIDER</i>	-		0.033	-0.065
<i>BLOCK</i>	?		0.051***	0.026***
<i>E_SCORE</i>	+		-0.053***	-0.066***
<i>%BRD_IND</i>	-		-0.384***	-0.342***
<i>%BRD_STOCK</i>	-		-0.514***	-0.405***
Adjusted R-square		0.34	0.38	0.46
Incremental <i>F</i> -test			293.79***	164.59***
Sample Size		6,223	6,223	6,223

Notes:

YEAR is a series of year indicator variables identifying fiscal years 1997 through 2003. All other variables are as defined in Table 1. ***, **, * indicates significance at the 0.01, 0.05, and 0.10 level or better, respectively. The incremental *F*-test indicates whether the governance variables as a whole add explanatory power to the model.

TABLE 5
 OLS Regression Results of the Effects of Corporate Governance on Beta

$$\begin{aligned}
 BETA = & \beta_0 + \beta_1 STDCFO + \beta_2 LEV + \beta_3 CFO + \beta_4 MB + \beta_5 SIZE + \beta_6 WCAQ \\
 & + \beta_7 FIN_TRANS + \beta_8 \%INST_ACT + \beta_9 \%INSIDER + \beta_{10} BLOCK \\
 & + \beta_{11} E_SCORE + \beta_{12} \%BRD_IND + \beta_{13} \%BRD_STOCK + \sum_{t=1997}^{2003} \alpha_t YEAR + \varepsilon
 \end{aligned}$$

<u>Variables</u>	Predicted <u>Sign</u>	<u>Estimated Parameters</u>		
		<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>
INTERCEPT	?	0.878***	1.183***	0.874***
Firm Characteristics:				
<i>STDCFO</i>	+	5.325***		3.586***
<i>LEV</i>	+	-0.733***		-0.494***
<i>CFO</i>	-	-1.465***		-1.239***
<i>MB</i>	+	0.009***		-0.001
<i>SIZE</i>	-	0.031***		0.057***
Governance Attributes:				
<i>WCAQ</i>	-		-7.102***	-5.016***
<i>FIN_TRANS</i>	-		-0.513***	-0.368***
<i>%INST_ACT</i>	-		0.945**	0.293
<i>%INSIDER</i>	-		-0.199***	-0.133**
<i>BLOCK</i>	?		0.009***	0.018***
<i>E_SCORE</i>	+		-0.052***	-0.033***
<i>%BRD_IND</i>	-		-0.188***	-0.200***
<i>%BRD_STOCK</i>	-		-0.355***	-0.320***
Adjusted R-square		0.19	0.20	0.28
Incremental <i>F</i> -test			187.50***	96.40***
Sample Size		6,223	6,223	6,223

Notes:

YEAR is a series of year indicator variables identifying fiscal years 1997 through 2003. All other variables are as defined in Table 1. ***, **, * indicates significance at the 0.01, 0.05, and 0.10 level or better, respectively. The incremental *F*-tests test whether the governance variables as a whole add explanatory power to the model.

TABLE 6
Governance Effects on Cost of Equity

$$\begin{aligned} \text{IMPLIED_CC} = & \beta_0 + \beta_1 \text{BETA} + \beta_2 \text{SIZE} + \beta_3 \text{MB} + \beta_4 \text{I_RISK} + \beta_5 \text{WCAQ} + \beta_6 \text{FIN_TRANS} \\ & + \beta_7 \% \text{INST_ACT} + \beta_8 \% \text{INSIDER} + \beta_9 \text{BLOCK} + \beta_{10} \text{E_SCORE} + \beta_{11} \% \text{BRD_IND} \\ & + \beta_{12} \% \text{BRD_STOCK} + \sum_{t=1997}^{2003} \alpha_t \text{YEAR} + \varepsilon \end{aligned}$$

Variables	Predicted Sign	Estimated Parameters			
		Model 1	Model 2	Model 3	Model 4
INTERCEPT	?	0.248***	0.207***	0.258***	0.198***
Firm Characteristics:					
BETA	+		0.034***	0.036***	0.017***
SIZE	-			-0.005***	-0.001
MB	-			-0.003***	-0.003***
I_RISK	+				0.023***
Governance Attributes:					
WCAQ	-	-0.362***	-0.117***	-0.114***	-0.035
FIN_TRANS	-	-0.061***	-0.043***	-0.045***	-0.017***
%INST_ACT	-	-0.077	-0.109*	-0.092	-0.030
%INSIDER	-	-0.007	-0.001	-0.007	-0.007
BLOCK	?	0.003***	0.003***	0.002***	0.001***
E_SCORE	+	-0.001	0.001	0.000	0.001
%BRD_IND	-	-0.028***	-0.022***	-0.019***	-0.015**
%BRD_STOCK	-	-0.019***	-0.007*	-0.003	0.001
Adjusted R-square		0.10	0.14	0.16	0.19
Incremental F-test		45.17***	17.09***	11.93***	2.75***
Sample Size		6,223	6,223	6,223	6,223

Notes:

YEAR is a series of year indicator variables identifying fiscal years 1997 through 2003. All other variables are as defined in Table 1. ***, **, * indicates significance at the 0.01, 0.05, and 0.10 level or better, respectively. The incremental F-tests test whether the governance variables as a whole add explanatory power to the model.

TABLE 7

Results of the Effects of Corporate Governance on Cost of Equity using Rank Regressions

$$\text{IMPLIED_CC} = \beta_0 + \beta_1 R_BETA + \beta_2 R_SIZE + \beta_3 R_MB + \beta_4 R_I_RISK + \beta_5 GOV_COMPOSITE + \sum_{t=1997}^{2003} \alpha_t YEAR + \varepsilon$$

<u>Variables</u>	Predicted <u>Sign</u>	<u>Estimated Coefficient</u>			
		<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>	<u>Model 4</u>
INTERCEPT	?	0.258***	0.216***	0.236***	0.207***
Firm Characteristics:					
<i>R_BETA</i>	+		0.069***	0.072***	0.043***
<i>R_SIZE</i>	-			-0.026***	-0.008**
<i>R_MB</i>	-			-0.021***	-0.023***
<i>R_I_RISK</i>	+				0.062***
Total Governance:					
<i>GOV_COMPOSITE</i>	-	-0.038***	-0.023***	-0.020***	-0.010***
Adjusted R-square		0.07	0.13	0.15	0.18
Incremental <i>F</i> -test		132.01***	50.00***	37.88***	9.02***
Sample Size		6,223	6,223	6,223	6,223

Notes:

R_BETA is the scaled quintile rank of *BETA*, *R_SIZE* is the scaled quintile rank of *SIZE*, *R_MB* is the scaled quintile rank of *MB*, *R_I_RISK* is the scaled quintile rank of *I_RISK*, *GOV_COMPOSITE* is equal to the scaled quintile rank of the following sum: quintile rank of *WCAQ* + quintile rank of *FIN_TRANS*+ quintile rank of *%INST_ACT*+ quintile rank of *%INSIDER*+ quintile rank of *(BLOCK*-1)*+ quintile rank of *(E_SCORE*-1)*+ quintile rank of *%BRD_IND* + quintile rank of *%BRD_STOCK*. Quintile ranks are scaled by dividing the rank value (zero to four) by four so that each observation takes on a value between zero and one. Ranks are calculated by fiscal year. *YEAR* is a series of year indicator variables identifying fiscal years 1997 through 2003. Other variables are defined in Table 1. . ***, **, * indicates significance at the 0.01, 0.05, and 0.10 level or better, respectively. The incremental *F*-tests test whether the governance variables as a whole add explanatory power to the model.