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Abstract

This paper explores the relation between corporate governance mechanisms in Japan and the costs of public debt financing. Using a sample of Japanese corporate bond issues during the period 2005-2008, we find that CEO ownership is associated with higher yield spreads after controlling for firm- and bond-specific characteristics. Founding family ownership is also positively related to yield spreads. In contrast, firms with large corporate shareholders enjoy lower yield spreads. These results are robust to various alternative specifications. Overall, our results indicate that corporate governance mechanisms in Japan are important factors affecting the costs of public debt financing.

JEL classification: G32, G34

Keywords: Yield spreads; Ownership structure; Corporate governance

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1. Introduction

Investors are generally concerned about whether they will certainly get some returns on their investments. The main purpose of corporate governance systems is then to provide investors with an assurance that they will be distributed some profits as these returns (Shleifer and Vishny, 1997). Thus, investors have a great interest in the type of corporate governance system in firms with which they invest. For instance, if corporate governance systems that protect investor's interests dominate, then investors is likely to obtain their returns, and these firms will enjoy lower costs of external financing. In contrast, when corporate governance systems that generate the agency conflicts with investors prevail, then the required returns on investments are not likely to materialize, and these firms will face higher costs of external financing. Thus, the quality of the corporate governance system has a significant effect on the ability of firms to raise external finance.

It is often argued that shareholder's interests do not fully align with those of bondholders. For example, shareholders could expropriate wealth from bondholders by investing in riskier projects, and then reap most gains if the projects perform well, while bondholders bear most of the costs (the asset substitution problem) (Jensen and Meckling, 1976). Such a divergence of interests between shareholders and bondholders becomes severe when controlling shareholders have an incentive to pursuit self-serving activities. Controlling shareholders then tend to entrench themselves at the expense of other investors, and then enjoy the private benefits of control, thereby leading to a reduction in firm value. Moreover, these activities include risk-taking and wealth transfer activities that are detrimental to bondholder. Thus, these incentives could potentially exacerbate the shareholder-bondholder conflict and generate an increase in potential default risk. Recognizing the agency conflicts with controlling shareholders, bondholders will require higher yields for these firms. However, controlling shareholders often bring benefits to bondholders. Controlling shareholders have an incentive to monitor, discipline, and even oust incumbent managers. These monitoring activities serve to curb managerial discretion, and then enhance firm value. Consequently, monitoring activities potentially mitigate the shareholder-bondholder conflict, and thus lower potential default risk. Bondholders reflect such benefits in bond yields, and so permit the firms to enjoy lower yields.[1]

In this paper, we examine the relation between corporate governance mechanisms in Japan and the costs of public debt financing. Using a sample of 640 corporate bond issues on 196 firms during the period 2005-2008, our empirical analysis reveals that CEO ownership is positively associated with yield spreads after controlling for firm- and bond-specific characteristics. This suggests that bondholders are concerned about conflict of interests with the CEO, and correspondingly require

[1] For an extensive survey on the role of controlling shareholders in agency conflicts within firms, see Denis and McConnell (2003), and Shleifer and Vishny (1997).

higher yields for the bond issues of these firms. In addition, we find that family ownership is positively correlated with higher bond yields. This indicates that family firms face higher costs of public debt financing because of concerns about the agency conflicts with family members. Finally, firms with large corporate shareholders have lower yield spreads. This could be interpreted as evidence that monitoring activities by large corporate shareholders enable the firms to enjoy lower costs of public debt financing.

In addition, we present some other interesting results. First, we consider whether managerial ownership affects the costs of public debt financing. Consistent with the results above, managerial ownership is positively related to yield spreads, suggesting that managerial ownership is viewed negatively in the bond markets. Second, we construct five family firm-related variables. In particular, when the firm founder serves as president or chairperson *and* family members are among the top ten shareholders, these family firms face higher yield spreads. This indicates that the costs of public debt financing vary with the type of family firm. Finally, a larger share of directors from large corporate shareholders is related to lower yield spreads. This shows that monitoring activities are considered favorably by bondholders.

To check the robustness of our results, we test various regressions models. Our main results are robust to alternative specifications with respect to the type of security firms serving as bond underwriters, inclusion of financial institution ownership, sample selection, nonlinearities in credit rating and leverage, adjusted credit rating variable, and endogeneity concerns. Overall, our findings show that corporate governance systems in Japan are essential factors influencing the costs of public debt financing and then these impacts change with the characteristics of the corporate governance system.

This study is related to other works on the impacts of corporate governance systems on the costs of public debt financing. Anderson et al. (2003) examine the effect of family ownership on the costs of public debt financing, and show that family ownership is associated with lower yield spreads. Bhojraj and Sengupta (2003) document that institutional ownership has an adverse impact on yield spreads, while a higher share of outside directors has a favorable effect on yield spreads. Cremers et al. (2007) explore the relation between shareholder control as internal governance and takeover defenses as external governance, and provide evidence that the impact of shareholder control on yield spreads varies with takeover vulnerability. In examination of the relation between corporate governance and the costs of public debt financing, earlier studies also adopt the antitakeover provisions index constructed by Gompers et al. (2003). Klock et al. (2005) provide evidence that antitakeover provisions lower the costs of public debt financing, and so conclude that antitakeover provisions are viewed positively by bondholders. Chava et al. (2009) investigate the relation between the

antitakeover provisions index and the costs of bank loans. They find that firms with higher takeover vulnerability are required to pay higher spreads on bank loans. However, these studies are limited to corporate governance systems in the United States. We then require further investigations of the linkages between ownership structures and the costs of public debt financing in other countries, including Japan.

This paper makes two contributions to existing literatures. First, we provide first evidence that corporate governance mechanisms in Japan have substantial impacts on the costs of public debt financing. Japanese firms mainly use bank loans for raising funds, and analyses in previous studies are largely limited to examination of the relation between corporate governance by banks and easy access to banks loans (e.g., Hoshi et al., 1991).[2] Moreover, of the works investigating the determinants of yield spreads in Japanese corporate bond market, corporate governance structures that could affect yield spreads have been not explored (see, e.g., Nakashima and Saito, 2009; Takaoka and McKenzie, 2006; Shirasu and Yonezawa, 2008). Second, our results suggest that bondholders have different concerns about governance mechanisms in Japan by focusing on governance structures that receive less attention in previous literatures. For CEO ownership, earlier works ignore the linkage between CEO ownership and the costs of public debt financing. For family-owned firms, the analysis of family firms in Japan is primarily rare.[3] For non-financial firms as shareholders, extant empirical literatures mainly place emphasis on the relation between ownership level and firm performance (e.g., Miyajima and Kuroki, 2007; Morck et al., 2000), and therefore focus less on the relation between ownership level and the costs of public debt financing. In addition, previous papers consider the large institutional shareholders that have no special relationship with firms other than ownership (Anderson et al., 2003; Bhojraj and Sengupta, 2003; Cremers et al., 2007). In contrast, Japanese non-financial firms as large shareholders maintain long-term relationship with firms apart from ownership.

The rest of the paper is organized as follows. Section 2 provides explanations with characteristics of our data sample, the construction of the variables, and descriptive statistics. Section 3 provides the basic results, and Section 4 shows some additional results. Section 5 tests the robustness of our results. Section 6 concludes the paper.

2. Data, variables, and descriptive statistics

In our analyses, we use a sample of at-issue straight bond issues during the period 2005-2008,

[2] The agency problems between shareholders and debtholders in Japan are explored in Prowse (1990) that documents that concentrated ownership by Japanese financial institutions as debtholders helps mitigate the agency problems.

[3] The extant literatures on family firms in Japan include Nguyen (2011) and Saito (2008).

published by the *Japan Securities Dealers Association*. This dataset, among other things, includes information about bond yields, amounts, maturities, and ratings. The bond issue data is merged with information on corporate governance measures, and financial information. Our sample is restricted to bond issues with fixed rate. We exclude from the sample firms in the finance industry, and regulated industries such as electric and gas. In particular, our sample does not include the data for Japan Railway Group, and Japan Tobacco Inc. because these firms were managed previously by the government, and even now continue to maintain close relationship with the government. We also remove unlisted firms and investment trusts because financial information is not available. After merging the datasets and excluding unnecessary observations, the resulting sample covers 640 firm-year observations on 196 firms.

2.1. Yield spreads

Our dependent variable, *Spread*, is calculated as the at-issue yield to maturity on straight bonds in excess of the yield to maturity on government bonds with the closest maturity as a benchmark. Information on government bonds come from the *Japan Securities Dealers Association.*

2.2. Corporate governance variables

For governance measures, we use three key corporate governance variables: CEO ownership, family ownership, and corporate ownership. These corporate governance variables are calculated at the fiscal year-end prior to the bond issue.

2.2.1. CEO ownership

As suggested by Berle and Means (1932), when managers have little equity in the firms, and shareholders are widely dispersed, managers have less incentive to pursue value-maximization objectives. Instead, they tend to adopt investment and financing policies that benefit themselves at the expense of shareholders. Self-serving activities include opportunistic behavior, job protection, and the allocation of investor's funds for personal benefits as non-value-maximizing activities. In such a situation, the manager's interests are not coincident with those of the firm's shareholders.

However, when managerial ownership rises, manager's incentive to pursue non-value-maximizing objectives declines because managers with equity need to incur costs associated with self-serving activities. In its place, managers have an incentive to enhance the market

value of the firm. As such, alignment of the manager's interests with those of shareholders results in a reduction in the potential divergence of interests between managers and shareholders (Morck et al., 1988).[4] Furthermore, the reduction in managerial discretion benefits bondholders because manager's self-interested activities that harm bondholders decline. As a consequence, interests of managers as shareholders become closer to those of bondholders, and the likelihood of default risk is lower. Overall, if bondholders perceive managerial ownership as lowering the likelihood of default, they allow these firms to issue debt with lower yields.

However, there are costs associated with higher managerial ownership because higher ownership provides managers with an incentive to entrench themselves against other corporate governance mechanisms. Entrenched managers could then again indulge their preferences for non-value-maximizing objectives (Morck et al., 1988). Moreover, self-serving activities harm bondholders. In such a situation, the bondholder-shareholder conflict is exacerbated, and default risk potentially increases. If bondholders predict such managerial incentives, they demand higher returns from these firms.

We examine the impact of ownership held by managers on the costs of public debt financing by using the variable for the fraction of equity held by the CEO (*CEO ownership*). CEOs are generally powerful figures on board, and have the ability to exercise great power over management decisions. Thus, if CEO ownership is considered positively in the bond markets, the coefficient on CEO ownership is expected to be negative. On the other hand, if CEO ownership is considered unfavorably in the bond markets, the coefficient on CEO ownership is expected to be positive. Because there is no theoretically strong a priori reason to favor one effect over the other, the effect of CEO ownership on yield spreads is an empirical issue. We often face the difficulty in identifying the CEO on board. For many of our sample firms, either the chairperson (Kaicho) or president (Shacho) is typically the CEO. However, in other firms, we sometimes obtain no clear information about CEO, and so we assume that the president (Shacho) on the board is the CEO.[5] Identification of CEO on board and data on ownership level held by CEO come from the *Yakuin Shikiho* published by *Toyo Keizai Shinposha* and the *Yuka Shoken Houkokusho.*

In addition to CEO ownership, we use the fraction of equity held by the managers (Managerial ownership). While CEO ownership captures the effect of CEO incentive on yields, Managerial

[4] Some studies argue that alignment of manager's interests with shareholder's those could harm bondholders by encouraging managers to invest in riskier activities (Bagnani et al., 1994; Ortiz-Molina, 2006). However, because bondholders receive benefits from the decrease in managerial discretion, these alignment effects do not always have an adverse impact on bondholders.

[5] Chairperson often exerts powerful influence on firm management. For this reason, Kubo and Saito (2009), and Saito (2008) use information about the sum of equity held by both president and chairperson. However, we are unable to do this because our sample includes firms with committee systems that have no chairperson in an executive position.

ownership are included to control for the effects of all manager's incentives.

2.2.2. Family ownership

Founding family firms are prevalent among public firms around the world.[6] Unlike other shareholders, families have an unique incentive to manage their firms. In particular, they have an interest in both the firm's long-term survival, and their family's own reputation. These could potentially affect the shareholder-bondholder conflict. First, families have a strong impetus to keep the firm survive, and to pass the firm to other family members or their descendants. Thus, families seek to manage the firm for survival by maximizing firm value rather than shareholder value. Because bondholders benefit from higher firm value, this incentive unique to family firms could help mitigate the shareholder-bondholder conflict. Second, families are concerned about their family's reputation held by external parties. Family firms generally experience infrequent turnover of managers and directors. This long-term board presence keeps relationship with external parties sustainable. More importantly, long-term relationship established through family reputation is also desirable for bondholders because families continue to maintain firm performance in the long run (Anderson et al., 2003).[7]

As discussed earlier, when families are major shareholders, they have an incentive to monitor and discipline management, thereby enhancing firm performance. These monitoring activities benefit bondholders, and so help mitigate the shareholder-bondholder conflict, thereby resulting in lower default risk. Taken together, if family-owned firms are viewed as lowering default risk in the bond markets, family-owned firms enjoy lower costs of public debt financing (Anderson et al., 2003).

However, family firms could also extract the private benefits of control at the expense of other investors, including bondholders. This could aggravate the shareholder-bondholder conflict, thereby leading to an increase in default risk. When family-owned firms are viewed as raising default risk by bondholders, they have higher costs of public debt financing.

Unfortunately, we have no comprehensive data source on family firms, and face the difficulty in obtaining reliable data on these firms. Accordingly, we attempt to gather manually information on family firms from several data sources. First, we identify the firm founder, using the *Nihon Kaishashi Souran* published by *Toyo Keizai Shinposha*, and the *Yuka Shoken Houkokusho*. If we are unable to identify the firm founder, we consider the firms as those without founders, e.g., firms founded by other firms. Second, we obtain information on the founder's descendants, including distant relatives or in-laws with different last names using the *Nikkei Telecom 21* and the *Yuka Shoken Houkokusho*.

[6] Saito (2008) documents that family firms are relatively common in Japan.
[7] For a more detailed discussion, see Anderson et al. (2003).

Finally, we seek to collect information about equity ownership related to family members. Family-member related ownership includes not only equity held directly by family members, but family member-related holding companies or foundations.

We attempt to obtain information on family member-related ownership, but have the difficulty in accurately collecting the data. Following Anderson et al. (2003), we construct a ownership-based binary variable (*Family ownership*) that has a value of 1 if family members, and the affiliated firms are among the top ten shareholders, and 0 otherwise (50 firm-year observations on 28 firms). This definition differs from that in Saito (2008) in that in identifying family firms, we do not use information about the family members on board. If family firms enjoy lower yields, the coefficient on *Family ownership* is expected to be negative. In contrast, if family firms face higher yields, the coefficient on *Family ownership* is expected to be positive. However, we have no a priori reasoning to underpin the exact effect of ownership held by family members on yield spreads. Ultimately, the question of the effect of family ownership on yield spreads is an empirical issue.

In addition, existing studies document that the characteristics of the CEO, management, and ownership in family firms have different effects on firm performance (Anderson and Reeb, 2003; Mork et al., 1988; Saito, 2008; Villalonga and Amit, 2006), and the costs of public debt financing (Anderson et al., 2003). To capture these impacts, we use five dummy variables for family firms: *Founder ownership* is a variable that takes a value of 1 if the firm founder serves as president or chairperson, *and* family members are among the top ten shareholders, and 0 otherwise (26 firm-year observations on 13 firms). *Founder management* is a variable that takes a value of 1 if the firm founder serves as president or chairperson, *and* family members are not among the top ten shareholders, and 0 otherwise (3 firm-year observations on 1 firms). *Descendant ownership* is a variable that takes a value of 1 if the founder's descendants serve as president or chairperson, *and* family members are among the top ten shareholders, and 0 otherwise (15 firm-year observations on 10 firms). *Descendant management* is a variable that takes a value of 1 if the founder's descendants serve as president or chairperson, *and* family members are not among the top ten shareholders, and 0 otherwise (18 firm-year observations on 9 firms). *Outsider management* is a variable that takes a value of 1 if outsider hired by family members serves as president or chairperson, *and* family members are not among the top ten shareholders, and 0 otherwise (9 firm-year observations on 6 firms). The exact effects of these five dummy variables on yield spreads are also empirical issues.

2.2.3. Corporate ownership

Large shareholders have an incentive to gather information about the firms they partly own, and

so monitor the incumbent mangers of these firms. Furthermore, they exert control over firm management to have their interests respected. These monitoring activities decrease managerial discretion. This suggests that the interests of outside shareholders are closely aligned with those of bondholders that suffer from managerial discretion. Consequently, this alignment could help mitigate bondholder-shareholder divergence, and lower default risk. Furthermore, large shareholders that typically invest in the firms over longer periods have an incentive to alleviate the potential agency conflicts with bondholders to repeatedly access the funds in the debt markets (Anderson et al., 2003). Anticipating the benefits from such activities, bondholders require lower yields for the firm's debt (Bhojraj and Sengupta, 2003; Denis and McConnell, 2003). Conversely, outside large shareholders could also exercise undue influence over management to enjoy the private benefits of control (see, e.g., Shleifer and Vishny, 1997). Such incentives could exacerbate the shareholder-bondholder conflict, thereby leading to an increase in potential default risk. Recognizing this, bondholders require higher yields for the firms in which such controlling shareholders dominate.

We focus on non-financial firms among the firm's outside shareholders. In Japan, non-financial firms as the largest shareholders have a long-term relationship with the owned firms through repeated business transactions. In turn, vertical business linkages between subcontracting and parent firms often characterize the relationship between owned firms and corporate sharehoders. We define corporate shareholders as those with more than 10 % shareholdings, and use the proportion of equity held by corporate shareholders (*Corporate ownership*) to capture the effect of ownership level by corporate shareholders on the costs of public debt financing. Furthermore, when firm performances declines, corporate shareholders could put pressure on management, and even replace incumbent managers by appointing their employees as new directors to the board. Thus, the presence of directors from corporate shareholders on the board indicates that corporate shareholders intervene in the management of owned firms, and discipline incumbent managers.[8] In contrast, corporate directors could have an incentive to enjoy the private benefits of control that often harm bondholders. As a result, corporate directors are also likely to bring benefits or costs to bondholders. To address this, we also use *Corporate director* that is defined as the fraction of directors previously appointed by corporate shareholders as director members to the board. If activities by corporate shareholder are beneficial for bondholders, the coefficients on both *Corporate ownership* and *Corporate director* are expected to be negative. In contrast, if activities by corporate shareholder are costly for bondholders, the coefficients on both *Corporate ownership* and *Corporate director* are expected to be positive. Yet again, it is not possible to predict a priori which effect will dominate, and thus the effect of corporate shareholders on yield spreads is an empirical question. Data on corporate ownership are obtained from the *Japan*

[8] See, e.g., Kaplan and Minton (1994).

Company Handbook, and identification of directors previously appointed by corporate shareholders comes from the *Yakuin Shikiho*.

2.3. Control variables

In examining the relation between corporate governance mechanisms and the costs of public debt financing, we use three variable categories as control variables: governance-related variables, bond characteristics, and firm characteristics.

2.3.1. Governance-related variables

In addition to our main three corporate governance variables, we use the years of CEO tenure, the fraction of outside directors on the board, the size of board as control variables. These help control for other governance characteristics that could potentially affect the costs of public debt financing. CEO tenure length is associated with managerial opportunism by the CEO because the CEO's control over management increases with the length of CEO tenure. In addition, the CEO could become more entrenched despite a relatively lower level of ownership by virtue of tenure length. *CEO tenure* is the variable that takes a value of 1 if the tenure length is more than ten years, and 0 otherwise.

Outside directors also play an important role in monitoring managers, and then curbing their self-interested activities. Moreover, outside directors have the ability to oversee the financial accounting process, and as a result financial statement fraud is less prevalent in firms with outside directors (Anderson et al., 2004). Thus, these firms with such directors could enjoy lower costs of public debt financing. This is measured by the proportion of outside directors on the board (*Outside director*).[9]

The number of board members could be related to the effectiveness of corporate governance because board size plays an essential role in monitoring and controlling managers. A smaller board could make decisions more quickly, and this effectively decrease any agency problems among boards. Indeed, Yermack (1996) finds negative relation between firm value and board size. On the other hand, a larger board also has some benefits in that the allocation of workload is across a great number of directors that in turn could commit greater efforts in overseeing management. As a result, monitoring activities become more frequent in larger boards (Anderson et al., 2004). This is measured as the number of the directors on the board (*Board size*). Identification of members of director boards comes

[9] In the calculation of board members, we do not include audit committee members.

from the *Yakuin Shikiho*.[10] All of these corporate governance-related variables correspond to the fiscal year-end preceding the bond issue.

2.3.2. Bond characteristics

To control for other factors that could potentially affect the costs of public debt financing, we also need to include variables for the bond characteristics. Our equations include the variables for amount, maturity period, time of issue, and credit rating. An increase in leverage makes the bond riskier, which results in higher yield spreads. Amount (*Amount*) is measured by the natural logarithm of issue size (in billions of yen). Bond issues with longer maturities have higher risk and correspondingly have higher default risk. This leads to higher yield spreads. Maturity period (*Maturity*) is measured by the number of years to maturity. Firms with extensive experience in accessing the debt market are familiar with bondholders, and these firms could correspondingly enjoy lower yield spreads. This is measured as the natural logarithm of the number of times the firm has previously issued bonds (*Times*).

In our sample of bond issues, each issue has credit ratings assigned by at least one of the four credit rating agencies: Standard & Poor's (S&P), Moody's, Japan Credit Rating Agency (JCR), and Rating & Investment Information (R&I). Problematically, bond issues usually have multiple credit ratings. To address this, we convert the credit rating into a numerical index, and calculate an average credit ratings score (Anderson et al., 2003; Klock et al., 2005; Ortiz-Molina, 2006). Table 1 presents the conversion numbers for S&P, Moody's, JCR, and R&I firm bond ratings. For example, a firm with an A－ rating from S&P and an A＋ rating from R&I are assigned to an average score of 14. However, credit rating agencies are concerned about governance structure in evaluating the firm's creditworthiness. The effect of corporate governance on default risk could be generally reflected on credit ratings. Indeed, previous papers find significant relation between corporate governance and credit rating (Ashbaugh-Skaife et al., 2006; Bhojraj and Sengupta, 2003). Accordingly, we regress an average credit rating score on our corporate governance variables, and then compute the residual from the regression. This residual thus contains information about creditworthiness excluding the effects of the corporate governance mechanisms on credit ratings. We use this residual as the variable for credit rating (*Credit rating*). Higher credit rating score generates lower yield spreads.

2.3.3. Firm characteristics

[10] After the asset price bubbles in the early 1990s in Japan, board meetings in Japanese firms drastically changed. The focus of the reform is on outside directors and board member size (Nitta, 2008). Thus, controlling for different board characteristics resulting from board reform is important for our analyses.

To control for firm characteristics, we use the variables for profitability, immediate financial distress, leverage, growth opportunities, size, age, and dividend policy. Less profitable firms tend to have difficulty in repaying debt. These firms typically experience higher costs of public debt financing. Firm's profitability (*ROA*) is defined as the ratio of pretax income to total assets. Lower working capital indicates that the firms are under intermediate financial stress. Such firms face higher costs of public debt financing. More importantly, corporate shareholders continue to maintain long-term relationship with owned firms through repeated business transactions. By controlling trade payables to owned firms or trade receivables from owned firms, corporate shareholders could help bail out the poorly performing owned firms. Thus, inclusion of working capital in our equation helps capture these effects on the costs of public debt financing. This is measured by the current assets minus current liabilities, divided by total assets (*Working capital*). Firms with larger leverage increase the probability of bankruptcy, thereby facing higher costs of public debt financing. Firm's leverage (*Leverage*) is defined as the long-term debt, including long-term loans and bonds (straight, convertible, and warrant bonds), divided by total assets. Firms with higher growth opportunities could be also subject to greater risk, and then have higher costs of public debt financing. We define growth opportunities (*Market-to-book ratio*) as the sum of the market value of equity plus the book value of total debt, divided by the book value of total assets. Larger firms generally enjoy the economies of scale, and stable performance. Thus, larger firms could enjoy lower costs of public debt financing. As firm's size is not expected to be linearly associated with the costs of public debt financing, this is measured as the natural logarithm of total assets (*Firm size*) (in millions of yen). Older firms survive competitively in the market over longer periods, and thereby establish a reputation as creditworthy firms. Thus, older firms could have lower costs of public debt financing. Specifically, among family firms, firms in which the firm founder is on the board or is a major shareholder are younger. This shows that characteristics of family firms are closely related to firm's age. Thus, inclusion of the variable for firm's age in our specification is important in examining our predictions. We also expect the chronological firm age to nonlinearly affect the costs of public debt financing, and so this is measured by the natural logarithm of years elapsed since establishment (*Firm age*) (in years). Finally, bondholders are concerned about wealth transfer from bondholders to shareholders through dividend payments. If firm's dividend policy is viewed as a form of wealth transfer by bondholders, dividend policy generates higher costs of public debt financing. In contrast, firm's dividend policy could be a signal that the firm has substantial internal funds, and thus has lower default risk. If firm's dividend policy is viewed favorably by bondholders, such a policy is negatively associated with the costs of public debt financing. To control for these effects, we use *Dividend* that is defined as total dividends,

divided by total sales. All of these firm-specific variables are measured at the fiscal year-end preceding the bond issue. Data on financial statement used for the calculation of these variables come from the Nikkei Needs dataset, which provides information on balance sheet and financial statement for the firms listed on the stock exchange.

2.4. Descriptive statistics

Table 2 provides descriptive statistics for the bond characteristics, corporate governance measures, and firm characteristics. The descriptive statistics include the means, medians, standard deviations, maximums, and minimums for the variables used in the basic analysis. *Spread* has a mean of 44.370 basis points, with a standard deviation of 32.411.[11] *CEO ownership* has a mean value of 0.007, with a standard deviation of 0.041. Family-owned firms comprise only about 8% of our sample. This suggests that family firms mainly use other methods for raising funds. *Corporate ownership* has a mean value of 0.054, a standard deviation of 0.136, a maximum value of 0.672, and minimum value of 0, respectively. The mean value of *Maturity* is 6.257 years, with a standard deviation of 2.501 years. *Credit rating* has a mean value of 13.888, with a standard deviation of 1.965.[12] The mean value of *ROA* is 0.022, with a standard deviation of 0.179. *Firm size*, the natural log of total assets, has a mean value of ¥14.066 million, a standard deviation of ¥1.152 million, a maximum value of ¥17.295 million, and minimum value of ¥10.561 million, respectively.

Table 3 shows the distribution of the 640 firm-year observations on the 196 firms during the period 2005-2008. Panel A presents the distribution of the sample by fiscal year, while Panel B provides the industry distribution. The industry classifications come from the *Japan Company Handbook*.

Table 4 reports the correlations between *Spread*, and the corporate governance variables, including *CEO ownership*, *Family ownership*, *Corporate ownership*, *CEO tenure*, *Outside director*, and *Board size*. *Spread* is positively correlated with *CEO ownership*, and *Family ownership*. This is consistent with the notion that bondholders are concerned about the agency conflicts with the CEO or family members that could enjoy the private benefits of control. Conversely, we find no significant relation between *Spread* and *Corporate ownership*. However, we do not control for other factors that could potentially affect *Spread*. To better explore the relation between *Spread* and *Corporate*

[11] In the subsequent empirical analysis, the yield spreads used are the raw values, not in basis points.

[12] For the credit rating variable in Table 2, we use the residual from regressions of an average credit rating score on CEO ownership, family ownership, corporate ownership, outside director, and board size. CEO tenure is not used as an independent variable in the regression because it is highly correlated with CEO ownership, and so the effect of CEO tenure on credit rating is likely to be captured in CEO ownership. In the subsequent analysis, we use different corporate governance variables across different specifications, and correspondingly we reestimate a credit rating variable for each specification.

ownership, we need to use multivariate regression frameworks.

3. Results

In this section, we use multivariate frameworks to explore the relation between governance mechanisms and the costs of public debt financing. To draw meaningful inferences, we control for other governance-related factors, bond characteristics, and firm characteristics that could potentially affect the costs of public debt financing. We also include industry- and year-specific variables to control for any possible industry and year effects. Table 5 presents the results for the impacts of corporate governance measures on the costs of public debt financing during the period 2005-2008. The coefficients are estimated using ordinary least squares (OLS) regression method. Standard errors reported in parentheses are robust to heteroskedasticity and adjusted for the clustering of multiple observations for the same firm.[13]

Column 1 in Table 5 contains regression estimates for the specification with *CEO ownership*. The estimated coefficient on *CEO ownership* is statistically significant and positive. This suggests that firms in which the CEO dominates have higher costs of public debt financing, consistent with the notion that bondholders demand higher yields from the firms with higher CEO ownership because of the concerns about the potential default risk arising from potential conflict of interests.

Column 2 contains the results for the specification including *Family ownership*. The estimated coefficient on *Family ownership* is statistically significant and positive, suggesting that family firms experience higher costs of public debt financing. This is in line with the view that bondholders require higher yields from the firms in which conflict of interests between family members and bondholders potentially arises. This result runs contrary to the finding that firms with family ownership enjoy lower costs of public debt financing in the United States (Anderson et al., 2003). The contrasting results show that bondholders have different views about family-owned firms in different countries.

Column 3 is based on the specification with *Corporate ownership*. The estimated coefficient on *Corporate ownership* is statistically significant and negative, suggesting that the costs of public debt financing are lower in firms with large corporate shareholders. This concurs with the notion that monitoring activities by large corporate shareholders serve as an effective mechanism for better protecting the interests of bondholders.[14]

Column 4 considers the basic specification in which we simultaneously consider all three

[13] For the clustering technique, see, e.g., Wooldridge (2002).

[14] Negative relation between corporate ownership and spread could interpreted as suggesting that parent firms as large shareholders explicitly or implicitly guarantee the credit for their subsidiaries or affiliated firms, and that such a credit guarantee is viewed favorably in the bond markets.

corporate governance variables. In line with our results in columns 1-3, the estimated coefficient on *CEO ownership* is statistically significant and positive, and the estimated coefficient on *Family ownership* is statistically significant and positive. The estimated coefficient on *Corporate ownership* is also statistically significant and negative.

In terms of control variables, the estimated coefficient on *CEO tenure* is not statistically significant in two regressions because the effect of *CEO tenure* on *Spread* could be captured in *CEO ownership*. As Table 4 reports, the correlation coefficient between *CEO tenure* and *CEO ownership* is 0.482. The estimated coefficients on *Outside director* and *Board size* are not statistically significant. This could be because of collinearity among the governance variables. *Amount* has an estimated coefficient that is positive and statistically significant. This suggests that larger amounts of debt have higher default risk, resulting in higher costs of public debt financing. The estimated coefficient on *Maturity* is statistically significant and positive, suggesting that bonds with longer maturities have higher costs of public debt financing because of greater default risk. *Times* has a coefficient that is negative and statistically significant in two of the four regressions, indicating that firms that issue bonds frequently are viewed favorablely in the bond markets. The negative and statistically significant estimated coefficient on *Credit rating* indicates that a decrease in default risk lowers the costs of public debt financing. The estimated coefficient on *ROA* is statistically significant and negative, indicating that firms with better performance are viewed positively by bondholders. The significant negative estimated coefficient on *Working capital* indicates that firms under immediate financial stress face higher costs of public debt financing. The statistically significant and positive coefficient on *Leverage* indicates that firms with higher debt levels face higher costs of public debt financing because of higher default risk. *Market-to-book ratio* has no statistically significant coefficients in all four specifications, possibly because the effects are likely to be captured in *Credit rating*. Statistically significant and negative coefficients on *Firm size* and *Firm age* indicate that larger and older firms enjoy lower costs of public debt financing. *Dividend* has a negative and statistically significant coefficient. This could be interpreted as evidence that bondholders consider dividend policy as a signal that firms have rich source of internal funds.

In Table 5, we explore the relation between corporate governance mechanisms and the costs of public debt financing. Our findings reveal that all three governance variables are significantly associated with yield spreads. We thus conclude that these governance measures have influential impacts on the costs of public debt financing, and that these impacts vary across alternative corporate governance systems.

4. Additional results

In this section, we present additional results for the relation between corporate governance and the costs of public debt financing. First, to capture managerial incentives, *Managerial ownership* is included in our specification. Column 1 of Table 6 reports the results for the specification with *Managerial ownership*.[15] Like *CEO ownership*, the estimated coefficient on *Managerial ownership* is statistically significant and positive. This suggests that firms with higher managerial ownership face higher costs of public debt financing, and corresponds with the view that bondholders are concerned about potential agency conflicts, and thus require higher yields when financing such firms. It is well documented that a nonlinear relation between managerial ownership and firm performance exists (see e.g., Morck et al., 1988). To capture this effect, we estimate the regression with a squared term of *Managerial ownership* as an additional variable. In unreported results, both the linear and squared terms of *Managerial ownership* have no significant coefficients. This could be attributed to multicollinearity between the linear and squared terms.[16]

Next, family firm characteristics could have different impacts on the costs of public debt financing. To capture the effects of family firm characteristics on the costs of public debt financing, we use five family firm-related variables: *Founder ownership*, *Founder management*, *Descendant ownership*, *Descendant management*, and *Outsider management*. In unreported results, we find no significant relation between five family-related variables and yield spreads. This could be attributable to higher correlation of *CEO ownership* with *Founder ownership*. Indeed, the correlation coefficient between *CEO ownership* and *Founder ownership* is 0.766. Then, we examine the effects of these family firm-related variables on yield spreads by removing *CEO ownership* from our specification. Column 2 presents the results for the specification with five family firm-related variables. The estimated coefficient on *Founder ownership* is statistically significant and negative. This indicates that family firms in which the firm founder occupies a top management position, *and* family members are major shareholders face higher costs of public debt financing, suggesting that such family firms have more incentive to entrench themselves at the expense of bondholders. However, the remaining family firm-related variables have no significant coefficients, possible because of the smaller observations for these variables.

Third, we focus attention on the directors previously appointed by corporate shareholders to the board. As we argued earlier, when corporate shareholders have an incentive to intervene in the management of owned firms, they tend to dispatch their employees as directors on the firm's board.

[15] Bagnani et al. (1994) explore the linkage between managerial ownership and the return premia on corporate bonds.

[16] Hiraki et al. (1998) find no nonlinear relation between managerial ownership and firm performance. However, unlike our findings, they document that managerial ownership is positively related to firm value over their sample period, ranging from the late 1980s to the late 1990s.

These appointed directors then help discipline managers to have their interests respected. Thus, the presence of corporate directors on board is a direct indicator that the involvement of corporate shareholders in management increases. Our variable, *Corporate director*, helps capture the impacts of corporate directors on the costs of public debt financing. Column 3 provides the results with *Corporate director*. The estimated coefficient on *Corporate director* is statistically significant and negative, suggesting that firms with directors from large corporate shareholders experience lower costs of public debt financing. This aligns the view that directors appointed by large corporate shareholders to the board discipline the incumbent managers, thereby reducing the agency conflicts with bondholders.

Table 6 reports additional regression results for the relation between corporate governance mechanisms and the costs of public debt financing. We provide evidence that managerial ownership, family-firm related variables, and corporate director have essential impacts on the costs of public debt financing.

5. Robustness checks

Earlier sections present evidence that corporate governance mechanism in Japan exercises significant influence over the costs of public debt financing. In this section, we test whether our results are robust to various alternative specifications. Table 7 provides the regression estimates as robustness checks of our results. We only present the robustness tests of our results for the basic regression in Table 5, but our robustness checks also hold for the three specifications in Table 6.

5.1 Security firms as underwriters

Existing works extensively explore the role of commercial banks in underwriting securities, especially via bank subsidiary security firms.[17] These papers propose two opposing views: the certification view and the conflict-of-interest view. According to the certification view, close relationships with banks brings benefits to client firms that issue bonds because commercial banks have an advantage over security firms in gathering firm's private information unavailable to other security firms and investors through loan contracts and other financial services. When bank-owned security firms underwrite the securities of firms that establish close relationship with banks, banks then have the ability to provide greater certification to the value of the issue. Investors reflect this certification by banks in bond yields, and demand lower yields on the issues underwritten by bank

[17] For empirical analyses on the role of Japanese banks in bond underwriting, see Hamao and Hoshi (2000), Kang and Liu (2007), and Konishi (2002).

subsidiary security firms. Thus, we expect issues underwritten by bank subsidiary security firms to have lower yields than those underwritten by other security firms. In contrast, in the view of the conflict-of-interest, strong bank-firm relationship develops conflict of interests between banks and investors. Banks could exercise significant influence over their client firms, and so often require client firms to issue bonds to repay bank loans. In particular, such bank incentives become stronger when the client firms are under financial distress. In this situation, bank-owned security firms underwrite bonds issued by poorly performing firms, and entice potential investors by lowering the prices of these bonds. This indicates that default risk is transferred from banks to investors, thereby resulting in the divergence of interests between banks and investors. When investors forecast this incentive, they reflect the wealth transfer in bond yields, and demand higher yields on the issues underwritten by bank-owned security firms. In summary, we predict that issues underwritten by bank-owned security firms have higher yields than those underwritten by other security firms. Overall, the effect of the bank-firm relationship on bond yields is an empirical question. In our analysis, if bank-owned security firms are among the lead managers of underwriters, we denote the issue as underwritten by bank-owned security firms. We then construct a dummy variable (*Bank underwriting*) that takes a value of 1 if the issue is classified as underwritten by bank-owned security firm, and 0 otherwise. Of the 640 bond issues in our sample, there are 234 issues on 111 firms underwritten by bank-owned security firms. Column 1 provides the regression estimates including *Bank underwriting*. Consistent with the findings in Hamao and Hoshi (2000), the estimated coefficient on *Bank underwriting* is negative, but not statistically significant. However, our results concerning corporate governance variables remain significant, even after controlling for the difference between underwriters.

5.2 Financial institution ownership

The bank-firm relationship is also closely associated with the firm's public debt financing. Datta et al. (1999) show that the bank-firm relationship (as measured by the presence of bank loans as a certification of creditworthiness) significantly lowers the at-issue yield spread for new public debt.[18] Along with bank debt, equity ownership by banks then also plays a role in establishing the bank-firm relationship in Japan. Accordingly, we use the proportion of equity held by financial institutions (*Financial institution ownership*) to control for this relationship. If this variable helps capture the effect of the bank-firm relationship, firms with ties to financial institutions as shareholders have lower yield spreads. On the other hand, earlier works document that financial institutions as shareholders

[18] The variable, leverage, includes long-term loans from financial institutions, mainly banks. Given that long-term loans are closely associated with bank-firm relationship, we already control for the effect of bank-firm relationship through bank debt on yield spreads.

could play less role in corporate governance (see, e.g., Miyajima and Kuroki, 2007). If this is the case, bondholders will require higher yields for firms with such ineffective governance systems. In column 2, we present the results for the specification with *Financial institution ownership*. The estimated coefficient on *Financial institution ownership* is negative, but not statistically significant. However, inclusion of *Financial institution ownership* does not affect our basic results for the relation between our corporate governance variables and yield spreads.

5.3 Sample selection

Our results are susceptible to sample selection concerns because our sample is restricted to firms that issued only straight bonds to raise funds during the sample period. The results from this nonrandomly selected sample could then face a self-selection problem that biases the estimated coefficients. To correct for any possible bias, we reestimate the regression coefficients, using Heckman's two-step approach (Heckman, 1979). In the first-stage probit regression, we analyse debt issue choice using an additional sample of 1532 publicly-traded firms, with fiscal years ending in March, that did not issue straight bonds at least during the sample period. The independent variables in the regression includes ROA, financial institution ownership, working capital, cash holding (the ratio of cash and short securities to total assets), leverage, market-to book ratio, firm size, and firm age. In the second-stage, the inverse Mills ratio estimated from the probit regression is included in our specification, and we estimate the equation using OLS regression. Column 3 report the regression results with the inverse Mills ratio as the sample selection adjustment term. The estimated coefficient on *Inverse Mills ratio* is positive, but not statistically significant. Thus, our results remain stable, even after controlling for the sample selection term.

5.4 Nonlinearities in credit rating and leverage

We estimate regression models allowing for the nonlinear effects of *Leverage* and *Credit rating* on *Spread*. Column 4 of Table 7 shows the results with the specification including the squared term of *Leverage* ($Leverage^2$) (Anderson et al., 2003; Klock et al., 2005). The estimated coefficient on *Leverage* is negative, but not statistically significant, while $Leverage^2$ have a statistically significant and positive coefficient. Adding the squared term of *Leverage* to the equation does not affect our results. Column 5 contains the results for the specification with the squared term of *Credit rating* ($Credit\ rating^2$) (Anderson et al., 2003; Klock et al., 2005; Ortiz-Molina, 2006). The estimated coefficient on *Credit rating* is statistically significant and negative, and the estimated coefficient on

$Credit\ rating^2$ is statistically significant and positive. This indicates that credit rating scores are nonlinearly associated with yield spreads. For corporate governance variables, this regression also yields similar results to those in Table 5. Taken together, our results are robust to alternative specifications with respect to nonlinearities in *Leverage* and *Credit rating*.

5.5 Adjusting credit rating score

In Table 1, we assign the same conversion numbers to each credit rating level from the four credit rating agencies. However, it is well known that Japanese firms typically receive lower credit ratings from foreign credit rating agencies (S&P and Moody's) than from domestic credit rating agencies (JCR and R&I). Indeed, we find that for 104 issues on 23 firms with credit ratings from both foreign and domestic agencies in our sample, an average credit rating score by foreign agencies is lower than by domestic agencies, and the differences are statistically significant. To adjust for this difference, when we add a value of 1.5 to each conversion number of foreign agencies in Table 1, the difference between average credit rating scores by foreign agencies and domestic agencies is not statistically significant.[19] Using the adjusted conversion numbers applied to all credit ratings from foreign agencies, we estimate the variable for adjusted credit rating (*Adjusted credit rating*). Column 6 reports the regression estimates for the specification with *Adjusted credit rating*. *Adjusted credit rating* has a coefficient that is negative and statistically significant. Nevertheless, for our corporate governance variables, this specification yields similar results to those in Table 5.

5.6 Endogeneity concerns

One concern about our results is that the relation between corporate governance variables and yield spreads is subject to potential endogeneity problems. Thus, we need to check whether our corporate governance variables are endogenous. In the test for endogeneity (Wooldridge's regression-based test), we cannot reject the null hypothesis that all the corporate governance variables under consideration are exogenous at conventional significant levels.[20] This suggests that our results in Table 5 will not be biased. Overall, this test confirms the view that our results are less susceptible to endogeneity concerns, and thus provide confidence in our evidence that our corporate governance

[19] For example, a firm with an A− rating from S&P and an A+ rating from R&I receive an average value of 14.75.

[20] The relation between corporate governance and yield spreads could be less subject to endogeneity problems because changes in corporate governance will be reflected in bond yields immediately, but it is unlikely that changes in bond yields affect corporate governance quickly (Klock, et al., 2005).

variables are significantly related to the costs of public debt financing.

6. Conclusion

In this paper, we empirically test the relation between corporate governance mechanisms in Japan and the costs of public debt financing. In particular, our analyses evaluate competing hypotheses about the impact of corporate governance on the costs of public debt financing, with special attention to three mechanisms: CEO ownership, family ownership, and corporate ownership. The overall conclusion is that corporate governance structures in Japan significantly influence the costs of public debt financing.

Using a sample of Japanese straight corporate bonds during the period 2005-2008, we find that CEO ownership is positively correlated with yield spreads after controlling for firm- and bond-characteristics. This suggests that firms in which the CEO dominates have higher costs of public debt financing because of the potential agency problem with bondholders. In addition, family ownership is also positively associated with yield spreads, suggesting that bondholders are concerned about agency conflicts with family firms, and so family firms experience higher costs of public debt financing. Third, corporate ownership is related to lower yield spreads. This indicates that firms with effective governance mechanisms are rewarded with lower yields.

In addition, we provide several additional results. First, managerial ownership is associated with higher yield spreads. Second, among family firms, family firms in which the firm founder occupies a top director position, *and* family members are major shareholders face higher yield spreads. Finally, a higher proportion of directors from corporate shareholders is related to lower yield spreads. To check the robustness of our results, we test various regression models. Our results are robust to alternative specifications with respect to the types of security firms serving as bond underwriters, inclusion of financial institution ownership, sample selection concerns, nonlinearities in credit rating and leverage, adjusted credit rating variable, and endogeneity concerns.

Consequently, we provide strong evidence that corporate governance systems in Japan significantly affect the costs of public debt financing. This paper contributes to the existing literatures on the determinants of at-issue bond yields by showing that corporate governance systems in Japan are significantly associated with the costs of public debt financing, and then these costs vary with the characteristics of corporate governance systems.

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Table 1. Credit rating numerical conversions

Conversion no.	S&P	Moody's	JCR	R&I
19	AAA	Aaa	AAA	AAA
18	AA+	Aa1	AA+	AA+
17	AA	Aa2	AA	AA
16	AA−	Aa3	AA−	AA−
15	A+	A1	A+	A+
14	A	A2	A	A
13	A−	A3	A−	A−
12	BBB+	Baa1	BBB+	BBB+
11	BBB	Baa2	BBB	BBB
10	BBB−	Baa3	BBB−	BBB−
9	BB+	Ba1	BB+	BB+
8	BB	Ba2	BB	BB
7	BB−	Ba3	BB−	BB−
6	B+	B1	B+	B+
5	B	B2	B	B
4	B−	B3	B−	B−
3	CCC	Caa	CCC	CCC
2	CC	Ca	CC	CC
1	C	C	C	C

Notes: This table presents the credit rating conversion codes for the S&P, Moody's, JCR, and R&I used in the analysis.

Table 2. Descriptive statistics of bond characteristics, governance measures, and firm characteristics

Variables	Mean	Median	Std.dev.	Maximum	Minimum
(a) Bond characteristics					
Spread (basis points)	44.370	36.600	32.411	267.400	0.800
Amount	4.988	4.605	0.608	7.601	3.401
Maturity (years)	6.258	5.000	2.501	20.000	3.000
Times	2.746	2.970	1.130	4.543	0.000
Credit rating	13.888	14.000	1.956	18.333	9.000
(b) Governance measures					
CEO ownership	0.007	0.000	0.041	0.338	0.000
Managerial ownership	0.010	0.000	0.046	0.505	0.000
Family ownership	0.078	0.000	0.268	1.000	0.000
Founder ownership	0.041	0.000	0.197	1.000	0.000
Founder management	0.005	0.000	0.068	1.000	0.000
Descendant ownership	0.023	0.000	0.151	1.000	0.000
Descendant management	0.028	0.000	0.165	1.000	0.000
Outsider management	0.014	0.000	0.118	1.000	0.000
Corporate ownership	0.054	0.000	0.136	0.672	0.000
Corporate director	0.050	0.000	0.134	0.923	0.000
CEO tenure	0.066	0.000	0.248	1.000	0.000
Outside director	0.134	0.100	0.149	0.800	0.000
Board size	12.075	11.000	4.156	31.000	5.000
(c) Firm characteristics					
ROA	0.022	0.029	0.179	0.282	−1.779
Working capital	0.020	0.008	0.059	0.235	−0.184
Leverage	0.215	0.201	0.113	0.499	0.000
Market-to-book ratio	1.221	1.170	0.376	4.360	0.167
Firm size	14.066	14.190	1.152	17.295	10.561
Firm age	4.001	4.127	0.796	4.828	0.693
Dividend	0.052	0.014	0.152	1.254	0.000

Notes: This table presents summary statistics—means, medians, standard deviations, maximums, and minimums—for the variables used in the analysis. The sample comprises 640 firm-year observations on 196 firms during the period 2005-2008.

Table 3. Year and industry distribution of the sample

Panel A. Year distribution		
Year	No. of firms	No. of firm-year observations
2005	80	138
2006	83	156
2007	111	206
2008	70	140
Panel B. Industry distribution		
Industry	No. of firms	No. of firm-year observations
Construction	5	11
Foods	14	37
Texitles	3	6
Pulp and paper	4	14
Chemicals	16	43
Drug and medicine	1	3
Oil and coal	3	10
Rubber	4	9
Glass and ceramics	6	15
Iron and steel	7	46
Nonferrous metals	7	22
Metal products	2	2
General machinery	10	28
Electronic equipment	22	61
Transport equipment	13	33
Precision equipment	3	7
Other products	5	6
Land transportation	17	72
Marine transportation	3	7
Air transportation	1	5
Warehouse	3	7
Information and communication	9	33
Wholesale	8	70
Retail	10	14
Real estate	17	73
Service	3	6

Notes: This table shows the distribution of 640 firm-year observations on 196 firms during the period 2005-2008. Panel A presents the fiscal year distribution of the sample, and Panel B shows the industry distribution of the sample. Industry classifications come from the *Japan Company Handbook*.

Table 4. Correlation coefficients between yield spreads and corporate governance variables

Variables	Spread	CEO ownership	Family ownership	Corporate ownership	CEO tenure	Outside director
CEO ownership	0.501					
	(0.000)					
Family ownership	0.352	0.589				
	(0.000)	(0.000)				
Corporate ownership	−0.024	−0.050	−0.066			
	(0.544)	(0.211)	(0.094)			
CEO tenure	0.235	0.482	0.464	−0.059		
	(0.000)	(0.000)	(0.000)	(0.134)		
Outside director	0.095	0.052	0.084	−0.028	−0.071	
	(0.017)	(0.189)	(0.034)	(0.488)	(0.074)	
Board size	−0.157	−0.157	−0.203	−0.069	−0.154	−0.148
	(0.000)	(0.000)	(0.000)	(0.080)	(0.000)	(0.000)

Notes: This table provides the correlation coefficients between variables including spread, CEO ownership, family ownership, corporate ownership, CEO tenure, outside director, and board size. The sample covers 640 firm-year observations on 196 firms during the period 2005-2008. Significance level is provided in parentheses below each coefficient.

Table 5. Corporate governance and yield spreads

Variables	1	2	3	4
CEO ownership	3.677***			3.117****
	(0.361)			(0.367)
CEO tenure	0.007			−0.025
	(0.049)			(0.052)
Family ownership		0.436***		0.162**
		(0.104)		(0.080)
Corporate ownership			−0.483***	−0.211**
			(0.126)	(0.090)
Outside director	0.031	−0.004	0.012	0.015
	(0.096)	(0.101)	(0.110)	(0.093)
Board size	0.001	0.004	0.000	0.002
	(0.003)	(0.003)	(0.004)	(0.003)
Amount	0.039*	0.047**	0.061**	0.041***
	(0.021)	(0.023)	(0.025)	(0.021)
Maturity	0.008***	0.006**	0.008**	0.007**
	(0.003)	(0.003)	(0.003)	(0.003)
Times	−0.033*	−0.017	−0.019	−0.029*
	(0.017)	(0.020)	(0.023)	(0.017)
Credit rating	−0.067***	−0.071***	−0.067***	−0.064***
	(0.009)	(0.010)	(0.011)	(0.010)
ROA	−0.465***	−0.489***	−0.423***	−0.459***
	(0.061)	(0.061)	(0.070)	(0.055)
Working capital	−0.541*	−0.647**	−0.952***	−0.530*
	(0.310)	(0.301)	(0.329)	(0.286)
Leverage	0.267**	0.405**	0.464**	0.281**
	(0.126)	(0.164)	(0.189)	(0.122)
Market-to-book ratio	−0.004	0.014	0.040	−0.023
	(0.048)	(0.049)	(0.049)	(0.048)
Firm size	−0.040**	−0.042*	−0.091***	−0.041**
	(0.019)	(0.023)	(0.030)	(0.018)
Firm age	−0.062***	−0.086***	−0.091***	−0.070***
	(0.023)	(0.022)	(0.025)	(0.023)
Dividend	−0.262***	−0.366***	−0.429***	−0.289***
	(0.080)	(0.076)	(0.091)	(0.069)
R^2	0.678	0.636	0.607	0.685
No. of observations	640	640	640	640

Notes: This table reports the regression results for 640 straight corporate bond issues during the period 2005-2008. Coefficients are estimated using ordinary least squares. All equations include industry- and year-specific variables. Standard errors in parentheses are robust to heteroskedasticity, and adjusted for firm clustering. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Table 6. Corporate governance and yield spreads: additional results

Variables	1	2	3
CEO ownership			3.143***
			(0.368)
Managerial ownership	2.611***		
	(0.573)		
CEO tenure	−0.016		−0.027
	(0.050)		(0.052)
Family ownership	0.163*		0.165**
	(0.090)		(0.081)
Founder ownership		0.762***	
		(0.121)	
Founder management		−0.192	
		(0.166)	
Descendant ownership		0.073	
		(0.073)	
Descendant management		0.075	
		(0.073)	
Outsider management		0.011	
		(0.109)	
Corporate ownership	−0.220**	−0.244***	
	(0.090)	(0.089)	
Corporate director			−0.228***
			(0.084)
Outside director	0.045	−0.011	0.008
	(0.098)	(0.090)	(0.093)
Board size	0.002	0.000	0.002
	(0.003)	(0.003)	(0.003)
Amount	0.043**	0.049**	0.040*
	(0.021)	(0.022)	(0.021)
Maturity	0.007**	0.009***	0.007**
	(0.003)	(0.003)	(0.003)
Times	−0.025	−0.028	−0.028
	(0.018)	(0.018)	(0.017)
Credit rating	−0.064***	−0.066***	−0.064***
	(0.010)	(0.009)	(0.009)
ROA	−0.465**	−0.499***	−0.466***
	(0.056)	(0.051)	(0.055)
Working capital	−0.548*	−0.446	−0.503*
	(0.289)	(0.291)	(0.292)
Leverage	0.305**	0.340***	0.280**
	(0.130)	(0.128)	(0.123)
Market-to-book ratio	−0.017	0.049	−0.022
	(0.048)	(0.055)	(0.049)
Firm size	−0.043**	−0.032*	−0.039**
	(0.019)	(0.018)	(0.018)
Firm age	−0.073***	−0.077***	−0.068***
	(0.023)	(0.023)	(0.023)
Dividend	−0.295***	−0.415***	−0.279***
	(0.065)	(0.111)	(0.068)
R^2	0.676	0.683	0.684
No. of observations	640	640	640

Notes: This table reports the regression results for 640 straight corporate bond issues during the period 2005-2008. Coefficients are estimated using ordinary least squares. All equations include industry- and year-specific variables. Standard errors in parentheses are robust to heteroskedasticity, and adjusted for firm clustering. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Table7. Corporate governance and yield spreads: robustness checks

Variables	1	2	3	4	5	6
CEO ownership	3.130***	2.988***	3.112***	3.028***	3.250***	3.140***
	(0.369)	(0.361)	(0.362)	(0.360)	(0.358)	(0.372)
CEO tenure	−0.027	−0.023	−0.027	−0.022	−0.004	−0.026
	(0.052)	(0.051)	(0.053)	(0.051)	(0.051)	(0.051)
Family ownership	0.161**	0.159*	0.161**	0.158*	0.162**	0.171**
	(0.080)	(0.082)	(0.081)	(0.080)	(0.071)	(0.081)
Corporate ownership	−0.208**	−0.273***	−0.213**	−0.221**	−0.253***	−0.210**
	(0.090)	(0.103)	(0.092)	(0.092)	(0.081)	(0.092)
Financial institution ownership		−0.135				
		(0.163)				
Outside director	0.014	−0.009	0.013	0.030	0.066	0.001
	(0.093)	(0.100)	(0.093)	(0.090)	(0.086)	(0.094)
Board size	0.002	0.002	0.002	0.001	0.001	0.002
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Amount	0.042*	0.042**	0.041*	0.035*	0.025	0.042**
	(0.021)	(0.021)	(0.021)	(0.020)	(0.020)	(0.021)
Maturity	0.007**	0.007**	0.007**	0.008***	0.007**	0.008***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Times	−0.029	−0.031*	−0.028	−0.023	−0.024	−0.028
	(0.017)	(0.017)	(0.017)	(0.017)	(0.016)	(0.018)
Credit rating	−0.064***	−0.065***	−0.064***	−0.061***	−0.515***	
	(0.010)	(0.009)	(0.010)	(0.010)	(0.087)	
Credit rating^2					0.018***	
					(0.003)	
Adjusted credit rating						−0.062***
						(0.009)
ROA	−0.459***	−0.470***	−0.461***	−0.434***	−0.377***	−0.459***
	(0.054)	(0.052)	(0.059)	(0.054)	(0.058)	(0.054)
Working capital	−0.539*	−0.533*	−0.543*	−0.508*	−0.429	−0.512*
	(0.284)	(0.286)	(0.292)	(0.276)	(0.280)	(0.282)
Leverage	0.281**	0.291**	0.289**	−0.477	0.274**	0.261**
	(0.121)	(0.123)	(0.146)	(0.331)	(0.112)	(0.127)
Leverage^2				1.077**		
				(0.464)		
Market-to-book ratio	−0.024	−0.023	−0.027	−0.029	−0.054	−0.021
	(0.048)	(0.048)	(0.060)	(0.048)	(0.043)	(0.047)
Firm size	−0.042**	−0.039**	−0.037	−0.045**	−0.043**	−0.036*
	(0.019)	(0.018)	(0.032)	(0.018)	(0.017)	(0.019)
Firm age	−0.070***	−0.071***	−0.071***	−0.072***	−0.051**	−0.073***
	(0.023)	(0.024)	(0.024)	(0.023)	(0.022)	(0.022)
Dividend	−0.287***	−0.291***	−0.288***	−0.329***	−0.228***	−0.268***
	(0.069)	(0.071)	(0.069)	(0.068)	(0.061)	(0.071)
Bank underwriting	−0.010					
	(0.020)					
Inverse mills ratio			0.008			
			(0.063)			
R^2	0.685	0.685	0.685	0.691	0.716	0.684
No. of observations	640	640	640	640	640	640

Notes: This table reports the regression results for 640 straight corporate bond issues during the period 2005-2008. Coefficients are estimated using ordinary least squares. All equations include industry- and year-specific variables. Standard errors in parentheses are robust to heteroskedasticity, and adjusted for firm clustering. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.