Foreign Investors and the Maturity Structure of Corporate Public Debt

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Abstract

This study explores the relation between foreign investors and the maturity structure of corporate public debt. Using a sample of corporate bonds newly issued in Japan over the 2005-2009, my results reveal that firms with higher foreign institutional ownership enjoy longer maturity of public debt. Firms with higher foreign institutional ownership also exhibit higher firm performance. These results indicate that bondholders benefits from managerial discipline by foreign investors, thereby allowing for issuing debt with longer maturity. In addition, firms with higher foreign institutional ownership experience lower cost of public debt financing. Overall, my empirical evidence indicates the importance of monitoring activities by large shareholders in corporate bond markets.

Key words: Public debt maturity; Foreign institutional ownership; Firm performance; Yield spreads

JEL classification: G32, G34

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1. Introduction

In recent years, the importance of foreign institutional investors around the world has drawn considerable attention from researchers. Especially, foreign institutional investors as shareholders of the invested firms affect the quality of corporate governance. For example, they promote better governance practice, and themselves function as disciplinary mechanisms (e.g., Ferreira and Matos, 2008; Ferreira et al., 2010; Aggarwal et al., 2011). Despite the increasing presence of foreign investors around the world, the evaluation of foreign investors as shareholders in corporate bond markets has so far remained unclear. In this paper, I aim to fill this gap and takes on the perspective of bondholders. Especially, I explore the relation between foreign investors and the maturity structure of corporate public debt.

Existing theories on foreign investors and debt maturity structure propose different views on the relation between foreign ownership and maturity structure of corporate public debt. On the one hand, as Myers (1977) argues, conflict of interests between shareholders and bondholders over the firm's future investment opportunities is severe in the issue of risky debt (underinvestment problem). Especially, firm value that derives from investment opportunities is sensitive to the degree of managerial discretion. However, when foreign investors are active monitors over the managers on the behalf of creditors, creditors benefit from the monitoring activities through a decrease in managerial discretion. Overall, when monitoring activities by foreign investors discipline managers, thereby reducing agency problems of debt, firms could issue public debt with longer maturities. In addition to the arguments above, in traditional agency theory, it is well recognized that managers have incentive to entrench themselves to enjoy the private benefits of control. This includes job retention. Such entrenchment activities are often detrimental to creditors. When perceiving such manager's incentives, creditors require the managers to be under monitoring by shortening maturity of debt. If outside shareholders monitor the managers, thereby leading to decline in managerial discretion, creditors have less incentive to oversee the mangers by using short-term debt. This, managerial discipline by outside shareholders allows the firms to issue debt with longer-maturity. I term these predictions as *monitoring hypothesis*.

On the other hand, traditional agency theory posits a conflict of interest between shareholders and creditors. Shareholders have an incentive to expropriate bondholder wealth by substituting into riskier investments (asset substitution problem) (e.g., Jensen

and Meckling, 1976). Foreign investors exert influential power over the managers to increase risk-taking behavior that create higher firm value (Nguyen, 2012). If bondholders are concerned about the foreign investor's incentive to increase risk, they could reduce the incentive by providing short-term debt to the firms. Thus, firms with higher equity ownership by foreign investors issue bond with short-term maturity. I term this prediction as *risk-shifting hypothesis*.

Overall, the impact of foreign investors on maturity structure of corporate public debt is an empirical question. To investigate this question, I use a dataset of corporate public debt newly issued in Japan during the period 2005-2009. Thus, this study is based on incremental maturity of debt, while a large body of literatures test their hypotheses based on the maturity of debt outstanding.[1] My focus is on Japanese firms for two reasons. First, foreign investors face no constraints on equity ownership of Japanese firms, and then the data on foreign ownership accurately reflect investment behavior by foreigners.[2] That is, my study is based on foreign ownership in a single country.[3] Second, I could use foreign ownership data for individual firms. Firm-level ownership data are easily matched with the data on corporate public debt (Kang and Stulz, 1997). Second, Japan has one of the largest corporate bond markets in the world, and detailed data on corporate bonds are available. Thus, Japanese firms are suitable for examinations of my hypothesis.

My results show that higher foreign ownership is related to longer maturity of public debt. This is consistent with *monitoring hypothesis* that foreign investors reduce managerial discretion, and foreign investors recognizing such actions have less to incentive monitor managers by shortening the maturity of debt, and rather allow the firms to issue the maturity of debt. My results hold even after I address sample selection problem, adjust for credit rating score, and divide total foreign investors into foreign institutional investors and foreign corporations.

Although positive relation between foreign ownership and the maturity of public debt provide support for my argument, I acknowledge that there are concerns for this result. Previous works find the positive relation between managerial entrenchment and

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[1] Among studies examining the determinants of new public debt issue, Guedes and Opler (1996) work on American firms, and Cai et al. (1999) focus on Japanese firms.
[2] For analyses of foreign ownership in Japan, see, e.g., Ahmadjian (2007), Baba (2009), Hamao and Mei (2001), Hamao et al. (2011), Kang and Stulz (1997), and Kimura and Kiyota (2007).
[3] For analyses of foreign ownership in a single country outside Japan, see, e.g., Gompers and Metrick (2001) for the United States, and Dahlquist and Robertsson (2001) for the Sweden.

debt maturity structure, suggesting that entrenched insiders have incentive to choose debt with longer maturities as a way of avoiding monitoring by creditors, underwriters, and credit rating agencies at issuance or renewal (Datta et al., 2005; Shyu and Lee, 2009; Lin et al., 2013). Taking into account these arguments, my results could be interpreted as evidence suggesting that foreign investors have incentives to entrench themselves by issue bonds with longer maturities. In addition, Arslan and Karan (2006) find that concentrated ownership and the presence of large shareholder effectively monitor the managers, thereby allowing the firms to use debt with longer maturities. However, their results could be interpreted as suggesting that controlling shareholders have incentives to entrench themselves by choosing the debt structure with longer maturity. Thus, I need to examine whether foreign investors play a monitoring and disciplinary role in the firms. To examine whether foreign investors act as active monitors, I explore the relation between foreign ownership and firm performance.[4] If foreign investors play a monitoring and disciplinary role, I should find positive relation between foreign investors and firm performance. Using a dataset of Japanese corporate bond, my empirical results reveal that firms with higher foreign ownership enjoy higher firm performance, measured by Tobin's Q and ROA. Consequently, these results are consistent with the view that foreign investors serve as an effective monitors over the management. These results are robust to sample selection, adjustment of credit rating score, and endogeneity concerns.

Finally, I examine the relation between foreign investors and yield spreads. If monitoring activities by foreign investors are beneficial for bondholders, firms with foreign investors are expected to enjoy lower yield spreads. Consistent with previous works (e.g., Bhojraj and Sengupta, 2003), I find that firms with foreign investors enjoy lower yield spreads.

Overall, my study show that monitoring and disciplinary role by foreign investors are viewed positively in corporate bond markets. Especially, anticipating the monitoring roles, bondholders allow the firms to issue public bond with longer maturities.

My work makes three contributions to the extant literatures. First, I provide empirical support for the view that monitoring activities over the management reduce agency problems, thereby benefiting bondholders, and then allow the firms to enjoy debt with longer maturities. Second, this study is the first to examine the evaluation of corporate governance by foreign investors in corporate bond markets. Therefore, my study is add the extant literatures on the relation between corporate governance and the

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[4] Previous works have no examination of whether their variables really capture the effects of managerial entrenchment.

maturity structure of corporate debt (e.g., Arslan and Karan, 2006; Brockman et al., 2010; Cai et al., 2008; Datta et al., 2005; Shyu and Lee, 2009; Wiwattanakantang, 1999; Harford et al., 2008) and the relation between corporate governance and yield spreads (e.g., Anderson et al., 2003; Anderson et al., 2004; Anderson et al., 2010; Bhojraj and Sengupta, 2003; Cremers et al., 2007; Datta et al., 1999; Klock et al., 2005) by showing that foreign ownership is an important determinant of corporate public debt maturity and yield spreads. Third, for debt structure, I use the data on new bond issue, while a large body of literatures test their hypotheses based on the maturity of debt outstanding. In particular, in an examination of the relation between corporate governance and the maturity of debt, no paper uses the data on new bond issue.[5]

The remainder of the paper is organized as follows. Section 2 presents data, construction of the variables, and descriptive statistics. Section 3 provides the results about the between foreign ownership and the maturity of public debt. Section 4 examines whether foreign investors act as monitors. Section 5 investigates the relation between foreign ownership and the cost of public debt. Section 6 concludes the paper.

2. Data

2.1. Data

I start the sample construction with publicly traded straight corporate bonds newly issued in Japan. These data come from the Japan Securities Dealers Association, which contains detailed issue-specific information. My sample covers the period from 2005 to 2009. I merge this data with data on financial information and corporate governance. Data on financial information data are from a dataset compiled by the Nikkei Needs dataset, which provides information on balance sheets and financial statements for publicly traded firms. Note that accounting information is based on consolidated and unconsolidated data. Data on corporate governance is obtained from a dataset compiled by the Japan Development Bank and manually collected from the annual editions of *Yakuin Shikihou* (published by *Toyo Keizai Shimposha*), which contain detailed information on all directors of publicly traded Japanese firms, and *Yuka Shoken Houkokusho*, which corresponds with 10-k filings in the United States. Particularly, I use financial and corporate governance information preceding the date of the bond issuance

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[5] Cai et al. (1999) report that public debt maturity is longer for *keiretsu* firms by using a ample of Japanese firms.

to help attenuate any endogeneity concerns. Then, I screen my sample as follows. I first restrict the sample to bond issues with a fixed rate. Next, I exclude firms in the finance industry and those in highly regulated industries, such as electricity and gas. Third, my sample does not contatins data for the Japan Railway Company (JR), the Japan Tobacco Inc.(JT), and the Nippon Telegraph and Telephone Corporation (NTT) because these firms were under the control of the government and remain subject to the influence of the government. Finally, I remove unlisted firms and investment trusts for which financial information is unavailable. These sample construction procedures produce a dataset of 839 observations on 225 firms during the period 2005 -2009

Table 3 shows the distribution of 839 firm-year observations on 225 firms during the period 2005-2009. Panel A presents the distribution of the sample by fiscal year, while Panel B provides the industry distribution. Industry classifications are from the *Japan Company Handbook*.

2.2. Debt maturity

My dependent variable (*Debt maturity*) is the years to maturity of new corporate public debt. Figure 1 reports the distribution for debt maturity variable. The most frequent maturity period is 5 years (37.4% of total sample issues), followed by the 10 years of maturity period (23.7% of total sample issues).

2.3. Foreign ownership variables

The influential power of foreign investors over the managements is measured by the percentage of total shares held by foreign investors (*Foreign institutional ownership*) (%). It is recognized that foreign investors as shareholders are segmented into two groups: foreign instiutional investors, and foreign business company. Foreign institution investors have incentive to put more pressure on the managers. In contrast, foreign business companies are reluctant to incur costs arising from monitoring costs because pressure for managers are detrimental to business relationship with the firms (e.g., Ferreira and Matos, 2008). To construct the variable limited to foreign institutional investors, I attempt to divide total shares held by foreign investors into foreign institutional ownership and foreign corporate ownership. Consequently, *Foreign institutional ownership* as my key variable is measured by subtracting total

shareholdings of foreigners from shareholdings of foreign corporations.

2.4. Control variables

2.4.1. Governance characteristics

To assess the effect of foreign institutional ownership on maturity of new corporate public debt, I control for other corporate governance characteristics that could affect the debt maturity. Corporate governance characteristics that I control for include CEO ownership and financial institutional ownership.

The CEO is generally a powerful figure on the board and can exercise great power over management decisions, and CEO with higher ownership have greater managerial discretion. Thus, as in Myers's (1977) model, manager discretion is mitigated by issuing debt with shorter-maturities. And in traditional agency theory, it is well recognized that managers with higher ownership have incentive to entrench themselves to enjoy the private benefits of control. This includes job retention. Such entrenchment activities are often detrimental to creditors. When perceiving such manager's incentives, creditors require the managers to be under monitoring by shortening maturity of debt. Overall, the impact of CEO ownership on maturity structure of public debt is expected to be negative.

I examine the impact of ownership held by managers on yield spreads by using the variable for the percentage of equity held by the CEO (*CEO ownership*). The CEO is generally a powerful figure on the board and can exercise great power over management decisions. If CEO ownership is considered positively in bond markets, the coefficient on CEO ownership is expected to be negative. However, if CEO ownership is considered unfavorably in 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. I often face the difficulty of identifying the CEO on the board. For many of my sample firms, either the chairperson (Kaicho) or president (Shacho) is typically the CEO. However, in other firms, I often obtain no clear information about the CEO, and thus, I assume that the president (Shacho) on the board is the CEO.[6] Identification of the CEO on the board and data on

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[6] The chairperson often exerts powerful influence on firm management. For this reason, Saito (2008), and Kubo and Saito (2009) use information on the sum of equity ownership held by both the president and chairperson. However, I am unable to use such data because my sample includes firms with committee systems that have no chairperson in an executive position.

ownership level by the CEO come from the Yakuin Shikiho and Yuka Shoken Houkokusho.

2.4.2 Bond characteristics

To control for bond-specific factors that could potentially affect debt maturity, I includes the variables for amount, and credit rating. An increase in leverage makes the bonds riskier, which results in higher yield spreads. The amount of issue is measured by the natural logarithm of issue size (*Debt size*) (in billions of yen).

Bonds with higher credit ratings have a lower default risk and thus lengthen maturity period. In my sample, each bond 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). However, bond issues typically have multiple credit ratings. To reflect total credit rating levels in my credit rating variable, I transform each credit rating into a numerical scale and calculate an average credit rating score (*Credit rating*) (Anderson et al., 2003; Klock et al., 2005; Ortiz-Molina, 2006). However, The effect of corporate governance on default risk could be generally reflected in credit ratings (Bhojraj and Sengupta, 2003; Ashbaugh-Skaife et al., 2006). I first regress an average credit rating score on corporate governance variables and then compute the residual from the regression.[7] Thus, this residual contains information about creditworthiness, but excludes the effects of corporate governance mechanisms on credit ratings. I use this residual as the variable for credit ratings (*Rating*).

2.4.3. Firm characteristics

The firm characteristic that I use as control variables in my equations are motivated by the extant theories of determinants of debt maturity. Especially, these theories focus firm specific demand factor that can influence debt maturity.

Higher leverage lead to higher risk of financial distress. Firms with higher liquidity risk have an incentive to avoid the threat of inefficient liquidations by issuing debt with longer maturities (Guedes and Opler, 1996). *Leverage* is defined as

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[7] I use the residual from the regression of an average credit rating score on *Foreign institutional ownership*, *CEO ownership*, and *Financial institutional ownership*. In subsequent analyses, I use different corporate governance variables across different specifications, and correspondingly re-estimate the credit rating variable for each specification.

interest-bearing debt (short-term loans, long-term loans due in one year, bonds due in one year, commercial paper, remaining long-term loans and remaining bonds) as a percentage of total assets. Myers (1977) argues that in firms with risky debt outstanding, managers on behalf of shareholders may fail to carry out new profitable projects if enough of the projects' payoffs only accrue to bondholders, thereby reducing the incentive of shareholders to accept such projects (underinvestment problem). In particular, firms with more growth opportunity options in the investment are likely to face the conflict of interests between shareholders and bondholders. This problem could be mitigated by issuing shorter maturity of debt. Thus, firms with more growth opportunity tend to issue the shorter-maturity of debt. Growth opportunity is measured as *Tobin's Q* defined as the market value plus the book value of total debt, divided by the book value of total assets. Firm's size can be correlated with debt maturity for different reasons. Larger firms that unlikely face severe agency conflicts between shareholders and bondholders, and have less incentive to use short-term debt to alleviate the conflicts. Thus, larger firms are more likely to issue long-term debt (Stohs and Mauer, 1996). In addition, larger firms are familiar with the market, and asymmetric information problems are less serious. Larger firms are less concerned about the information cost associated with long-term debt, are more likely to issue long-term debt (Flannery, 1986). *Firm size* is measured by the natural logarithm of total assets. Older firms have survived longer in competitive markets, and established a reputation as creditworthy firms in the markets. Older firms face less asymmetric information problems. As mentioned above, older firms are more likely to issue long-term debt. *Firm age* is measured as the natural logarithm of years elapsed since establishment. Firms can match the maturity of its liabilities to that of its assets, thereby reducing Myers's (1977) underinvestment problems. Thus, firms with more long-term assets in place are more likely to issue debt with longer maturities. *Asset maturity* is defined as the ratio of fixed assets over depreciation allowance times the proportion of fixed assets in total assets, plus the ratio of current assets over cost of goods sold times the proportion of current assets in total assets. Firm insiders are better known about firm quality than outside investors. Insiders of high quality firms can signal their private information by issuing short-term debt because the cost of rolling over the short-term debt is higher, and is difficult to be afforded by low quality firms (Flannery, 1986). To test signaling models, I use a proxy measure for insider's information, defined as the difference between next year's and this year's earnings per share, divided by stock price in this year (*Abnormal earnings*).

Kane et al. (1985) argue that firms extend the debt maturity when the tax advantage of debt decreases. This suggests a negative association between debt maturity and effective tax rate. I measure the effective tax rate as the ratio of corporate income tax to pretax income (*Tax rate*) (Stohs and Mauer, 1996). As an additional tax implication of the debt maturity, Brick and Ravid (1985) theoretically shows that firms increase firm value by issuing debt with longer maturity in the positive slope of the term structure due to interest tax shields. Conversely, in the negative slope of term structure, firm value decreases for firms issuing debt with shorter maturity. *Term structure* is measured by the difference between the month-end yield on 1 year government bonds and the month-end yield on 10 year government bonds, matched to the firm's fiscal year-end month. Data on yields of government bonds are from *Japan Securities Dealers Association*.

2.5. Descriptive statistics

Table 3 provides descriptive statistics for the variables used in the analyses. To ensure the robustness of the results, I delete extreme observations. Extreme observations are defined as those for which any one of the variables has value that is more 4 standard deviations away from its mean value. *Debt maturity* has a mean of 6.746 years with a standard deviation of 3.082 years. Figure 1 presents histogram of Debt maturity among my sample. The number of bonds with five year maturity is the largest, followed by the number of bond with 10 year maturity. *Foreign institutional ownership* has a mean of 22.307 % with a standard deviation of 11. 685. Credit rating has a mean of 14.027, with a standard deviation of 1.892.

Table 4 reports the results of a univariate analysis between firms with high and low foreign institutional ownership for the variables used in the analysis. Firms with high foreign ownership consist of those whose foreign institutional ownership is above the median for the sample. Firms with low foreign ownership consist of those whose foreign institutional ownership is below the median for the sample. Debt maturity is longer for firms with high foreign institutional ownership than for firms with low foreign institutional ownership. This results show that firms with higher foreign institutional ownership issue debt with longer maturities. This is consistent with *monitoring hypothesis* that monitoring activities by foreign institutional ownership allow the firms to issue debt with longer maturities. Firms with high foreign institutional ownership have higher credit ratings, suggesting that firms with high foreign institutional ownership are

viewed creditworthy by credit rating agencies. Firms with high foreign institutional ownership enjoy higher performance, measured by *Tobin's Q* and *ROA*. This indicates that foreign investors play a monitory and disciplinary role in firms. However, I find no significant difference of *yield spread* between firms with high and low foreign institutional ownership. I explore this relation further in a mulitivariate framework where other factors are controlled for.

3. Results

3.1. The effect of foreign institutional ownership on debt maturity

In this section, I examine the relation between foreign institutional ownership and maturity of corporate public debt in multivariate regression framework. I estimate the following regression model:

$$Debt\ maturity = \propto_0 + \propto_1 Foreign\ institutional\ ownership\ + \propto_2 Debt\ size + \propto_3 Rating + \propto_4 Leverage + \propto_5 Tobin's\ Q + \propto_6 Firm\ size + \propto_7 Firm\ age + \propto_8 Asset\ maturity + \propto_9 Abnormal\ earnings + \propto_{10} Term\ structure + \propto_{11} Tax\ rate + \varepsilon$$

In the equation, the dependent variable is Debt maturity. The key independent variable is *Foreign institutional ownership*. As mentioned above, other independent variables control for other governance, bond, and firm characteristics. I include industry and year dummy variable to control for industry- and year-specific effects.

Table 5 reports the regression results of debt maturity on foreign institutional ownership, and other control variables. 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.

Column 1 reports the results of *Debt maturity* on *Foreign institutional ownership* and bond characteristic variables, such as *Debt size* and *Rating*. Column 2 includes governance and firm characteristics as additional control variables. Across two specifications, the coefficient on *Foreign institutional ownership* is significantly positive, suggesting that firms with higher foreign institutional ownership enjoy longer maturity of the debt. This is consistent with *monitoring hypothesis* that monitoring activities by

foreign investors allow the firms to issue debt with longer maturities. Diamond (1991) predicts a nonlinear relation between debt maturity and credit quality. Specially, he argues that high and low credit quality firms tend to borrow short-term debt, while medium credit quality firms use long-term loans. I use *Rating* and Firm size as proxies for credit quality (Johnson, 2003). Thus, I include the squared terms of Rating and Firm size in my equation. In Column 3, the coefficient on *Foreign institutional ownership* is significantly positive after controlling for nonlinear effect of credit quality.

Regarding control variables, I find that issue with larger size and higher credit ratings have longer maturity. Larger and older firms with higher CEO ownership and higher tax rate have longer maturity of debt. In column 3, *Rating* has significantly positive coefficient, while *Rating²* have no significant coefficient. The coefficient on *Firm size* is not statistically significant, but the coefficient on *Firm size²* is significantly positive.

My results show that firms with higher foreign institutional ownership have longer maturity debt. As ownership level increases, foreign investors monitor and even discipline the mangers to have their interests respected. The monitoring activities by foreign investors mitigate the managerial discretion, thereby allowing the firms to issue debt with longer maturities. The positive relation between foreign institutional ownership and debt maturity is consistent with *monitoring hypothesis*.

3.2. Endogeneity concerns

Furthermore, the results in Column 1 could be subject to the endogeneity concerns For example, if some of the factors are not fully controlled for in the regression, but correlated with *Debt maturity*, *Foreign institutional ownership* could be correlated with the error term, thereby leading to biased coefficient. Then, I address the endogeneity problem of *Foreign institutional ownership* using instrumental variable (IV) approach. I construct four instrumental variables: *Market size*, *R&D*, and *Foreign corporate ownership*. Column 3 presents the results from the first-stage regressions in with dependent variable is *Foreign institutional ownership*.

Both *Market size* and *R&D* have significant and positive coefficients while *Foreign corporate ownership* has a significantly negative coefficient. This suggests that my IVs are properly correlated with *Foreing ownership*. Next, I perform the regression-based test

to check whether my IVs are uncorrelated with the error term.[8] This test is amenable to heteroskedastic error and clustering. The test does not reject the null hypothesis that my IVs are exogenous at conventional significant levels. This suggests that my IVs are uncorrelated with the error term. Given above tests, my IVs could qualify as valid variables.

Finally, I perform a regression-based test of endogeneity. This test is amenable to heteroskedastic error and clustering. The test rejects the null hypothesis that *foreign institutional ownership* are exogenous at 10 % level. *Foreign institutional ownership* in my specification needs to be treated as endogenous. Column 4 of Table 4 provides the results from the second-stage of 2SLS. The estimated coefficient on *Foreign institutional ownership* is significantly positive, with even larger magnitudes than the estimated coefficient form the OLS regressions

The results are consistent with the notion that firms with higher foreign institutional ownership enjoy longer maturity of debt. The effect of foreign institutional ownership on debt maturity remains is indeed strengthened after addressing potential endogeneity problems.

3.3. Sample selection issues

My sample is limited to only firms that issued straight bonds during the sample period. Therefore, my results may face the sample selection concerns, thereby leading to biased coefficients. Then, to examine whether my results are sensitive to sample selection bias, I run a Heckman selection model (Heckman, 1979). In the first-state regression, I estimate the probit model predicting the issuance of straight bond during sample period. The probit model includes *Cash* (cash and short securities / total assets) *Market size* (natural logarithm of the market value of equity outstanding), *ROA*, *Leverage*, *Tobin's Q*, *Firm size*, *Firm age*, *Financial institutional ownership*. For probit regressions, I use as an additional sample of 1590 publicly-traded firms, with fiscal years ending in March, that did not issue straight bonds at least during the sample period. From probit model, I estimate the inverse Mills ratio. The second-stage regressions include as adjustment term the inverse Mills ratio, and I re-estimate the debt maturity model. My results do not change even after controlling for sample selection terms.

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[8] For a more detailed description of this endogeneity test, see, e.g., Cameron and Trivedi (2005).

3.4. Adjusting credit rating scores

It is well recognized that relative to Japanese credit rating agencies (JCR and R&I), foreign credit rating agencies (S&P and Moody's) assign lower credit ratings to Japanese firms (Shin and Moore, 2003). To correct for the difference, I arbitrarily add a value of 1 to each conversion number of Japanese agencies in Table 1.[9] On the basis of the adjusted conversion numbers applied to all credit ratings from foreign agencies, I reestimate the variable for adjusted credit rating. My results remain unchanged. In Japan, credit ratings awarded by the foreign credit rating agencies (S&P and Moody's) are lower than those from the Japanese credit rating agencies (JCR and R&I) (Shin and Moore, 2003). To correct for this difference, I arbitrarily add a value of 1 to each conversion number for S&P and Moody's in Table 1. The adjusting procedures of conversion numbers are applied to all of the credit ratings by the foreign rating agencies. I re-estimate the equation using this adjusted credit rating variable. Controlling for the adjusted credit rating does not affect my results.

3.5. Seemingly unrelated regression models

One potential concern about my results is that I do not account for the endogeneity problems of at-issue yields and the time to maturity because they can be often made simuletaneously (Dennis et al., 2000; Gottesman and Roberts, 2004; Goss and Roberts, 2011; Ge et al., 2012). To address any endogeneous concerns resulting from joint determination of yields and maturity structure, I estimate a system of equations in which dependent variables are *Debt maturity* and *Yield spreads* by using the seemingly unrelated regression (SUR) models. The impact of foreign institutional ownership remains significant and positive after performing SUR models.

4. Foreign ownership and firm performance

I argue that a positive relation between foreign institutional ownership and the maturity of public debt could be interpreted as evidence that managerial discipline lengthen the maturity of public debt. However, in the environment in which foreign investors are entrenched because of large shareholdings, such foreign investors tend to

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[9] 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.

avoid repeatedly monitoring activities by issue debt with longer maturity of debt. Thus, I need to examine whether foreign investors have incentives to enjoy the private benefits of control or not. To address the concern, I attempt to examine the relation between foreign institutional ownership and firm performance. Especially, I use the two performance variables: Tobin's Q and ROA.

4.1. Firm value

To assess whether foreign investors positively affect firm value, I estimate the following equations:

$$Tobin\ Q=\beta_0+\beta_1 Foreign\ institutional\ ownership+\beta_2 Leverage+\beta_3 Firm\ size$$
$$+\beta_4 Firm\ age+\beta_5 Tangible\ asset+\beta_6 R\&D+\beta_7 Advertise+\varepsilon$$

In the regression, the dependent variable is *Tobin's Q.* The key independent variable is *Foreign institutional ownership*. If foreign investors effectively monitor the incumbent mangers, and reduce the managerial opportunism, the coefficient on *Foreign institutional ownership* is expected to positive. On the other hand, when foreign investors have incentives to extract private benefits, I find a negative relation between foreign institutional ownership and firm performance (e.g., Morck et al., 1988). The choice of variables that control for other firm characteristics that could affect Tobin's Q is based on the previous studies (Morck et al., 1988; Morck et al., 2000). Unfortunately, information about R&D expenditure are not available among the firms in my sample. Eliminating observations with missing values significantly reduce sample size and bias my results in favor of firms with R&D data. Then, w set missing observations of R&D equal to 1, and 0 otherwise. Instead, I construct a dummy variable that take a value of 1 if R&D data not available, and 0 otherwise. This help capture the average effect of missing observations of R&D with a value of 0 (Himmelberg et al., 1999). Similar to R&D data, information about advertising expenditure required to construct *Advertise* are not available. Then, when I obtain no data about advertising expenditure, I set missing observations of *Advertise* equal to 1, and 0 otherwise. And a dummy variable is defined as one that has a value of 1 if advertising expenditures data not available. In addition, my equations include industry- and year-specific variables as well as R&D and advertising missing dummy variables. The coefficients are estimated using ordinary least squares (OLS) regression

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method. Standard errors reported in parentheses are robust to heteroskedasticity and adjusted for the clustering of multiple observations for the same firm.

Table 4 reports the regression results. In column 1, the coefficient on *Foreign institutional ownership* is significantly positive, suggesting that firms with higher foreign institutional ownership enjoy higher performance measured by Tobin's Q. This is consistent with the notion that foreign investors are effective at monitoring the mangers. In addition, both coefficients on CEO ownership and Financial institutional ownership are also significantly positives.

I further investigate the robustness of the OLS regression results. I address the endogeneity problem of *Foreign institutional ownership* using instrumental variable (IV) approach. I construct four instrumental variables: *Foreign corporate ownership*, *Stock opption*, and *Foreign sales*, and *Board size*. Stock option is a dummy variable that takes a value of 1 if the firm adopt stock option system, and 0 otherwise. *Foreign sales* is the share of foreign sales as a percentage of total sales. Column 2 of Table 6 reports the regression results of first state of two stage least squares (2SLS). All my IVs are significantly associated with *Foreign institutional ownership.* In addition, I perform the regression-based test to check whether my IVs are uncorrelated with the error term.[10] This test is amenable to heteroskedastic error and clustering. The test does not reject the null hypothesis that my IVs are exogenous at conventional significant levels. This suggests that my IVs are uncorrelated with the error term. Given above tests, my IVs could qualify as valid variables. Finally, I perform a regression-based test of endogeneity. This test is amenable to heteroskedastic error and clustering. The test rejects the null hypothesis that *Foreign institutional ownership* are exogenous at 10 % level. Thus, *Foreign institutional ownership* in my specification needs to be treated as endogenous. Column 2 of Table 5 provides the results from the second-stage of 2SLS. The estimated coefficient on *Foreign institutional ownership* is significantly positive. This finding is consistent with results from OLS.

Following the analyses of debt maturity, I estimate a Heckman selection model (Heckman, 1979) to check whether my results are driven by sample selection concerns. The first-stage probit model includes the variable and sample used in the analyses of debt maturity. I obtain similar results to the results in OLS after control for sample selection terms. These results are robust to sample selection concerns.

Overall, these results show that firms with higher foreign institutional ownership

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[10] For a more detailed description of this endogeneity test, see, e.g., Cameron and Trivedi (2005).

enhance higher performance. This indicates that foreign investors play a monitoring and disciplinary role in corporate governance. This results support the view that foreign investors effectively serve as monitors over the management.

4.2. Operating performance

Positive relation between foreign institutional ownership and firm value support the view that foreign investors are actively involved in monitoring the firms invested by them. However, the findings could be interpreted as suggesting that stock price is temporarily driven up by foreign investors (Ferreira and Matos, 2008). The, I address the question whether foreign investors have a positive impact on accounting-based firm performance. I run the following regression model:

$$ROA=\beta_0+\beta_1 Foreign\ institutional\ ownership+\beta_2 Leverage+\beta_3 Firm\ size$$
$$+\beta_4 Firm\ age+\beta_5 Tangible\ asset+\beta_6 R\&D+\beta_7 Advertise +\varepsilon$$

In the regression, the dependent variable is *ROA*. The key independent variable is *Foreign institutional ownership*. If foreign investors serve as effective monitors over the management, the coefficients on *Foreign institutional ownership* is expected to positive. My motivation to include control variables is similar to the regression analysis for *Tobin's Q*. In addition, my equations include industry- and year-specific variables to control for any possible industry and year effects. 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.

Column 4 of Table 6 reports the results of *ROA* on *Foreign institutional ownership* and control variables. As with the results for *Tobin's Q*, the coefficient on *Foreign institutional ownership* is significantly positive, suggesting that firms with higher foreign institutional ownership enjoy higher ROA. This is consistent with *monitoring hypothesis* that monitoring activities by foreign investors lead to higher firm performance.

As for control variables, the coefficient on *Leverage* is significantly negative, suggesting that firms with higher leverage have lower ROA. The coefficient on *Firm age* is significantly negative, suggesting that younger firms have higher ROA.

As a robustness of my results, I check whether my results are sensitive to

endogeneity and sample selection problems. First, I address the endogeneity problem of *Foreign institutional ownership* using instrumental variable (IV) approach. I construct four instrumental variables: *Market size*, *R&D*, and *Foreign corporate ownership*, *Stock option*, and *Foreign sales*. Stock option is a dummy variable that takes a value of 1 if the firm adopt stock option system, and 0 otherwise. *Foreign sales* is the share of foreign sales as a percentage of total sales. In unreported results, my IVs are significantly associated with *Foreign institutional ownership.* In addition, I perform the regression-based test to check whether my IVs are uncorrelated with the error term.[11] This test is amenable to heteroskedastic error and clustering. The test does not reject the null hypothesis that my IVs are exogenous at conventional significant levels. This suggests that my IVs are uncorrelated with the error term. Given above tests, my IVs could qualify as valid variables. Finally, I perform a regression-based test of endogeneity. This test is amenable to heteroskedastic error and clustering. The test do not rejects the null hypothesis that *foreign institutional ownership* are exogenous at conventional significance level. *Foreign institutional ownership* in my specification needs to be treated as exogenous. Thus, results in Table 5 are not subject to any endogeneity problems.

Second, to address any sample selection problems, I estimate a Heckman selection model (Heckman, 1979). Note that ROA is not included in the first-stage regression. In the second-stage regression with the Inverse Mills Ratio, I find results similar to those in OLS. Thus, my results remain unchanged after control for sample selection terms.

I present evidence in support of the hypothesis that foreign investors as monitors enhance firm performance. Considering a positive relation between foreign investors and firm performance, I could not interpret the results for the maturity of public debt as suggesting that entrenchment effect are key role of determinants of the maturity of public debt. Rather, monitoring activities that are viewed as favorably in the bond markets, and then enable the firms to issue the debt with longer maturity.

5. Foreign ownership and the cost of corporate public debt

I have presented evidence in support of the hypothesis that foreign investors as active monitors are viewed favorably in the bond markets, and then firms with higher foreign institutional ownership enjoy longer maturity of public debt. I proceed to examine the relation between foreign institutional ownership and the cost of public debt. If

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[11] For a more detailed description of this endogeneity test, see, e.g., Cameron and Trivedi (2005).

monitoring activities by foreign investors benefit bondholders, firms with higher foreign institutional ownership should enjoy lower cost of public debt.

To test the relation between foreign institutional ownership and the cost of public debt, I estimate the following regression model:

$$Yield\ spread = \alpha_0 + \alpha_1 Foreign\ institutional\ ownership + \propto_2 CEO\ ownership\ +\ \propto_3 Debt\ maturity$$
$$+ \propto_4 Debt\ size + \propto_5 Rating + \alpha_6 Leverage + \alpha_7 Tobin\ Q + \alpha_8 Firm\ size$$
$$+ \alpha_9 Firm\ age + \alpha_{10} ROA + \alpha_{11} Tangible\ assets + \varepsilon$$

In the regression, the dependent variable is *Yield spread* . Similar to the results in Table 4, my key variable is here *Foreign institutional ownership*. If monitoring activities by foreign investors are viewed favorably in corporate bond markets, the coefficients on *Foreign institutional ownership* is expected to be negative. In examining the relation between foreign investors and yield spreads, I control for governance, bond, and firm characteristics that could affect yield spreads.

My motivation to include control variables is similar to the regression analysis of determinants of *Debt maturity*. *ROA* is a measure of profitability. Profitable firms have lower probabilities of default and are expected to have lower yield spreads. *Tangible asset* is a measure of liquidation value. Firms with higher tangible assets may provide higher liquidation value in the state of default and are expected to have lower yield spreads. In addition, my equations include industry- and year-specific variables to control for any possible industry and year effects. 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.

Table 7 reports the regression results. Column 1 presents the results of *Yield spread* on *Foreign institutional ownership* and bond characteristic variables, such as *Debt maturity*, *Debt size* and *Rating*. Column 2 uses governance and firm characteristics as additional control variables. Across two specifications, the coefficient on *Foreign institutional ownership* is significantly negative, suggesting that firms with higher foreign institutional ownership enjoy lower yield spreads. This is consistent with earlier findings in Table 4 that monitoring activities by foreign investors benefits bondholders, thereby decreasing yield spreads.

In terms of control variables, issues with higher credit ratings have lower yield

spreads. Larger firms with higher CEO ownership and leverage tend to have lower yield spreads. In contrast, firm with higher tangible assets experience lower yield spreads.

Taken together, significant relation between foreign institutional ownership and yield spreads support the notion that bondholders benefit from monitoring activities from foreign investors, and demand lower yield for firms with higher foreign institutional ownership. The results complement the results from the positive relation between foreign institutional ownership and the maturity of corporate public debt. Foreign investors as an effective monitoring device play a role in Japanese corporate bond markets.

I further check

In this subsection, I examine whether my results are robust to various alternative specifications. To address any sample selection problems, I estimate a Heckman selection model (Heckman, 1979). In the second-stage regression with the Inverse Mills Ratio, I find results similar to those in OLS. Thus, my results remain unchanged after control for sample selection terms.

Like the debt maturity analyses, I arbitrarily adjust credit ratings awarded by the foreign credit rating agencies to correct for the difference among credit ratings by foreign and Japanese credit rating agencies. I obtain similar results to those in OLS after controlling for re-estimated credit rating variables

The extant literatures explore the role of banks in yield spreads through bank subsidiary security firms.[12] These papers offer two opposing views: the certification view and the conflict-of-interest view. In the certification view, 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 because banks have an advantage over security firms in gathering firm's private information unavailable to security firms and investors through loan contracts and other financial services. Bondholders reflect this certification by banks in bond yields, and require lower yields on the issues underwritten by bank subsidiary security firms. In contrast, in the view of the conflict-of-interest, banks could often require client firms to repay bank loans by issuing public debt. When bank-owned security firms underwrite bonds issued by client firms, potential default risk is transferred from banks to bondholders, thereby leading to the divergence of interests between banks and bondholders. Predicting forecast this incentive, they demand higher yields on the issues underwritten by bank-owned security firms. In this paper, I denote the issue to be

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

underwritten by bank-owned security firms if bank-owned security firms are among the lead managers of underwriters. I then construct a dummy variable that takes a value of 1 if the issue is classified as underwritten by bank-owned security firms, and 0 otherwise. My results concerning foreign ownership variables remain significant after controlling for type of underwriters.

I further allow for any nonlinearities between control variables and yield spreads by including squared terms of *Leverage* and *Rating* as additional control variables (Anderson *et al.*, 2003; Klock *et al.*, 2005; Ortiz-Molina, 2006). Regressions including these squared terms yield qualitatively similar results.

6. Conclusion

While there are rich empirical literatures on the roles of foreign investors in corporate governance, the evaluation of foreign investors in corporate public debt markets remain unexplored. Especially, I examine the relation between foreign investors and the maturity structure of corporate public debt. Foreign investors could mitigate agency problems induced by managers through monitoring activities. In anticipation of the intensive monitoring by foreign investors, bondholders allow the firms with foreign investors to issue public debt with longer maturities.

My paper test this monitoring hypothesis using a sample of corporate bonds newly issued in Japan during the period 2005-2009. I present several important results. First of all, my results show that firms with foreign investors enjoy longer maturity of public debt. This is consistent with the notion that monitoring activities by foreign investors bring benefits to bondholders, thereby allowing the firms with foreign investors to issue debt with longer maturities. Second, firms with foreign investors enhance firm performance, measured by Tobin's and ROA. These results supplement the relation between foreign investors and the maturity of public debt by showing that foreign investors play a disciplinary and monitoring role in incumbent managers. Finally, firms with foreign investors experience lower yield spreads. Taken as a whole, my results indicate that foreign investors play a key role in corporate bond markets.

Acknowledgements

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Figure 1. Maturity Distribution of Corporate Public Debt
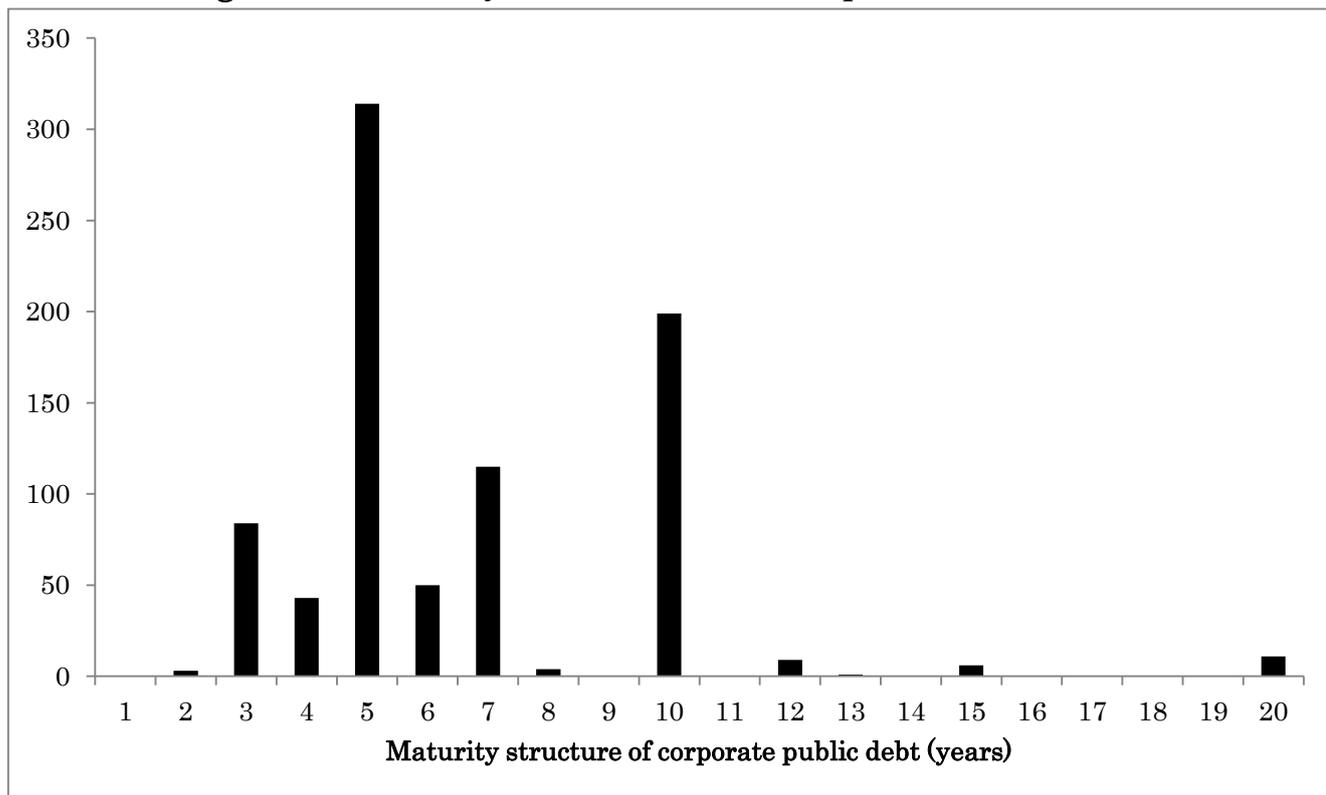
The table provides the distribution of debt maturity for new corporate public debt. The sample consists of 839 firm-year observations on 225 firms during the period 2005-2009.

Table 1. Sample distribution

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
2009	105	199
Panel B. Industry distribution		
Industry	No. of firms	No. of firm-year observations
Construction	7	14
Foods	15	46
Texitles	3	6
Pulp and paper	4	15
Chemicals	22	57
Drug and medicine	3	7
Oil and coal	3	10
Rubber	5	12
Glass and ceramics	9	21
Iron and steel	7	57
Nonferrous metals	7	26
Metal products	2	4
General machinery	15	38
Electronic equipment	23	74
Transport equipment	17	50
Precision equipment	4	9
Other products	6	8
Land transportation	18	108
Marine transportation	3	13
Air transportation	1	5
Warehouse	3	8
Information and communication	11	48
Wholesale	8	87
Retail	10	16
Real estate	17	94
Service	3	6

The table presents the distribution of 839 firm-year observations on 225 firms during the period 2005-2009. Panel A shows the fiscal year distribution of the sample, and Panel B indicates the industry distribution of the sample. Industry classifications come from the *Japan Company Handb*

Table 2. 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

The table presents the credit rating conversion codes for the S&P, Moody's, JCR, and R&I.

Table 3. Descriptive Statistics

Variable	Mean	Median	Std.Dev	Minimum	Maximum
Bond characteristics					
Debt maturity (years)	6.621	5.000	2.951	2.000	20.000
Debt size (¥ billion)	5.018	4.787	0.630	3.401	7.601
Credit rating	14.027	14.000	1.892	10.000	18.333
Yield spread (basis points)	46.199	37.550	32.146	0.800	207.500
Goverance characteristics					
Foreign institutional ownership (%)	22.307	22.080	11.685	0.043	84.974
CEO ownership (%)	0.701	0.007	3.978	0.000	33.753
Firm characteristics					
Leverage (%)	37.160	36.061	16.597	0.000	74.549
Tobin's Q	1.190	1.148	0.269	0.337	2.173
Firm size (¥)	27.624	27.685	1.046	24.377	29.976
Firm age (years)	4.039	4.143	0.755	0.693	4.828
Asset maturity	29.972	16.659	35.544	3.075	207.582
Abnormal earnings	−0.321	0.094	7.097	−60.508	50.988
Term structure (%)	115.990	114.600	24.255	84.400	160.700
Tax rate (%)	25.122	25.922	30.768	−166.038	201.837
ROA (%)	3.431	2.711	3.822	−11.330	19.857
Tangible assets (%)	32.425	30.207	22.466	0.066	91.735
R&D (%)	1.340	0.441	1.971	0.000	14.151
Advertising (%)	0.885	0.031	1.540	0.000	13.038

The table reports summary statistics for the variables used in the analysis.

Table 4. Univariate Analyses: tests of differences in means

Variable	High foreign ownership	Low foreign ownership	t-statistic
Debt maturity	7.022	6.224	3.944***
Debt size	5.127	4.910	5.083***
Credit rating	14.452	13.606	6.652***
Yield spread	43.457	48.889	−2.446**
CEO ownership	0.568	0.831	−0.959
Leverage	35.671	38.820	−2.591***
Tobin's Q	1.227	1.153	3.978***
Firm size	27.968	27.285	9.985***
Firm age	3.959	4.119	−3.093***
Asset maturity	41.088	19.173	9.222***
Abnormal earnings	−0.112	−0.525	0.840
Term structure	115.948	116.030	−0.049
Tax rate	21.785	28.419	−3.128***
ROA	3.792	3.073	2.716***
Tangible assets	25.165	39.599	−9.822***
R&D	1.418	1.265	1.117
Advertising	1.202	0.574	5.973***

The table provides the results from tests of the differences in means between firms with high and low foreign institutional ownership for the variables used in the analysis. Firms with high foreign ownership consist of those whose foreign institutional ownership is above the median for the sample. Firms with low foreign ownership consist of those whose foreign institutional ownership is below the median for the sample. ***, **, and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

Table 5. Foreign ownership and the maturity of corporate public debt

Independent variable	Dependent variable				
	Debt maturity	Debt maturity	Debt maturity	Foreign institutional ownership	Debt maturity
	(1) OLS	(2) OLS	(3) OLS	(4) 1st stage of 2SLS	(5) 2nd stage of 2SLS
Foreign institutional ownership	0.047***	0.027**	0.024**		0.093**
	(0.012)	(0.012)	(0.012)		(0.038)
Debt size	−0.789***	−1.162***	−1.160***	−1.438*	−1.094***
	(0.193)	(0.230)	(0.244)	(0.762)	(0.237)
Rating	0.784***	0.705***	0.715***	−1.569***	0.770***
	(0.110)	(0.111)	(0.108)	(0.353)	(0.114)
Leverage		0.007	0.010	−0.178***	0.021
		(0.012)	(0.012)	(0.048)	(0.014)
Tobin's Q		−0.055	−0.076	1.130	−0.451
		(0.974)	(0.953)	(3.291)	(1.104)
Firm size		0.682***	−8.802	1.088	0.386
		(0.210)	(5.835)	(2.123)	(0.275)
Firm age		0.414**	0.399**	−0.812	0.520***
		(0.188)	(0.192)	(0.939)	(0.193)
Asset maturity		−0.006	−0.008	0.049**	−0.011**
		(0.006)	(0.006)	(0.020)	(0.006)
Abnormal earnings		0.008	0.005	−0.120	0.010
		(0.009)	(0.010)	(0.079)	(0.010)
Term structure		0.000	0.000	0.013	0.002
		(0.014)	(0.014)	(0.088)	(0.015)
Tax rate		−0.010***	−0.010***	0.014	−0.009***
		(0.003)	(0.003)	(0.013)	(0.003)
Rating^2			−0.026		
			(0.026)		
Firm size^2			0.173		
			(0.108)		
Market size				4.106*	
				(2.142)	
R&D				0.817**	
				(0.389)	
Foreign corporate ownership				−0.149**	
				(0.074)	
Industry average ownership				1.132***	
				(0.176)	
Test of overidentifying restrictions				4.611	
(p−value)				(0.203)	
Endogeneity test				2.905*	
Industry effects	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes
No. of observations	839	813	813	806	806
R^2	0.277	0.315	0.319	0.647	0.287

The table reports regression results on the effect of foreign institutional ownership on the maturity of corporate public debt. The dependent variables in Columns 1, 2, and 4 are Debt maturity. Columns 1-2 present the results of OLS regressions, Column 3 present the first-stage results of 2SLS regressions, and Column 4 present the second-stage results of 2SLS regressions. All equations control for industry and year effects. Standard errors in parentheses are robust to heteroskedasticity, and adjusted for firm clustering. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 6. Foreign ownership and firm performance

Independent variable	Dependent variable			
	Tobin's Q	Foreign institutional ownership	Tobin's Q	ROA
	(1)	(2)	(3)	(4)
	OLS	1st stage of 2SLS	2nd stage of 2SLS	OLS
Foreign institutional ownership	0.004***		0.026**	0.066**
	(0.002)		(0.012)	(0.027)
Leverage	−0.001	−0.053	0.000	−0.082***
	(0.002)	(0.038)	(0.002)	(0.017)
Firm size	0.011	3.634***	−0.066	−0.086
	(0.018)	(0.616)	(0.042)	(0.258)
Firm age	0.001	0.216	0.011	−0.931***
	(0.020)	(1.043)	(0.028)	(0.256)
Tangible assets	0.000	−0.050	0.002	0.020
	(0.001)	0.041	(0.002)	(0.019)
R&D	0.002	0.138	−0.004	−0.074
	(0.011)	(0.370)	(0.014)	(0.124)
Advertising	−0.007	1.141**	−0.033	−0.055
	(0.020)	(0.495)	(0.027)	(0.206)
Foreign corporate ownership		−0.264***		
		(0.081)		
Stock option		3.030***		
		(0.987)		
Foreign sales		0.053*		
		(0.031)		
Board size		−0.227*		
		(0.132)		
Test of overidentifying restrictions		3.144		
(p-value)		(0.370)		
Endogeneity test		4.658**		
Industry effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
No. of observations	822	822	822	819
R^2	0.381	0.592	0.028	0.434

The table reports regression results on the effect of foreign institutional ownership on the maturity of corporate public debt. The dependent variables in Column 1 and 3 are Tobin's Q, and in Column 4 is ROA. Column 1 presents the results of OLS regressions, Column 2 present the first-stage results of 2SLS regressions, Column 3 present the second-stage results of 2SLS regressions, and Column 4 presents the results of OLS regressions. All equations control for industry and year effects. Standard errors in parentheses are robust to heteroskedasticity, and adjusted for firm clustering. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 7. Foreign ownership and yield spreads

Independent variable	Dependent variable	
	Yield spread	Yield spread
	(1) OLS	(2) OLS
Foreign institutional ownership	−0.597***	−0.296**
	(0.185)	(0.142)
CEO ownership		3.254***
		(0.328)
Debt maturity	−0.269	0.338
	(0.304)	(0.263)
Debt size	3.414	2.976
	(2.477)	(1.961)
Rating	−11.596***	−7.146***
	(1.151)	(0.874)
Leverage		0.407***
		(0.130)
Tobin's Q		−11.827**
		(5.355)
Firm size		−5.164***
		(1.546)
Firm age		−2.997
		(2.262)
ROA		0.472
		(0.378)
Tangible assets		−0.291***
		(0.107)
Industry effects	Yes	Yes
Year effects	Yes	Yes
No. of observations	834	819
R^2	0.468	0.585

The table reports OLS regression results on the effect of foreign institutional ownership on yield spreads. The dependent variables in Columns 1-2 are Yield spread. All equations control for industry and year effects. Standard errors in parentheses are robust to heteroskedasticity, and adjusted for firm clustering. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.