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This article provides evidence linking corporate governance mechanisms to higher bond ratings and lower bond yields. Governance mechanisms can reduce default risk by mitigating agency costs and monitoring managerial performance and by reducing information asymmetry between the firm and the lenders. We find firms that have greater institutional ownership and stronger outside control of the board enjoy lower bond yields and higher ratings on their new bond issues. However, concentrated institutional ownership has an adverse effect on yields and ratings. These results are robust to a specification that controls for institutional ownership being influenced by bond yields.

I. Introduction

Debt is the primary means of raising long-term capital in the United States. The value of new bond issues rose from $651 billion in 1996 to $1,001 billion in 1998. This is compared with new stock issues of $122 billion in 1996 and $126 billion in 1998. Factors that influence the price that debt holders charge the borrowers are therefore of immense economic significance. Small changes in debt yields could lead to large shifts in capital allocation. In this article we explore the influence of corporate governance mechanisms on bond ratings and yields.

Debt yields and ratings are essentially determined by the probability that the firm will not be able to meet its debt obligations (i.e., likelihood of default) and by the degree of protection afforded to the lenders in such an event (i.e., bond covenants and restrictions). Existing research has identified several financial risk characteristics of the firm and the characteristics of the debt issuance (e.g., Fisher 1959; Cohen 1962; Hor-

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rigan 1966; West 1970; Kaplan and Urwitz 1979; and Weinstein 1981) as factors influencing debt yields and ratings. However, a firm's likelihood of default would also depend on the availability of credible information for accurately evaluating the default risk and agency costs (including potential expropriation of assets and empire-building activities). Governance mechanisms can influence the assessment of default likelihood in both of these dimensions.

We call the first dimension "agency risk." This represents the risk that management acting in its self-interest would take actions that deviate from firm value maximization, as well as the risk that the manager is incompetent. This agency problem has been well documented and can cause managers to shirk and expropriate minority shareholders and creditors (Jensen and Meckling 1976), take actions that maximize short-term returns rather than long-term returns (DeAngelo and Rice 1983; Dechow and Sloan 1991; Murphy and Zimmerman 1993), and make potentially unprofitable investments in order to increase firm size and, possibly, total compensation (Murphy 1985; Jensen 1986). If governance mechanisms reduce agency risk, then firms with stronger governance should be associated with superior bond ratings and lower yield.

The second dimension relates to "information risk." This is the risk that firm managers have private information that would adversely affect the default risk of the loan. Governance mechanisms can help reduce information risk by inducing firms to disclose information in a timely manner. In support of this argument Ajinkya, Bhojraj, and Sengupta (1999) documented that financial analysts' ratings of overall corporate disclosure practices of a sample of firms is positively associated with institutional stock ownership and the proportion of the board that is composed of outsiders, while Healy, Hutton, and Palepu (1999) reported that sustained increases in disclosure ratings result in higher levels of institutional ownership. Similarly, Beasley (1996) documented a negative association between the proportion of the board that is composed of outsiders and the probability of financial statement fraud. Furthermore, Sengupta (1998) found a positive (negative) association between the quality of corporate disclosure and bond ratings (yields), suggesting that governance mechanisms can affect bond ratings and yields indirectly through a reduction in information risk.

Research has explored widely the role of institutional owners and outside board members in corporate governance. However, the role of each in reducing agency risk is still under debate. Although a number of papers document that institutional owners and outside directors actively monitor management's actions and take actions to protect shareholders' interests, there is also some research that fails to document any effect of these mechanisms.

Shleifer and Vishny (1986) argued that institutional shareholders, by virtue of their large stockholdings, would have incentives to monitor corporate performance since they have greater benefits through this monitoring and enjoy greater voting power that makes it easier to take corrective action when it is deemed necessary. Consistent with this "active monitoring hypothesis," Jarrell

and Poulsen (1987) and Brickley, Lease, and Smith (1988) documented that institutional shareholders are more likely to vote against harmful amendments that reduce shareholder wealth, while Agrawal and Mandelker (1990) found a positive relationship between institutional ownership and shareholder wealth effects of various antitakeover charter amendments. McConnell and Servaes (1990) found a positive relationship between institutional ownership and productivity, as measured by Tobin's *q*. However, others have argued that institutional investors have limited incentives to monitor management actions. This could be because of free-riding among institutional investors making it difficult for them to take collective action (Black 1990; Admati, Pfleiderer, and Zechner 1994). Furthermore, institutional investors may have incentives to sell their stock in the face of poor performance rather than to initiate corrective action (Coffee 1991). In support of the "passive monitoring hypothesis," Karpoff, Malatesta, and Walking (1996) failed to confirm the positive effect of institutional activism on shareholder value. Institutional ownership could therefore beneficially influence bond yields (if the active monitoring hypothesis holds true) or have no effect on yields (if the passive monitoring hypothesis holds true).

However, a large body of literature that focuses on the effect on concentrated outside ownership (or blockholdings) on firm value and agency costs suggests that, under certain conditions, institutional ownership could adversely affect bond yields and ratings.[1] The literature on blockholding essentially evaluates two competing hypotheses. One hypothesis suggests that concentrated ownership allows the blockholder to exercise undue influence over the management to secure benefits that are to the detriment of other providers of capital (shareholders and bondholders). This is called the "private benefits hypothesis" and relates to blockholders and the rest of the providers of capital (shareholders and bondholders). It is distinct from the "wealth transfer hypothesis" between shareholders and bondholders. These benefits could take the form of pecuniary benefits (below-market transfer prices, preventing the opening of closed-end funds), underwriting or advisory contracts (Barclay, Holderness, and Pontiff 1993), or nonpecuniary benefits (access to private information or the ability to influence the political, social, or environmental policies of the firm, etc.). Barclay et al. (1993) find several private benefits that are peculiar to the fund or to the blockholder. This hypothesis suggests that blockholding would have an adverse impact on bond yields and ratings. A conflicting hypothesis ("shared benefits hypothesis") suggests that blockholding leads to more efficient monitoring by the management and that the benefits from such monitoring are shared by all stock-

1. Demsetz 1983; Lease, McConnell, and Mikkelson 1983; Shleifer and Vishny 1986; Jarrell and Poulsen 1987; Barclay and Holderness 1989, 1992; Agrawal and Mandelker 1990; Mikkelson and Regassa 1991; Barclay et al. 1993; Zwiebel 1995; Agrawal and Knoeber 1996. See also Jensen and Warner 1988.

holders.[2] The relation between blockholding and bond yields would depend on the bondholders' evaluation of which effect is dominant. If the private benefits hypothesis dominates, we should find a positive association between blockholding and yields, and a negative association if the shared benefits hypothesis dominates.

Corporate boards have the fiduciary duty of monitoring management performance and protecting shareholder interests. A number of researchers, including Fama (1980) and Fama and Jensen (1983) have argued that outside directors bear a reputation cost if the performance is poor, which leads them to monitor management actions more carefully compared with other directors. Consistent with this argument, research shows that firms with outsider-dominated boards are more likely to participate in major restructuring events such as mergers, takeovers, and tender offers (Lin 1996) and are more likely to remove poorly performing Chief Executive Officers (CEOs; Weisbach 1988) and nominate outside CEOs (Borokhovich, Parrino, and Trapani 1996). Rosenstein and Wyatt (1990) documented that shareholder wealth increases with the addition of outsiders to the board, while Cotter, Shivdasani, and Zenner (1997) provided evidence to indicate that outside directors enhance shareholder wealth during tender offers. However, a second view is that outside directors may be ineffective either because they are appointed by company managers or because the board culture discourages conflict (Mace 1986; Jensen 1993). Consistent with these arguments, Yermack (1996) and Bhagat and Black (1997) failed to document an association between the proportion of independent outside directors and firm performance. Coombes and Watson (2000) recently conducted three surveys to discover how shareholders perceive and value corporate governance in developed and emerging markets. Three quarters of the investors surveyed said that board practices are at least as important as financial performance when they evaluate companies for investment. Over 80% of investors said that they would pay a premium for well-governed firms. This indicates that investors value the role of corporate governance.

By looking at the effect of institutional ownership and board composition on bond ratings and yields, this article provides an alternative framework for testing these competing theories. If rating agencies and bondholders perceive institutional investors and outside directors as playing an active role in reducing agency risk and information risk, we would expect a positive (negative) relationship between these governance variables and bond ratings (yields). Of course, institutional investors and outside directors are expected to act in the interests of shareholders and not necessarily in the interests of bondholders. Therefore, these governance mechanisms could exacerbate wealth transfers from bondholders to shareholders. However, empirical evidence on wealth transfers suggests that redistributions from bondholders to stockholders are

2. See Barclay and Holderness (1992) for a discussion of the private benefits and the shared benefits hypotheses. Other papers examining the benefits of large blockholders include Huddart (1993) and Maug (1998).

relatively small. While Marais, Schipper, and Smith (1989) find no evidence of loss to bondholders resulting from a leveraged buy-out, Asquith and Wizman (1990) and Warga and Welch (1993) find that losses accruing to bondholders are small compared with gains accruing to shareholders. Warga and Welch (1993) find that average risk-adjusted bondholder losses are less than 7% of the average risk-adjusted equity holders gains. As a result, we expect that the perceived benefits from reduction in agency and information risk will dominate the potentially negative wealth transfer effects.

Using a sample of 1,005 industrial bond issues over 1991–96 collected from the Warga Fixed Income Database (Warga 1997), we show that firms with larger institutional ownership enjoy higher bond ratings and lower bond yields after controlling for other potential determinants of ratings and yields. However, as the institutional ownership gets concentrated, the firms face lower ratings and higher yields (after controlling for the level of institutional ownership). Firms that have a greater percentage of outside directors on the board are found to have higher ratings and lower bond yields. These findings are consistent with the view that institutional owners and outside directors play an active role in reducing management opportunism and promoting firm value.

Our findings are consistent with an alternative explanation. It may be argued that the positive (negative) association between institutional ownership and bond ratings (yields) stems from institutions preferring to invest in higher rated bonds. To control for the potential endogeneity between institutional ownership and bond yields (and ratings), we used a simultaneous equations approach where institutional ownership influences bond yields (ratings) and is influenced by bond yields (ratings). The results suggest that institutions indeed seem to invest more in companies with higher (lower) bond ratings (yields). However, institutional ownership continues to be a statistically significant determinant of bond ratings and yields. These results are also robust to an alternative specification where ratings and yields are associated with 1-period ahead institutional ownership (in order to allow for the possibility that institutions react to ratings-yield information with a lag) and vice versa. Using the three-stage least squares approach, we found that firms with high yields in a given year indeed have lower institutional followings in a subsequent year. However, by the same measure, high institutional ownership in a given year enjoys lower yields in the subsequent year.

Finally, we also examine the effect of governance mechanisms on lower rated bonds. The monitoring role of governance mechanisms would be more critical when dealing with debt of poor quality, for high-risk traditional measures of default risk (past profitability, leverage, etc.) may not be informative about future cash flows. Our results are consistent with a greater role for governance mechanisms in reducing default risk for poorly rated firms.

The rest of the article is organized as follows. Section II describes the research design, including the governance proxies, the sample, and the research method adopted. The results are reported in Section III, and Section IV summarizes the conclusions and inferences.

II. Methodology

A. The Sample

Data on all industrial bond issues during 1991–96 were collected from the Warga Fixed Income Database (see Warga 1997). Created in conjunction with Lehman Brothers, this database provides detailed information on bonds, including information on call and put options, maturity, subordination status, ratings, price, and so on. The database provided information on 2,098 new debt issues. Bond information was then matched with corporate governance data collected from Compact Disclosure. This database provides information on stock ownership collected from Spectrum and information on officers and boards of directors collected from proxy statements. The June database for each of the years 1991–96 was examined to obtain stock ownership and outside directors' information. The ownership data in these databases represented holdings as of March 1 of each year. Data on officers and boards of directors were based on the latest year's proxy statements available. We deleted 869 observations because ownership information was not available. Finally, we deleted another 218 observations because these were missing information required to compute some of the control variables, resulting in a final sample of 1,005 observations.

B. The Variables

Measures of Corporate Governance:

To determine the association between bond yields and ratings and corporate governance, we use two widely used measures: institutional ownership and the proportion of the board consisting of outsiders:

INST	the percentage of the company's common stock held by institutions.
OUTDIR	the percentage of the board of directors who are not also officers of the firm.

In order to examine possible effects of concentrated ownership, we use two additional variables in some regressions:[3]

INST5	the percentage of company's common stock held by the five largest institutional owners of the firm.
BLOCK	the total percentage of company's stock held by institutions owning 5% or more of the company's stock.

3. Similar variables have been used in the prior literature (e.g., Brickley et al. 1988; Agrawal and Mandelker 1990).

Corporate Bond Yields and Ratings:

We computed corporate bond yields as the spread over U.S. Treasury bond rate defined as:

YIELD yield to maturity on debt issues−yield to maturity on a U.S. Treasury bond of similar maturity.

United States Treasury bond rates were obtained from the Federal Reserve Database (FRED). These represent the daily averages of the constant-maturity yield on the U.S. Treasury bond. If the maturity period of a corporate bond did not exactly match that of a Treasury bond, yield data was matched with the Treasury bond with the closest maturity.[4]

The ratings variable represents Moody's credit ratings.

RATING ordinal variable taking on values from 1 to 6 representing Moody's bond ratings B or below, Ba, Baa, A, Aa, and Aaa, respectively.

Control Variables:

We selected a number of additional explanatory variables based on a survey of prior research on the determinants of corporate bond ratings and yields (e.g., Fisher 1959; Horrigan 1966; West 1970; Kaplan and Urwitz 1979; Sorensen 1979; Boardman and McEnally 1981; Kidwell, Marr, and Thompson 1984; Fung and Rudd 1986; Lamy and Thompson 1988; and Ziebart and Reiter 1992). These studies typically explain bond yields and ratings in terms of issuer characteristics (surrogating default risk) and issue characteristics (such as size, maturity, and special features of the debt). Based on these studies, we included the following control variables.[5]

Issue characteristics.

LSIZE log of the size of issue (in millions of dollars). Economies of scale in underwriting suggest that the LSIZE would be inversely related to bond yields and positively associated with credit ratings.

MATUR years to maturity. Bonds with longer maturity are expected to have a higher yields and lower ratings because of their greater (interest) risk exposure.

4. We also ran regressions using raw bond yields (with Treasury bond rates as an additional control variable). The results of these regressions were very similar to those reported using the yield spread.

5. All regressions do not use the same set of control variables. The exact specification for each model is given in Sec. III.

CALL	the ratio of the days to first call divided by the days to maturity. This variable takes the value of 1 if there is no call and 0 if it is callable from the date of issue. The issuer is expected to pay a penalty for the call provision, which indicates that CALL will be negatively associated with bond yield and positively associated with Moody's ratings.
SENIOR	1 if the debt is senior, 0 otherwise. Senior debt is expected to be associated with lower yields and higher bond ratings.
SINK	1 if the debt has sinking fund provisions, 0 otherwise. Sinking fund provisions reduce default risk so that this should be negatively associated with bond yields and positively associated with bond ratings.

Data on each of these variables were obtained from the Warga database.

Issuer characteristics. Prior research has typically used a number of financial ratios to capture issuer characteristics. Some studies on the determinants of YIELD have also used bond ratings to capture the overall measure of the default risk of a firm. In this study, however, we argue that governance mechanisms reduce agency costs and improve information, which is captured by both bondholders and rating agencies in their evaluation of the default risk of the firm. This suggests that once the ratings are included as control variables in the determination of yields, the incremental effect of the governance variables may be lessened. To deal with this issue, we present our main results using an alternative set of control variables, derived from the literature on the determinants of corporate bond ratings, to capture the default risk of the firm. We also present results using dummies for bond ratings as additional control variables for comparison. We use the following variables to control for issuer characteristics.

DE	book value of long term debt divided by the market value of common equity at the end of year *t*. Firms with higher debt-to-equity ratios are expected to have higher yields and lower ratings.
MARGIN	income before extraordinary items divided by total assets of year *t*. Firms with higher profit margin are expected to enjoy lower yields and higher ratings.
ASSET	total assets at the end of year *t* (in $1,000 million). Larger firms are expected to enjoy lower YIELD and higher RATING because of their lower market risk.
MKBK	market value of common equity divided by the book of common equity at the end of year *t*. Firms with higher MKBK represent high-growth firms that could be associated with greater risk. This suggests that MKBK will be positively associated with bond yields and negatively associated with credit ratings.

TABLE 1 Summary Statistics

Variables	Mean	Standard	Median	Minimum	Maximum	25%	75%
YIELD	1.40	1.32	.93	−.46	9.01	.62	1.60
INST	55.23	19.23	58.21	0	93.83	46.54	68.64
INST5	19.29	9.82	17.43	0	62.91	12.13	25.32
BLOCK	8.88	10.09	6.16	0	56.06	0	14.99
OUTDIR	74.03	20.21	77.78	0	100	69.23	85.71
LSIZE	5.15	.56	5.07	3.22	7.13	4.61	5.52
MATUR	15.77	13.00	10.01	1	100	9.01	20.03
CALL	.88	.23	1	0	1	1	1
SENIOR	.12	.32	0	0	1	0	0
SINK	.02	.15	0	0	1	0	0
DE	.63	.88	.37	0	9.83	.18	.75
MARGIN	.04	.05	.04	−.22	.36	.02	.07
ASSET	12.83	28.82	5.03	.05	243.28	1.71	11.60
MKBK	2.96	5.32	2.10	.37	110.73	1.37	3.28
CUMRET	.18	.33	.16	−.90	2.24	−.02	.34
BETA	.99	.42	.94	−.63	2.85	.75	1.22

NOTE.—This table provides summary statistics of the test variables for a sample of 1,005 industrial bond issues over the period 1991–96. The variables are defined as follows: YIELD is the interest spread calculated as the difference between the bond's yield to maturity and the yield on a U.S. Treasury bond of similar maturity; INST is the percentage of outstanding common stock held by institutions; INST5 is the percentage of outstanding shares held by the five largest institutional owners of the firm; BLOCK is the percentage of common shares held by institutional blockholders; OUTDIR is the percentage of the board of directors who are not also officers of the firm; LSIZE is the natural log of size of the issue (in millions of dollars); MATUR is the years to maturity; CALL is the days to first call divided by the days to maturity; SENIOR is 1 if the debt is senior, 0 otherwise; SINK = 1 if the debt has sinking fund provisions, 0 otherwise; DE is the ratio of long-term debt to market value of common stock outstanding at the end of period *t*; MARGIN is the income before extraordinary items of period *t* divided by the total assets at the end of period *t*; ASSET is total assets at the end of period *t* (in $1,000 million); MKBK is the market value of equity divided by the book value of equity at the end of period *t*; CUMRET is the cumulative daily stock return over year *t*; and BETA is the equity beta calculated based on daily stock returns over period *t*.

CUMRET cumulative daily stock return over year *t*; CUMRET captures the stock price performance of the firm over a period. On the one hand, this could be positively associated with future expected cash flows of the firm, which would suggest lower default risk. On the other hand, firms with superior stock performance could also be associated with higher risk so that we do not make a prediction of the sign here.

BETA market beta calculated using daily stock returns over period *t*; BETA captures the systematic risk of the firm, which is expected to be positively associated with default risk. This suggests that BETA would be positively associated with YIELD and negatively associated with RATING.

C. Descriptive Statistics

Table 1 provides summary statistics for the sample of 1,005 debt issues. The table shows that the mean yield spread is about 1.4%. There is considerable variation in YIELD over the sample with the range of variation of 9.47 and

a standard deviation of 1.32. The median size of the firms (total assets) is about $5 billion, with large variation in size across the sample. The average institutional ownership is about 55%, with top-five institutions owning an average of 19% of the outstanding shares. The percentage of outside directors has a mean of about 74%, while the median is 78%.

III. Results

A. *Effect of Corporate Governance on Bond Ratings*

We test the effect of governance variables on bond ratings using the following general model.

Bond ratings = f (governance variables, control variables). Since bond ratings are ordinal (i.e., they have a natural ordering), we estimate the above model using an ordered probit model based on a six-way ratings classification, representing ratings of Aaa, Aa, A, Baa, Ba, and B.

The results are given in table 2. Model 1 is based on the two governance variables INST and OUTDIR, along with control variables. Models 2 and 3 include the variables BLOCK and INST5, respectively, in an effort to examine the effect of concentrated institutional ownership on bond ratings. All the governance variables have their expected signs and are statistically significant at .01 level. Models' χ^2s ranged from 668 to 796. The control variables generally have their expected signs except for MATUR, which is positive and statistically significant in all models. Apart from CUMRET and BETA in model 1 and SINK in models 2 and 3, all other control variables are statistically significant at conventional levels. These results are consistent with institutional ownership and outside directorships having a favorable impact on default risk. However, the block institutional ownership has an adverse effect on bond ratings, which is consistent with the private benefits hypothesis.

B. *Effect of Corporate Governance on Bond Yields*

We examine the effect of corporate governance on bond yields using the following general model.

Bond yields = f (governance variables, control variables). We use four different model specifications. In model 1, bond yields are regressed against the two governance variables, INST and OUTDIR, and control variables capturing the firm's financial characteristics and specific features of the loan to examine the explanatory power of these variables. In model 2, bond rating dummies (6-level classification) are added. Based on the results of the previous subsection, we expect a weaker association between yield and governance once ratings are included in the specification, since table 1 results indicate that bond ratings impound the effect of governance variables. Models 3 and 4 add the variables BLOCK and INST5, respectively, to examine the effect of concentrated institutional ownership.

The results are summarized in table 3. The reported *t*-statistics are based

TABLE 2 Ordered Probit Regression Results of the Effects of Corporate Governance Mechanisms on Bond Ratings (Dependent Variable = RATING)

Variables	Predicted Sign	Estimated Coefficient (*t*-Statistic) Model 1	Model 2	Model 3
Governance variables:				
INST	+	.006	.015	.027
		(3.298)**	(7.209)**	(10.497)**
OUTDIR	+	.005	.004	.004
		(2.598)**	(2.178)*	(2.328)**
Concentration in institutional ownership:				
BLOCK	−		−.035	
			(−8.258)**	
INST5	−			−.059
				(−11.406)**
Loan characteristics:				
LSIZE	+	.296	.259	.238
		(4.023)**	(3.648)**	(3.373)**
MATUR	−	.018	.017	.016
		(8.170)**	(7.511)**	(6.752)**
CALL	+	1.328	1.309	1.239
		(8.610)**	(8.318)**	(7.682)**
SENIOR	+	.278	.249	.222
		(2.336)**	(2.133)*	(1.900)*
SINK	+	.517	.396	.390
		(1.839)*	(1.372)	(1.344)
Firm characteristics:				
DE	−	−.482	−.431	−.393
		(−18.047)**	(−14.985)**	(−12.716)**
MARGIN	+	11.458	11.499	11.251
		(22.955)**	(20.454)**	(19.205)**
ASSET	+	.015	.014	.001
		(13.090)**	(12.603)**	(11.486)**
MKBK	−	−.037	−.040	.041
		(−4.060)**	(−4.335)**	(4.034)**
CUMRET	?	−.143	.226	−.172
		(−1.405)	(−2.096)*	(−1.617)*
BETA	−	−.120	−.240	.310
		(−1.498)	(−2.908)**	(3.745)**
Model χ^2		668.340	739.32	796.292

NOTE.—This table provides regression results relating to the effects of corporate governance variables on ordinal bond ratings based on a sample of 1,005 industrial bond issues over the period 1991–96. The dependent variable RATING is an ordinal variable taking the values 6, 5, 4, 3, 2, and 1 corresponding to Moody's bond ratings of Aaa, Aa, A, Baa, Ba, and B, respectively. Variables INST, OUTDIR, BLOCK, INST5, LSIZE, MATUR, CALL, SENIOR, SINK, DE, MARGIN, ASSET, MKBK, CUMRET, and BETA are all as defined in the note to table 1.

* Statistically significant at .05 level based on a one-tailed test.

** Statistically significant at .01 level based on a one-tailed test.

TABLE 3 OLS Regression Results of the Effects of Corporate Governance Mechanisms on Bond Yields

Variables	Predicted Sign	Estimated Coefficient (t-Statistic)[a] Model 1	Model 2	Model 3	Model 4
Governance variables:					
INST	−	−.011 (−5.571)**	−.001 (−1.057)	−.018 (−8.412)**	−.024 (−10.160)**
OUTDIR	−	−.004 (−2.542)**	−.001 (−.396)	−.003 (−2.142)*	−.003 (−2.289)**
Concentration in institutional ownership:					
BLOCK	+			.027 (8.222)**	
INST5	+				.037 (8.997)**
Loan characteristics:					
LSIZE	−	−.131 (−2.470)**	−.087 (−1.904)*	−.098 (−1.825)*	−.861 (−1.609)
MATUR	+	−.013 (−5.254)**	.002 (1.838)*	−.012 (−5.325)**	−.011 (−5.174)**
CALL	−	−1.786 (−9.647)**	−.280 (2.266)*	−1.715 (−9.699)**	−1.661 (−9.449)**
SENIOR	−	−.437 (−6.587)**	−.208 (−4.341)**	−.398 (−6.255)**	−.380 (−5.994)**
SINK	−	−.052 (−.193)	.389 (2.321)*	.067 (.266)	.056 (.222)
Firm characteristics:					
DE	+	.389 (5.891)**	.143 (3.051)**	.338 (5.480)**	.323 (5.374)**
MARGIN	−	−7.799 (−7.186)**	−3.025 (−4.019)**	−7.373 (−7.292)**	−7.011 (−7.162)**
ASSET	−	−.010 (−8.159)**	−.001 (−3.165)**	−.008 (−7.436)**	−.001 (−7.097)**
MKBK	+	.012 (3.692)**	−.006 (−1.875)	.017 (3.759)**	.012 (4.364)**
CUMRET	?	−.046 (−.376)	−.051 (−.584)	.012 (.107)	−.028 (−.248)
BETA	+	.349 (3.939)**	.203 (3.109)**	.435 (5.015)**	.459 (5.172)**
Rating dummies:					
RATING1	−		−2.939 (−15.747)**		
RATING2	−		−2.970 (−18.971)**		
RATING3	−		−2.901 (−18.971)**		
RATING4	−		−2.542 (−16.786)**		
RATING5	−		−1.441 (−8.847)**		
Adjusted R^{2a}		.52	.76	.55	.56
Breusch Pagan χ^2		367.630	973.515	404.391	406.693

NOTE.—This table provides ordinary least squares (OLS) regression results relating to the effects of corporate governance variables on bond yield based on a sample of 1,005 industrial bond issues over the period 1991–96. The variables YIELD, INST, OUTDIR, INST5, BLOCK, LSIZE, MATUR, CALL, SENIOR, SINK, DE, MARGIN, ASSET, MKBK, CUMRET, and BETA are all as defined in the note to table 1. The variables RATING1–RATING5 represent 1, 0 dummies for Moody's bond ratings of Aaa, Aa, A, Baa, and Ba, respectively.

* Statistically significant at .05 level based on a one-tailed test.

** Statistically significant at .01 level based on a one-tailed test.

[a] The t-values are calculated using White's (1980) heteroscedasticity consistent covariance matrix.

on White's (1980) heteroscedasticity-corrected covariance matrix. Model 1 results show that the coefficients for INST and OUTDIR are negative and statistically significant at .01 level as hypothesized. The adjusted R^2 for the model is 52%. Model 2 results are based on additional dummy variables for bond ratings. The objective here is to examine if the governance variables help to explain bond yields beyond what is captured by the bond ratings. Five dummy variables, RATING1–RATING5, were included to capture ratings of Aaa, Aa, A, Baa, and Ba, respectively. The results indicate that governance variables, while having a favorable impact on yields, fail to be statistically significant once bond rating dummies are added. The weak results are anticipated, as table 2 suggests that the favorable effect of governance variables is captured in bond ratings and therefore is unlikely to have a great impact on yields in the presence of ratings. Hence, subsequent regressions do not use the bond rating dummies. In models 3 and 4 we add the variables BLOCK and INST5. The results indicate an adverse impact of concentrated institutional ownership as both variables turn out to be positive. The variables INST5 and BLOCK are statistically significant at the .01 level.

Overall, the results indicate that measures of corporate governance such as INST and OUTDIR are important determinants of corporate bond yields and ratings. Furthermore, when institutional ownership becomes sufficiently large or concentrated, it tends to have an adverse impact on bond yields and ratings.

C. Are Governance Mechanisms More Important for Lower Rated Bonds?

The results above indicate that governance mechanisms have a role in the determination of bond yield and ratings. This raises the question of whether these mechanisms have a differential impact on debt of differing quality. The monitoring role of these mechanisms would be more critical when dealing with debt of poor quality than otherwise. For high-risk firms, traditional measures of past profitability and leverage may not be very informative about future cash flows so that lenders and rating agencies would rely more on the firm's governance structure. Thus, the governance mechanisms should have a greater yield lowering effect (rating improving effect) for poorly rated debt than on high-quality debt.

To test this possibility we interact each of the governance variables with a dummy variable RATE where

RATE 1 if the bond has Moody's rating of A or higher, 0 otherwise.

We expect the coefficients on the INST × RATE and OUTDIR × RATE to be negative in ratings regressions and positive in yield regressions. The results of the regressions with these interaction terms are given in table 4. For ratings regressions, both interaction terms are negative and statistically significant at the .01 level. In the YIELD regression the interaction term for OUTDIR is positive and statistically significant at the .01 level as expected.

TABLE 4 Results of the Differential Effects of Corporate Governance Mechanisms on Bond Ratings and Yields for "High"- and "Low"-Rated Bonds

	Model 1: Ordered Probit Regression Dependent Variable = RATING		Model 2: OLS Regression Dependent Variable = YIELD	
Variables	Predicted Sign	Coefficient (*t*-Statistic)	Predicted Sign	Coefficient (White's *t*-Statistic)
Governance variables:				
INST	+	.014	−	−.009
		(4.549)**		(−5.080)**
OUTDIR	+	.026	−	−.009
		(11.943)**		(−5.118)**
Interaction with ratings:				
RATE × INST	−	−.014	+	−.001
		(−3.635)**		(−.583)
RATE × OUTDIR	−	−.038	+	.010
		(−12.262)**		(5.189)**
Loan characteristics:				
LSIZE	+	.164	−	−.058
		(1.873)*		(−1.161)
MATUR	−	.018	+	−.010
		(6.589)**		(−4.597)**
CALL	+	1.699	−	−1.697
		(10.716)**		(−9.875)**
SENIOR	+	.389	−	−.403
		(2.778)**		(−6.564)**
SINK	+	−.035	+	.099
		(−.117)		(.421)
Firm characteristics:				
DE	−	−.313	+	.307
		(−8.893)**		(5.119)**
MARGIN	+	10.761	−	−6.098
		(11.370)**		(6.150)**
ASSET	+	.010	−	−.006
		(6.204)**		(−6.738)**
MKBK	−	−.026	+	.009
		(−2.580)**		(3.668)**
CUMRET	?	−.116	?	−.068
		(−.987)		(−.602)
BETA	−	−.004	+	.322
		(−.043)		(3.882)**
Model χ^2		1,482.650		
Adjusted R^2				.57

NOTE.—This table reports regression results of the interaction of governance variables with a dummy variable representing bonds rated A and higher versus others. The variables are defined as follows: RATING is an ordinal variable taking the values 6, 5, 4, 3, 2, and 1 corresponding to Moody's bond ratings of Aaa, Aa, A, Baa, Ba, and B, respectively. The variables YIELD, INST, OUTDIR, LSIZE, MATUR, CALL, SENIOR, SINK, DE, MARGIN, ASSET, MKBK, CUMRET, and BETA are as defined in the note to table 1. RATE = 1 if the bond is rated A or better, 0 otherwise.

* Statistically significant at .05 level based on a one-tailed test.

** Statistically significant at .01 level based on a one-tailed test.

The coefficient for RATE × INST, however, is negative, although it is not statistically significant. Overall, the results indicate that institutional ownership and outside director representation on the board have stronger effects on bond yields and ratings for lower rated bonds.

D. Endogeneity of Institutional Ownership and Bond Ratings/Yields

Our results are consistent with the suggestion that active monitoring by institutions helps improve bond ratings and reduce yields through a reduction in default risk. However, some of the observed association between yields and institutional ownership could be attributable to institutions preferring to hold stocks of firms that have higher bond ratings or lower yields (and lower risk). To examine if bond yields also enter into institutions' decision to hold stock, we carry out two analyses. Initially, we adopt a simultaneous equation approach with institutional ownership and yields as the two endogenous variables. The two equations, estimated simultaneously using three-stage least squares (3SLS) procedure, are (model 1):

$$\begin{aligned} \text{YIELD} = {} & b_0 + b_1\text{INST} + b_2\text{OUTDIR} + b_3\text{MKBK} + b_4\text{SIZE} \\ & + b_7\text{MATUR} + b_8\text{CALL} + b_9\text{SENIOR} + b_{10}\text{SINK} \\ & + b_{11}\text{DE} + b_{12}\text{MARGIN} + \text{b}_{13}\text{ASSET} + \text{b}_{14}\text{MKBK} \\ & + b_{15}\text{CUMRET} + b_{16}\text{BETA} + \gamma, \end{aligned} \tag{1}$$

$$\begin{aligned} \text{INST} = {} & a_0 + a_1\text{YIELD} + a_2\text{LASSET} + a_3\text{CUMRET} \\ & + a_4\text{STDRET} + a_5\text{NUMEST} + a_6\text{LSHAOUT} + \varepsilon, \end{aligned} \tag{2}$$

where

LASSET	log of total assets at the end of year *t*.
STDRET	standard deviation of daily stock returns over fiscal year *t*.
NUMEST	number of forecast estimates made by financial analysts during year *t*. This information is collected from Compact Disclosures and is used in lieu of the number of analysts following.
LSHAOUT	natural log of shares outstanding at the end of year *t*.

All other variables are as defined previously in Section II. The control variables used in regression 2, such as firm size, numbers of analyst following, stock returns, and volatility of stock returns, are drawn from prior research on the determinants of institutional ownership (e.g., O'Brien and Bhushan 1990).

The simultaneous equation specification above uses contemporaneous yield and institutional ownership. To allow for potential timing factors, we also

examine the influence of bond yields of one period on institutional ownership in the subsequent year and vice versa. The equations, estimated simultaneously using three-stage least squares procedure, are (model 2):

$$\begin{aligned}\text{YIELD}_{t+1} = {} & b_0 + b_1\text{INST} + b_2\text{BLOCK} + b_3\text{OUTDIR} \\ & + b_4\text{CEOC} + b_5\text{MKBK} + b_6\text{LSIZE} \\ & + b_7\text{MATUR} + b_8\text{CALL} + b_9\text{SENIOR} \\ & + b_{10}\text{SINK} + b_{11}\text{DE} + b_{12}\text{MARGIN} \\ & + b_{13}\text{ASSET} + b_{14}\text{MKBK} + b_{15}\text{CUMRET} \\ & + b_{16}\text{BETA} + \gamma,\end{aligned} \tag{1a}$$

$$\begin{aligned}\text{INST}_{t+1} = {} & a_0 + a_1\text{YIELD} + a_2\text{LASSET} \\ & + a_3\text{CUMRET} + a_4\text{STDRET} \\ & + a_5\text{NUMEST} + a_6\text{LSHAOUT} + \epsilon.\end{aligned} \tag{2a}$$

The results of the 3SLS regressions are presented in table 5. The coefficient for YIELD in the INST regression is negative and statistically significant at .01 level, while the coefficient for INST in the YIELD regression is also negative and statistically significant at .01 level for both the 3SLS specifications. This indicates that while institutions seem to prefer debt with lower bond yields, yields are also influenced by the extent of institutional ownership in the firm. The coefficients for the other governance variables and control variables are similar to those obtained in separate regressions. The control variables used in the INST regressions also have their expected signs except for LSHAOUT, which turns out to be negative and statistically significant. This could be caused by high correlation between LSHAOUT and LASSET. The regressions were rerun after dropping one of these variables and replacing LASSET with other size measures such as total assets and total sales. These variations did not qualitatively affect any of the results presented in table 5.

Finally, we reran the 3SLS regressions using bond ratings instead of bond yields. The results (not reported) were similar to those presented in table 5.

E. Regression Diagnostics

Regression results were tested for the presence of influential observations using procedures suggested by Belsley, Kuh, and Welsch (1980). These procedures identified some influential observations. To control for the effects of potential influential observations on the regression results, we performed two procedures: (i) regressions were rerun after dropping all potentially influential observations and (ii) regressions were rerun using Welsch's (1980) method of bounded influence estimation that runs weighted least squares regression

TABLE 5 **3SLS Regression Results of the Effects of Governance Mechanisms on Bond Yields and the Effect of Bond Yields on Institutional Ownership**

	Estimated Coefficient (*t*-Statistic)			
	Model 1		Model 2	
Variables	YIELD	INST	$YIELD_{t+1}$	$INST_{t+1}$
YIELD		−5.886		−2.098
		(−4.960)**		(−3.330)**
INST	−.024		−.023	
	(−15.700)**		(−4.720)**	
OUTDIR	−.003		−.015	
	(−2.320)*		(−3.590)**	
LASSET		3.160		1.920
		(4.250)**		(2.560)**
CUMRET	−.056	6.337	−.089	12.282
	(−.630)	(3.570)**	(−.320)	(6.810)**
STDRET		−363.540		−552.518
		(−2.780)**		(−5.480)**
NUMEST		.417		.404
		(4.250)**		(4.030)**
LSHAOUT		−7.541		−6.770
		(−8.310)**		(−7.830)**
MKBK	.005	−.253	.022	−.271
	(.84)	(−2.270)*	(1.430)	(−2.630)**
LSIZE			−.162	
			(−.910)	
MATUR	−.011		−.029	
	(−4.840)**		(−4.250)**	
CALL	−1.525		−2.121	
	(−11.790)**		(−5.120)**	
SENIOR	−.393		−.159	
	(−4.710)**		(−.590)	
SINK	−.096		−.859	
	(−.520)		(−1.400)	
DE	.392		.375	
	(10.860)**		(3.06)**	
MARGIN	−7.521		−11.038	
	(−12.390)**		(−5.620)**	
ASSET	−.001		−.016	
	(−7.810)**		(−4.820)**	
BETA	.273		.119	
	(3.990)**		(.054)**	
System R^2	.51		.21	

NOTE.—This table provides simultaneous equation results relating to effect of governance mechanisms on bond yields and the effect of bond yields on institutional ownership. The variables YIELD, INST, OUTDIR, LSIZE, MATUR, CALL, SENIOR, SINK, DE, ASSET, MKBK, CUMRET, and BETA are as defined in the note to table 1. The variable LASSET is the log of total assets at the end of year *t*, STDRET is the standard deviation of daily stock returns over period *t*, NUMEST is the number of earnings forecasts issued by financial analysts over year *t*, LSHAOUT is the log of total number of common shares outstanding at the end of year *t*, and MARGIN is the income before extraordinary items of period *t* divided by the total assets at the end of period *t*.

* Statistically significant at .05 level based on a one-tailed test.

** Statistically significant at .01 level based on a one-tailed test.

after assigning lower weights to the influential observations. The conclusions of the article remained essentially the same under both procedures.

IV. Conclusions

This article explored the link between governance mechanisms and bond yields and ratings. An effective corporate governance mechanism can affect bond yields and ratings through its impact on default risk of the firm. Governance mechanisms reduce potential conflicts of interests between the management and providers of capital through effective monitoring of their actions. This can reduce expropriation or misallocation of funds, improve the firm's productivity and disclosures, and provide management with a long-term planning horizon. All of these could be perceived positively by bondholders, resulting in a reduction in the firms' default risk. However, concentrated institutional ownership could result in institutions influencing firm decisions that could prove costly to other providers of capital (private benefits hypothesis of blockholding).

We tested these arguments using data on new bond issues over the period 1991–96. Our results showed that bond ratings (yields) on new debt issues are positively (negatively) associated with the percentage of shares held by the institutions and the fraction of the board made up of nonofficers. In addition, concentrated institutional ownership has an adverse impact on bond yields and ratings (after controlling for the level of institutional ownership). These findings suggest that firms facing stronger external monitoring through effective governance mechanisms are rewarded with lower yields and superior bond ratings. These results are also robust to a simultaneous equation specification that controls for yields influencing the extent of institutional ownership and a specification that controls for lag in the effect of ownership on yields.

Further, consistent with the underlying motivation, institutional ownership is more effective for low-rated bonds, which is a proxy for conditions of greater default risk. Thus, rather than viewing corporate governance mechanisms as exacerbating the wealth transfer problem between bondholders and shareholders, bondholders actually consider the governance mechanisms to be beneficial.

In this article we provide empirical evidence to help evaluate competing hypotheses of corporate governance by studying the impact of the mechanisms on a key factor influencing firm value, that is, the cost of debt capital. We also contribute to the existing literature on the determinants of bond yields and ratings by identifying several factors that explain bond yields and ratings beyond factors traditionally used to explain them.

There are several potential directions of future research that this study would suggest. One direction would be to study the effect of governance variables on other cost of capital measures, such as the cost of equity capital. Another potential extension would be to use more refined measures of corporate gov-

ernance and to study their effect on cost of capital (e.g., Brickley et al. [1988] and Bhagat and Jefferis [1991] study differences in various institutional investor monitoring incentives). This line of research would help develop a clearer picture of the relative benefits of governance mechanisms, since ultimately one of the primary reasons for the existence of these mechanisms is the reduction in cost of capital (in a world of incomplete contracting).

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