IMES DISCUSSION PAPER SERIES

The Effect of Bank Monitoring on the Demand for Earnings Quality in Bond Contracts

Akinobu Shuto, Norio Kitagawa, and Naoki Futaesaku

Discussion Paper No. 2017-E-12

IMES

INSTITUTE FOR MONETARY AND ECONOMIC STUDIES

BANK OF JAPAN

2-1-1 NIHONBASHI-HONGOKUCHO

CHUO-KU, TOKYO 103-8660

JAPAN

IMES Discussion Paper Series 2017-E-12
December 2017

The Effect of Bank Monitoring on the Demand for Earnings Quality in Bond Contracts

Akinobu Shuto*, Norio Kitagawa, and Naoki Futaesaku*****

Abstract

We investigate whether bank monitoring that relies on private information in private debt decreases the demand for earnings quality in public debt. In doing so, we focus on Japanese main banks that have high abilities to access the private information of borrowing firms. We find that under stable financial conditions in the bond-issuing firms, accruals quality is negatively associated with bond yield spreads, regardless of the existence of a main bank, suggesting that reporting higher quality earnings affects the reduction of the cost of debt in public debt. In contrast, we find that when the bond-issuing firms with a main bank have high default risk, there is no relationship between accruals quality and bond yield spread. The results suggest that when a main bank has a stronger incentive to monitor their borrowing firms due to the firm's poor financial performance, the increased bank monitoring using private information decreases the demand for earnings quality in bond contracts.

Keywords: Accruals Quality; Bond Yield Spread; Main Bank; Private Information; Japan
JEL classification: M41

*Associate Professor, Graduate School of Economics, The University of Tokyo (E-mail: shuto@e.u-tokyo.ac.jp)
**Associate Professor, Graduate School of Business Administration, Kobe University (E-mail: kitagawa@b.kobe-u.ac.jp)
***Director, Institute for Monetary and Economic Studies, Bank of Japan (E-mail: naoki.futaesaku@boj.or.jp)

The authors would like to thank Hisakatsu Sakurai, Kazuhisa Otogawa, Keiichi Oishi, Hideaki Miyajima, participants of Accounting Workshop in the Bank of Japan on March 21, and the staff of the Institute for Monetary and Economic Studies (IMES), the Bank of Japan, for their useful comments and discussions. Authors also appreciate the helpful comments and suggestions received from Yasuharu Aoki, Masahiro Enomoto, Takuya Iwasaki, Hitoshi Takehara, Tatsushi Yamamoto, and participants of Japan Accounting Association 2017 Annual Meeting. This paper was prepared in part while Akinobu Shuto was a visiting scholar at IMES. Views expressed in this paper are those of the authors and do not necessarily reflect the official views of the affiliated institutions of the authors.

1 Introduction

The competitive advantage of accounting information depends on the availability of alternative information in a capital market and in contracts. For example, studies often argue that private communication with related banks can substitute for accounting information to resolve information asymmetry problems among stakeholders (Ali and Hwang, 2000; Guenther and Young, 2000; Ball et al., 2000; Ball and Shivakumar, 2005; Biddle and Hilary, 2006; Bharath et al., 2008). To address the issue, we investigate whether a main bank's monitoring with private information in private debt contract substitutes for the role of earnings quality in the bond market by focusing on the Japanese main bank with a high ability to access the private information of borrowing firms.

In particular, we investigate 1) whether higher quality earnings lowers the bond yield spread in the Japanese bond market and 2) how main bank of bond-issuing firms affects the relationship between earnings quality and the bond yield spread. To enhance the understanding of the role of accounting information as public information, it is important to examine how private communication in private debt contract affects the usefulness of accounting information in public debt contract.

As a theoretical study suggests (Easley and O'Hara, 2004), prior studies have shown that high quality accounting and disclosures reduce the cost of debt (Sengupta, 1998; Francis et al., 2005; Bharath et al., 2008). These findings suggest that public information such as accounting information reduces information asymmetry among stakeholders and increases the efficiency of a debt contract. However, we should note that private information held by stakeholders can also help to resolve information asymmetry problems and increase the efficiency of debt contracts. Prior studies have argued the possibility that in the corporate governance mechanism, private communication among stakeholders substitutes for accounting information to monitor managers and resolves the problems due to information asymmetry (Ali and Hwang, 2000; Guenther and Young, 2000; Ball et al., 2000; Ball and Shivakumar, 2005; Biddle and Hilary, 2006; Bharath et al., 2008).

As we describe later, the main bank relationship is one of the main institutional factors in Japan. The main bank has a significant access various private information that is timely and relevant for their monitoring through their long-term relationships with borrowing firms (Fama, 1985; Diamond, 1991; Aoki, 1994b). On the other hand, bond investors are more likely to depend on accounting information for their investment decision making because they have less private communication with borrowing firms compared to banks (Bharath et al, 2008).

However, when firms issuing bonds have a main bank, bond investors benefit significantly from the strict monitoring of the main bank with its private information in the bond contract. Related banks' strong monitoring may induce bondholders to delegate the monitoring role to the banks and decrease the demand for accounting information in bond contracts. Nikolaev (2010) provides evidence suggesting that the importance of accounting information in a bond market decreases when firms have tight relationships with banks. Vashishtha (2014) also finds that managers are less likely to make a discretionary disclosure following a covenant violation, suggesting that shareholders delegate the monitoring role to banks since bank monitoring is expected to increase after the violation. These results suggest that the demand for accounting information decreases when strong bank monitoring exists. Thus, we predict that the usefulness of earnings quality in a bond market, defined as the relationship between earnings quality and bond yield spread, decreases when the main bank of bond-issuing firms has a strong incentive to monitor their borrowing firms.

The bank has a strong incentive to monitor and influence borrowing firms when the borrowing firms are performing poorly due to the concave structure of creditors' payoffs (Aghion and Bolton, 1992; Dewatripont and Tirole, 1994; Vashishtha, 2014). Prior studies of main bank relationship in Japan have revealed that while the main bank never intervenes in the management of borrowing firms as long as their financial performance is stable, reports of bad performance prompt banks to engage in various management interventions, such as recontracting, changing the CEO, and dispatching their chosen directors (Kaplan, 1994; Kaplan and Minton, 1994; Kang and Shivdasani, 1995).[1] These arguments and findings suggest that the strength of main bank monitoring would be higher as the performance of borrowing firms declines. We also expect that main bank is likely to use more of their private information than accounting information as borrowing firms' performance decreases. This is because more detailed and timely information is needed to monitor borrowing firms with higher default risk.

Based on these arguments, we hypothesize that as the default risk of bond-issuing firms with main bank increases, the importance of earnings quality decreases in improving the efficiency of a debt contract in Japan. To test the hypothesis, we investigate the relationship between earnings quality and the bond yield spread for 2,181 straight bonds in the Japanese bond market. As a proxy for earnings quality, we use an accruals quality measure based on McNichols (2002), which extends that of Dechow and Dichev (2002)

[1] This monitoring by the main bank is often referred to as "contingent governance", in that the controlling of power of the main bank is contingent on the financial state of the firms (Aoki, 1994a, Aoki, 1994b).

(hereafter, DD). Our main findings are summarized as follows.

First, our preliminary analysis for the full sample indicates that accruals quality is negatively associated with the bond yield spread. The result suggests that higher accruals quality lowers a firm's cost of debt by reducing information asymmetry among stakeholders, which is consistent with the findings of prior studies on U.S. firms (Francis et al., 2005; Bharath et al., 2008).

Second, as our primary concern, we examine the effect of the main bank of bond-issuing firms on the relationship between accruals quality and bond yield spread. We find that when the default risk of the bond-issuing firms is not very high and the firms have stable financial conditions, accruals quality is negatively associated with the bond yield spread, regardless of the existence of main bank. This result suggests that consistent with full sample results, higher quality earnings reduce the cost of debt. In other words, when the borrowing firms have relatively stable financial conditions, the main bank's monitoring does not substitute for earnings quality.

Finally, when the default risk of the bond-issuing firms with main bank is relatively high, there is no significant relationship between accruals quality and the bond yield spread. In contrast, when the default risk of bond-issuing firms that do *not* have a main bank is relatively high, accruals quality is negatively associated with the bond yield spread. The overall results suggest that when the financial conditions of bond-issuing firms with a main bank deteriorate, the increased bank monitoring substitutes for earnings quality and decreases the demand for it in Japanese bond market.

Our study contributes to the literature in several ways. First, our results suggest that the presence of an alternative monitoring mechanism based on private information in private debt decreases the demand for accounting information in public debt. While prior international comparative studies provide evidence suggesting that private communication with stakeholders can substitute for accounting quality (Ball et al., 2000; Ball and Shivakumar, 2005), they do not analyze specific stakeholders with private information and the economic effect of the private information on the debt contract[2].

Second, we provide additional evidence on the effect of default risk of the

[2] One exception is Nikolaev (2010), who provides evidence suggesting that the relationship between public debt covenants and earnings quality (accounting conservatism) weakens in a firm relying on private debt issues. Our study contributes to this study by examining the ex-ante role of the bond contract of accounting earnings to resolve the adverse selection problem. Specifically, while Nikolaev (2010) focuses on the use of accounting earnings in debt covenants to reduce moral hazard (i.e., the ex-post role of a bond contract), we clarify the role of earnings quality used to design the terms of a bond contract by investigating the relationship between earnings quality and the bond yield spread. Further, we focus on the Japanese main bank since it has a greater ability to communicate privately with borrowing firms, which provides a useful research setting for comparing the private information and accounting earnings in the debt contract.

bond-issuing firms on the usefulness of earnings. Prior studies have shown that the usefulness of earnings in the bond market increases as a firm's default risk increases since bondholders have a fixed claim on a firm (Plummer and Tse, 1999; Khurana and Raman, 2003; Jiang, 2008). In contrast, our results indicate that in the case of bond-issuing firms with a main bank, the usefulness of earnings decreases as a firm's default risk increases, suggesting that a bank monitoring with private information plays a significant role in bond-issuing firms with higher default risk, even after accounting for the higher importance of the earnings of such firms that prior studies suggest.[3]

Finally, our study contributes to traditional finance theory on main bank relationship. Corporate governance theory on main bank relationship argues that the strength of main bank monitoring depends on the financial conditions of borrowing firms, and other stakeholders delegate their monitoring role to the main bank (Aoki, 1994b). We elucidate this specific mechanism on how bank monitoring affects the design of bond contracts in terms of the usefulness of earnings quality in the bond market.

The remainder of this paper proceeds as follows. Section 2 summarizes the findings of prior studies and develops the hypotheses. Section 3 defines the variables and explains the research design. Section 4 describes the sample selection procedure and reports the descriptive statistics. Section 5 reports our empirical results, and Section 6 summarizes the results of our additional analyses. Finally, section 7 concludes with a summary.

2 Literature review and hypothesis development

2.1 Accounting quality and cost of debt

Theoretical and empirical studies have indicated that firms with higher accounting quality have a lower cost of capital than those with lower accounting quality do (Easley and O'Hara, 2004; Francis et al., 2005; Bharath et al., 2008). Easley and O'Hara (2004) demonstrate that the information risk due to information asymmetry between informed and uninformed investors increases the cost of capital, and thus predict that precise accounting information reduces the cost of capital since it decreases the systematic information risk to uninformed investors.

[3] Note that our results indicate that consistent with prior studies (Plummer and Tse, 1999; Khurana and Raman, 2003; Jiang, 2008), the usefulness of earnings increase as a firm's default risk increases when the bond-issuing firms do *not* have a main bank. The results suggest that the existence of a main bank is critically important to consider in the relationship between earnings quality and the bond yield spread of firms with higher default risk.

Following these theoretical implications, Francis et al. (2005) use accruals quality as the proxy for information risk and find that firms with lower accruals quality have higher interest costs of debt than firms with higher accruals quality. Bharath et al. (2008) also examine the effect of accounting quality using an accrual-based measure on the design of debt contracts, and find that in the bond market, higher accounting quality results in a significantly lower interest spread. These results suggest that higher accounting quality is likely to reduce information risk and result in a lower cost of debt.[4] Because our preliminary concern is to examine the relationship between earnings quality and the cost of debt in the Japanese bond market, based on the above argument, we hypothesize as follows:

H1: Earnings quality is negatively associated with the firm's bond yield spread.

2.2 Effect of main bank on the relationship between earnings quality and cost of debt

2.2.1 Substituting private communication for accounting information

Our primary concern is to examine the effect of a main bank with private information on the usefulness of accounting information in the bond market. As a corporate governance mechanism, prior studies argue that private information substitutes for accounting quality to resolve problems of information asymmetry (Ali and Hwang, 2000; Guenther and Young, 2000; Ball et al., 2000; Ball and Shivakumar, 2005; Biddle and Hilary, 2006; Bharath et al., 2008).

For example, Ball and Shivakumar (2005) provide evidence that private companies report lower quality of earnings (i.e., less "timely loss recognition") than public companies do. They interpret the result as suggesting that private companies are likely to substitute private communication for financial reporting to reduce information asymmetry between mangers and other parties (Ball and Shivakumar, 2005, p.126).

Ball et al. (2000) compare the demand for higher quality of earnings (i.e., more conservative income) between common-law countries and code-law countries. They hypothesize that the demand for high earnings quality in code-law countries is less than that in common-law countries because in code-law countries, insider communication solves the information asymmetry between managers and stakeholders. Consistent with their prediction, they find that code-law countries such as Japan report less conservative income compared to common-law countries.

[4] For Japanese firms during 1992-2011, Takasu (2012) indicates that firms with higher accounting quality and that conduct income smoothing have lower bond spreads.

Finally, Biddle and Hilary (2006) examine the relationship between accruals-based earnings quality and investment efficiency. They show that while higher earnings quality enhances investment efficiency by reducing information asymmetry, the effect is weaker for countries such as Germany and Japan where creditors play a more dominant role. To explain the lesser effect of accounting quality on investment efficiency in bank-oriented countries, they argue that the bank may be able to obtain information through private channels (mitigating adverse selection problems) and be in a better position to monitor managers directly once they supply capital (mitigating moral hazard).

The overall results suggest that the demand for higher accounting quality would decline in financial markets where stakeholders with private information, such as banks, have dominant role.

2.2.2 Main bank monitoring using private information

Prior studies have revealed that bank-oriented countries and bank-affiliated firms are likely to substitute private communication for accounting information to reduce information asymmetry between lenders and borrowers. Japan is often referred to as bank-oriented country and the main bank relationship is the one of the representative institutional factors in Japan.[5]

One of the unique features of main bank monitoring is that it uses private information obtained from their long-term relationships with borrowing firms. The long-term loans the main bank provides are normally rolled over on maturity. Main banks access detailed information of their borrowers through holdings of major payment settlement accounts, which amounts to an ability to partially open the books (Aoki, 1994b, p.118). Aoki (1994b) argues that the main bank is deeply involved in the daily transactional operations of customer firms and thus has private information useful for judging the organizational and managerial capacity of borrowing firms. Such information is not available to other financial institutions since they have less frequent and more tangential contracts with the borrowing firms.

Further, a bank generally has a stronger incentive to monitor borrowing firms when they are performing poorly due to the concave structure of creditors' payoffs (Aghion and Bolton, 1992; Dewatripont and Tirole, 1994; Vashishtha, 2014). Many studies show that a

[5] Aoki et al. (1994) state that the traditional academic definition of a main bank relationship is a long-tern relationship between a firm and a particular bank from which the firm obtains its largest share of borrowing. Another important aspect is the role the main bank plays in corporate monitoring and governance. The main bank not only provides loans, it holds equity, and, in the eyes of capital market participants and regulators, is expected to monitor the firms and intervene when things go wrong (Aoki et al., 1994, p.3).

Japanese main bank directly intervenes in the management of borrowing firms when the borrowing firms report extremely bad performance (Aoki, 1994b; Aoki and Patrick, 1994; Sheard, 1994a; 1994b). In particular, prior studies indicate that the main bank engages in various management interventions such as recontracting, changing the CEO, and dispatching their chosen directors (Kaplan, 1994; Kaplan and Minton, 1994; Kang and Shivdasani, 1995).[6]

Hence, the main bank is expected to monitor the borrowing firms effectively using both private information and public information such as accounting information. In terms of the relative importance of private and accounting information for bank monitoring, we infer that the main bank is more likely to use their private information on borrowing firms as the borrower's performance decreases. As many prior studies have shown, the main bank uses accounting information to evaluate the credit risk of borrowing firms to avoid the adverse selection problem, and uses accounting-based debt covenants to mitigate moral hazard (Armstrong et al., 2010). Hence, when the financial conditions of the borrowing firms are relatively stable, we expect that the main bank use accounting information as well as their own private information.[7]

However, as the performance of borrowing firms worsens, banks need more detailed and timely information to monitor borrowing firms since banks have a fixed claim on a firm. Because financial statements basically provide historical accounting data on a quarterly basis, the bank is likely to use more timely and relevant private information, such as daily transaction information through checking the payment settlement account. Further, in the case of more dramatic financial deterioration, the main bank intervenes in the management of borrowing firms and could thus fully access borrowing firms' private information about their management. Therefore, we predict that main bank monitoring uses more private information than public information as the default risk of borrowing firms increases.

[6] This contingent governance theory explains the role of main bank monitoring well, especially Japan's high economic growth period. While there is an argument that the function of the main bank in Japan has changed over time (Hoshi and Kashyap, 2001; Miyajima and Kuroki, 2007), a recent survey study shows that Japanese firms still have an incentive to maintain their long-term relationships with a main bank because they expect to receive funding from main bank if their performance declines (Hirota, 2009).

[7] Consistent with this argument, some studies indicate that firms with a main bank tend to report higher earnings quality (Okuda and Yasuda, 2003; Umezawa and Ebihara, 2016).

2.2.3 Effect of the main bank on the demand for accounting quality in the bond market

Compared to banks, bondholders have a lower ability to process information and access to private information on borrowing firms (Bharath et al., 2008). Thus, bondholders are more likely to rely on accounting information as public information and require higher earnings quality. Consistent with this argument, Bharath et al. (2008) show that borrowers with lower earnings quality tend to choose public debt (i.e., to issue bonds) than private debt (i.e., bank loans).

However, in the case of bond-issuing firms that have a main bank, bond investors can benefit significantly from the main bank's monitoring through private information. Consistent with the prediction, Nikolaev (2010) reveals that the demand for accounting information in the bond market decreases when the bond issuers have a tight relationship with banks. Specifically, he first shows that firms whose public debt contracts employ more covenants exhibit a significant increase in timely loss recognition (i.e., accounting conservatism) in the years after the debt issues, suggesting that a reliance on covenants requires higher earnings quality. He also finds that a firm's prior private debt issues and their reliance on financial covenants weaken this relationship between public debt covenants and timely loss recognition. The results suggest that banks' alternative monitoring mechanisms can substitute for accounting quality and reduce the demand for accounting information (Nikolaev, 2010, p.140).

Vashishtha (2014) investigates how the demand for accounting disclosure changes in the presence of bank monitoring. He examines the effect of increased bank monitoring following a covenant violation on borrower's discretionary disclosure and finds that managers are less likely to make a discretionary disclosure, issuing management earnings forecasts, after violation. These results suggest that shareholders delegate the monitoring role to banks since increased bank monitoring benefits both banks and shareholders by reducing managerial agency problems.

In our research context, these arguments suggest that as bank monitoring with private information increases, the use of accounting information in the bond market would decrease relatively. In particular, we predict that accounting quality is not associated with the firm's bond spread when its default risk is relatively high because main banks increase their monitoring with private information. In contrast, we also predict that earnings quality has a significant negative association with the firm's bond spread when its default risk is relatively stable. When the borrowing firms have sound performance, the main bank

conducts moderate monitoring using both accounting and private information. These arguments lead to hypotheses 2 and 3.

H2: When the default risk of bond-issuing firms with a main bank is relatively stable, earnings quality is negatively associated with the firm's bond spread.

H3: When the default risk of bond-issuing firms with a main bank is relatively high, earnings quality is not associated with the firm's bond spread.

We should note that prior studies have indicated that because bondholders have a fixed claim on a firm, earnings information should become increasingly important to them as the firm's default risk increases (Fischer and Verrecchia, 1997; Plummer and Tse, 1999; Jiang, 2008). Other studies show that the usefulness of earnings in the bond market increases as a firm's default risk increases (Plummer and Tse, 1999; Khurana and Raman, 2003; Jiang, 2008). This argument suggests that the relationship between earnings quality and the firm's bond spread increases as the firm's default risk increases. This prediction is not consistent with hypothesis 3. Thus, whether earnings quality reduces a firm's cost of debt when its default risk is relatively high is an empirical question.

3 Research design

3.1 Variables

3.1.1 Earnings quality

Based on prior studies (Dechow and Dichev, 2002; McNichols, 2002), we define earnings quality as the estimation errors included in accruals.[8] Accounting earnings are divided into two components: cash flow from operations and accruals. Dechow and Dichev (2002) argue that working capital accruals that are not explained by cash flow from operations in the past, current, and future period mean low accruals quality because cash flow realization related to working capital accruals usually occurs within a year. Thus, DD propose the standard deviations or absolute values of the residual estimated by a model that regresses

[8] Accounting conservatism is often referred to as one of earnings quality measure. However, we do not use this measure because our primary concern is the relative importance of the usefulness of earnings information and private information. Nikolaev (2010) argues that accounting conservatism can lower the cost of debt through two paths: mitigating the agency cost of debt and reducing information risk. As our concern is to explore the latter path, we define earnings quality as the estimation errors in accruals since it is more likely to reflect an information risk rather than accounting conservatism (Francis et al., 2005).

working capital accruals on cash flow from operations in the past, current, and future periods as a proxy for accruals quality.

Further, McNichols (2002) extends the DD model and argues that the change in sales and the level of gross property, plant, and equipment, which are the explanatory variables included in Jones' (1991) model, can be the omitted variables of the DD model, and finds that including these variables improves the explanatory power of the DD model.

Hence, we measure the proxy for earnings quality by estimating the McNichols (2002) model.[9] Specifically, we obtain the residual by estimating model (1) by year and industry.

$$TCA_{i,t} = \alpha_0 + \beta_1 CFO_{i,t-1} + \beta_2 CFO_{i,t} + \beta_3 CFO_{i,t+1} + \beta_4 \Delta REV_{i,t} + \beta_5 PPE_{i,t} + \varepsilon_{i,t} \quad (1)$$

where

$TCA_{i,t}$ = total current accruals for firm i in year t[10] / total assets for firm i in year t-1.

$CFO_{i,t}$ = cash flow from operations for firm i in year t / total assets for firm i in year t-1 = (ordinary income after tax for firm i in year t[11] − accruals for firm i in year t [12]) / total assets for firm i in year t-1.

$\Delta REV_{i,t}$ = the change in sales for firm i in year t / total assets for firm i in year t-1.

$PPE_{i,t}$ = gross property, plant, and equipment for firm i in year t / total assets for firm i in year t-1.

We measure the proxy for earnings quality as the absolute value of the residual of model (1). Based on prior studies (Dechow and Dichev, 2002; McNichols, 2002), we interpret a larger absolute value of the residual as a lower earnings quality.

---

[9] As a robustness check, we conduct an additional analysis based on alternative measures of earnings quality: 1) the absolute values of discretionary accruals estimated by the CFO modified Jones model (Kasznik, 1999), 2) the absolute value of discretionary accruals estimated by the performance-matched Jones model (Kothari et al., 2005), and 3) the absolute value of accruals quality estimated by the Dechow and Dichev (2002) model. See section 6 for details.

[10] We calculate total current accruals as follows. Total current accruals = (change in current assets – change in cash and deposits) – (change in current liabilities – change in financing items). Financing items = change in short-term loans payable + change in commercial paper + change in current portion of long-term loans payable + change in current portion of straight and convertible bonds.

[11] We calculate ordinary income after tax as follows. Ordinary income = net income + special expenses – special revenues.

[12] We calculate total accruals as follows. Total accruals = total current accruals – (change in allowance for doubtful debts (non-current items) + change in provision for retirement benefits or provision for retirement allowance + change in provision for directors' retirement benefits + change in other long-term provision + depreciation).

3.1.2 Identifying a main bank

Many studies on Japanese corporate governance identify a main bank in terms of 1) the magnitude of lending and 2) the fraction of share ownership, which are typical characteristics of a main bank that outsiders can observe (Kang, 1993; Kang and Shivdasani, 1996, 1997, 1999; Yasuda, 2007).[13] Based on these studies, we define a main bank as a firm's largest lender (city bank, regional bank, second regional bank, or trust bank) that is also one of the firm's top 30 largest shareholders.[14] In our analysis, we use a main bank dummy (*MBANK*) defined as a binary variable set to 1 if a firm has a main bank in year *t* and 0 otherwise. We obtain data on lending and large share ownership from the *NEEDS-Financial Quest* database of Nikkei Digital Media, Inc.

3.2 Regression model to test hypothesis 1

To test Hypothesis 1, we estimate the following model (2):

$$\begin{aligned} SPREAD_{i,j,t+1} = {} & \alpha_0 + \beta_1 AQ_{i,t} + \beta_2 MARGIN_{i,t} + \beta_3 INCR_{i,t} + \beta_4 MB_{i,t} + \beta_5 RND_{i,t} \\ & + \beta_6 STDROA_{i,t} + \beta_7 STDRET_{i,t} + \beta_8 SIZE_{i,t} + \beta_9 LEV_{i,t} \\ & + \beta_{10} ISSUESIZE_{i,j,t+1} + \beta_{11} MATURITY_{i,j,t+1} + \beta_{12} BCFIRM_{i,j,t+1} \\ & + \beta_{13} REGULATED_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (2)$$

where

$SPREAD_{i,j,t+1}$ = the yield spread at issue on straight bond *j* issued by firm *i* in fiscal year *t*+1.

$AQ_{i,t}$ = the proxy for earnings quality for firm *i* in year *t* estimated by the McNichols (2002) model. See section 3.1.1 for more detail.

$MARGIN_{i,t}$ = operating income for firm *i* in year *t* / sales revenue for firm *i* in year *t*.

$INCR_{i,t}$ = the interest coverage ratio for firm *i* at the end of year *t*.

$MB_{i,t}$ = firm *i*'s market value of equity at the end of year *t* / firm *i*'s book value of equity at the end of year *t*.

$RND_{i,t}$= research and development expense for firm *i* in year *t* / total assets for firm *i* in year *t*-1.

---

[13] We can also identify the main bank by investigating the existence of dispatched or interlocking directors. However, main banks usually do not dispatch directors to firms in ordinal conditions as mentioned before. Thus, we do not consider this factor to identify a firm's main bank.

[14] In case a firm has two or more largest lenders, we define the *MBANK* as dummy variable as 1 if one or more of them are among the firm's top 30 largest shareholders and 0 otherwise.

$STDROA_{i,t}$ = the standard deviation of firm *i*'s ROA calculated using five years of data from year *t*-4 to *t*.

$STDRET_{i,t}$ = the standard deviation of firm *i*'s monthly stock returns during year *t*.

$SIZE_{i,t}$ = the natural log of firm *i*'s total assets at the end of fiscal year *t*.

$LEV_{i,t}$ = firm *i*'s total liabilities at the end of year *t* / firm *i*'s total assets at the end of year *t*.

$ISSUESIZE_{i,j,t+1}$ = the natural log of the offering amount of bond *j* issued by firm *i* in fiscal year *t*+1.

$MATURITY_{i,j,t+1}$ = the maturity period of bond *j* issued by firm *i* in year *t*+1.

$BCFIRM_{i,j,t+1}$ = a dummy variable set to 1 if a bond management company is established and 0 otherwise.

$REGULATED_{i,t}$ = a dummy variable set to 1 if firm *i* in year *t* belongs to a regulated industry (i.e., electricity and gas industry) and 0 otherwise.

The dependent variable *SPREAD* represents the initial yield spread on the straight bond, which is the proxy for the cost of debt. We calculate the initial yield spreads as the corporate bond yields at the issuance date minus government bond yields with comparable maturity. The independent variable *AQ* is the proxy for earnings quality defined in Section 3.1.1. If hypothesis 1 is supported, the coefficient of *AQ* will be negative. Following prior studies (e.g. Bharath et al., 2008; Jiang, 2008; Shuto et al., 2009; Shuto and Kitagawa, 2011; Kitagawa and Shuto, 2017), we include several control variables. First, we include profit margin (*MARGIN*), interest coverage ratio (*INCR*), and market-to-book ratio (*MB*) to control for the issuer's profitability. Second, we include research and development intensity (*RND*), earnings variability (*STDROA*), stock return variability (*STDRET*), firm size (*SIZE*), and financial leverage (*LEV*) as variables to control for the issuer's risk. Finally, as a proxy for the characteristics of the issued bonds, we use the offered amount of the bond (*ISSUE*), maturity period in years (*MATURITY*), a bond management company dummy (*BCFIRM*), and a regulated industry dummy (*REGULATED*). We predict that the coefficients of *RND*, *STDROA*, *STDRET*, *LEV*, and *MATURITY* will be positive, and those of *MARGIN*, *INCR*, *MB*, *SIZE*, *BCFIRM*, and *REGULATED* will be negative. We can predict both signs of the coefficient of *ISSUESIZE*.[15]

In all of our regression analyses, we use scaled decile ranks of sequential variables to address potential outliers.[16] Furthermore, to mitigate the cross-sectional and time-series

[15] As Jiang (2008) discusses, if we interpret *ISSUE* as a proxy for a bond's liquidity, it will be negatively associated with *SPREAD*. In contrast, if we interpret *ISSUE* as a proxy for a firm's overall debt burden, it will be positively associated with *SPREAD*.

[16] We re-scale the decile ranks such that they range from zero to one.

dependence problems of the panel data, we use standard errors clustered at the firm- and year-levels, as proposed by Petersen (2009).

3.3 Research design to test hypotheses 2 and 3

We conduct two analyses to test hypotheses 2 and 3. First, we focus on sample firms with a main bank (*MBANK*=1) and divide them into two subsamples based on the extent of default risk. Then, we estimate regression model (2) for each subsample and compare the results of the coefficients of *AQ*.

To define the extent of a firms' default risk, we use Ohlson's (1980) O-score (Burgstahler et al., 1989; Han et al., 1992; Ittner et al., 1997; Dichev, 1998; Rogers and Stocken, 2005).[17, 18] The default risk dummy ($DEFAULT_{OSCORE}$) equals 1 if the O-score is equal to or is greater than the 75 percentile in year *t*, and 0 otherwise, positing that firms' default risk is relatively high (low) if $DEFAULT_{OSCORE}$ =1 (0).[19] Then, hypothesis 2 predicts that the coefficient of *AQ* will be significantly positive when the bond-issuing firms have a main bank (*MBANK*=1) and their default risk is lower ($DEFAULT_{OSCORE}$=0). Further, if hypothesis 3 is supported, the coefficient of *AQ* will be insignificant when the bond-issuing firms have a main bank (*MBANK*=1) and their default risk is higher ($DEFAULT_{OSCORE}$=1).

Second, we develop model (3) by adding the main bank dummy (*MBANK*) and the interaction term of the proxy for earnings quality and the main bank dummy (*AQ***MBANK*) to model (2).

$$SPREAD_{i,t+1} = \alpha_0 + \beta_1 AQ_{i,t} + \beta_2 MBANK_{i,t} + \beta_3 AQ_{i,t}*MBANK_{i,t} + \beta_4 MARGIN_{i,t} + \beta_5 INCR_{i,t} + \beta_6 MB_{i,t} + \beta_7 RND_{i,t} + \beta_8 STDROA_{i,t} + \beta_9 STDRET_{i,t}$$

---

[17] The O-score is calculated as follows: O-score = －1.32－0.407 × ln (total assets at the end of year *t*) +6.03×(total liabilities at the end of year *t* /total assets at the end of year *t*)－1.43al assets at the end of year year re *t* /total assets at the end of year *t*) +0.076×(current liabilities at the end of year *t* /current assets at the end of year *t*)－1.72×(1 if total liabilities at the end of year *t* > total assets at the end of year *t*, and 0 otherwise)－2.37×(net income for year *t* /total assets at the end of year *t*)－1.83(funds from operations for year *t* / total liabilities at the end of year *t*)+0.285×(1 if net loss for last two years, and 0 otherwise)－0.521×((net income for year *t*－net income for year *t*-1)/(| net income for year *t* |+| net income for year *t*-1 |)).

[18] We can use bond ratings as an alternative measure of a firm's default risk (Bharath et al., 2008; Jiang, 2008). Many studies in the U.S. generally assume that firms' default risks are high when bond ratings are non-investment grade (i.e., BB+ or below). However, in the Japanese bond market, there are very few non-investing grade bonds. Therefore, we use the O-score to identify "relatively" high default risk firms in our sample. In Section 6, we conduct an additional analysis defining default risk based on bond ratings.

[19] Although in our main analysis we use only the 75th percentile (i.e., the third quartile) as a cutoff point capturing management's stronger monitoring incentive, we also conduct an additional analysis of the choice of the cutoff point in Section 6.

$$+ \beta_{10}\, SIZE_{i,t} + \beta_{11}\, LEV_{i,t} + \beta_{12}\, ISSUESIZE_{i,t} + \beta_{13}\, MATURITY_{i,t}$$
$$+ \beta_{14}\, BCFIRM_{i,t} + \beta_{15}\, REGULATED_{i,t} + \varepsilon_{i,t} \quad (3)$$

The coefficient of *AQ* indicates the relationship between earnings quality and the yield spread in sample firms without a main bank. The sum of the coefficients of *AQ* and *AQ*MBANK* represent the relationship between earnings quality and the yield spread in sample firms with a main bank.

To test the hypotheses, we divide sample into two subsamples based on the extent of default risk ($DEFAULT_{OSCORE}$) and estimate regression model (3) for each subsample. If hypothesis 2 is supported, both the coefficient of *AQ* and the sum of the coefficients of *AQ* and *AQ*MBANK* will be significantly positive in the sub-sample with lower default risk. On the other hand, if hypothesis 3 is supported, the coefficient of *AQ* will be significantly positive while the sum of the coefficients of *AQ* and *AQ*MBANK* will be insignificant in the sub-sample with higher default risk. Furthermore, hypothesis 3 also predicts that the coefficient of *AQ*MBANK* will be significantly negative because it suggests that a main bank attenuates the relationship between earnings quality and the yield spread.

4 Sample and descriptive statistics

4.1 Sample selection criteria

Table 1 shows the sample selection procedure. Our initial sample consists of 3,670 observations, which covers all Japanese firms (except financial institutions) with straight bonds issued from January 2001 to December 2015. We also exclude 1,386 observations for which we are unable to obtain bond yield spread data. Furthermore, we eliminate all observations that do not have the necessary data to calculate the control variables. The final sample contains 2,181 bonds.

[Insert Table 1 about here]

We obtain the bond yield spread data and other bond issuing data from the *INDB Funding Eye* database from I-N Information Systems Ltd. We obtain data for financial statements, bank borrowing, and share ownership from the *NEEDS-Financial QUEST* database of Nikkei Digital Media, Inc. Furthermore, we obtain stock price data from the *Nikkei Portfolio Master* of Nikkei Media Marketing Financial Data Solutions, Inc. We collect bond ratings data from the *Bond Rating Data Service* of Rating and Investment Information, Inc.

4.2 Descriptive statistics and correlation matrix

Table 2 summarizes the descriptive statistics. The mean yield spread (*SPREAD*) and accruals quality (*AQ*) are 23.800 and 0.011, respectively. The mean value for the main bank dummy (*MBANK*) is 0.351, suggesting that about 35 percent of our sample is firms with ties to a main bank. Note that the standard deviation and maximum value of some sequential variables are quite large. Therefore, we conduct our analyses by using scaled decile ranks of sequential variables.

[Insert Table 2 about here]

Table 3 shows the Pearson and Spearman correlation matrix for the variables in our main analysis. For both matrices, *AQ* has a significantly positive correlation with *SPREAD*, suggesting that reporting higher (lower) accruals quality decreases (increases) the bond yield spread. The correlation between *MBANK* and *SPREAD* is also positive, though it is insignificant. In addition, *MARGIN* and *INCR* are negatively related to *MBANK*. This may suggest that a main bank provides poor profitability firms with creditworthiness, which enables them to issue straight bonds, though they incur a higher cost of debt.

[Insert Table 3 about here]

Because we observe higher correlations among independent variables, we calculate variance inflation factors (VIF), and find that VIF values are below 10. Therefore, we conclude that the multicollinearity problem in our regression models is not serious.

5 Empirical results

5.1 Results for hypothesis 1

Table 4 presents the results of testing the relationship between accruals quality and the bond yield spread. The table shows that the coefficient of *AQ* (0.095) is significantly positive at the 1 percent level, implying that reporting higher earnings quality lowers the cost of debt, which is consistent with hypothesis 1.

[Insert Table 4 about here]

As for the coefficients of the control variables, almost all are consistent with the expected signs, while the coefficients of *INCR* and *BCFIRM* are unexpectedly positive.

5.2 Results for hypotheses 2 and 3

5.2.1 Preliminary analyses

Before testing hypotheses 2 and 3, we perform a preliminarily analysis of the general effect of a main bank on the relationship between earnings quality and the bond yield spread. Specifically, we conduct two analyses similar to those in testing hypothesis 2 and 3 as explained in the previous section.

First, we divide our sample into two subsamples based on the main bank dummy (*MBANK*) and estimate regression model (2) for each subsample. Table 5 summarizes the results. The results show that, in both subsamples, the coefficient of *AQ* is significantly positive. This suggests that reporting higher earnings quality lowers the cost of debt, regardless of the existence of main banks.

[Insert Table 5 about here]

In the second analysis, we estimate regression model (3) and include *MBANK* and the interaction term of *AQ* and *MBANK* (*AQ***MBANK*) as independent variables of model (2). Table 6 reports the results. The results show that the coefficient of *AQ* (0.092) is significantly positive, suggesting that, if firms do not have a main bank, reporting higher earnings quality lowers the bond yield spread. Furthermore, the result of the *F*-test indicates that the sum of the coefficients of *AQ* and *AQ***MBANK* (0.082) is also significantly positive. However, the coefficient of *AQ***MBANK* (-0.010) is not significant, suggesting that the existence of main bank does not affect the relationship between earnings quality and the bond yield spread in an analysis that includes all observations. These results are consistent with those of Table 5.

[Insert Table 6 about here]

5.2.2 Tests of hypotheses 2 and 3

As our primary concern, we investigate the effect of default risk on the relationships among earnings quality, a main bank, and the bond yield spread. First, as we describe in Section 3, we divide firms with a main bank (*MBANK*=1) into two subsamples based on the extent of default risks and estimate model (2) for each subsample.

Table 7 summarizes the results. In the lower default risk subsample (*MBANK*=1 & $DEFAULT_{OSCORE}$=0), the coefficient of *AQ* (0.142) is significantly positive, which is consistent with hypothesis 2. In the higher default risk subsample (*MBANK*=1 & $DEFAULT_{OSCORE}$=1), in contrast, the coefficient of *AQ* (-0.003) is insignificant. This

suggests that when the financial conditions of firms with a main bank worsen, earnings quality does not affect the bond yield spread, which is consistent with hypothesis 3.

[Insert Table 7 about here]

Furthermore, we divide the full sample into two subsamples based on default risk and estimate model (3) for each subsample. Table 8 reports the results. In the lower default risk subsample ($DEFAULT_{OSCORE}$=0), the coefficient of *AQ* (0.086) is significantly positive and the sum of the coefficients of *AQ* and *AQ*MBANK* (0.145) is also significantly positive (The *F*-stat. is 6.740, significant at the 1 percent level). This suggests that reporting high quality earnings has pronounced effects on the bond yield spread regardless of the existence of main bank, consistent with hypothesis 2.

[Insert Table 8 about here]

However, in the higher default risk subsample ($DEFAULT_{OSCORE}$=1), the sum of the coefficients of *AQ* and *AQ*MBANK* (-0.028) is not significant (The *F*-stat. is 0.490), while the coefficient of *AQ* (0.116) is still positive and significant. These results imply that although high quality earnings lowers the yield spread when firms do not have a main bank, consistent with the results for all observations, earnings quality does not affect the bond yield spread when firms have a main bank. Furthermore, note that the coefficient of *AQ*MBANK* (-0.144) is significantly negative. This suggests that if firms have a main bank, the relationship between earnings quality and the bond yield spread becomes weaker, consistent with hypothesis 3.

The results in this section present evidence that when the bond-issuing firms with a main bank have a relatively high default risk, earnings quality does not affect the bond yield spread. This implies that when bond-issuing firms with main bank do not have sound financial conditions, the increased bank monitoring with private information substitutes for earnings quality and decreases the demand for it in Japanese bond contracts.

6 Additional analyses

In this section, we conduct several additional analyses. First, we examine whether our results depend on the definition of the default risk measure. Our main analyses identify higher default risk firms based on the cutoff point, the 75th percentile of the O-score. Because our hypothesis only assumes that a main bank has a stronger incentive to monitor their borrowing firms as their performance worsens, we do not posit that the 75 percentile is the right threshold where main bank monitoring strengthens. Thus, we examine whether our main results change *gradually* according to the cut-off point of O-score. Specifically, we

redefine $DEFAULT_{OSCORE}$ as a dummy variable set to 1 if the O-score is equal to or greater than: 1) the 65th percentile, 2) the 70th percentile, 3) the 75th percentile (cutoff point of our main analysis), 4) the 80th percentile, 5) the 85th percentile, and 0 otherwise, and reexamine the analyses in Table 7.

We show the results in Table 9. In the lower default risk subsample (*MBANK*=1 & $DEFAULT_{OSCORE}$ =0), the coefficient of *AQ* is significantly positive, regardless of the extent of default risk. By contrast, in the higher default risk subsample (*MBANK*=1 & $DEFAULT_{OSCORE}$ =1), the coefficient of *AQ* is significantly positive only when we define firms with high default risk those over the 65th percentile of the O-score. These results are consistent with our assumption that a main bank is more likely to monitor borrowing firms with a higher default risk.

[Insert Table 9 about here]

Second, we use credit ratings as a proxy for default risk instead of the O-score. Some studies in the U.S. generally assume that firms' default risks are high when bond ratings are non-investment grade (Bharath et al., 2008; Jiang, 2008). However, in the Japanese bond market, there are quite few high yield, non-investment grade bonds. In fact, we find that there are *no* non-investment grade bonds in our sample. This is why we primary use the O-score for default risk measure. In this section, we define the default risk dummy ($DEFAULT_{RATING}$) as a dummy variable set to 1 if the firms have an A− or below rating and 0 otherwise, and reexamine the analyses summarized in Table 7.[20]

Table 10 reports the results.[21] We find that in the lower default risk subsample ($DEFAULT_{RATING}$ =0), the coefficient of *AQ* is significantly positive. By contrast, in the higher default risk subsample ($DEFAULT_{RATING}$ =1), the coefficient of *AQ* is not significant.[22] These results are consistent with those in Table 7. These results suggest that our results are robust under alternative definition and measures of default risk.

[Insert Table 10 about here]

Finally, we reexamine our hypotheses using alternative proxies for earnings quality. In the main analysis, we adopt accruals quality estimated by the McNichols (2002) model. In this section, we use 1) the absolute values of discretionary accruals estimated by the CFO modified Jones model (Kasznik, 1999), 2) the absolute value of discretionary accruals

[20] Although there are firms with a BBB+ grade in our sample, we do not have enough observations to conduct analyses. Therefore, we define firms that have A− or below rating as firms with relatively high default risk.

[21] Due to data availability for credit ratings, the observations in this analysis decrease from 2,181 to 1,663.

[22] The higher default risk subsample does not include firms that belong to regulated industries. Therefore, we exclude *REGULATED* from the regression model when analyzing the higher default risk subsample.

estimated using the performance-matched Jones model (Kothari et al., 2005), and 3) the absolute value of accruals quality estimated by the Dechow and Dichev (2002) model (Dechow and Dichev, 2002) as proxies for earnings quality, and reexamine the analyses summarized in Tables 4 and 7.

We show the results in Table 11 and 12. In Table 11, we find that the coefficient of *AQ* is significantly positive, regardless of the definition of earnings quality. Furthermore, Table 12 shows that the coefficient of *AQ* is significantly positive in the lower default risk subsample, while it is insignificant in the higher default risk subsample. These results are consistent with those of Tables 4 and 7, suggesting that our results are robust to alternative earnings quality measures.

[Insert Table 11 about here]

[Insert Table 12 about here]

7 Summary and conclusion

This study examines the effect of the availability of private information in bank monitoring on the demand for earnings quality in bond contracts. We find that when bond-issuing firms have stable financial conditions, accruals quality is negatively associated with the bond yield spread, regardless of the existence of a main bank. In contrast, we find that when bond-issuing firms with a main bank have relatively high default risk, there is no relationship between accruals quality and the bond yield spread. Further, we also find that when the default risk of bond-issuing firms *without* a main bank is relatively high, accruals quality is negatively associated with the bond yield spread.

The overall results suggest that while bond investors *generally* use earnings quality to evaluate bond-issuing firms, they are likely to delegate their monitoring role to the main bank of bond-issuing firms when the firm's performance declines, which results in a decrease in the demand for higher earnings quality.

There are some limitations to this study. First, our results depend on the validity of the proxies such as accruals quality and main bank. Second, some studies argue that it is possible that the function of main banks has changed recently (Hoshi and Kashyap, 2001; Miyajima and Kuroki, 2007). Future studies should consider this point and conduct additional analyses.

References

Aghion, P., Bolton, P., 1992. An incomplete contracts approach to financial contracting. *Rev. Econ. Stud.* 59(3), 473-494.

Ali, A., Hwang, L.S., 2000. Country-Specific factors related to financial reporting and the value relevance of accounting data, *J. Account. Res.* 38(1), 1-21.

Aoki, M., 1994a. Monitoring characteristics of the main bank system, in Aoki, M., Patrick, H. (Eds.), The Japanese Main Bank System; Its Relevance for Developing and Transforming Economies, Oxford University Press, 109-141.

Aoki, M., 1994b. The contingent governance of teams: Analysis of institutional complementarity. *Int. Econ. Rev.* 35(3), 657-676.

Aoki, M. Patrick, H. (Eds.), 1994. The Japanese main bank system: Its relevance for developing and transforming economies. Oxford University Press, 1994.

Aoki, M., Patrick, H., Sheard, P., 1994. The Japanese main bank system: An introductory overview," in Aoki, M., Patrick, H. (Eds.), The Japanese Main Bank System: Its Relevance for Developing and Transforming Economies, Oxford University Press.

Armstrong, S.C., Guay, W.R., Weber J.P., 2010. The role of information and financial reporting in corporate governance and debt contracting. *J. Account. & Econ.* 50(2-3), 179-234.

Ball, R., Kothari, S.P., Robin, A., 2000. The effect of international institutional factors on properties of accounting earnings. *J. Account. & Econ.* 29(1), 1-51.

Ball, R., Shivakumar, L., 2005. Earnings quality in UK private firms: Comparative loss recognition timeliness. *J. Account. & Econ*. 39(1), 83-128.

Bharath, S.T., Sunder, J., Sunder, S.V., 2008. Accounting quality and debt contracting. *Account. Rev.* 83(1), 1-28.

Biddle, G.C., Hilary, G., 2006. Accounting quality and firm-level capital investment. *Account. Rev.* 81(5), 963-982.

Burgstahler, D., Jiambalvo, J., Noreen, E. 1989. Changes in the probability of bankruptcy and equity value. *J. Account. & Econ*. 11(2), 207-224.

Dechow, P.M., Dichev, I.D., 2002. The quality of accruals and earnings: The role of accrual estimation errors. *Account. Rev.* 77(supplement), 35-59.

Dewatripont, M., Tirole, J., 1994. A theory of debt and equity: Diversity of securities and manager-shareholder congruence. *Q. J. Econ.* 109(4), 1027-1054.

Diamond, D.W., 1991. Monitoring and reputation: The choice between bank loans and directly placed debt. *J. Political Econ.* 99(4), 689-721.

Dichev, I.D., 1998. Is the risk of bankruptcy a systematic risk? *J. Finance.* 53(3), 1131-1147.

Easley, D., O'Hara, M. 2004. Information and the cost of capital. *J. Finance.* 59(4), 1553-1583.

Fama, E.F., 1985. What's different about banks? *J. Monetary Econ.* 15(1), 29-39.

Fischer, P.E., Verrecchia, R.E., 1997. The effect of limited liability on the market response to disclosure. *Contemp. Account. Res*. 14(3), 515-541.

Francis, J., Lafond, R., Olsson, P., Schipper, K., 2005. The market pricing of accruals

quality. *J. Account. & Econ*. 39(2), 295-327.
Guenther, D.A., and D.Young, 2000. The Association between financial accounting measures and real economic activity: A multinational study. *J. Account. & Econ.* 29(1), 53-72.
Han, B.H., Jennings, R., Noel, J. 1992. Communication of nonearnings information at the financial statements release date. *J. Account. & Econ.* 15(1), 63-86.
Hirota, S., 2009. Nihon no Main Bank Kankei: Monitoring kara Risk Hedge he. RIETI Discussion Paper Series 09-J-023, 1-40 (in Japanese).
Hoshi, T., Kashyap, A. 2001. Corporate Financing and Governance in Japan: The Road to the Future. The MIT Press.
Ittner, C.D., Larcker, D.F., Rajan, M.V., 1997. The choice of performance measures in annual bonus contracts. *Account. Rev.* 72(2), 231-255.
Jiang, J., 2008. Beating earnings benchmarks and the cost of debt. *Account. Rev.* 83(2), 377-416.
Jones, J. J., 1991. Earnings management during import relief investigations. *J. Account. Res.* 29(2), 193-228.
Kang, J.-K., 1993. The international market for corporate control: Mergers and acquisitions of US firms by Japanese firms. *J. Financial Econ.* 34(3), 345-371.
Kang, J.-K., Shivdasani, A., 1995. Firm performance, corporate governance, and top executive turnover in Japan. *J. Financial Econ.* 38(1), 29-58.
Kang, J.-K., Shivdasani, A., 1996. Does the Japanese governance system enhance shareholder wealth? Evidence from the stock-price effects of top management turnover. *Rev. Financial Stud.* 9(4), 1061-1095.
Kang, J.-K., Shivdasani, A., 1997. Corporate restructuring during performance declines in Japan. *J. Financial Econ.* 46(1), 29-65.
Kang, J.-K., Shivdasani, A., 1999. Alternative mechanisms for corporate governance in Japan: An analysis of independent and bank-affiliated firms. *Pacific-Basin Finance J.* 7(1), 1-22.
Kaplan, S.N., 1994. Top executives rewards and firm performance: A comparison of Japan and the United States. *J. Political Econ.* 102(3), 510-546.
Kaplan, S.N., Minton, B., 1994. Appointments of outsiders to Japanese boards: Determinants and implications for managers. *J. Financial Econ.* 36(2), 225-258.
Kasznik, R., 1999. On the association between voluntary disclosure and earnings management. *J. Account. Res.* 37(1), 57-81.
Khurana, I.K., Raman, K.K., 2003. Are fundamentals priced in the bond market? *Contemp. Account Res.* 20(3), 465-494.
Kitagawa, N., Shuto, A., 2017. Management earnings forecasts and the cost of debt. WP.
Kothari, S.P., Leone, A.J., Wasley, C.E., 2005. Performance matched discretionary accrual measures. *J. Account. & Econ*. 39(1), 163-197.
McNichols, M.F., 2002. Discussion of the quality of accruals and earnings: The role of accrual estimation errors. *Account. Rev.* 77(supplement), 61-69.
Miyajima, H., Kuroki, F., 2007. The unwinding of cross-shareholding in Japan: Causes, effects, and implications, in Aoki, M., Jackson, G., Miyajima, H. (Eds.), Corporate Governance in Japan: Institutional Change and Organizational Diversity, Oxford

University Press, pp.79-124.
Nikolaev, V.V., 2010. Debt covenants and accounting conservatism. *J. Account. Res.* 48(1), 137-176.
Ohlson, J.A., 1980. Financial ratios and the probabilistic prediction of bankruptcy. *J. Account. Res.* 18(1), 109-131.
Okuda, S., Yasuda, Y., 2003. Main Bank ha Zaimukiki Kigyo no Kaikei Seisaku ni Eikyo wo Ataeru ka? *J Tokyo Keizai Univ.* 234, 231-244 (in Japanese).
Petersen, M.A., 2009. Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches. *The Review of Financial Studies.* 22(1), 435-480.
Plummer, E.C., Tse, S.Y., 1999. The effect of limited liability on the informativeness of earnings: Evidence from the stock and bond markets. *Contemp. Account. Res.* 16(3), 541-574.
Rogers, J.L., Stocken, P.C., 2005. Credibility of management forecasts. *Account. Rev.* 80(4), 1233-1260.
Sengupta, P., 1998. Corporate disclosure quality and the cost of debt. *Account. Rev.* 73(4), 459-474.
Sheard, P., 1994a. Main banks and the governance of financial distress, in Aoki, M., Patrick, H. (Eds.), The Japanese Main Bank System; Its Relevance for Developing and Transforming Economies, Oxford University Press, 188-230.
Sheard, P., 1994b. Reciprocal delegated monitoring in the Japanese main bank system. *J. Jpn. & Int. Econ.* 8(1), 1-21.
Shuto, A., Otomasa, S., Suda, K., 2009. The relative and incremental explanatory powers of dirty surplus items for debt interest rate. *J. Int. Account. Audit. & Tax.* 18(2), 119-131.
Shuto, A., Kitagawa, N., 2011. The effect of managerial ownership on the cost of debt: Evidence from Japan. *J. Account. Aud. & Finance.* 26(3), 590-620.
Takasu, Y., 2012. The effect of accounting earnings attributes on bond spread. *Jpn. J. Finance*. 32(1-2), 55-76 (in Japanese).
Umezawa, T., Ebihara, T., 2016. The main bank relationship and earnings quality. *Waseda shogaku*, 446, 163-213 (in Japanese).
Vashishtha, R., 2014. The role of bank monitoring in borrowers' discretionary disclosure: Evidence from covenant violations. *J. Account. & Econ*. 57(2), 176-195.
Yasuda, A., 2007. Bank relationships and underwriter competition: Evidence from Japan. *J. Financial Econ.* 86(2), 369-404.

Table 1 Sample selection criteria

Criteria	Obs.
Japanese straight bond issued from January 2001 to December 2015 excluding financial institutions (banks, securities companies, and insurance companies) and other financial institutions (credit and leasing).	3,670
Less: The bond yield spread data (*SPREAD*) is not available.	(1,386)
Less: The necessary data for calculating accruals quality (*AQ*), main bank dummy (*MBANK*), default risk dummy ($DEFAULT_{OSCORE}$), and other control variables are not available.	(103)
Final sample	2,181

Note:
The bond yield spread data and other bond issuing data are obtained from *INDB Funding Eye* from I-N Information Systems Ltd. The data for financial statements, bank borrowing, and share ownership are obtained from the *NEEDS-Financial QUEST database* of Nikkei Digital Media, Inc. Furthermore, we obtain stock price data from the *Nikkei Portfolio Master* of Nikkei Media Marketing Financial Data Solutions, Inc. The bond ratings data are obtained from *Bond Rating Data Service* of Rating and Investment Information, Inc.

Table 2 Descriptive statistics

	Mean	Min.	Q1	Median	Q3	Max.	STD	Obs.
SPREAD	23.800	2.000	12.000	19.000	29.000	264.000	19.264	2,181
AQ	0.011	0.000	0.003	0.008	0.014	0.109	0.012	2,181
MBANK	0.351	0.000	0.000	0.000	1.000	1.000	0.477	2,181
$DEFAULT_{OSCORE}$	0.249	0.000	0.000	0.000	0.000	1.000	0.429	2,181
$DEFAULT_{RATING}$	0.138	0.000	0.000	0.000	0.000	1.000	0.345	1,663
MARGIN	0.081	-0.198	0.037	0.069	0.120	0.384	0.069	2,181
INCR	22.105	-18.996	2.747	5.283	12.617	7540.167	232.958	2,181
MB	1.470	0.414	1.022	1.280	1.665	6.959	0.783	2,181
RND	0.014	0.000	0.001	0.003	0.016	0.285	0.024	2,181
STDROA	0.014	0.000	0.005	0.008	0.017	0.135	0.014	2,181
STDRET	0.076	0.014	0.051	0.070	0.096	0.363	0.035	2,181
SIZE	13.632	8.173	12.981	13.703	14.456	16.901	1.158	2,181
LEV	0.674	0.130	0.586	0.712	0.780	0.942	0.146	2,181
ISSUESIZE	9.759	7.601	9.210	9.903	10.127	12.301	0.652	2,181
MATURITY	8.607	2.000	5.000	8.000	10.000	30.000	4.549	2,181
BCFIRM	0.283	0.000	0.000	0.000	1.000	1.000	0.451	2,181
REGULATED	0.273	0.000	0.000	0.000	1.000	1.000	0.446	2,181

Note:

SPREAD = the initial yield spread on the straight bond *j* issued by firm *i* in fiscal year *t*+1.

AQ = the proxy for earnings quality for firm *i* in year *t*, estimated by the McNichols (2002) model.

MBANK = a dummy variable set to "1" if a firm has a main bank and "0" otherwise. We define main bank as a firm's largest lender (city bank, regional bank, second regional bank or trust bank) that is also the firm's top 30 largest shareholder.

$DEFAULT_{OSCORE}$ = a dummy variable set to "1" if the O-score equals to or is greater than the 75 percentile in year *t* and "0" otherwise.

$DEFAULT_{RATING}$ = a dummy variable set to "1" if the firms have A− or below rating and "0" otherwise.

MARGIN = operating income for firm *i* in year *t* / sales revenue for firm *i* in year *t*.

INCR = the interest coverage ratio for firm *i* at the end of year *t*.

MB = firm *i*'s market value of equity at the end of year *t* / firm *i*'s book value of equity at the end of year *t*.

RND = research and development expense for firm *i* in year *t* / total assets for firm *i* in year *t*-1.

STDROA = the standard deviation of firm *i*'s ROA calculated using five years data from year *t*-4 to *t*.

STDRET = the standard deviation of firm *i*'s monthly stock returns during year *t*.

SIZE = the natural log of the firm *i*'s total assets at the end of fiscal year *t*.

LEV = firm *i*'s total liabilities at the end of year *t* / firm *i*'s total assets at the end of year *t*.

ISSUESIZE = the natural log of the offering amount of the bond *j* issued by firm *i* in fiscal year *t*+1.

MATURITY = the maturity period of bond *j* issued by firm *i* in year *t*+1.

BCFIRM = a dummy variable set to "1" if a bond management company is established and "0" otherwise.

REGULATED = a dummy variable set to "1" if firm *i* in year *t* belongs to regulated industries (i.e., electricity and gas industry) and "0" otherwise.

After Table 2, we use scaled decile ranks of sequential variables to address potential outliers.

Table 3　Correlation matrix

	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰
①*SPREAD*		**0.22**	0.05	**0.34**	**0.30**	**-0.39**	**0.11**	-0.05	**0.08**	**0.32**	**0.48**	**-0.27**	-0.01	**-0.12**	**-0.05**	**-0.14**	**-0.22**
②*AQ*	**0.21**		-0.01	**0.10**	0.06	-0.04	**0.21**	**0.12**	**0.12**	**0.22**	**0.20**	-0.05	**-0.18**	0.03	**-0.12**	**-0.21**	**-0.23**
③*MBANK*	0.05	-0.03		0.03	-0.03	**-0.09**	-0.03	**-0.10**	**-0.08**	**0.07**	-0.02	**-0.18**	-0.04	**-0.08**	-0.03	**0.07**	**0.15**
④$DEFAULT_{OSCORE}$	**0.33**	**0.06**	0.05		**0.15**	**-0.30**	**-0.09**	0.04	**-0.20**	**0.09**	**0.34**	**-0.11**	**0.26**	**-0.15**	-0.05	-0.05	**-0.11**
⑤$DEFAULT_{RATING}$	**0.30**	**0.06**	-0.03	**0.15**		**-0.11**	0.05	0.05	0.00	**0.11**	**0.19**	**-0.23**	0.00	**-0.19**	**-0.17**	**-0.15**	**-0.22**
⑥*MARGIN*	**-0.36**	**-0.04**	**-0.09**	**-0.31**	**-0.12**		-0.01	**0.39**	**-0.13**	**-0.32**	**-0.29**	**0.25**	0.01	-0.04	**0.21**	0.04	-0.01
⑦*INCR*	**0.11**	**0.23**	-0.05	**-0.12**	0.05	**0.07**		**0.13**	**0.37**	**0.31**	**0.19**	-0.06	**-0.73**	-0.03	**-0.28**	**-0.53**	**-0.44**
⑧*MB*	-0.04	**0.10**	**-0.13**	0.05	0.05	**0.33**	**0.12**		0.03	0.05	**0.12**	**0.40**	**0.07**	0.02	0.06	**-0.22**	**-0.33**
⑨*RND*	**0.06**	**0.12**	**-0.11**	**-0.20**	-0.01	**-0.10**	**0.36**	-0.03		**0.39**	**0.15**	-0.03	**-0.46**	**0.17**	**-0.27**	**-0.22**	**-0.18**
⑩*STDROA*	**0.30**	**0.25**	0.03	**0.06**	**0.11**	**-0.29**	**0.30**	**0.06**	**0.39**		**0.46**	**-0.08**	**-0.34**	**0.08**	**-0.28**	**-0.20**	**-0.21**
⑪*STDRET*	**0.47**	**0.23**	-0.03	**0.28**	**0.18**	**-0.23**	**0.21**	**0.09**	**0.19**	**0.47**		**-0.10**	**-0.10**	-0.03	**-0.20**	**-0.18**	**-0.32**
⑫*SIZE*	**-0.28**	-0.04	**-0.20**	**-0.13**	**-0.23**	**0.19**	-0.05	**0.34**	0.00	-0.03	**-0.08**		**0.19**	**0.40**	**0.19**	**-0.11**	**-0.14**
⑬*LEV*	0.00	**-0.22**	0.00	**0.28**	0.00	-0.05	**-0.72**	**0.10**	**-0.47**	**-0.34**	**-0.16**	**0.16**		0.05	**0.25**	**0.41**	**0.30**
⑭*ISSUESIZE*	**-0.15**	0.01	**-0.12**	**-0.16**	**-0.19**	-0.02	-0.05	0.01	**0.15**	**0.07**	-0.04	**0.46**	0.03		**-0.09**	**0.18**	**0.16**
⑮*MATURITY*	**-0.07**	**-0.10**	-0.01	**-0.07**	**-0.17**	**0.21**	**-0.25**	0.05	**-0.20**	**-0.25**	**-0.19**	**0.20**	**0.20**	**-0.06**		0.05	**0.12**
⑯*BCFIRM*	**-0.17**	**-0.23**	0.04	-0.05	**-0.15**	0.05	**-0.49**	**-0.18**	**-0.20**	**-0.21**	**-0.22**	-0.02	**0.39**	**0.24**	0.03		**0.75**
⑰*REGULATED*	**-0.26**	**-0.27**	**0.11**	**-0.13**	**-0.22**	0.00	**-0.46**	**-0.30**	**-0.15**	**-0.23**	**-0.34**	-0.04	**0.32**	**0.21**	**0.13**	**0.71**	

Note:

Spearman (Pearson) correlations are above (below) the diagonal.

SPREAD = the initial yield spread on the straight bond *j* issued by firm *i* in fiscal year *t*+1.

AQ = the proxy for earnings quality for firm *i* in year *t*, which is estimated by the McNichols (2002) model.

MBANK = a dummy variable set to "1" if a firm has a main bank and "0" otherwise. We define main bank as a firm's largest lender (city bank, regional bank, second regional bank or trust bank) that is also the firm's top 30 largest shareholder.

$DEFAULT_{OSCORE}$ = a dummy variable set to "1" if the O-score equals to or is greater than the 75 percentile in year *t* and "0" otherwise.

$DEFAULT_{RATING}$ = a dummy variable set to "1" if the firms have A− or below rating and "0" otherwise

MARGIN = operating income for firm *i* in year *t* / sales revenue for firm *i* in year *t*.

INCR = the interest coverage ratio for firm *i* at the end of year *t*.

MB = firm *i*'s market value of equity at the end of year *t* / firm *i*'s book value of equity at the end of year *t*.

RND = research and development expense for firm *i* in year *t* / total assets for firm *i* in year *t*-1.

STDROA = the standard deviation of firm *i*'s ROA calculated using five years data from year *t*-4 to *t*.

STDRET = the standard deviation of firm *i*'s monthly stock returns during year *t*.

SIZE = the natural log of the firm *i*'s total assets at the end of fiscal year *t*.

LEV = firm *i*'s total liabilities at the end of year *t* / firm *i*'s total assets at the end of year *t*.

ISSUESIZE = the natural log of the offering amount of the bond *j* issued by firm *i* in fiscal year *t*+1.

MATURITY = the maturity period of bond *j* issued by firm *i* in year *t*+1.
BCFIRM = a dummy variable set to "1" if a bond management company is established and "0" otherwise.
REGULATED = a dummy variable set to "1" if firm *i* in year *t* belongs to regulated industries (i.e., electricity and gas industry) and "0" otherwise.
Bold indicates statistically significant at less than 0.01 level of significance using a two-tailed t-test.

Table 4 The relationship between accruals quality and the bond yield spread

Dependent variable: *SPREAD*			
	Pred. sign	Coeff.	*t-stat.*
Intercept	?	0.240***	3.298
AQ	+	0.095***	2.936
MARGIN	–	-0.227***	-5.284
INCR	–	0.149**	2.516
MB	–	-0.009	-0.251
RND	+	0.006	0.157
STDROA	+	0.104***	3.111
STDRET	+	0.320***	6.685
SIZE	–	-0.284***	-4.186
LEV	+	0.268***	4.148
ISSUESIZE	–/+	0.009	1.034
MATURITY	+	0.143***	2.728
BCFIRM	–	0.030	1.034
REGULATED	–	-0.131***	-3.006
Adj. R^2		0.397	
Obs.		2,181	

Note:

SPREAD = the initial yield spread on the straight bond *j* issued by firm *i* in fiscal year *t*+1.

AQ = the proxy for earnings quality for firm *i* in year *t*, which is estimated by the McNichols (2002) model.

MARGIN = operating income for firm *i* in year *t* / sales revenue for firm *i* in year *t*.

INCR = the interest coverage ratio for firm *i* at the end of year *t*.

MB = firm *i*'s market value of equity at the end of year *t* / firm *i*'s book value of equity at the end of year *t*.

RND = research and development expense for firm *i* in year *t* / total assets for firm *i* in year *t*-1.

STDROA = the standard deviation of firm *i*'s ROA calculated using five years data from year *t*-4 to *t*.

STDRET = the standard deviation of firm *i*'s monthly stock returns during year *t*.

SIZE = the natural log of the firm *i*'s total assets at the end of fiscal year *t*.

LEV = firm *i*'s total liabilities at the end of year *t* / firm *i*'s total assets at the end of year *t*.

ISSUESIZE = the natural log of the offering amount of the bond *j* issued by firm *i* in fiscal year *t*+1.

MATURITY = the maturity period of bond *j* issued by firm *i* in year *t*+1.

BCFIRM = a dummy variable set to "1" if a bond management company is established and "0" otherwise.

REGULATED = a dummy variable set to "1" if firm *i* in year *t* belongs to regulated industries (i.e., electricity and gas industry) and "0" otherwise.

t-statistics are corrected for heteroscedasticity, and cross-sectional and time-series correlation using a two-way cluster at the firm and year levels proposed by Petersen (2009).

*** Statistically significant at the 0.01 level of significance using a two-tailed *t*-test.

** Statistically significant at the 0.05 level of significance using a two-tailed *t*-test.

* Statistically significant at the 0.1 level of significance using a two-tailed *t*-test.

Table 5 The effect of main banks on the relationship between accruals quality and the bond yield spread (1)

Dependent variable: *SPREAD*					
		Model (1) *MBANK* = 0		Model (2) *MBANK* = 1	
	Pred. sign	Coeff.	*t-stat.*	Coeff.	*t-stat.*
Intercept	?	0.239***	3.108	0.229**	2.428
AQ	+	0.106***	3.335	0.091**	2.221
MARGIN	–	-0.253***	-5.562	-0.158***	-2.711
INCR	–	0.181**	2.113	0.081	1.089
MB	–	-0.003	-0.072	-0.010	-0.219
RND	+	0.000	-0.001	0.049	0.933
STDROA	+	0.061	1.105	0.152**	2.443
STDRET	+	0.323***	5.387	0.323***	7.061
SIZE	–	-0.297***	-3.995	-0.261***	-3.295
LEV	+	0.287***	4.278	0.215**	2.403
ISSUESIZE	–/+	0.033	0.892	-0.032	-0.649
MATURITY	+	0.124**	2.183	0.204***	3.235
BCFIRM	–	0.003	0.075	0.099*	1.862
REGULATED	–	-0.083 *	-1.842	-0.234***	-3.267
Adj. R^2		0.367		0.473	
Obs.		1,415		766	

Note:

SPREAD = the initial yield spread on the straight bond *j* issued by firm *i* in fiscal year *t*+1.

AQ = the proxy for earnings quality for firm *i* in year *t*, which is estimated by the McNichols (2002) model.

MBANK = a dummy variable set to "1" if a firm has a main bank and "0" otherwise. We define main bank as a firm's largest lender (city bank, regional bank, second regional bank or trust bank) that is also the firm's top 30 largest shareholder.

MARGIN = operating income for firm *i* in year *t* / sales revenue for firm *i* in year *t*.

INCR = the interest coverage ratio for firm *i* at the end of year *t*.

MB = firm *i*'s market value of equity at the end of year *t* / firm *i*'s book value of equity at the end of year *t*.

RND = research and development expense for firm *i* in year *t* / total assets for firm *i* in year *t*-1.

STDROA = the standard deviation of firm *i*'s ROA calculated using five years data from year *t*-4 to *t*.

STDRET = the standard deviation of firm *i*'s monthly stock returns during year *t*.

SIZE = the natural log of the firm *i*'s total assets at the end of fiscal year *t*.

LEV = firm *i*'s total liabilities at the end of year *t* / firm *i*'s total assets at the end of year *t*.

ISSUESIZE = the natural log of the offering amount of the bond *j* issued by firm *i* in fiscal year *t*+1.

MATURITY = the maturity period of bond *j* issued by firm *i* in year *t*+1.

BCFIRM = a dummy variable set to "1" if a bond management company is established and "0" otherwise.

REGULATED = a dummy variable set to "1" if firm *i* in year *t* belongs to regulated industries (i.e., electricity and gas industry) and "0" otherwise.

t-statistics are corrected for heteroskedasticity, and cross-sectional and time-series correlation using a two-way cluster at the firm and year levels proposed by Petersen (2009).

*** Statistically significant at the 0.01 level of significance using a two-tailed *t*-test.

** Statistically significant at the 0.05 level of significance using a two-tailed *t*-test.

* Statistically significant at the 0.1 level of significance using a two-tailed *t*-test.

Table 6 The effect of main banks on the relationship between accruals quality and the bond yield spread (2)

Dependent variable: *SPREAD*			
	Pred. sign	Coeff.	*t-stat.*
Intercept	?	0.233***	3.212
AQ	+	0.092***	2.586
MBANK	–/+	0.009	0.439
*AQ*MBANK*	–	-0.010	-0.230
MARGIN	–	-0.226***	-5.305
INCR	–	0.150**	2.530
MB	–	-0.009	-0.242
RND	+	0.009	0.228
STDROA	+	0.102***	3.010
STDRET	+	0.321***	6.612
SIZE	–	-0.281***	-4.174
LEV	+	0.269***	4.189
ISSUESIZE	–/+	0.010	0.292
MATURITY	+	0.143***	2.719
BCFIRM	–	0.031	1.068
REGULATED	–	-0.133***	-2.945
Adj. R^2		0.397	
Obs.		2,181	
F-test		Coeff.	*F*-stat.
*AQ+AQ*MBANK*		0.082**	5.26

Note:

SPREAD = the initial yield spread on the straight bond *j* issued by firm *i* in fiscal year *t*+1.

AQ = the proxy for earnings quality for firm *i* in year *t*, which is estimated by the McNichols (2002) model.

MBANK = a dummy variable set to "1" if a firm has a main bank and "0" otherwise. We define main bank as a firm's largest lender (city bank, regional bank, second regional bank or trust bank) also the firm's top 30 largest shareholder.

MARGIN = operating income for firm *i* in year *t* / sales revenue for firm *i* in year *t*.

INCR = the interest coverage ratio for firm *i* at the end of year *t*.

MB = firm *i*'s market value of equity at the end of year *t* / firm *i*'s book value of equity at the end of year *t*.

RND = research and development expense for firm *i* in year *t* / total assets for firm *i* in year *t*-1.

STDROA = the standard deviation of firm *i*'s ROA calculated using five years data from year *t*-4 to *t*.

STDRET = the standard deviation of firm *i*'s monthly stock returns during year *t*.

SIZE = the natural log of the firm *i*'s total assets at the end of fiscal year *t*.

LEV = firm *i*'s total liabilities at the end of year *t* / firm *i*'s total assets at the end of year *t*.

ISSUESIZE = the natural log of the offering amount of the bond *j* issued by firm *i* in fiscal year *t*+1.

MATURITY = the maturity period of bond *j* issued by firm *i* in year *t*+1.

BCFIRM = a dummy variable set to "1" if a bond management company is established and "0" otherwise.

REGULATED = a dummy variable set to "1" if firm *i* in year *t* belongs to regulated industries (i.e., electricity and gas industry) and "0" otherwise.

t-statistics are corrected for heteroskedasticity, and cross-sectional and time-series correlation using a two-way cluster at the firm and year levels proposed by Petersen (2009).

*** Statistically significant at the 0.01 level of significance using a two-tailed *t*-test.

** Statistically significant at the 0.05 level of significance using a two-tailed *t*-test.

* Statistically significant at the 0.1 level of significance using a two-tailed *t*-test.

Table 7 The effect of main banks on the relationship between accruals quality and the bond yield spread (1): Sample decomposition by default risk

Dependent variable: *SPREAD*					
		Model (1) *MBANK* = 1 & $DEFAULT_{OSCORE}$ = 0		Model (2) *MBANK* = 1 & $DEFAULT_{OSCORE}$ = 1	
	Pred. sign	Coeff.	*t-stat.*	Coeff.	*t-stat.*
Intercept	?	0.140	1.598	0.601***	4.074
AQ	+	0.142***	2.692	-0.003	-0.055
MARGIN	–	-0.130*	-1.769	-0.169*	-1.956
INCR	–	0.100	1.151	0.013	0.142
MB	–	-0.105*	-1.670	0.110	1.310
RND	+	0.111*	1.829	-0.096*	-1.712
STDROA	+	0.144***	3.354	0.128**	2.023
STDRET	+	0.326***	7.914	0.220***	2.663
SIZE	–	-0.143	-1.619	-0.543***	-4.235
LEV	+	0.155*	1.660	0.055	0.418
ISSUESIZE	–/+	-0.053	-1.169	0.102	0.998
MATURITY	+	0.243***	3.531	0.184*	1.862
BCFIRM	–	0.128**	2.071	0.091	1.046
REGULATED	–	-0.250***	-3.156	-0.180*	-1.672
Adj. R^2		0.456		0.335	
Obs.		559		207	

Note:

SPREAD = the initial yield spread on the straight bond *j* issued by firm *i* in fiscal year *t*+1.

AQ = the proxy for earnings quality for firm *i* in year *t*, which is estimated by the McNichols (2002) model.

MBANK = a dummy variable set to "1" if a firm has a main bank and "0" otherwise. We define main bank as a firm's largest lender (city bank, regional bank, second regional bank or trust bank) also the firm's top 30 largest shareholder.

$DEFAULT_{OSCORE}$ = a dummy variable set to "1" if the O-score equals to or is greater than the 75 percentile in year *t* and "0" otherwise.

MARGIN = operating income for firm *i* in year *t* / sales revenue for firm *i* in year *t*.

INCR = the interest coverage ratio for firm *i* at the end of year *t*.

MB = firm *i*'s market value of equity at the end of year *t* / firm *i*'s book value of equity at the end of year *t*.

RND = research and development expense for firm *i* in year *t* / total assets for firm *i* in year *t*-1.

STDROA = the standard deviation of firm *i*'s ROA calculated using five years data from year *t*-4 to *t*.

STDRET = the standard deviation of firm *i*'s monthly stock returns during year *t*.

SIZE = the natural log of the firm *i*'s total assets at the end of fiscal year *t*.

LEV = firm *i*'s total liabilities at the end of year *t* / firm *i*'s total assets at the end of year *t*.

ISSUESIZE = the natural log of the offering amount of the bond *j* issued by firm *i* in fiscal year *t*+1.

MATURITY = the maturity period of bond *j* issued by firm *i* in year *t*+1.

BCFIRM = a dummy variable set to "1" if a bond management company is established and "0" otherwise.

REGULATED = a dummy variable set to "1" if firm *i* in year *t* belongs to regulated industries (i.e., electricity and gas industry) and "0" otherwise.

t-statistics are corrected for heteroskedasticity, and cross-sectional and time-series correlation using a two-way cluster at the firm and year levels proposed by Petersen (2009).

*** Statistically significant at the 0.01 level of significance using a two-tailed *t*-test.

** Statistically significant at the 0.05 level of significance using a two-tailed *t*-test.

* Statistically significant at the 0.1 level of significance using a two-tailed *t*-test.

Table 8 The effect of main banks on the relationship between accruals quality and the bond yield spread (2): Sample decomposition by default risk

Dependent variable: *SPREAD*					
		Model (1) $DEFAULT_{OSCORE} = 0$		Model (2) $DEFAULT_{OSCORE} = 1$	
	Pred. sign	Coeff.	*t-stat.*	Coeff.	*t-stat.*
Intercept	?	0.162**	2.087	0.392***	4.573
AQ	+	0.086**	2.139	0.116***	2.637
MBANK	–/+	-0.024	-1.023	0.122***	3.496
*AQ*MBANK*	–	0.059	1.104	-0.144**	-2.244
MARGIN	–	-0.217***	-4.848	-0.160*	-1.860
INCR	–	0.220***	2.984	-0.006	-0.091
MB	–	-0.033	-0.741	0.022	0.427
RND	+	0.033	0.882	0.010	0.198
STDROA	+	0.072**	2.427	0.144**	2.306
STDRET	+	0.346***	6.287	0.166***	2.706
SIZE	–	-0.249***	-3.250	-0.301***	-4.327
LEV	+	0.294***	3.964	0.165*	1.809
ISSUESIZE	–/+	-0.009	-0.243	0.091	1.566
MATURITY	+	0.143**	2.557	0.205***	2.956
BCFIRM	–	0.040	1.531	-0.015	-0.165
REGULATED	–	-0.113***	-2.693	-0.142	-1.567
Adj. R^2		0.364		0.264	
Obs.		1,650		531	
F-test		Coeff.	*F*-stat.	Coeff.	*F*-stat.
*AQ+AQ*MBANK*		0.145***	6.74	-0.028	0.49

Note:

SPREAD = the initial yield spread on the straight bond *j* issued by firm *i* in fiscal year *t*+1.

AQ = the proxy for earnings quality for firm *i* in year *t*, which is estimated by the McNichols (2002) model.

MBANK = a dummy variable set to "1" if a firm has a main bank and "0" otherwise. We define main bank as a firm's largest lender (city bank, regional bank, second regional bank or trust bank) that is also the firm's top 30 largest shareholder.

$DEFAULT_{OSCORE}$ = a dummy variable set to "1" if the O-score equals to or is greater than the 75 percentile in year *t* and "0" otherwise.

MARGIN = operating income for firm *i* in year *t* / sales revenue for firm *i* in year *t*.

INCR = the interest coverage ratio for firm *i* at the end of year *t*.

MB = firm *i*'s market value of equity at the end of year *t* / firm *i*'s book value of equity at the end of year *t*.

RND = research and development expense for firm *i* in year *t* / total assets for firm *i* in year *t*-1.

STDROA = the standard deviation of firm *i*'s ROA calculated using five years data from year *t*-4 to *t*.

STDRET = the standard deviation of firm *i*'s monthly stock returns during year *t*.

SIZE = the natural log of the firm *i*'s total assets at the end of fiscal year *t*.

LEV = firm *i*'s total liabilities at the end of year *t* / firm *i*'s total assets at the end of year *t*.

ISSUESIZE = the natural log of the offering amount of the bond *j* issued by firm *i* in fiscal year *t*+1.

MATURITY = the maturity period of bond *j* issued by firm *i* in year *t*+1.

BCFIRM = a dummy variable set to "1" if a bond management company is established and "0" otherwise.

REGULATED = a dummy variable set to "1" if firm *i* in year *t* belongs to regulated industries (i.e., electricity and gas industry) and "0" otherwise.

t-statistics are corrected for heteroskedasticity, and cross-sectional and time-series correlation using a two-way cluster at the firm and year levels proposed by Petersen (2009).

*** Statistically significant at the 0.01 level of significance using a two-tailed *t*-test.

** Statistically significant at the 0.05 level of significance using a two-tailed *t*-test.

* Statistically significant at the 0.1 level of significance using a two-tailed *t*-test.

Table 9 The effect of the definition of $DEFAULT_{OSCORE}$ on the relationship between accruals quality and the bond yield spread

Panel A: $DEFAULT_{OSCORE}$ = 1 if O-score equals to or is greater than the 65 percentile

Dependent variable: : SPREAD

		Model (1) *MBANK* = 1 & $DEFAULT_{OSCORE}$ = 0		Model (2) *MBANK* = 1 & $DEFAULT_{OSCORE}$ = 1	
	Pred. sign	Coeff.	*t-stat.*	Coeff.	*t-stat.*
Intercept	?	0.129	1.169	0.396***	3.686
AQ	+	0.125**	2.164	0.064**	2.538
Control variables		Yes		Yes	
Adj. R^2		0.433		0.349	
Obs.		479		287	

Panel B: $DEFAULT_{OSCORE}$ = 1 if O-score equals to or is greater than the 70 percentile

Dependent variable: : *SPREAD*

		Model (1) *MBANK* = 1 & $DEFAULT_{OSCORE}$ = 0		Model (2) *MBANK* = 1 & $DEFAULT_{OSCORE}$ = 1	
	Pred. sign	Coeff.	*t-stat.*	Coeff.	*t-stat.*
Intercept	?	0.151	1.373	0.413***	3.862
AQ	+	0.132***	2.635	0.047	1.067
Control variables		Yes		Yes	
Adj. R^2		0.467		0.331	
Obs.		522		244	

Panel C: $DEFAULT_{OSCORE}$ = 1 if O-score equals to or is greater than the 75 percentile

Dependent variable: : *SPREAD*

		Model (1) *MBANK* = 1 & $DEFAULT_{OSCORE}$ = 0		Model (2) *MBANK* = 1 & $DEFAULT_{OSCORE}$ = 1	
	Pred. sign	Coeff.	*t-stat.*	Coeff.	*t-stat.*
Intercept	?	0.140	1.598	0.601***	4.074
AQ	+	0.142***	2.692	-0.003	-0.055
Control variables		Yes		Yes	
Adj. R^2		0.456		0.335	
Obs.		559		207	

Panel D: $DEFAULT_{OSCORE}$ = 1 if O-score equals to or is greater than the 80 percentile

Dependent variable: : *SPREAD*

		Model (1) *MBANK* = 1 & $DEFAULT_{OSCORE}$ = 0		Model (2) *MBANK* = 1 & $DEFAULT_{OSCORE}$ = 1	
	Pred. sign	Coeff.	*t-stat.*	Coeff.	*t-stat.*
Intercept	?	0.170*	1.895	0.604***	3.331
AQ	+	0.132**	2.575	0.027	0.414
Control variables		Yes		Yes	
Adj. R^2		0.460		0.274	
Obs.		603		163	

Panel E: $DEFAULT_{OSCORE}$ = 1 if O-score equals to or is greater than the 85 percentile

Dependent variable: : *SPREAD*

		Model (1) *MBANK* = 1 & $DEFAULT_{OSCORE}$ = 0		Model (2) *MBANK* = 1 & $DEFAULT_{OSCORE}$ = 1	
	Pred. sign	Coeff.	*t-stat.*	Coeff.	*t-stat.*
Intercept	?	0.166*	1.790	0.813***	4.430
AQ	+	0.107**	2.197	0.015	0.191
Control variables		Yes		Yes	

Adj. R^2	0.467	0.265
Obs.	644	122

Note:

SPREAD = the initial yield spread on the straight bond *j* issued by firm *i* in fiscal year *t*+1.

AQ = the proxy for earnings quality for firm *i* in year *t*, which is estimated by the McNichols (2002) model.

MBANK = a dummy variable set to "1" if a firm has a main bank and "0" otherwise. We define main bank as a firm's largest lender (city bank, regional bank, second regional bank or trust bank) that is also the firm's top 30 largest shareholder.

$DEFAULT_{OSCORE}$ = a dummy variable set to "1" if the O-score equals to or is greater than the 75 percentile in year *t* and "0" otherwise.

t-statistics are corrected for heteroskedasticity, and cross-sectional and time-series correlation using a two-way cluster at the firm and year levels proposed by Petersen (2009).

*** Statistically significant at the 0.01 level of significance using a two-tailed *t*-test.

** Statistically significant at the 0.05 level of significance using a two-tailed *t*-test.

* Statistically significant at the 0.1 level of significance using a two-tailed *t*-test.

Table 10 The effect of main banks on the relationship between accruals quality and the bond yield spread: Additional analyses by using default risk dummy defined by credit rating

Dependent variable: *SPREAD*					
		Model (1) *MBANK* = 1 & $DEFAULT_{RATING}$ = 0		Model (2) *MBANK* = 1 & $DEFAULT_{RATING}$ = 1	
	Pred. sign	Coeff.	*t-stat.*	Coeff.	*t-stat.*
Intercept	?	0.176	1.208	0.536***	3.325
AQ	+	0.137***	2.658	-0.036	-0.707
MARGIN	–	-0.125*	-1.860	-0.077	-0.578
INCR	–	0.083	0.776	-0.061	-0.666
MB	–	-0.107	-1.353	0.048	0.778
RND	+	0.023	0.366	-0.032	-0.437
STDROA	+	0.188**	2.421	0.171	1.331
STDRET	+	0.326***	4.581	0.224**	2.258
SIZE	–	-0.174	-1.551	-0.651**	-2.230
LEV	+	0.135	0.989	0.151	1.381
ISSUESIZE	–/+	-0.005	-0.070	0.307**	2.552
MATURITY	+	0.244***	2.801	0.180*	1.818
BCFIRM	–	0.030	0.424	0.081	0.808
REGULATED	–	-0.160*	-1.844		
Adj. R^2		0.425		0.348	
Obs.		559		207	

Note:

SPREAD = the initial yield spread on the straight bond *j* issued by firm *i* in fiscal year *t*+1.

AQ = the proxy for earnings quality for firm *i* in year *t*, which is estimated by the McNichols (2002) model.

MBANK = a dummy variable set to "1" if a firm has a main bank and "0" otherwise. We define main bank as a firm's largest lender (city bank, regional bank, second regional bank or trust bank) that is also the firm's top 30 largest shareholder.

$DEFAULT_{RATING}$ = a dummy variable set to "1" if the firms have A− or below rating and "0" otherwise.

MARGIN = operating income for firm *i* in year *t* / sales revenue for firm *i* in year *t*.

INCR = the interest coverage ratio for firm *i* at the end of year *t*.

MB = firm *i*'s market value of equity at the end of year *t* / firm *i*'s book value of equity at the end of year *t*.

RND = research and development expense for firm *i* in year *t* / total assets for firm *i* in year *t*-1.

STDROA = the standard deviation of firm *i*'s ROA calculated using five years data from year *t*-4 to *t*.

STDRET = the standard deviation of firm *i*'s monthly stock returns during year *t*.

SIZE = the natural log of the firm *i*'s total assets at the end of fiscal year *t*.

LEV = firm *i*'s total liabilities at the end of year *t* / firm *i*'s total assets at the end of year *t*.

ISSUESIZE = the natural log of the offering amount of the bond *j* issued by firm *i* in fiscal year *t*+1.

MATURITY = the maturity period of bond *j* issued by firm *i* in year *t*+1.

BCFIRM = a dummy variable set to "1" if a bond management company is established and "0" otherwise.

REGULATED = a dummy variable set to "1" if firm *i* in year *t* belongs to regulated industries (i.e., electricity and gas industry) and "0" otherwise.

t-statistics are corrected for heteroskedasticity, and cross-sectional and time-series correlation using a two-way cluster at the firm and year levels proposed by Petersen (2009).

*** Statistically significant at the 0.01 level of significance using a two-tailed *t*-test.

** Statistically significant at the 0.05 level of significance using a two-tailed *t*-test.

* Statistically significant at the 0.1 level of significance using a two-tailed *t*-test.

Table 11 The relationship between the alternative proxies for earnings quality and the bond yield spread

Panel A: The absolute value of discretionary accruals estimated by Kasznik (1999) model

Dependent variable: *SPREAD*			
	Pred. sign	Coeff.	*t-stat.*
Intercept	?	0.251***	3.390
AQ	+	0.081***	2.643
Control variables		Yes	
Adj. R^2		0.394	
Obs.		2,181	

Panel B: The absolute value of discretionary accruals estimated by Kothari et al. (2005) model

Dependent variable: *SPREAD*			
	Pred. sign	Coeff.	*t-stat.*
Intercept	?	0.255***	3.511
AQ	+	0.064**	2.371
Control variables		Yes	
Adj. R^2		0.392	
Obs.		2,181	

Panel C: Accruals quality estimated by Dechow and Dichev (2002)

Dependent variable: *SPREAD*			
	Pred. sign	Coeff.	*t-stat.*
Intercept	?	0.251***	3.378
AQ	+	0.063*	1.922
Control variables		Yes	
Adj. R^2		0.393	
Obs.		2,181	

Note:

SPREAD = the initial yield spread on the straight bond *j* issued by firm *i* in fiscal year *t*+1.

AQ = the proxy for earnings quality for firm *i* in year *t* (i.e., the absolute value of discretionary accruals estimated by Kasznik (1999) model, the absolute value of discretionary accruals estimated by Kothari et al. (2005), and accruals quality estimated by Dechow and Dichev (2002)).

$DEFAULT_{OSCORE}$ = a dummy variable set to "1" if the O-score equals to or is greater than the 75 percentile in year *t* and "0" otherwise.

t-statistics are corrected for heteroskedasticity, and cross-sectional and time-series correlation using a two-way cluster at the firm and year levels proposed by Petersen (2009).

*** Statistically significant at the 0.01 level of significance using a two-tailed *t*-test.

** Statistically significant at the 0.05 level of significance using a two-tailed *t*-test.

* Statistically significant at the 0.1 level of significance using a two-tailed *t*-test.

Table 12 The effect of main banks on the relationship between the alternative proxies for earnings quality and the bond yield spread: Sample decomposition by default risks

Panel A: The absolute value of discretionary accruals estimated by Kasznik (1999) model

Dependent variable: *SPREAD*

		Model (1) *MBANK* = 1 & $DEFAULT_{OSCORE}$ = 0		Model (2) *MBANK* = 1 & $DEFAULT_{OSCORE}$ = 1	
	Pred. sign	Coeff.	*t-stat.*	Coeff.	*t-stat.*
Intercept	?	0.153	1.662	0.598***	4.344
AQ	+	0.106**	2.117	0.003	0.038
Control variables		Yes		Yes	
Adj. R^2		0.446		0.332	
Obs.		559		207	

Panel B: The absolute value of discretionary accruals estimated by Kothari et al. (2005) model

Dependent variable: *SPREAD*

		Model (1) *MBANK* = 1 & $DEFAULT_{OSCORE}$ = 0		Model (2) *MBANK* = 1 & $DEFAULT_{OSCORE}$ = 1	
	Pred. sign	Coeff.	*t-stat.*	Coeff.	*t-stat.*
Intercept	?	0.140	1.434	0.599***	4.170
AQ	+	0.112**	2.030	0.056	0.954
Control variables		Yes		Yes	
Adj. R^2		0.447		0.336	
Obs.		559		207	

Panel C: Accruals quality estimated by Dechow and Dichev (2002) model

Dependent variable: *SPREAD*

		Model (1) *MBANK* = 1 & $DEFAULT_{OSCORE}$ = 0		Model (2) *MBANK* = 1 & $DEFAULT_{OSCORE}$ = 1	
	Pred. sign	Coeff.	*t-stat.*	Coeff.	*t-stat.*
Intercept	?	0.120	1.348	0.586***	4.395
AQ	+	0.144**	2.336	0.026	0.506
Control variables		Yes		Yes	
Adj. R^2		0.456		0.336	
Obs.		559		207	

Note:

SPREAD = the initial yield spread on the straight bond *j* issued by firm *i* in fiscal year *t*+1.

AQ = the proxy for earnings quality for firm *i* in year *t* (i.e., the absolute value of discretionary accruals estimated by Kasznik (1999) model, the absolute value of discretionary accruals estimated by Kothari et al. (2005), and accruals quality estimated by Dechow and Dichev (2002)).

MBANK = a dummy variable set to "1" if a firm has a main bank and "0" otherwise. We define main bank as a firm's largest lender (city bank, regional bank, second regional bank or trust bank) that is also the firm's top 30 largest shareholder.

$DEFAULT_{OSCORE}$ = a dummy variable set to "1" if the O-score equals to or is greater than the 75 percentile in year *t* and "0" otherwise.

t-statistics are corrected for heteroskedasticity, and cross-sectional and time-series correlation using a two-way cluster at the firm and year levels proposed by Petersen (2009).

*** Statistically significant at the 0.01 level of significance using a two-tailed *t*-test.

** Statistically significant at the 0.05 level of significance using a two-tailed *t*-test.

* Statistically significant at the 0.1 level of significance using a two-tailed *t*-test.