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DP2018-12

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Revised December 8, 2023

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I acknowledge and appreciate the helpful comments from Nobuhiro Asano, Keishi Fujiyama, Shu Inoue, Fumihiko Kimura, Yuya Koga, Kenji Kometani, Yoshitaka Ohashi, Ruei-Shian Wu, Tomoyasu Yamaguchi, Yuto Yoshinaga, and workshop participants at Tohoku University Accounting School (Tohoku University Accounting School Workshop) and 2018 Taiwan Accounting Association Annual Conference and Asian Accounting Associations Conference.

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December 2023

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ABSTRACT

This study investigates the effects of shareholdings on the relationship between accounting quality and trade credit in Japan. It focuses on cross-sectional and stable shareholdings, which are well-known features of Japanese corporate governance, as a private information-sharing system. The relationships among cross- and stable shareholdings, accounting quality, and trade credit are tested. The results indicate that the trade credit of customers without either cross- or stable shareholdings increases with accounting quality, and in most cases, such shareholdings weaken the relationship between accounting quality and trade credit. These findings suggest that close ties to cross- and stable shareholders reduce the importance of accounting information through sharing private information.

Keywords: accounting quality; cross-shareholdings; stable shareholdings; trade credit
JEL Classifications: G34; M41
Data Availability: Data are available from sources indicated in the text.

I. INTRODUCTION

Trade credit is a major source of short-term financing for firms in several countries. For example, Li, Ng, and Saffer (2021) show a ratio of trade credit to cost of goods sold that is, on average, 26.4 percent in an International Financial Reporting Standards (IFRS) sample of 36,180 firm-years from 30 countries between 2000–2014, and 22.4 percent in a non-IFRS sample using 36,227 firm-years across six countries.[1] Chen, Liu, Ma, and Martin (2017) report an average ratio of trade credit to total assets of 11 percent among a sample of US firms. Business transactions using trade credit are also prevalent in Japan. In the sample used in this study, the ratio of trade credit to total assets is 14 percent on average, which is considerably higher than both the 10 percent for short-term borrowings and 7 percent for long-term borrowings. In their international comparative study, El Ghoul and Zheng (2016) report that the receivables to sales ratio of Japanese firms ranks eighth out of the 49 sampled countries. Trade credit in Japan is characterized by long maturity and low interest rates; it is, therefore, similar in nature to short-term borrowings

[1] Levine, Lin, and Xie (2018) show an average ratio of trade credit to total debt liabilities of 25 percent using over 3,500 firms across 34 countries from 1990 to 2011.

because of the "promissory bill" system used in Asian countries (Lau and Shaede 2020; Miwa and Ramseyer 2008; Uchida, Uesugi, and Hotei 2010).[2] Given its economic importance, accounting information and its quality should play an important role in offering trade credit. However, trade credit is frequently disregarded in research studies, despite its widespread prevalence and significant scale. Furthermore, the theoretical connection between trade credit and accounting quality has not been explicitly formulated thus far (Hope and Vyas 2017). Empirical investigations demonstrating the relationship between these two variables are also scarce. This could be because business practices for trade credit differ by country. The current study examines this relationship in Japan, focusing on whether Japanese corporate governance as a private information channel changes the role of accounting information and the abovementioned relationship.

Japanese corporate governance is characterized by close ties to stakeholders, as seen in cross- and stable shareholdings. This relationship with stakeholders results in exchanges of private information and affects the materiality of accounting information. It also offers an interesting avenue for research on the relationship between accounting quality and trade credit from the viewpoint of sharing private information. Japan is characterized by stakeholder corporate governance under code law and has the third-largest stock market worldwide. In code-law countries, major groups such as banks, business associations, and labor unions form a firm's agents, and insider communication between managers and stakeholders tends to be the primary system for resolving information asymmetry (Ball, Kothari, and Robin 2000). This means that communication with stakeholders adds another private information channel in the supplier-customer relationship. This impact of private information on the relationship between trade credit and accounting information has not been addressed in previous research. The current

[2] Uchida et al. (2010, 7) describe promissory bills in the following manner: "the buyer issues, and the seller receives, a bill after an invoice is issued. At or after the due date of the bill, the seller deposits the bill at a bank, the bank takes the bill to a regional clearinghouse (which is run by banks and is open every business day), and the bill is settled and cleared through the bank settlement system. … The maturity of promissory bill is long." See also Lau and Shaede (2020).

study serves as a basis for future research on trade credit and private information channels in Japan and other countries with similar corporate governance structures.

Previous studies indicate that high-quality accounting information mitigates information asymmetry and reduces agency costs. Many previous papers have presented evidence on the relationship between accounting information and providing equity capital and debt (e.g., Bharath, Sunder, and Sunder 2008; Francis, LaFond, Olsson, and Schipper 2004, 2005). These studies indicate that firms with high-quality accounting information tend to attract financing from debt and equity providers, leading to more favorable contract terms for these firms.

However, few studies examine the association between accounting information and trade credit financing, leaving this relationship unclear. Furthermore, few studies focus on listed firms; for example, García-Teruel, Martínez-Solano, and Sanchez-Ballesta (2014) demonstrate the positive relationship between accounting quality and trade credit among non-listed Spanish firms. Elemes and Filip (2022) report a similar relationship for non-listed firms in five European countries. However, Chen et al. (2017) report negative relationships among listed US firms.

This study seeks to address the inconclusive evidence in prior research and extends the findings of the literature by examining how a corporate governance structure that leads to private information sharing affects the impact of accounting quality on trade credit. Japanese firms are characterized by a close relationship with stakeholders in which private information exchange is widespread (Ball et al. 2000). The Japanese capital market is the third largest in the world, yet its reliance on trade credit is high. This environment provides a suitable setting for observing the relationship between trade credit and accounting information, and the impact of the corporate governance structure on the relationship between the two.

This study focuses on cross- and stable shareholdings as corporate governance factors that influence the relationship between trade credit and accounting quality.

Previous literature considers cross- and stable shareholdings (and main banks), which are well-known features of Japanese corporate governance (e.g., Aoki, Jackson, and Miyajima 2007; Aoki and Patrick 1994; Hoshi and Kashyap 2001).[3] Cross-shareholders reciprocally hold each other's shares and rarely trade them. Many Japanese firms have transactional relationships with cross-shareholders, including suppliers, customers, and banks. In addition, firms and banks hold (albeit not reciprocally) shares of other firms with whom they have long-standing business relationships.[4] They form stable shareholders with cross-shareholders (Sheard 1994) and play a similar role for managers as cross-shareholders do (Ikeda, Inoue, and Watanabe 2018, 56).[5] Therefore, cross- and stable shareholders are assumed to have similar effects on the relationship between accounting quality and trade credit. In this study, shares held by stable shareholders are defined as stable shareholdings. In most cases, stable shareholders act as friendly shareholders for incumbent managers, although they do not necessarily offer as much protection as cross-shareholders (Ikeda et al. 2018, 56).

Cross- and stable shareholders play crucial roles in both Japanese corporate and industrial groups known as *keiretsu* and in business economies. Cross- and stable shareholders are considered friendly or sympathetic as they allow managers to protect themselves from the external takeover market. Moreover, they principally comprise long-term transaction partners (including financial institutions) (Sheard 1989, 409).

Cross- and stable shareholders regularly collect private information to facilitate transactions in these relationships. When private information is shared, accounting information tends to play a lesser role within cross-shareholding groups. Previous literature demonstrates that the private information often exchanged between firms and stakeholders reduces the role of accounting information (e.g., Ball and Shivakumar 2005;

[3] The influence of cross- and stable shareholdings in Japan is said to have weakened around the mid-1990s. However, in Miyajima and Kuroki's (2007) sample, the ratio of cross- and stable shareholdings stabilizes after around 2005. In this study's sample, the ratio also levels off after around 2005.

[4] This type of shareholding is referred to as "other stable shareholdings."

[5] This study posits that stable shareholders include cross-shareholders and other stable shareholders.

Beatty, Liao, and Weber 2010; Biddle and Hilary 2006). Biddle and Hilary (2006) argue that bank financing and *keiretsu*, which are both important sources of financing, could serve as private channels to reduce information asymmetry in Japan. The exchange of private information discussed in these studies suggests that Japanese corporate governance reduces the importance of accounting information through its relationship, this reduction has not been directly tested. This study attempts to directly examine the impact of this relationship through trade credit financing.

Several studies argue that private information exchanged between managers and cross-shareholders spreads to outside investors (e.g., Bae and Kim 1998; Jiang and Kim 2000). They present evidence that greater cross-shareholdings result in less information asymmetry in Japanese capital markets, claiming that private information is more prevalent in firms with higher rather than lower cross-shareholdings. Based on this prior research, the present study posits that cross-shareholdings could reduce information asymmetry between firms and suppliers.

Given that the pervasiveness of private information in the relationship between firms and cross- and stable shareholders reduces the importance of accounting information, this study predicts that strong ties to cross- and stable shareholders weaken the effect of accounting quality on trade credit. In their studies, García-Teruel et al. (2014) and Chen et al. (2017) do not investigate the effects that result from close ties to shareholders. The regression models in the present study follow those of Chen et al. (2017) for listed firms and incorporate cross- and stable shareholdings in the models. As a measure of accounting quality, I use the first principal component score of three accrual-based metrics derived using principal component analysis, according to prior literature (Bharath et al. 2008, Beatty et al. 2010, and Chen et al. 2017). Cross- and stable shareholders are taken from the NRL (NLI Research Institute) database.

To examine the effects of cross- and stable shareholdings on the relationship between accounting quality and trade credit, I collect 27,794 firm-years from Japanese

firms between 2001 and 2016 from *Nikkei NEEDS-FinacialQUEST.* I investigate the incremental effect of accounting quality on trade credit with stable shareholdings compared to the effect on firms without stable shareholders.

This study finds that the trade credit of firms without stable shareholdings increases with accounting quality. Suppliers are more likely to consider accounting quality in the absence of stable shareholders. Further, stable shareholdings reduce the effect of accounting quality on trade credit, consistent with this study's prediction. When splitting stable shareholdings into cross- and other stable shareholdings, cross-shareholdings generally have a similar effect on the association. My findings are robust to alternative accounting quality measures and endogeneity checks.

In additional analyses, cross- and stable shareholdings are replaced with bank shareholding variables (banks' shareholdings and cross-shareholdings by banks). This is because banks are the center of *keiretsu* and play a key role in obtaining private information from cross-shareholders. Bank shareholding variables have a similar effect on the abovementioned association. These additional findings suggest that suppliers, acting as financing providers, may delegate customer monitoring to closely affiliated banks. This is consistent with the argument in previous studies, which suggest that other stakeholders delegate a monitoring role to banks in Japan (Aoki 1994).

To further understand the relationship among accounting quality, trade credit, and cross- and stable shareholdings, I conduct a series of subsample analyses. These analyses aim to examine how the relationship may change in the cross-section of firms based on information environment, firm risk, and financial constraints. In other words, the analyses seek to specify the specific condition under which the relationships found in this study function more effectively.

The first analysis examines whether the information environment, which means transparency defined as the availability of firm-specific information (Bushman, Piotroski, and Smith 2001), enhances the role of accounting quality and private information

stemming from cross- and stable shareholdings. The findings indicate that the primary results in this study are observed only for firms with a high information environment.

Subsequently, I focus on the impact of firm risk, reflecting the degree of uncertainty of future outcomes (Miller 1997). This test reports that the primary results are observed in low-risk firms while in high-risk firms, accounting quality does not have an impact on trade credit and the substitution effect is not observed. The two findings of information environment and firm risk imply that accounting information is effective for trade credit and the substitution of private information occurs when information asymmetry is lower (high transparency) and future firm prospect is relatively more predictable (low firm risk).

Finally, I test how my findings are influenced by financial constraints, that is, financial difficulties as measured by Altman's (1968) Z-Score. Under high financial constraints, accounting quality affects trade credit regardless of the presence of cross- and stable shareholdings. Conversely, under low financial constraints, accounting quality does not show an effect on trade credit, and cross- and stable shareholdings further weaken the effect of accounting quality. These three additional analyses collectively suggest that the substitution is more likely to occur for firms in favorable environments.[6]

This study makes three contributions to the literature. First, to the best of my knowledge, this study is the first to indicate that a close tie to shareholders (i.e., cross- and stable shareholdings) weakens the relationship between accounting quality and trade credit financing in proportion to the cross- and stable shareholding ratio. Several papers have investigated the effect of accounting quality on trade credit (e.g., Chen et al. 2017 and García-Teruel et al. 2014), but the impact of private information exchange with stakeholders on the materiality of accounting information for trade credit financing has not yet been addressed. By focusing on trade credit, this study extends the literature on

[6] The results also suggest that, in an unfavorable firm environment, private information from suppliers' daily business transactions may be preferred over accounting quality and private information based on cross- and stable shareholdings.

the substitution of private information for accounting information (e.g., Biddle and Hilary 2006). This study also adds to the accounting literature on private information sharing by cross- and stable shareholdings and stakeholders (Bae and Kim 1998; Cheung, Kim, and Lee 1999; Chung, Ho, and Kim 2004; Darrough, Pourjalali, and Saudagaran 1998; Jiang and Kim 2000). It also contributes to the recent literature addressing the relationship between trade credit and ownership (Chen, El Ghoul, Guedhami, Kwok, and Nash 2021; He and Liu 2023; Liu and Hou 2022). In additional analyses conducted by the study, the primary results are mainly observed in firms with a high information environment, low firm risk, and low financial constraint. The results contribute to the research on the impact of information environment and firm risk on trade credit (e.g., Fan, Pan, and Yu 2023; Goto, Xiao, and Xu 2015; Li et al. 2021; Zhang 2020). This study also contributes to prior studies that have described the usefulness of information possessed by suppliers under high risk and information asymmetry (e.g., Ng, Smith, and Smith 1999; Petersen and Rajan 1997; Smith 1987).

Second, accounting quality positively affects trade credit financing among firms without cross- and stable shareholdings. This contributes to the literature on the relationship between the quality of accounting information (including conservatism and auditing) and trade credit (e.g., Allee and Yohn, 2009; Chen et al. 2017; Dou, Hope, and Thomas 2013; Elemes and Filip 2022; García-Teruel et al. 2014; Hui, Klasa, and Yeung 2012; Johnstone, Li, and Luo 2014; Li et al. 2021; Radhakrishnan, Wang, and Zhang 2014; Raman and Shahrur 2008; Saeed, Munir, and Zafar 2022; Zhang 2020). This study extends prior studies regarding the effect of accounting quality on equity financing (e.g., Francis et al. 2004, 2005; García Lara, García Osma, and Penalva 2011) and debt financing (e.g., Bharath, et al. 2008; Francis et al. 2004; Ge and Kim 2014; Hasan, Park, and Wu 2012; Lambert, Leuz, and Verrecchia 2007) by showing a similar effect on trade credit financing. Given the substantial role of trade credit in financing, the present study contributes to the growing body of literature on the relationship between accounting

quality and financing.

Finally, the results for firms without stable shareholdings are consistent with those of García-Teruel et al. (2014) based on a sample of Spanish non-listed firms, but are inconsistent with those of Chen et al. (2017) based on a sample of US-listed firms. Japan and Spain are considered to share common code-law and bank-oriented financial systems, which differ from systems in the US. García-Teruel et al. (2014) provide no interaction terms for accounting quality with bank variables under a bank-oriented financial system. In countries with similar corporate governance, my findings have implications for the relationship between borrowings, including trade credit, accounting quality, and the corporate governance system, which may weaken the function of accounting information in contractual relationships. Thus, this study contributes not only to single country research on corporate governance and trade credit but also to cross-country research on the institutional characteristics of countries and trade credit (e.g., Chen, Chen, Tan, and Zheng 2020; Demirgüç-Kunt and Maksimovic 2001; El Ghoul and Zheng 2016; Levine et al. 2018; Li et al. 2021; Mättö and Niskanen 2021).

The remainder of this paper is organized as follows. Section 2 describes the institutional setting in Japan, literature review, and hypothesis development. Section 3 presents the study's research design, data, and sample-selection procedures. Section 4 reports the empirical results. Section 5 presents additional tests. Section 6 presents the robustness tests. Finally, Section 7 concludes the study.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Prior literature on the relationship between trade credit and accounting quality

Previous studies show two conflicting hypotheses and sets of findings on the relationship between accounting quality and trade credit. Related studies (e.g., Bharath et al. 2008; Francis et al. 2004, 2005) indicate that high accounting quality lowers information risk, thereby reducing debt and capital costs. Given this relationship, suppliers could be willing

to offer trade credit to firms with better accounting quality, which provides customers with an incentive to improve accounting quality to receive more trade credit. Raman and Shahrur (2008) demonstrate that restraint in earnings management, which is a crucial factor of accounting quality, encourages supplier-customer relationships. García-Teruel et al. (2014) report that suppliers tend to provide more trade credit to firms with higher accrual quality, using a sample of 8,396 firm-years from non-listed Spanish firms between 1995–2005. They emphasize that Spain is a country with a code law and a bank-oriented financial system and that suppliers are a significant source of external financing for non-listed firms, due to limited access to capital markets.

Elemes and Filip (2022) examine a cross-country sample of private firms that are required to file and audit financial statements. They utilize firms from the five largest economies in the European Union: specifically, the United Kingdom, Germany, France, Italy, and Spain. This enables them to use non-listed firms with high-quality financial statements as a sample and to expand their evidence to privately held firms in multiple countries instead of a single country. Elemes and Filip (2022) document a positive relationship between trade credit and accrual quality for 423,434 non-listed firms in five European countries, and the results are promoted by information asymmetry and uncertainty regarding future cash flows.[7]

However, trade credit typically has higher interest rates than short-term debt, leading to an opposite relationship between accounting quality and trade credit. Previous research suggests that firms with higher accounting quality can finance short-term debt from financial institutions more easily and cheaply. If so, customers with low accounting quality would have difficulties accessing debt and equity financing and would need to increase trade credit because of their financial constraints. In this case, trade credit is

[7] Li et al. (2021) assume that mandatory adoption of IFRS improves financial reporting transparency and find that IFRS adoption increases trade credit. Financial reporting transparency is a concept that closely relates to accounting quality as used in this study. Li et al. (2021) do not directly show the relationship between improved financial reporting transparency and increased trade credit.

negatively related to accounting quality. Chen et al. (2017) present evidence that accounting quality is negatively associated with trade credit based on a US sample of 115,703 firm-years between 1985–2011. They assert that suppliers can provide trade credit even for firms with low accounting quality because of a close relationship between suppliers and customers. They extend the literature on debt contracts and accounting information, similar to Beatty et al. (2010), by using listed firms with access to large capital markets in the US.

Prior research shows that accounting quality has both positive and negative effects on trade credit amounts. Generally, financial information is used to facilitate transactions between suppliers and customers. More specifically, it is a major source of credit ratings on which suppliers usually rely to offer trade credit. Pike and Cheng (2001) report that credit ratings are the most popular source of information on credit risk. Moreover, based on a survey of Japanese non-listed firms, Uesugi et al. (2009) find that only 6.3 percent of trade credit contracts include early payment discounts. This tendency is similar to that of Spanish firms (Garcıa-Teruel and Martınez-Solano 2010; García-Teruel et al. 2014). Early payment discounts tend to be offered to risky customers (Klapper, Laeven, and Rajan 2012). The percentage (6.3 percent) in Uesugi et al. (2009) is much less than that of US firms in both Ng et al. (1999) (24.5 percent), and Giannetti, Burkart, and Ellingsen (2011) (21.3 percent).

Trade credit in Japan tends to have long maturity and low interest rates with similar properties to short-term borrowing. This could lead suppliers in Japan to focus on accounting quality when offering trade credit. Although the positive effect appears to dominate the negative effect, I do not propose a hypothesis regarding this relationship because neither effect can be eliminated.[8]

[8] Li et al. (2021) also predict that the positive effect of accounting quality on trade credit is likely to outweigh the negative effect in a similar manner.

Features of Japanese corporate governance and hypothesis development

Several studies focus on cross- and stable shareholdings as characteristics of Japanese firms' corporate governance (e.g., Aoki and Patrick 1994; Hoshi and Kashyap 2001; Aoki et al. 2007). Cross-shareholders comprise suppliers, customers, and banks, and tend to rarely trade reciprocally held shares. Japanese industrial groups (*keiretsu*) typically involve extensive cross-shareholdings between two firms and between firms and banks (Berglof and Perotti 1994; Gilson and Roe 1993; Sheard 1994). Member firms actively and regularly engage in transactions with each other over the long term and strongly rely on trade credit financing within the group (Berglof and Perotti 1994). They typically share a strong network with suppliers and customers and often construct relationships through value or supply chains (e.g., Yoshikawa and Phan 2001). In addition to cross-shareholders, firms and banks hold stable shares of other firms within the business relationship. They form stable shareholder networks with cross-shareholders. Cross- and stable shareholdings protect firms from pressure from the capital market and hostile takeovers (Osano 1996; Sheard 1989, 1991). This system of interlocking shareholdings between firms stabilizes managerial positions.

In such an environment, managers can exchange private information within cross- and stable shareholding groups, thereby alleviating information asymmetry. Specifically, information sharing comes through interlocking directorates and "presidential club" (*Shacho-kai*) meetings held regularly to exchange inside information on affiliated firms (Cooke 1996; Douthett and Jung 2001; Goto 1982; Sheard 1991).[9] Through this mechanism, cross-shareholders can gain access to strategic information (e.g., associated firms' performance and business plans), develop strategic or business relationships, and provide mutual support (McGuire and Dow 2003, 2009). In Japan, cross-ownership of stock and access to information are particularly prevalent among firms in the same

[9] Goto (1982) reports the coordination of R&D within member firms. He also states that member firms undertake various types of interfirm coordination.

industrial group (*keiretsu*) (Jacobson and Aaker 1993, 403). Given that this type of information-sharing system lowers information asymmetry, cross- and stable shareholders may base decisions related to monitoring each other on inside information rather than accounting information. Therefore, the exchange of private information should increase with stable shareholdings, while the impact of accounting information on trade credit should decrease. Private information is substituted for accounting information and its quality.

Studies have focused on the exchange of private and accounting information and its relationship with debtholders. Ball and Shivakumar (2005) compare conservatism between listed and non-listed firms, taking advantage of the financial reporting regulations in the UK that are substantially equivalent for listed and non-listed firms. Under the difference of the importance of market demand and debt, they show that private information tends to resolve information asymmetry, especially for non-listed firms, and imply that private information is a substitute for accounting information between debtholders and the firm. Biddle and Hilary (2006) and Beatty et al. (2010) refer to debtholders as stakeholders that enhance the role of private information. Beatty et al. (2010) highlight the exchange of private information with banks by distinguishing firms with bank loans. They find that the relations through bank loans reduce information asymmetry by private information and reduce the importance of accounting quality for investment efficiency. Biddle and Hillary (2006) argue that firms with higher accounting quality invest more efficiently through better access to financing. Their international study separately analyzes Japan, but they fail to find such a relationship for Japanese firms. They assert that the reason why bank financing and *keiretsu*, in which cross-shareholdings are crucial sources of financing, could provide private channels to mitigate information asymmetry and reduce the importance of accounting information. Thus, their study also suggests that accounting information be substituted for private information in the relationship between debtholders and firms. However, no previous studies investigate

whether cross-shareholdings affect suppliers' trade credit offers. With the communication of private information under cross-shareholdings, such shareholdings could have a similar effect on suppliers included in the cross-shareholding group.

Regarding the information availability of firms with cross-shareholdings of external suppliers, it is useful to focus on the literature that addresses the role of accounting information for market participants under Japanese corporate governance. Jacobson and Aaker (1993) provide evidence that Japanese capital markets have lower information asymmetry between managers and investors compared with those in the US. Bae and Kim (1998) and Jiang and Kim (2000) claim that cross-shareholding networks are influential in mitigating information asymmetry under Japanese corporate governance. Jiang and Kim (2000) report that stock prices for firms with higher cross-shareholdings incorporate more private information about future business prospects or strategies, concluding that more cross-corporate shareholdings lead to more information sharing or less information asymmetry between the firm and market participants (external investors). Considering the evidence for the positive effect of cross-shareholdings on the availability of private information in the Japanese stock market, and generally lower information asymmetry between firms and their suppliers than among market investors, I predict that external suppliers can (at least partly) rely on non-accounting information from firms with cross-shareholdings to monitor customers. Further, information sharing through stable shareholdings can be explained in the same way as cross-shareholdings.

In summary, cross- and stable shareholdings in Japan encourage the exchange of private information, which reduces the role of accounting information. Accordingly, more cross- and stable shareholdings would weaken the effect of accounting quality on trade credit. Therefore, I formulate the following hypotheses:

Hypothesis: Increases in cross- and stable shareholdings reduce the effect of accounting quality on trade credit.

Notably, suppliers can obtain private information through business relationships regardless of whether cross- and stable shareholder relationships exist. The amount of trade credit they offer to customers is likely to be based on private and public information. Suppliers may meet customers more regularly than banks to access information regarding business plans, industry and demand trends, R&D, and financial information. Moreover, suppliers can know the size and timing of customer orders through daily operating activities (Miwa and Ramseyer 2008; Petersen and Rajan 1997; Uesugi et al. 2009). Suppliers also accumulate soft information (qualitative information that is difficult to observe from the outside) from such business relationships, which gives them an advantage compared to banks in terms of offering credit (Petersen and Rajan 1994, 1997). Thus, the amount of trade credit they offer to customers is likely to be based on both private and public information.[10] Access to customers' private information could make the relationship between accounting quality and trade credit ambiguous, thereby weakening it.[11]

This study focuses on the effect of private information sharing on cross- and stable shareholdings in addition to the above relationships.

III. RESEARCH DESIGN, SAMPLE SELECTION PROCEDURE, AND DATA

Research design

Equation (1) shows the baseline model tested in this study:

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it\text{-}1} + \beta_2 LiquidCost_{it} + \beta_3 InfoAsym_{it} + \beta_4 Log(Asset)_{it} + \beta_5 Log(Age$$

[10] In addition, Ng et al. (1999) show that credit analysis for offering trade credit to customers is under economies of scale that increase with the number of customers, decreasing cost. Miwa and Ramseyer (2008) claim that suppliers are familiar with short term lending through daily activities.

[11] Along with this argument, suppliers collecting private information weaken the relationship even when trade credit decreases with accounting quality. Specifically, an effect of private information on the relationship is also described in footnote 18.

$$+ 1)_{it} + \beta_6 MktShare_{it} + \beta_7 POS\_ChgSale_{it} + \beta_8 NEG\_ChgSale_{it} + \beta_9 ROA_{it} + \beta_{10} MTB_{it} + \beta_{11} AltmanZ_{it} + \beta_{12} Leverage_{it} + \beta_{13} CA_{it} + \beta_{14} CL\_Xtrade_{it} + \beta_{15} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (1)$$

where AQ = accounting quality measure.

The hypothesis is tested by running the regression model on equations (2) and (3):

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it\text{-}1} + \beta_2 AQ_{it\text{-}1} \times StableSH_{it\text{-}1} + \beta_3\ StableSH_{it\text{-}1} + \beta_4 LiquidCost_{it} + \beta_5 InfoAsym_{it} + \beta_6 Log(Age + 1)_{it} + \beta_7 MktShare_{it} + \beta_8 POS\_ChgSale_{it} + \beta_9 NEG\_ChgSale_{it} + \beta_{10} ROA_{it} + \beta_{11} MTB_{it} + \beta_{12} AltmanZ_{it} + \beta_{13} Leverage_{it} + \beta_{14} CA_{it} + \beta_{15} CL\_Xtrade_{it} + \beta_{16} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (2)$$

$$TradeCredit_{it} = \beta_0 + \beta_1\ AQ_{it\text{-}1} + \beta_2\ AQ_{it\text{-}1} \times CrossSH_{it\text{-}1} + \beta_3 AQ_{it\text{-}1} \times OtherStableSH_{it\text{-}1} + \beta_4\ CrossSH_{it\text{-}1} + \beta_5\ OtherStableSH_{it\text{-}1} + \beta_6 LiquidCost_{it} + \beta_7 InfoAsym_{it} + \beta_8 Log(Age + 1)_{it} + \beta_9 MktShare_{it} + \beta_{10} POS\_ChgSale_{it} + \beta_{11} NEG\_ChgSale_{it} + \beta_{12} ROA_{it} + \beta_{13} MTB_{it} + \beta_{14} AltmanZ_{it} + \beta_{15} Leverage_{it} + \beta_{16} CA_{it} + \beta_{17} CL\_Xtrade_{it} + \beta_{18} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (3)$$

where:

StableSH = the sum of *CrossSH* and *OtherStableSH,*

CrossSH = the ratio of shares mutually held by financial institutions and other business corporations, and

OtherStableSH = the ratio of shares held by financial institutions, trust banks (for trading through their own accounts), and the parent company.[12]

[12] Considering data availability, the definitions of both cross-shareholdings and other stable shareholdings follow those in the *Data Package of Cross-Shareholding and Stable Shareholding* (NLI Research Institute).

The next approach, with a dummy variable for shareholdings, assesses the average effect of *AQ* on trade credit under cross- and stable shareholdings:

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it\text{-}1} + \beta_2 AQ_{it\text{-}1} \times StableSHD_{it\text{-}1} + \beta_3 StableSHD_{it\text{-}1} + \beta_4 LiquidCost_{it} + \beta_5 InfoAsym_{it} + \beta_6 Log(Age + 1)_{it} + \beta_7 MktShare_{it} + \beta_8 POS\_ChgSale_{it} + \beta_9 NEG\_ChgSale_{it} + \beta_{10} ROA_{it} + \beta_{11} MTB_{it} + \beta_{12} AltmanZ_{it} + \beta_{13} Leverage_{it} + \beta_{14} CA_{it} + \beta_{15} CL\_Xtrade_{it} + \beta_{16} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (4)$$

$$TradeCredit_{it} = \beta_0 + \beta_1\ AQ_{it\text{-}1} + \beta_2\ AQ_{it\text{-}1} \times CrossSHD_{it\text{-}1} + \beta_3 AQ_{it\text{-}1} \times OtherStableSHD_{it\text{-}1} + \beta_4\ CrossSHD_{it\text{-}1} + \beta_5\ OtherStableSHD_{it\text{-}1} + \beta_6 LiquidCost_{it} + \beta_7 InfoAsym_{it} + \beta_8 Log(Age + 1)_{it} + \beta_9 MktShare_{it} + \beta_{10} POS\_ChgSale_{it} + \beta_{11} NEG\_ChgSale_{it} + \beta_{12} ROA_{it} + \beta_{13} MTB_{it} + \beta_{14} AltmanZ_{it} + \beta_{15} Leverage_{it} + \beta_{16} CA_{it} + \beta_{17} CL\_Xtrade_{it} + \beta_{18} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (5)$$

where:

StableSHD = one if *StableSH* > 0 and zero otherwise,

CrossSHD = one if *CrossSH* > 0 and zero otherwise, and

OtherStableSHD = one if *OtherStableSH* > 0 and zero otherwise.

Equations (1) – (5) are based on Chen et al.'s (2017) model.[13] The independent variable, *TradeCredit*, is the ratio of trade credit to total assets. *AQ* is a measure of accounting quality. *AQ* is the first principal component score obtained using principal component analysis to extract the common component of firm-level accounting quality, in line with Beatty et al. (2010), Bharath et al. (2008), and Chen et al. (2017).[14] Bharath et al. (2008)

[13] The regression models in this study follow Chen et al. (2017) because the samples from both Chen et al. (2017) and this study samples are based on listed firms.

[14] This study assumes that suppliers offer trade credit based on the accounting quality and shareholdings that have

assert that this measure reduces the measurement error associated with each abnormal accrual measure. Three types of abnormal accrual measures (*AA1*, *AA2*, and *AA3*) are used for principal component analysis. For *AA1*, the absolute value of the residual of Dechow and Dichev's (2002) accrual model is standardized after multiplying by -1, *AA2* and *AA3* are computed similarly to *AA1* but based on Teoh, Welch, and Wong's (1998) model and Dechow, Sloan, and Sweeney's (1995) model, respectively. All three accrual models are estimated by industry-year, where industries are identified using the Tokyo Stock Exchange classification codes.[15] *AQ* is computed as the first principal component score of *AA1*, *AA2*, and *AA3*.

Following Chen et al. (2017), accounting accruals are computed using balance sheet and income statement data because the calculation of accruals is modified to reduce the influence of change in accounts payable. Change in accounts payable is removed from the calculation of accruals. Because a change in accounts payable is associated with a change in inventories, the changes in inventory are regressed on the changes in accounts payable changes, and the residuals of the regression are used as the modified change in inventories.[16]

The control variables in equation (1) are similar to those in Chen et al. (2017), and their definitions are provided in the Appendix.[17] A positive β_1, the coefficient of *AQ,* indicates that accounting quality promotes the offering of trade credit from suppliers.

already been disclosed to the public. Therefore, shareholding variables and *AQ* are incorporated with a lag. This mitigates concerns about reverse causality.

[15] Sample firms are divided into 33 industries according to the Tokyo Stock Exchange classification codes. At least 20 observations in each industry-year group are required to calculate abnormal accruals. As a result, the primary test uses 25 industries to estimate equation (1).

[16] "Accruals" is defined as (Δcurrent asset - Δcash - Δtrading securities - Δshort-term loans receivable) - (Δcurrent liability - Δshort-term loan payable - Δnote payable for PPE - Δaccrued amount payable for PPE) - Δlong-term allowance - depreciation); PPE = the amount of property, plant, and equipment: all of the items are divided by total assets at the end of year *t*-1. To modify change in accounts payable, the change in accounts payable and the change in inventories are excluded and the residuals of regression of the change in inventories on the changes in accounts payable are added. For Dechow and Dichev's (2002) and Teoh et al.'s (1998) models, working capital accruals are used after eliminating non-working capital items. Because of the adjustments of accounts payable and inventories, accruals are calculated from balance sheet and income statements.

[17] A deviation from Chen et al.'s (2017) model is the inclusion of *AltmanZ*. They use S&P credit ratings (*PredRating*) instead of *AltmanZ*. The database (*Nikkei NEEDS-FinancialQUEST*) does not include credit ratings.

Negative β_1 means that customers with low accounting quality might have difficulty accessing debt and equity financing, and thus need to increase trade credit in response to their financial constraints. Equation (1) does not isolate the effects of stable and cross-shareholdings; thus, β_1 can be interpreted to include the effects of firms with and without cross- and stable shareholdings.

To test the study's hypothesis, equation (2) includes the corporate governance variables *StableSH*, *CrossSH*, and *OtherStableSH*. First, *TradeCredit* is regressed on *AQ* and its interaction with *StableSH* in equation (2). As stable shareholdings can be split into cross-shareholdings and other stable shareholdings (*StableSH* = *CrossSH* + *OtherStableSH*), *StableSH* is replaced with *CrossSH* and *OtherStableSH*. *CrossSH* is the ratio of shares mutually held by financial institutions and other business corporations. *OtherStableSH* comprises the ratio of shares held by financial institutions, trust banks (for trading through their own account), and the parent company. Therefore, this variable represents stable shareholdings by financial institutions for firms without a parent company because many banks, including non-main banks, hold listed firms' shares for the purposes of lending and the strength of their relationship.

Equation (2) allows the coefficients to differ between firms with and without stable shareholders and tests the differences in the effect of accounting quality between the two. As previously described, stable shareholdings are predicted to weaken the relationship between accounting quality and trade credit. For equation (2), the coefficients of *AQ* and *AQ* × *StableSH* are predicted to have opposite signs. Thus, a positive (negative) coefficient of *AQ* would suggest that firms with high *AQ* and without stable shareholdings increase (decrease) the amount of trade credit, and a negative (positive) coefficient of *AQ* ×*StableSH* means that close ties to stable shareholders cancel out the effect of the coefficient of *AQ*.[18]

[18] β_1 in the equation (2) shows the mixed results of (a) the positive effects of accounting quality on the amount of trade credit and (b) the weakening effect of presence of private information between suppliers and customers (without stable shareholdings) on (a). Positive β_1 shows that the former effect dominates the latter. β_3 represents the direct effect of

Therefore, β_1 is the effect of *AQ* on a firm without stable shareholdings, and $\beta_1 + \beta_2 \times StableSH$ is the total effect of *AQ* when *AQ* is fixed. $\beta_2 \times StableSH$ is the incremental effect on a firm with stable shareholdings compared to one without stable shareholdings. In this study, if the absolute value of the total effect ($\beta_1 + \beta_2 \times StableSH$) is smaller than that of β_1, it would imply the reduction of the effect of *AQ* through stable shareholdings, thus supporting the study hypothesis.

Consider the case in which β_1 (β_2) is positive (negative). $\beta_2 \times StableSH$ is nonpositive because *StableSH* is nonnegative. Then, the nonnegative total impact of *AQ* ($\beta_1 + \beta_2 \times StableSH \geqq 0$) implies that the effect of *AQ* on trade credit is reduced by the intersection term. Even when the total impact of *AQ* is negative, but higher than $-\beta_1$ ($-\beta_1 < \beta_1 + \beta_2 \times StableSH < 0$), the total effect of accounting quality decreases in absolute value relative to the effect without stable shareholdings, which supports the study's hypothesis.

For equation (3), I focus on the coefficients of the two interaction terms β_2 and β_3 in equation (3). When the sign of β_1 in equation (3) is positive, β_2 and β_3 are expected to be negative in contrast to β_1, and *vice versa*. The interpretation of the coefficient is similar to that of equation (2). I replace the continuous stable and cross-shareholding variables with dummy variables in equations (4) and (5). In the case of equation (4), when the sign of β_1 is positive, β_2 is expected to be negative, in contrast to β_1. The coefficients in equation (5) are predicted similarly.

Sample selection and data collection

Table 1 summarizes the study's sample-selection procedure. The initial sample comprises nonfinancial firms with consolidated financial statement data from 2001 to 2016. To eliminate the impact of IFRS on accounting practices, the sample is limited to firms that have adopted the Japanese GAAP (Generally Accepted Accounting Principles). Firm

stable shareholdings on trade credit. When close ties to stable shareholdings could increase a firm's credibility, the sign of β_3 is expected to be positive.

years in which total assets and/or sales growth exceeds 100 percent are excluded to avoid the effect of major changes to business fundamentals, such as large M&As (Almeida, Campello, and Weisbach 2004; Hribar and Collins 2001). Firm-years that do not have sufficient data to calculate accounting accruals are also excluded. Moreover, firm-years without data on cross- and stable shareholdings or without the data necessary to calculate the control variables are deleted. Finally, firms with fewer than two observations are excluded to allow for firm fixed effects in my regression model. The final sample yields 25,526 firm-year observations.

[Insert Table 1 here]

Data are obtained from four databases. All data on financial statements are obtained from *Nikkei NEEDS-FinancialQUEST* (Nikkei Media Marketing). The data on cross- and stable shareholdings are derived from the *Data Package of Cross-Shareholding and Stable Shareholding* (NLI Research Institute). Stock price and return data are obtained from *NPM* (Financial Data Solutions). The data on analyst consensus forecast and analyst following are collected from *Datastream* (Refinitiv).

IV. RESULTS

Panel A of Table 2 reports the descriptive statistics for the dependent and independent variables used to analyze the relationship between accounting quality and trade credit. The mean of *TradeCredit* is 0.144 (median = 0.122). Cross-shareholders hold approximately 10 percent of shares on average, while stable shareholders hold over 20 percent, implying that cross- and stable shareholders still substantially influence corporate governance in Japan. Panels B and C of Table 2 report the descriptive statistics for firms with and without stable shareholdings. Firms with stable shareholdings have significantly higher trade credit and accounting quality; they are larger than firms without

stable shareholdings but show a lower return on assets (ROA). Almost all variables are significantly different between firms with and without stable shareholdings. These results suggest that firms without stable shareholdings may have less access to trade credit because of lower accounting quality despite better performance, while firms with stable shareholdings might be actively trading within the corporate group.

Table 3 shows the Pearson correlation matrix. No high correlation coefficient is observed within the independent variables; therefore, the results of the regressions reported in this section are not influenced by multicollinearity.[19]

[Insert Table 2 here]

[Insert Table 3 here]

Table 4 presents the regression results of equations (1) – (5).[20] In Column [1], the coefficient of *AQ* is not significant. These results could be a mixture of those for firms with and without stable shareholdings. Columns [2] and [3] report the results of testing the hypotheses using the interaction effect of *AQ* with *StableSH*, *CrossSH*, and *OtherStableSH*. Column [2] shows that the coefficient of *AQ* is significantly positive, indicating that accounting quality has a positive effect on trade credit when stable shareholdings are zero.[21] This study's results are consistent with those of García-Teruel et al. (2014), but they contradict the findings of Chen et al. (2017). The findings provide

[19] Since the variance inflation factors for the primary tests are below ten, the multicollinearity does not appear to affect the results.

[20] All continuous variables at the top and bottom 1 percent are winsorized to limit the influence of outliers.

[21] In Japan and Spain, the majority of trade credit contracts do not have cash discounts contracts in common (Uesugi et al. 2009; García-Teruel et al. 2014). In the US, Ng et al. (1999, 1110) report that "2/10 net 30" contracts are frequently observed in their sample. This contract stipulates the combination of 2 percent discount for payment within 10 days and a net period of 30 days. The implicit interest rate is 43.9 percent. The results of this study imply that Japanese and Spanish suppliers consider accounting quality when offering trade credit without discounts. Meanwhile, US firms with little access to traditional financing because of low accounting quality would seek to obtain trade credit despite the high-interest rate.

one useful piece of evidence to solve empirical questions about the relationship between trade credit and accounting quality.

[Insert Table 4 here]

The coefficient (β_2) of the interaction term (*AQ* × *StableSH*) has a significantly negative sign in contrast to the coefficient of *AQ* (β_1), which is consistent with the hypothesis. The relationship between accounting quality and trade credit without stable shareholdings is observed only when the impact of firms with stable shareholdings is isolated from the results in Column [1]. This implies that stable shareholders have a proportional impact on the relationship between accounting quality and trade credit.

Substituting the estimated coefficients (β_1 and β_2) and value of *StableSH* into $\beta_1 + \beta_2 \times$ *StableSH,* when *StableSH* is higher than 33.2 percent (25.9 percent of the sample), trade credit is negatively related to accounting quality ($\beta_1 + \beta_2 \times$*StableSH* < 0), albeit to a smaller degree.[22] The incremental effect of *AQ* with stable shareholdings ($\beta_2 \times$ *StableSH*) outweighs the effect (β_1) of *AQ* without them; however, the absolute value of the total effect for most of the sample (98.5 percent) does not exceed the absolute value of the *AQ* effect without stable shareholdings ($|\beta_1 + \beta_2 \times$*StableSH*$| < |\beta_1|$), and the (absolute) effect of *AQ* is weakened by the incremental effect.[23] Thus, the study's hypothesis is supported.

The findings show that an increase in stable shareholdings decreases the importance of accounting quality for supply and/or demand of trade credits. Thus, close ties to stakeholders, including suppliers, could encourage the exchange of private information instead of public disclosure. Column [4] shows a significantly negative coefficient of *AQ* × *StableSHD*, suggesting a decrease in the effect of accounting quality

[22] I calculate this by substituting the value of *StableH* and the unrounded coefficients (β_1 and β_2). The value of β_1 and β_2 before rounding are 0.0008992 and -0.02702, respectively.

[23] These results can be interpreted as those for the difference-in-difference approach because firm-fixed and shareholding dummies are included. The coefficient of *AQ* × *StableSHD* is the difference between the coefficient of *AQ* for firms without change in the presence of stable shareholders and those with change.

owing to the existence of stable shareholdings. Almost all of the control variables are significant, except for *CashHold*.

In Column [3], *StableSH* is replaced with *CrossSH* and *OtherStableSH*. The coefficients of *AQ* × *CrossSH* and *AQ* × *OtherStableSH* are significantly negative, in contrast to the coefficient of *AQ* (β_1), indicating that close ties to cross-shareholders or other financial shareholders reduce the association between accounting quality and trade credit. Similar to the results in Column [2], when cross- and other stable shareholders are high, trade credit is negatively related to accounting quality, albeit to a smaller degree.[24] However, the absolute value of the total effect for almost the whole sample (98.5 percent) does not exceed the original *AQ* effect without cross- or other stable shareholdings. Columns [4] and [5] show similar results.[25]

The coefficients of the interaction terms of *AQ* with the cross- and stable shareholding variables are not significant in all columns. These results suggest that close ties with stable shareholders do not increase the trade credit.

The aforementioned results can also be interpreted in another way. Given that either accounting quality or stable shareholdings increase the amount of trade credit, the effects of accounting quality and stable shareholdings cancel each other out because of the negative sign of their interaction term (*AQ* × *Stable SH*). The reason for this is the substitution between public and private information.

Cross- and stable shareholdings weakened between the mid-1990s and mid-2000s. Unwinding cross- and stable shareholdings appears to have enhanced the role of accounting information in trade credit.

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[24] I calculate this by substituting the value of *CrossSH and OtherStableSH* and the unrounded coefficients (β_1, β_2, and β_3). The values of β_1, β_2, and β_3 before rounding are 0.0015986, -0.009625, and -0.006683, respectively. Unlike stable shareholders, the magnitude of incremental effect depends on the combination of two variables (*CrossSH* and *OtherStableSH*). It is impossible to report the specific values for *CrossSH* and *OtherStableSH* so that the total effect will be negative.

[25] Although the coefficient of *AQ* × *CrossSH* is not significant when *CrossSH* and *OtherStableSH*-related variables are incorporated separately, the coefficient of *AQ* × *CrossSHD* is significantly negative when *CrossSHD* and *OtherStableSHD*-related variables are incorporated separately.

V. ADDITIONAL TESTS

Additional testing: Effects of bank shareholdings

As an additional test, this study analyzes bank shareholdings as another feature of Japanese-style shareholdings.[26] Japanese banks supply funds to lender firms with whom they have long-term relationships; these banks often hold the firms' shares and are involved in the firms' management, especially when the firm is facing financial difficulties (Douthett and Jung 2001; Hoshi and Kashyap 2001; Jacobson and Aaker 1993; Sheard 1994). Cross-shareholding banks, including the main banks, have the closest links to client firms and provide daily financial services. In particular, the main bank holds a prominent position in providing financing to client firms and is at the core of the cross-shareholder group; in many cases, it also has close ties to the lender firm. Other banks also hold the lender's shares; therefore, they can obtain private information about the lender firm. Such close ties with lender firms encourage the exchange of private information with the firms. Therefore, suppliers could utilize not only their own private information but also the banks' monitoring through their private information. However, previous studies on trade credit have not focused on this phenomenon.[27]

In line with the above argument, this study focuses on bank shareholdings to observe the effects of banks on trade credit by including three bank-related variables. Instead of cross- and stable shareholdings in equation (2), the following variables are incorporated: the ratio of bank shareholdings (*BankSH*), the ratio of shares held by cross-shareholding banks (*BankCrossSH*), and the ratio of bank shareholdings other than bank

[26] In Japan, banks are permitted to hold shares in non-financial firms up to a specified ratio (5 percent), as in European countries. Previous studies, such as that of Ono, Suzuki, and Uezugi (2018, 1) explain two reasons why both main and non-main banks hold borrowers' equity claims. They summarize that the motivation for holding a borrower's shares is to (1) obtain a competitive advantage from complementary effects between shareholdings and lending activity and (2) mitigate the conflict of interest between shareholder and borrowers.

[27] Nagata and Nguyen (2017) report that bank shareholdings lead to lower-quality disclosure, owing to the accessibility of private information. The results of this study also provide evidence regarding the possibility of sharing private information.

cross-shareholdings (*OtherBanksSH*). *BankSH* is a proxy for the strength of all banks' shareholdings, including cross-shareholding and non-cross-shareholding banks. *BankCrossSH* extracts strong (cross- shareholding) relationships between banks and firms. Higher values indicate stronger ties to banks, thereby increasing their potential to use private information.

The following regressions are run to test the bank relationship:

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it\text{-}1} + \beta_2 AQ_{it\text{-}1} \times BankSH_{it\text{-}1} + \beta_3 BankSH_{it\text{-}1} + \beta\ Controls + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (6)$$

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it\text{-}1} + \beta_2 AQ_{it\text{-}1} \times BankCrossSH_{it\text{-}1} + \beta_3 AQ_{it\text{-}1} \times OtherBanksSH_{it\text{-}1} + \beta_4 BankCrossSH_{it\text{-}1} + \beta_5 OtherBanksSH_{it\text{-}1} + \beta\ Controls + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (7)$$

Along with the primary tests, I replace bank shareholding variables with dummy variables as follows:

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it\text{-}1} + \beta_2 AQ_{it\text{-}1} \times BankSHD_{it\text{-}1} + \beta_3 BankSHD_{it\text{-}1} + \beta\ Controls + \beta\ Firm + \beta\ Year + \varepsilon_{it} \quad (8)$$

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it\text{-}1} + \beta_2 AQ_{it\text{-}1} \times BankCrossSHD_{it\text{-}1} + \beta_3 AQ_{it\text{-}1} \times OtherBanksSHD_{it\text{-}1} + \beta_4 BankCrossSHD_{it\text{-}1} + \beta_5 OtherBanksSHD_{it\text{-}1} + \beta\ Controls + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (9)$$

where:

BankSH = the ratio of shares held by banks,

BankCrossSH = the ratio of shares held by cross-shareholding banks,

OtherBanksSH = *BankSH* – *BankCrossSH*,

BankSHD = one if *BankSH* > 0 and zero otherwise,

BankCrossSHD = one if *BankCrossSH* > 0 and zero otherwise, and

OtherBanksSHD = one if *OtherBanksSHD* > 0 and zero otherwise.[28]

The coefficients of the interaction terms, which are β_2 in equations (6) and (8) and which are β_2 and which are β_3 in equations (7) and (9), are predicted to have negative signs, in contrast to the coefficient of *AQ* (which are β_1), as in the primary tests.

Table 5 presents the results from equations (6) – (9). All the coefficients of the interaction terms of *AQ* with the bank shareholding variables are significantly negative. These results are consistent with those for cross-shareholdings and stable shareholdings. Ties with banks with shareholdings also appear to lower the importance of accounting information in trade credit. In Column [1], when bank shareholdings are higher than 6.8 percent (36.4 percent of the sample) in Column [1], trade credit is negatively related to accounting quality ($\beta_1 + \beta_2 \times BankSH < 0$).[29] Furthermore, 14.23 percent of the observations are the absolute value of the total effect, exceeding the absolute value of the original *AQ* effect without bank shareholdings ($|\beta_1 + \beta_2 \times BankSH| > |\beta_1|$). Thus, the total effect of *AQ* did not increase with the interaction term in 85.7 percent of the samples. In Column [2], *BankSH* is replaced with *BankCrossSH* and *OtherBankSH*. The coefficients of *AQ* × *BankCrossSH* and *AQ* × *OtherBankSH* are significantly negative. These results hold for Columns [3], and [4].

These additional findings imply that suppliers, as financing providers, may delegate customer monitoring to banks with whom they have close ties. However, the findings also suggest that customers with high bank shareholdings rely (in part) on trade

[28] As previously mentioned, an upper limit on holding shares in non-financial firms is 5 percent for banks. Hence, the sample excludes firm-year observations in which a bank has shareholdings over 5 percent.

[29] I calculate this by substituting the value of *BankH* and the unrounded coefficients (β_1 and β_2). The values of β_1 and β_2 before rounding are 0.007356 and -0.0108171, respectively.

credit for short-term financing, despite low accounting quality. With higher bank shareholdings, trade credit may be supplied using information other than accounting information, such as close ties with banks.

[Insert Table 5 here]

Additional testing: information environment, firm risk, and financial constraint

I conduct subsample analyses to shed light on the situations under which suppliers and customers rely on accounting quality and private information exchange with cross- and stable shareholders. Specifically, the focus is on the potential impacts of the information environment, firm risk, and financial constraints on them. The purpose of these additional analyses is to identify situations in which the main result is more likely to be pronounced.

First, I examine the effects of the information environment. The concept of the information environment in this study is similar to transparency regarding whether firm-specific information is available, in line with Bushman et al. (2001). As posited by Bushman et al. (2001), a high information environment (high transparency) implies that more abundant information including private information is prevalent. This additional test aims to explore how the accessibility of firm-specific information to outsiders, such as analysts, affects the relationships among accounting quality and cross- and stable shareholdings.

In this study, I employ analyst forecast error to measure the information environment, following Lang, Lins, and Miller (2003), who use it to measure market participants' understanding of a firm's economics. Although this study primarily concentrates on accounting quality as the quality of disclosure by firms, this additional metric is intended to provide a comprehensive view of the transparency of firm information.[30]

[30] Goto et al. (2015) and Fan et al. (2023), who study trade credit, conduct a cross-sectional analysis using

There are different plausible explanations for the effects of the information environment on trade credit. On the one hand, in a low-information environment, where there is limited transparency, suppliers may hesitate to offer trade credit because it is more difficult to obtain related information about a firm's financial prospects than in a high information environment. On the other hand, customers in low-information environments may enhance their accounting quality. They might do this to compensate for the lack of transparency and to receive trade credit because trade credit is particularly crucial for less transparent firms (e.g., Berger and Udell 1998). This could lead to increased information sharing with stakeholders to facilitate smoother business transactions, possibly resulting in a substitution effect.

Firms with higher accounting quality in a high-information environment may receive more trade credit from suppliers. In a high information environment, suppliers and customers can rely on accounting quality with abundant related information for trade credit. However, at the same time, since the exchange of information related to customers including private information may become more active, the exchange can affect the relationship between accounting quality and trade credit. These are just a few examples of what I might encounter, and there may be other scenarios as well.

The analyst forecast error (*FE*), a proxy for the information environment, is defined as the absolute value of the difference between the analyst consensus forecast of earnings per share (*EPS*) and the actual EPS divided by the year-end stock price. This measure is calculated as $|EPS_{it} - AF_{it}| / P_{it}$, where EPS_{it} is the realized EPS for firm i in year t, AF_{it} represents the analyst consensus forecast of EPS_{it}, and P_{it} represents the year-end stock price. To create high- and low-information environment sub-samples, each year's sample is divided by the median *FE* at the end of the previous year. In this study, a low *FE* indicates a high-information environment. The two subsequent additional

the information environment as a proxy variable for opacity or transparency.

analyses use the same approach to divide the samples.[31]

Table 6 shows the results of the analysis of the effects of shareholdings on the relationship between accounting quality and trade credit in firms in high- and low-information environments.[32] Columns [1] to [5] report the results for a high-information environment, whereas Columns [6] to [10] display the results for a low-information environment. For firms in a high-information environment, the interaction terms of *AQ* with *StableSH*, *CrossSH*, and *OtherStableSH* in Columns [2] – [3] are significantly negative, consistent with the primary results reported in Table 4. For firms in a low-information environment, none of the interaction terms in Columns [7] – [10] are significant.[33] These findings suggest that for firms with a high information environment, i.e., high transparency, suppliers can offer trade credit using accounting information (along with other firm-specific information) and thus, accounting quality plays a critical role between suppliers and customers. Additionally, substituting accounting information and private information based on cross- and stable shareholdings for firms with a high information environment suggests that such private information is effective.

The results of *AQ* are consistent with evidence from Li et al. (2021), which reports that the improvement of financial reporting transparency through IFRS adoption increases trade credit through a stronger change in the information environment. Conversely, for firms with lower information environments, accounting quality alone is not valuable for suppliers and the substitution effect is limited. This implies that, in a low

[31] The missing observations of the analyst forecast reduce the entire sample size. Thus, singleton observations are again excluded from the entire sample before splitting high- and low-information environments. There is some degree of imbalance in the number of observations between the high- and low-information environments because singleton observations are newly generated in each regression after dividing into two sub-samples.

[32] When the sample is split into groups based on the number of analysts followed and whether any analysts were followed, there are no substantial differences in the results between the two samples. Owing to the prevalence of management forecasts in Japan (more than 90 percent of firms publish management forecasts and their publication is practically mandated), the number of analysts following may have been less effective in the information environment than in the US and other countries where the disclosure of management forecasts is not as prevalent as in Japan. Regarding the Japanese management forecast, please refer to Kato, Skinner, and Kunimura (2009).

[33] For the sake of brevity, I have omitted the percentage of the absolute value of the total effect not exceeding the absolute value of the *AQ* effect without stable shareholdings or cross-shareholdings and other stable shareholdings ($|\beta_1 + \beta_2 \times StableSH| < |\beta_1|$ or $|\beta_1 + \beta_2 \times CrossSH + \beta_2 \times OtherStableSH| < |\beta_1|$).

information environment, trade credit is supplied regardless of accounting quality and the exchange of private information with cross- and stable shareholdings.

[Insert Table 6 here]

Next, I analyze whether the relationship between trade credit, accounting quality, and the substitution role of shareholdings is impacted by firm risk, which represents the level of uncertainty surrounding potential future outcomes (Miller 1977). An increase in uncertainty leads to an increase in the perceived level of risk associated with the firm, which impacts both the valuation of the firm and its trade terms with stakeholders (García-Teruel et al. 2014).

I use return volatility as a proxy variable for firm risk level (*FirmRisk*), which is the annualized standard deviation of a firm's daily returns. The main focus here is to understand how important accounting quality and private information shared through cross- and stable shareholdings are when uncertainty about future performance is high or low.

I expect that the relationship between accounting quality and trade credit changes depending on firm risk as well as on the information environment. Higher firm risk, which is greater stock return volatility might increase the difficulty for stakeholders to accurately predict future performance based on accounting information. This reduced predictability may render accounting figures and their quality less important. However, suppliers with their own private information from daily transactions may still offer trade credit, even when uncertainty makes it difficult for firms to access financial markets (Petersen and Rajan 1997). Meanwhile, when there is a lot of uncertainty about the future, customers may work to improve accounting quality to make accounting numbers more predictable. They may also increase private communication, leading to a substitution effect.

In contrast, under a low level of uncertainty, accounting information may prove useful in making forward-looking decisions for suppliers and customers. Thus, as in the information environment, there are several possible scenarios for the impact of a firm's risk on trade credit.

Return volatility is calculated for each accounting period. A higher return volatility indicates higher firm risk. To generate high and low sub-samples, a similar approach is applied to the tests on the information environment.

Table 7 shows the estimation results of the coefficients for high firm risk in Columns [1] – [5] and low firm risk in Columns [6] – [10], respectively.[34] The interaction terms of *AQ* with *StableSH*, *OtherStableSH*, *StableSHD*, and *CrossSHD* are significant for lower risk firms. These results are similar to the primary results. However, for high-risk firms, the interaction terms of *AQ* are insignificant, except in Column [4]. These findings suggest that the substitution effect of cross- and stable shareholdings is less pronounced for high-risk firms, potentially owing to the limited impact of sharing private information on reducing the role of accounting information. In terms of firm risk, high levels of uncertainty may increase information asymmetries between suppliers and customers, which may result in greater reliance on information other than accounting information. This situation could weaken the relationship between trade credit and accounting quality; as a consequence, it might also lessen the impact of cross- and stable shareholdings on this relationship. These findings align with those of Zhang (2020), which demonstrates that the increase in economic uncertainty following the global financial crisis in 2008 weakens the positive link between conditional conservatism and firms' ability to obtain trade credit because suppliers rely less on conditional conservatism. Conversely, for lower-risk firms, the observed effects of cross- and stable shareholdings imply that exchanging private information functions reduces reliance on

[34] Extending the return volatility measurement period from one year to three or five years results in the insignificance of all interaction terms of shareholdings of *AQ* for high-risk firms. This implies that no substitution effect exists for high-risk firms (not tabulated).

accounting quality. These results are consistent with those of the information environment.

Taken together, these two additional results suggest that the effectiveness of accounting quality and the substitution by private information are confined to circumstances where the firm's future accounting information appears to be relatively predictable. These findings also suggest that, for firms with a low information environment and/or a high risk, suppliers may rely on their own superior private information (even under cross- and stable shareholdings).

[Insert Table 7 here]

As an additional test, this study focuses on the influence of financial constraints on the relationship between accounting quality and trade credit. Unlike information environment and firm risk, financial constraints are directly related to a firm's financial position. When customers' internal funds are less available, they should increase the demand for trade credit from suppliers (Petersen and Rajan 1997). Suppliers can also offer trade credit to financially constrained firms. This is because suppliers can set payment terms based on default risk (e.g., Ng et al. 1999). It is assumed that customers facing a high level of financial constraint have an incentive to improve accounting quality to alleviate this constraint by increasing trade credit, and suppliers consider such constraints when offering trade credit. In contrast, firms with low financial constraints may improve their accounting quality to obtain trade credit, and firms with higher financial constraints and lower accounting quality may seek to obtain trade credit. This test also examines whether accounting quality can be replaced with private information under both high and low financial constraints. The sample is split into two sub-samples based on Altman's Z-Score (*AltmanZ*): high and low. Altman's Z-score value decreases as financial constraints increase.

Table 8 presents the estimation results of the coefficients for firms with high financial constraints in Columns [1] – [5] and firms with low financial constraints in Columns [6] – [10]. The coefficient of *AQ* is significantly positive in all columns for financially constrained firms; however, in Column [4], the interaction term of *AQ* with *StableSH* is marginally significantly negative. Among financially unconstrained firms, the coefficients of *AQ* are generally insignificant. However, the coefficients of the interaction terms of *AQ* with *StableSH*, *CrossSH*, and *CrossSHD* are negatively significant. These findings suggest that accounting quality is less important among financially unconstrained firms and that sharing private information reduces accounting quality. In contrast, for suppliers, accounting quality plays an important role among firms with high financial constraints, regardless of the cross- and stable shareholdings, and firms with high financial constraints can increase their trade credit to relax the constraint by improving accounting quality. The private information based on cross- and stable shareholdings could not offset the importance of accounting quality among the firms with high financial constraints.

In summary, the common observation across the three additional analyses is that the occurrence of substitutions that weaken the accounting quality function is situation-specific. This implies that, especially for firms for which outside stakeholders are more uncertain (i.e., firms with weaker information environments, higher firm risk, and more financial constraints), the private information obtained from cross- and stable holdings has limitations and is insufficient to replace accounting information.

[Insert Table 8 here]

VI. ROBUSTNESS CHECKS

I conduct four sensitivity tests to confirm the robustness of the results. First, *AQ*

and shareholding variables with lags in equation (1) – (5) are replaced with those without a lag (please see footnote 14). I incorporate shareholding variables and *AQ* with a lag to mitigate concerns regarding reverse causality. When using *AQ* and shareholding variables without a lag, the untabulated results in equations (1), (4), and (5) are similar to those presented in Table 4.[35]

Second, I employ two alternative accrual models from Jones (1991) and Kothari, Leone, and Wasley (2005). The coefficients of *AQ* × *StableSH* and *AQ* × *OtherStableSH* remain unchanged when both models are used, whereas the coefficients of *AQ* × *CrossSH* are not significant. Hence, the results for stable shareholdings are robust against the alternative accrual models. The coefficients of *AQ* with the dummy variables for shareholdings are not significant (non-tabulated).

Third, three accounting quality measures are used separately before they are summarized using principal component analysis (non-tabulated). For *AA1*, the coefficients of *AQ* ×*StableSH*, *AQ* × *CrossSH*, and *AQ* × *CrossSHD* are consistent with this hypothesis. When *AA2* is used, the coefficients of *AQ* ×*StableSH*, *AQ* × *OtherStableSH*, *AQ* × *StableSHD*, and *AQ* × *CrossSHD* are consistent with the hypothesis. For *AA3*, the coefficients of the *AQ* interaction terms of *AQ* are not significant.[36] Overall, for *AA1* and *AA2*, the results for the other accounting-quality measures are consistent with those in Table 4, although the results for *AA3* do not support

[35] The absolute value of the total effect for most of the sample (89.6 percent) does not exceed the absolute value of the *AQ* effect without stable shareholdings ($|\beta_1 + \beta_2 \times StableSH| < |\beta_1|$). I have omitted the percentage of the absolute value of the total effect not exceeding the absolute value of the *AQ* effect without stable shareholdings or cross-shareholdings and other stable shareholdings ($|\beta_1 + \beta_2 \times StableSH| < |\beta_1|$ or $|\beta_1 + \beta_2 \times CrossSH + \beta_2 \times OtherStableSH| < |\beta_1|$) because the hypotheses are not supported using the level of the shareholdings.

[36] The second and third robustness tests employ two and three accounting accrual models, respectively. When *AQ* in equation (2) is replaced by each accounting accrual measure, all of the observations support the hypothesis when using Jones's (1991) and Dechow et al.'s (1995) models. Measures from the models by Kothari et al. (1998), Teoh et al. (1998), and Dechow et al. (1995) do not support the hypothesis with 1.98 percent, 1.40 percent, and 5.90 percent of the observations ($|\beta_1| < |\beta_1 + \beta_2 \times StableSH|$), respectively. For equation (3), 0.16 percent of the observations when using Jones's (1991) model, 2.20 percent when using Kothari et al.'s (2005) model, 0.24 percent when using Teoh et al.'s (1998) model, 0 percent when using Dechow and Dichev's (2002) model, and 4.31 percent when using Dechow et al.'s (1995) model do not support the hypothesis. All of the observations support the hypothesis when using Dechow and Dichev's (2002) model.

the hypothesis (see footnote 36). Overall, these analyses support the main results.

Finally, I investigate whether this study's results are biased by endogeneity. My primary results may be the result of systematic differences between firms with and without stable shareholdings. In other words, endogeneity can arise since stable shareholders might self-select to firms with better accounting quality ex-ante (self-selection bias). Table 3 shows that firms with stable shareholdings have higher accounting quality than those without stable shareholdings; thus, the factors that affect the presence of stable shareholdings may also be associated with accounting quality, potentially introducing a bias in the findings.

To address this potential self-selection bias from firm-level heterogeneity, I carry out propensity score matching (PSM) analysis. Due to the limited number of firm-years without stable shareholders, as indicated in Table 3, I categorize the firm-years without stable shareholdings as the treatment sample, while those with stable shareholders are classified as the control sample.[37] To calculate the propensity score, I employ the probit model outlined below.[38]

$$NStableSHD_{it} = \beta_0 + \beta_1\, Log(Asset)_{it} + \beta_2\, Log(Age + 1)_{it} + \beta_3\, ROA_{it} + \beta_4\, CFO_{it} + \beta_5\, Debts_{it} + \beta_6\, Tangibility_{it} + \beta_7\, SdROA_{it} + \beta_8 SdSales_{it} + \beta_9 Growth_{it} + \beta\, Industry + \beta\, Year + \varepsilon_{it}, \quad (10).$$

NStableSHD represents the firm without stable shareholders and equals one if *StableSH* equals zero and zero otherwise. I include as variables the firm's characteristics that affect

[37] By definition, cross-shareholdings are a subset of stable shareholdings, so matching is performed based on stable shareholders.

[38] Incorporating firm-fixed effects produces numerous singleton observations in the matching sample. Singleton observations are firms with only one observation during the sample period. Singleton observations in regressions with firm-fixed effects can result in incorrect inferences (Christensen, Huffman, Lewis-Western, and Valentine 2023; Correia 2015; deHaan 2021) and should thus be removed from the regression analysis. The majority of these exclusions occur in the control group, which is created by one-to-one matching in the PSM approach. When incorporating firm-fixed effects in Panel C in Table 9, 375 observations are eliminated and many observations thus lose matched pair observations. As a result, in this robustness test, I opt to include the industry-fixed effects instead of the firm-fixed effects.

the presence of stable shareholdings.[39] *Log*(*Asset*) represents the firm size, which is natural logarithm of total assets; *Log*(*Age* + 1) denotes firm age; *ROA* is net income divided by lagged total assets; *CFO* is cash-flow from operations divided by lagged total assets; *Debts* is short- and long-term borrowings divided by lagged total assets; *Tangibility* is fixed assets divided by lagged total assets; *SdROA* is standard deviation of net income divided by lagged total assets between $t - 1$ and $t - 5$; *SdSales* is standard deviation of sales divided by lagged total assets between $t - 1$ and $t - 5$; *Growth* is sales growth divided by lagged sales.

I implement one-to-one nearest neighbor matching without replacement and set the caliper width at 0.2 times the standard deviation of the propensity score, following Austin's (2011) approach; a common support requirement is also imposed.

Panel A in Table 9 reports the results of probit regression of equation (10).[40] Panel B shows the covariate balance checks. Before matching, all the covariates of the control sample in Column [2] display statistically significant variances in comparison with those of the treatment sample, while after matching, none of them show significant differences between the matched control and treatment samples.[41] This implies that the characteristics of the matched control sample generated through the PSM procedure closely resemble those of the treatment subsample. Furthermore, the mean and median values of *AQ* do not exhibit significant differences between treatment and matched control samples (non-tabulated).

Panel C in Table 9 presents the regression results for matched pair samples. In Columns (3), (4), and (5), the coefficients of *AQ* × *CrossSH*, *AQ* × *StableSHD*, and *AQ* × *CrossSHD,* are significantly negative. These results support my primary findings in Table

[39] Variables are selected in terms of fundamental firm characteristics, operating performance and financial condition, and firm risk and growth. These variables are expected to be associated with accrual-based accounting quality variables.
[40] The regression models of primary tests use lagged values of stable shareholdings. Thus, the observations whose current value of *NStableSHD* equals lagged one are used to estimate the probit regression. This leads to the reduction of the number of firm-years in the treatment sample, thereby shrinking the size of the control sample as well.
[41] Since imposing common support for selecting the matched sample reduce the observations, the sum of observations in the treatment and control samples is not equal to the observations for probit model in Panel A.

4. Thus, my results are robust after considering potential self-selection bias.

[Insert Table 9 here]

VII. CONCLUSION

This study investigates the effect of close ties to stakeholders on the relationship between accounting quality and trade credit in Japan, which is an important extension of previous studies on accounting quality and debt. This study uses well-known features of Japanese corporate governance: cross- and stable shareholdings. Firms closely relate to each other through cross- and stable shareholdings, and it is posited that they exchange private information through this mechanism.

In general, this study highlights that cross- and stable shareholdings weaken the relationship between accounting quality and trade credit. These findings suggest that in Japan, close ties to cross- and stable shareholders reduce the importance of accounting information through sharing private information in various relationships, including implicit contracts. The findings are relevant to the argument suggested by Biddle and Hilary (2006) that private information exchanges through cross-shareholdings and *keiretsu* serve as substitutes for the role of accounting information. This study is unique in that it directly examines this substitution. It also reveals that the substitutions take place in the context of trade credit financing, expanding upon previous research focusing on bank borrowing (e.g., Beatty et al. 2010). In a broader sense, my findings contribute to the argument that accounting quality affects debt contracts (e.g., Francis et al. 2004, 2005; Bharath et al. 2008).

This study also indicates that the trade credit of customers without cross- or stable shareholdings increases with accounting quality. The results conflict with those for US firms in Chen et al. (2017) but are consistent with those for Spanish firms in García-Teruel et al. (2014). The present findings suggest that the relationship between accounting

quality and trade credit depends on the characteristics of the country, which contributes to an understanding of international accounting. Additionally, they also contribute to the existing evidence presented by Ball et al. (2001), which highlights the exchange of private information between key external stakeholders and management as a strategy for mitigating information asymmetries that are considered to be a feature of code-law countries.

In an additional test, the replacement of cross- and stable shareholdings with bank shareholdings produces results similar to the primary findings. The results imply the possibility of delegating the monitoring function to banks in bank–firm relationships in Japan. The evidence of this study is relevant to that of Nagata and Nguyen (2017), who find that bank shareholdings tend to reduce the importance of disclosure because of easier access to private information.

Furthermore, additional tests show that the primary results are more pronounced under a higher information environment, lower firm risk, and lower financial constraint. These findings indicate that private information associated with cross- and stable shareholding can effectively substitute for accounting information in the context of trade credit financing, particularly for firms in which outsider stakeholders have more confidence. The results of these additional analyses contribute to research on the effects of the information environment and uncertainty on the relationship between trade credit and accounting quality (Li, et al. 2021; Zhang 2020). The results also contribute to prior research, which has shown that suppliers' private information is useful when information uncertainty and asymmetry are high (Ng et al. 1999; Petersen and Rajan 1997; Smith 1987).

The findings of this paper have important implications for regulators, management, and investors. Currently, regulatory authorities in Japan recommend unwinding cross-shareholdings to promote discipline from institutional and other investors and market participants. Based on the evidence in this study, such

recommendations will lead to an increased reliance on accounting information for supplying and receiving trade credit. Furthermore, regulatory authorities' enhancement of firms' transparency and reduction of information asymmetry through improved disclosure regulations amplifies the importance of public accounting information compared to private communication.

This study also bears relevance for firms' managerial policies. The unwinding of cross-shareholdings may diminish the proximity to stakeholders and the effectiveness of private information exchange channels. Consequently, even in cases in which regulatory authorities recommend the unwinding of cross-shareholdings, management should carefully assess the costs and benefits of such a decision. Given the relationship between accounting quality and financing, this also implies that unwinding cross-shareholdings should be coupled with efforts to enhance the quality of accounting information, which can prove beneficial for financing.

Investors – especially foreign investors who do not fall under the categories of cross- or stable shareholders – should pay attention to country-specific factors such as cross- and stable shareholders. The results of this study underscore that for firms with strong cross- and stable shareholdings, the importance of the public accounting information on which foreign investors rely is relatively weaker than for firms without cross- and stable shareholdings.

Cross-shareholdings are closely related to the Japanese banking system, which is also well-known for Japanese corporate governance. From the viewpoint of the exchange of private information, more detailed research on the role of banks in trade credit could be an avenue of interest for future research. Furthermore, the analyses in this study can be extended to research on the exchange of private information among stakeholders that occurs under contracts, including accounting information not limited to debt contracts.

Next, our empirical evidence is based on data from Japan, reflecting the country's institutional environment and corporate governance characteristics. Therefore, it remains

unclear whether the research design presented in this paper can be applied to countries with different institutional environments. Expanding the study's research design to an international setting would make it possible to validate the generalizability of the findings.

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APPENDIX

Definition of variables

Variable		Definition
Independent variable		
TradeCredit	=	Accounting payable divided by total assets
Accounting quality variables		
AQ	=	Accounting quality measure, the first principal component score of *AA*1, *AA*2, and *AA*3
*AA*1	=	Abnormal accruals, which is computed as the absolute value of the residual of Dechow and Dichev's (2002) accrual model. The absolute value of the residual is multiplied by -1 and standardized.
*AA*2	=	Abnormal accruals, which is computed as the absolute value of the residual of Teoh et al.'s (1998) model. The absolute value of the residual is multiplied by -1 and standardized.
*AA*3	=	Abnormal accruals, which are computed as the absolute value of the residual in Dechow et al.'s (1995) model. The absolute value of the residual is multiplied by -1 and standardized.
Shareholder variables		
StableSH	=	The ratio of shares held by stable shareholders, which is the sum of *CrossSH* and *OtherStableSH*
CrossSH	=	The ratio of shares mutually held by financial institutions and other business corporations
OtherStableSH	=	The ratio of shares held by financial institutions, trust banks (for trading through their own accounts), and the parent company
StableSHD	=	One if *StableSH* > 0 and zero otherwise.
CrossSHD	=	One if *CrossSH* > 0 and zero otherwise
OtherStableSHD	=	One if *OtherStableSH* > 0 and zero otherwise.

Control variables

CA	=	Non-cash current assets divided by total assets
CashHold	=	The sum of cash to marketable securities divided by total assets
CL_XTrade	=	Current liabilities subtracting accounting payable divided by total assets
InfoAsym	=	Decile rankings of mean bid-ask spread in year *t*-1
Leverage	=	Long-term debt and debt in current liabilities divided by total assets
LiquidCost	=	Raw material divided by total assets
Log(*Age* + 1)	=	Natural logarithm of firm age plus 1
Log(*Asset*)	=	Natural logarithm of total assets
MktShare	=	Market share, which is the ratio of a firm's sales to total sales in the same industry. The Tokyo Stock Exchange classification codes are used to divide the sample into industries.
MTB	=	Market value of equity to the book value of net assets.
NEG_ChgSale	=	Negative sales change divided by total assets
POS_ChgSale	=	Positive sales change divided by total assets
AltmanZ	=	Altman Z-score (Altman 1968)
ROA	=	Net income over total assets

Additional tests

BankSH	=	The ratio of shares held by banks
BankCrossSH	=	The ratio of shares held by cross-shareholding banks,
OtherBanksSH	=	*BankSH – BankCrossSH,*
BankSHD	=	One if *BankSH* > 0 and zero otherwise.
BankCrossSHD	=	One if *BankCrossSH* > 0 and zero otherwise.
OtherBanksSHD	=	One if *OtherBanksSH* > 0 and zero otherwise.

FE	=	Absolute value of the difference between the analyst consensus forecast of earnings per share (EPS) and actual EPS divided by the year-end stock price. Specifically, FE_{it} is $\|EPS_{it} - AF_{it}\| / P_{it}$, where EPS_{it} is realized EPS for firm i and year t, AF_{it} represents the analyst consensus forecast of EPS, and P_{it} is the year-end stock price.
FirmRisk	=	Standard deviation of the firm's daily return for each accounting period.

Robustness tests

NStableSHD	=	One if *StableSH* = 0 and zero otherwise.
CFO	=	Cash-flow from operating divided by lagged total assets.
Debts	=	Short- and long-term borrowings divided by lagged total assets
Tangibility	=	Fixed assets divided by lagged total assets.
SdROA	=	Standard deviation of *ROA* between *t* - 1 and *t* - 5.
SdSales	=	Standard deviation of *Sales* between *t* - 1 and *t* - 5. *Sales* is sales divided by lagged total assets.
Growth	=	Sales growth divided by lagged sales

Table 1.

Sample selection procedure

	Firm-years
Firm-years from 2001 to 2016 that adopt the Japanese GAAP, not including in banks, securities firms, insurance firms, or other financial industries	46,613
(Less) Firm-years with total assets or sales growth over 100 percent	(476)
(Less) Firm-years without sufficient data for calculating accounting quality	(8,671)
(Less) Firm-years without cross- and stable shareholdings data	(5,958)
(Less) Firm-years without data for control variables	(3,714)
(Less) Firms without more than one observation excluded to allow for bank fixed effects.	(268)
Firm- years observations for our primary analysis	27,526

Table 2.

Panel A. Descriptive statistics of the dependent and independent variables

Variables	Mean	Q1	Median	Q3	SD
TradeCredit	0.144	0.063	0.122	0.196	0.110
AQ	0.067	-0.372	0.475	0.952	1.338
StableSH	0.230	0.085	0.196	0.339	0.177
CrossSH	0.096	0.019	0.077	0.148	0.089
OtherStableSH	0.134	0.020	0.06	0.158	0.172
StableSHD	0.952	1	1	1	0.214
CrossSHD	0.856	1	1	1	0.351
OtherStableSHD	0.867	1	1	1	0.340
CA	0.376	0.263	0.376	0.485	0.167
CashHold	0.158	0.072	0.128	0.211	0.119
CL_XTrade	0.205	0.119	0.184	0.268	0.114
InfoAsym	5.498	3	5	8	2.872
Leverage	0.202	0.045	0.169	0.320	0.175
LiquidCost	-0.017	-0.027	-0.004	0	0.024
Log(*Age* + 1)	3.957	3.795	4.076	4.253	0.505
Log(*Asset*)	11.127	10.162	10.99	11.988	1.424
MktShare	0.011	0.001	0.003	0.009	0.024
MTB	1.303	0.655	0.967	1.519	1.123
NEG_ChgSale	-0.036	-0.033	0	0	0.079
POS_ChgSale	0.061	0	0.020	0.083	0.097
AltmanZ	1.120	0.757	0.989	1.344	0.566
ROA	0.023	0.007	0.022	0.043	0.045

Panel B. Descriptive statistics for the firms without stable shareholdings

Variables	Mean	Q1	Median	Q3	SD
TradeCredit	0.075***	0.014	0.049***	0.102	0.085
AQ	-0.434***	-1.044	0.093***	0.693	1.617
CA	0.307***	0.176	0.289***	0.407	0.171
CashHold	0.295***	0.143	0.275***	0.441	0.177
CL_XTrade	0.222***	0.120	0.192***	0.292	0.136
InfoAsym	6.230***	4	7***	9	2.956
Leverage	0.180***	0.010	0.114***	0.305	0.189
LiquidCost	-0.008***	-0.006	0***	0	0.019
Log(*Age* + 1)	3.185***	2.744	3.095***	3.600	0.605
Log(*Asset*)	9.746***	8.422	9.397***	10.848	1.570
MktShare	0.004***	0.000	0.001***	0.003	0.013
MTB	2.458***	1.019	1.779***	3.206	1.975
NEG_ChgSale	-0.049***	-0.041	0	0	0.104
POS_ChgSale	0.109***	0	0.037***	0.168	0.148
AltmanZ	1.227***	0.692	1.103***	1.547	0.726
ROA	0.024	-0.009	0.032***	0.076	0.082

Panel C. Descriptive statistics for the firms with stable shareholdings

Variables	Mean	Q1	Median	Q3	SD
TradeCredit	0.148	0.068	0.126	0.199	0.110
AQ	0.092	-0.342	0.492	0.963	1.317
CA	0.380	0.269	0.379	0.488	0.166
CashHold	0.151	0.070	0.124	0.203	0.111
CL_XTrade	0.204	0.118	0.183	0.267	0.112
InfoAsym	5.461	3	5	8	2.863
Leverage	0.203	0.047	0.171	0.321	0.174
LiquidCost	-0.017	-0.027	-0.004	0	0.024
Log(*Age* + 1)	3.997	3.848	4.090	4.264	0.467
Log(*Asset*)	11.197	10.238	11.031	12.028	1.379
MktShare	0.012	0.001	0.003	0.009	0.025
MTB	1.245	0.645	0.948	1.465	1.028
NEG_ChgSale	-0.035	-0.032	0	0	0.077
POS_ChgSale	0.059	0	0.019	0.081	0.093
AltmanZ	1.114	0.759	0.984	1.335	0.556
ROA	0.023	0.007	0.022	0.042	0.042

The variable definitions are provided in the Appendix. N = 27,526, (Panel A) 1,328 (Panel B) and 26,198 (Panel C). *** in Panel B denotes statistical significance at the 1 percent level (two-tailed) for the test of differences between firms with and without stable shareholdings. The statistical tests used to compare the two groups of firms include the t-test for mean values and the Wilcoxon rank-sum test for medians.

Table 3.

Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) *TradeCredit*	1										
(2) *AQ*	-0.092***	1									
(3) *StableSH*	0.205***	-0.027***	1								
(4) *CrossSH*	0.116***	0.094***	0.312***	1							
(5) *OtherStableSH*	0.152***	-0.077***	0.866***	-0.202***	1						
(6) *StableSHD*	0.142***	0.084***	0.292***	0.244***	0.175***	1					
(7) *CrossSHD*	0.104***	0.107***	0.181***	0.443***	-0.042***	0.550***	1				
(8) *OtherStableSHD*	0.115***	0.046***	0.374***	0.158***	0.305***	0.575***	0.245***	1			
(9) *CA*	0.645***	-0.187***	0.192***	0.026***	0.185***	0.094***	0.042***	0.091***	1		
(10) *CashHold*	-0.201***	0.003	-0.301***	-0.226***	-0.193***	-0.259***	-0.239***	-0.261***	-0.223***	1	
(11) *CL_XTrade*	-0.017**	-0.105***	0.020***	-0.048***	0.046***	-0.035***	-0.058***	0.033***	0.119***	-0.236***	1
(12) *InfoAsym*	0.147***	-0.095***	0.088***	0.034***	0.072***	-0.057***	-0.078***	-0.019**	0.115***	-0.004	0.150***
(13) *Leverage*	-0.104***	-0.021***	0.001	0.063***	-0.032***	0.028***	0.045***	0.084***	-0.091***	-0.421***	0.674***
(14) *LiquidCost*	0.063***	0.015*	-0.019**	-0.045***	0.004	-0.077***	-0.068***	-0.056***	-0.168***	0.078***	0.004
(15) *Log(Age+1)*	0.132***	0.080***	0.261***	0.393***	0.065***	0.344***	0.411***	0.264***	0.097***	-0.334***	-0.055***
(16) *Log(Asset)*	0.020***	0.139***	0.091***	0.139***	0.022***	0.218***	0.252***	0.150***	-0.039***	-0.277***	-0.014*
(17) *MktShare*	-0.064***	0.072***	-0.015*	0.034***	-0.032***	0.069***	0.096***	0.066***	-0.079***	-0.153***	0.030***
(18) *MTB*	-0.105***	-0.090***	-0.136***	-0.213***	-0.030***	-0.231***	-0.238***	-0.153***	-0.099***	0.177***	0.234***
(19) *NEG_ChgSale*	-0.074***	0.154***	-0.010	0.051***	-0.037***	0.037***	0.047***	0.020***	-0.111***	-0.031***	-0.090***
(20) *POS_ChgSale*	0.190***	-0.133***	-0.062***	-0.113***	-0.006	-0.110***	-0.130***	-0.084***	0.165***	0.072***	0.023***
(21) *PredRating*	0.500***	-0.116***	0.014*	-0.104***	0.069***	-0.043***	-0.105***	-0.029***	0.331***	-0.026***	0.093***
(22) *ROA*	-0.067***	0.017**	-0.082***	-0.085***	-0.040***	-0.007	-0.044***	-0.052***	-0.028***	0.218***	-0.231***

	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
(12) *InfoAsym*	1										
(13) *Leverage*	0.094***	1									
(14) *LiquidCost*	-0.011	-0.030***	1								
(15) *Log(Age+1)*	-0.033***	0.077***	-0.161***	1							
(16) *Log(Asset)*	-0.670***	0.152***	-0.009	0.272***	1						
(17) *MktShare*	-0.386***	0.156***	0.002	0.126***	0.639***	1					
(18) *MTB*	-0.157***	0.112***	0.093***	-0.226***	-0.020***	0.053***	1				
(19) *NEG_ChgSale*	-0.096***	-0.061***	0.036***	0.036***	0.119***	0.065***	0.050***	1			
(20) *POS_ChgSale*	-0.009	-0.085***	0.033***	-0.177***	-0.057***	-0.030***	0.242***	0.287***	1		
(21) *PredRating*	0.090***	-0.109***	0.118***	-0.201***	-0.144***	-0.085***	0.049***	-0.118***	0.346***	1	
(22) *ROA*	-0.185***	-0.314***	0.020***	-0.083***	0.063***	0.015*	0.197***	0.298***	0.289***	0.052***	1

Table 3 presents Pearson's correlation matrix. The variable definitions are provided in the Appendix. N = 27,526. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively (two-tailed).

Table 4.

Accounting quality and trade credit: Main results

Variable	[1]	[2]	[3]	[4]	[5]
Intercept	-0.157***	-0.156***	-0.156***	-0.160***	-0.156***
	(0.052)	(0.052)	(0.052)	(0.051)	(0.051)
AQ	0.000	0.001**	0.001**	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
AQ × *StableSH*		-0.003**			
		(0.001)			
AQ × *CrossSH*			-0.004*		
			(0.002)		
AQ × *OtherStableSH*			-0.002**		
			(0.001)		
StableSH		-0.005			
		(0.007)			
CrossSH			-0.014		
			(0.009)		
OtherStableSH			-0.002		
			(0.007)		
AQ × *StableSHD*				-0.001**	
				(0.001)	
AQ × *CrossSHD*					-0.001**
					(0.000)
AQ × *OtherStableSHD*					-0.001
					(0.001)
StableSHD				0.002	
				(0.003)	
CrossSHD					-0.000
					(0.001)
OtherStableSHD					0.001
					(0.002)
CA	0.195***	0.195***	0.195***	0.195***	0.195***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
CashHold	0.044***	0.044***	0.043***	0.044***	0.044***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
CL_XTrade	-0.090***	-0.090***	-0.090***	-0.090***	-0.090***
	(0.011)	(0.010)	(0.010)	(0.011)	(0.011)
InfoAsym	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	-0.017	-0.017	-0.017	-0.017	-0.017
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
LiquidCost	-0.019	-0.020	-0.020	-0.019	-0.020
	(0.035)	(0.035)	(0.035)	(0.036)	(0.036)
Log(*Age* + 1)	0.022**	0.022**	0.022**	0.023**	0.022**

	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Log(*Asset*)	0.008***	0.008***	0.008***	0.008***	0.008***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
MktShare	0.044	0.042	0.042	0.044	0.043
	(0.089)	(0.089)	(0.089)	(0.089)	(0.089)
MTB	0.002***	0.003***	0.003***	0.002***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
NEG_ChgSale	0.030***	0.030***	0.030***	0.030***	0.030***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
POS_ChgSale	0.038***	0.038***	0.038***	0.038***	0.038***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
PredRating	0.048***	0.048***	0.048***	0.048***	0.048***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
ROA	-0.059***	-0.059***	-0.059***	-0.059***	-0.059***
	(0.009)	(0.010)	(0.010)	(0.009)	(0.010)
Firm FE	*included*	*Included*	*included*	*included*	*included*
Year FE	*included*	*Included*	*included*	*included*	*included*
Adj. R-squared	0.950	0.950	0.950	0.950	0.950
Observations	27,526	27,526	27,526	27,526	27,526

Robust standard errors clustered by firm and year are shown in parentheses. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively (two-tailed). The dependent variable is *TradeCredit*. The variable definitions are provided in the Appendix. Columns [1], [2], [3], [4], and [5] show the results for equations (1), (2), (3), (4), and (5), respectively.

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it-1} + \beta_2 LiquidCost_{it} + \beta_3 InfoAsym_{it} + \beta_4\ Log(Asset)_{it} + \beta_5 Log(Age + 1)_{it} + \beta_6 MktShare_{it} + \beta_7 POS\_ChgSale_{it} + \beta_8 NEG\_ChgSale_{it} + \beta_9 ROA_{it} + \beta_{10} MTB_{it} + \beta_{11} AltmanZ_{it} + \beta_{12} Leverage_{it} + \beta_{13} CA_{it} + \beta_{14} CL\_XTrade_{it} + \beta_{15} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (1)$$

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it-1} + \beta_2 AQ_{it-1} \times StableSH_{it-1} + \beta_3\ StableSH_{it-1} + \beta_4 LiquidCost_{it} + \beta_5 InfoAsym_{it} + \beta_6 Log(Age + 1)_{it} + \beta_7 MktShare_{it} + \beta_8 POS\_ChgSale_{it} + \beta_9 NEG\_ChgSale_{it} + \beta_{10} ROA_{it} + \beta_{11} MTB_{it} + \beta_{12} AltmanZ_{it} + \beta_{13} Leverage_{it} + \beta_{14} CA_{it} + \beta_{15} CL\_XTrade_{it} + \beta_{16} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (2)$$

$$TradeCredit_{it} = \beta_0 + \beta_1\ AQ_{it-1} + \beta_2\ AQ_{it-1} \times CrossSH_{it-1} + \beta_3 AQ_{it-1} \times OtherStableSH_{it-1} + \beta_4\ CrossSH_{it-1} + \beta_5\ OtherStableSH_{it-1} + \beta_6 LiquidCost_{it} + \beta_7 InfoAsym_{it} + \beta_8 Log(Age + 1)_{it} + \beta_9 MktShare_{it} + \beta_{10} POS\_ChgSale_{it} + \beta_{11} NEG\_ChgSale_{it} + \beta_{12} ROA_{it} + \beta_{13} MTB_{it} + \beta_{14} AltmanZ_{it} + \beta_{15} Leverage_{it} + \beta_{16} CA_{it} + \beta_{17} CL\_XTrade_{it} + \beta_{18} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}. \quad (3)$$

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it-1} + \beta_2 AQ_{it-1} \times StableSHD_{it-1} + \beta_3\ StableSHD_{it-1} + \beta_4 LiquidCost_{it} + \beta_5 InfoAsym_{it} + \beta_6 Log(Age + 1)_{it} + \beta_7 MktShare_{it} + \beta_8 POS\_ChgSale_{it} + \beta_9 NEG\_ChgSale_{it} + \beta_{10} ROA_{it} + \beta_{11} MTB_{it} + \beta_{12} AltmanZ_{it} + \beta_{13} Leverage_{it} + \beta_{14} CA_{it} + \beta_{15} CL\_XTrade_{it} + \beta_{16} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (4)$$

$$TradeCredit_{it} = \beta_0 + \beta_1\ AQ_{it-1} + \beta_2\ AQ_{it-1} \times CrossSHD_{it-1} + \beta_3 AQ_{it-1} \times OtherStableSHD_{it-1} + \beta_4\ CrossSHD_{it-1} + \beta_5\ OtherStableSHD_{it-1} + \beta_6 LiquidCost_{it} + \beta_7 InfoAsym_{it} + \beta_8 Log(Age + 1)_{it} + \beta_9 MktShare_{it} + \beta_{10} POS\_ChgSale_{it} + \beta_{11} NEG\_ChgSale_{it} + \beta_{12} ROA_{it} + \beta_{13} MTB_{it} + \beta_{14} AltmanZ_{it} + \beta_{15} Leverage_{it} + \beta_{16} CA_{it} + \beta_{17} CL\_XTrade_{it} + \beta_{18} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}. \quad (5)$$

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Table 5.

Accounting quality and trade credit: Results of bank variables

Variable	[1]	[2]	[3]	[4]
Intercept	-0.156**	-0.155**	-0.156**	-0.152**
	(0.053)	(0.053)	(0.054)	(0.054)
AQ	0.001**	0.001**	0.001**	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
AQ × BankSH	-0.011**			
	(0.004)			
AQ × CrossBankSH		-0.008*		
		(0.004)		
AQ ×OtherBanksSH_BCSH		-0.018*		
		(0.009)		
BankSH	-0.020			
	(0.018)			
CrossBankSH		-0.028		
		(0.017)		
OtherBanksSH_CBSH		-0.005		
		(0.023)		
AQ × BankSHD			-0.001*	
			(0.001)	
AQ × CrossBankSHD				-0.001**
				(0.000)
AQ × OtherBanksSHD_BCSH				-0.001*
				(0.000)
BankSHD			0.002	
			(0.001)	
CrossBankSHD				-0.001
				(0.001)
OtherBanksSHD_CBSH				0.001
				(0.001)
Firm FE	*included*	*included*	*included*	*included*
Year FE	*included*	*included*	*included*	*included*
Adj. R-squared	0.952	0.952	0.952	0.952
Observations	25,678	25,678	25,678	25,678

Robust standard errors clustered by firm and year are shown in parentheses. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively (two-tailed). The dependent variable is *TradeCredit*. The variable definitions are provided in the Appendix. Columns [1], [2], [3], and [4] show the results for equations (6), (7), (8), and (9), respectively.

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it-1} + \beta_2 AQ_{it-1} \times BankSH_{it-1} + \beta_3 BankSH_{it-1} + \beta_4 LiquidCost_{it} + \beta_5 InfoAsym_{it} + \beta_6 Log(Age + 1)_{it} + \beta_7 MktShare_{it} + \beta_8 POS\_ChgSale_{it} + \beta_9 NEG\_ChgSale_{it} + \beta_{10} ROA_{it} + \beta_{11} MTB_{it} + \beta_{12} AltmanZ_{it} + \beta_{13} Leverage_{it} + \beta_{14} CA_{it} + \beta_{15} CL\_XTrade_{it} + \beta_{16} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (6)$$

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it-1} + \beta_2 AQ_{it-1} \times BankCrossSH_{it-1} + \beta_3 AQ_{it-1} \times OtherBanksSH\_BCSH_{it-1} + \beta_4 BankCrossSH_{it-1} + \beta_5 OtherBanksSH\_BCSH_{it-1} + \beta_6 LiquidCost_{it} + \beta_7 InfoAsym_{it} + \beta_8 Log(Age + 1)_{it} + \beta_9 MktShare_{it} + \beta_{10} POS\_ChgSale_{it} + \beta_{11} NEG\_ChgSale_{it} + \beta_{12} ROA_{it} + \beta_{13} MTB_{it} + \beta_{14} AltmanZ_{it} + \beta_{15} Leverage_{it} + \beta_{16} CA_{it} + \beta_{17} CL\_XTrade_{it} + \beta_{18} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it} \quad (7)$$

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it-1} + \beta_2 AQ_{it-1} \times BankSHD_{it-1} + \beta_3 BankSHD_{it-1} + \beta_4 LiquidCost_{it} + \beta_5 InfoAsym_{it} + \beta_6 Log(Age + 1)_{it} + \beta_7 MktShare_{it} + \beta_8 POS\_ChgSale_{it} + \beta_9 NEG\_ChgSale_{it} + \beta_{10} ROA_{it} + \beta_{11} MTB_{it} + \beta_{12} AltmanZ_{it} + \beta_{13} Leverage_{it} + \beta_{14} CA_{it} + \beta_{15} CL\_XTrade_{it} + \beta_{16} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (8)$$

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it-1} + \beta_2 AQ_{it-1} \times BankCrossSHD_{it-1} + \beta_3 AQ_{it-1} \times OtherBanksSHD\_BCSH_{it-1} + \beta_4 BankCrossSHD_{it-1} + \beta_5\ OtherBanksSHD\_BCSH_{it-1} + \beta_6 LiquidCost_{it} + \beta_7 InfoAsym_{it} + \beta_8 Log(Age + 1)_{it} + \beta_9 MktShare_{it} + \beta_{10} POS\_ChgSale_{it} + \beta_{11} NEG\_ChgSale_{it} + \beta_{12} ROA_{it} + \beta_{13} MTB_{it} + \beta_{14} AltmanZ_{it} + \beta_{15} Leverage_{it} + \beta_{16} CA_{it} + \beta_{17} CL\_XTrade_{it} + \beta_{18} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (9)$$

Table 6.

Accounting quality and trade credit: High- and low- information environments

	High-information environment					Low-information environment				
Variable	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Intercept	-0.245**	-0.244**	-0.242**	-0.244**	-0.240**	-0.094	-0.096	-0.096	-0.093	-0.091
	(0.102)	(0.101)	(0.101)	(0.103)	(0.102)	(0.069)	(0.068)	(0.068)	(0.070)	(0.070)
AQ	0.001*	0.002***	0.003***	0.001	0.003	0.001	0.001	0.001*	0.001	0.000
	(0.000)	(0.001)	(0.001)	(0.002)	(0.002)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
AQ × *StableSH*		-0.006***					-0.002			
		(0.002)					(0.002)			
AQ × *CrossSH*			-0.013**					-0.007		
			(0.005)					(0.005)		
AQ × *OtherStableSH*			-0.006***					-0.001		
			(0.002)					(0.002)		
StableSH		-0.008					-0.015			
		(0.012)					(0.010)			
CrossSH			0.001					-0.011		
			(0.014)					(0.016)		
OtherStableSH			-0.011					-0.014		
			(0.014)					(0.012)		
AQ × *StableSHD*				-0.001					-0.000	
				(0.002)					(0.001)	
AQ × *CrossSHD*					0.000					-0.000
					(0.002)					(0.001)
AQ × *OtherStableSHD*					-0.002					0.000
					(0.001)					(0.001)
StableSHD				-0.001					-0.001	
				(0.004)					(0.003)	
CrossSHD					-0.005					-0.002

					(0.003)					(0.003)
OtherStableSHD					0.001					-0.000
					(0.002)					(0.002)
Controls	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*
Firm FE	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*
Year FE	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*
Adj. R-squared	0.956	0.956	0.956	0.956	0.956	0.946	0.946	0.946	0.946	0.946
Observations	5,647	5,647	5,647	5,647	5,647	5,585	5,585	5,585	5,585	5,585

The *t*-statistics in parentheses are based on robust standard errors clustered by firm and year. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels respectively (two-tailed). The dependent variable is *TradeCredit*. The variable definitions are provided in the Appendix. The sample is divided into two subsamples: high- and low-information environments. The firm-years whose values of analyst forecast error (*FE*) are above (equal or less than) the median of each year are classified into low- (high-) information environment groups. Columns [1], [2], [3], [4], and [5] show the results for equations (1), (2), (3), (4), and (5) for high-information environment, respectively. Columns [6], [7], [8], [9], and [10] show the results for equations (1), (2), (3), (4), and (5), respectively, for low-information environment. The following regressions are estimated using the subsample:

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it-1} + \beta_2 LiquidCost_{it} + \beta_3 InfoAsym_{it} + \beta_4\ Log(Asset)_{it} + \beta_5 Log(Age + 1)_{it} + \beta_6 MktShare_{it} + \beta_7 POS\_ChgSale_{it} + \beta_8 NEG\_ChgSale_{it} + \beta_9 ROA_{it} + \beta_{10} MTB_{it} + \beta_{11} AltmanZ_{it} + \beta_{12} Leverage_{it} + \beta_{13} CA_{it} + \beta_{14} CL\_XTrade_{it} + \beta_{15} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (1)$$

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it-1} + \beta_2 AQ_{it-1} \times StableSH_{it-1} + \beta_3\ StableSH_{it-1} + \beta_4 LiquidCost_{it} + \beta_5 InfoAsym_{it} + \beta_6 Log(Age + 1)_{it} + \beta_7 MktShare_{it} + \beta_8 POS\_ChgSale_{it} + \beta_9 NEG\_ChgSale_{it} + \beta_{10} ROA_{it} + \beta_{11} MTB_{it} + \beta_{12} AltmanZ_{it} + \beta_{13} Leverage_{it} + \beta_{14} CA_{it} + \beta_{15} CL\_XTrade_{it} + \beta_{16} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (2)$$

$$TradeCredit_{it} = \beta_0 + \beta_1\ AQ_{it-1} + \beta_2\ AQ_{it-1} \times CrossSH_{it-1} + \beta_3 AQ_{it-1} \times OtherStableSH_{it-1} + \beta_4\ CrossSH_{it-1} + \beta_5\ OtherStableSH_{it-1} + \beta_6 LiquidCost_{it} + \beta_7 InfoAsym_{it} + \beta_8 Log(Age + 1)_{it} + \beta_9 MktShare_{it} + \beta_{10} POS\_ChgSale_{it} + \beta_{11} NEG\_ChgSale_{it} + \beta_{12} ROA_{it} + \beta_{13} MTB_{it} + \beta_{14} AltmanZ_{it} + \beta_{15} Leverage_{it} + \beta_{16} CA_{it} + \beta_{17} CL\_XTrade_{it} + \beta_{18} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}. \quad (3)$$

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it-1} + \beta_2 AQ_{it-1} \times StableSHD_{it-1} + \beta_3\ StableSHD_{it-1} + \beta_4 LiquidCost_{it} + \beta_5 InfoAsym_{it} + \beta_6 Log(Age + 1)_{it} + \beta_7 MktShare_{it} + \beta_8 POS\_ChgSale_{it} + \beta_9 NEG\_ChgSale_{it} + \beta_{10} ROA_{it} + \beta_{11} MTB_{it} + \beta_{12} AltmanZ_{it} + \beta_{13} Leverage_{it} + \beta_{14} CA_{it} + \beta_{15} CL\_XTrade_{it} + \beta_{16} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (4)$$

$$TradeCredit_{it} = \beta_0 + \beta_1\ AQ_{it-1} + \beta_2\ AQ_{it-1} \times CrossSHD_{it-1} + \beta_3 AQ_{it-1} \times OtherStableSHD_{it-1} + \beta_4\ CrossSHD_{it-1} + \beta_5\ OtherStableSHD_{it-1} + \beta_6 LiquidCost_{it} + \beta_7 InfoAsym_{it} + \beta_8 Log(Age + 1)_{it} + \beta_9 MktShare_{it} + \beta_{10} POS\_ChgSale_{it} + \beta_{11} NEG\_ChgSale_{it} + \beta_{12} ROA_{it} + \beta_{13} MTB_{it} + \beta_{14} AltmanZ_{it} + \beta_{15} Leverage_{it} + \beta_{16} CA_{it} + \beta_{17} CL\_XTrade_{it} + \beta_{18} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}. \quad (5)$$

Table 7.

Accounting quality and trade credit: High and low firm risk

	High firm risk					Low firm risk				
Variable	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Intercept	-0.181***	-0.181***	-0.184***	-0.181***	-0.180***	-0.140**	-0.139**	-0.143**	-0.145**	-0.138**
	(0.060)	(0.060)	(0.060)	(0.059)	(0.060)	(0.063)	(0.063)	(0.063)	(0.062)	(0.062)
AQ	0.000	0.001	0.001*	0.003**	0.001	0.000	0.001	0.001	0.001**	0.002**
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
AQ × *StableSH*		-0.001					-0.003**			
		(0.002)					(0.001)			
AQ × *CrossSH*			-0.005					-0.005		
			(0.003)					(0.003)		
AQ × *OtherStableSH*			-0.000					-0.002*		
			(0.002)					(0.001)		
StableSH		-0.007					-0.003			
		(0.008)					(0.010)			
CrossSH			0.005					-0.025*		
			(0.009)					(0.012)		
OtherStableSH			-0.010					0.003		
			(0.009)					(0.011)		
AQ × *StableSHD*				-0.003**					-0.001**	
				(0.001)					(0.001)	
AQ × *CrossSHD*					-0.001					-0.001**
					(0.001)					(0.001)
AQ × *OtherStableSHD*					-0.000					-0.001
					(0.001)					(0.001)
StableSHD				0.001					0.004	
				(0.003)					(0.004)	
CrossSHD					-0.001					0.000

					(0.002)					(0.002)
OtherStableSHD					0.001					0.001
					(0.002)					(0.002)
Controls	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*
Firm FE	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*
Year FE	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*
Adj. R-squared	0.964	0.964	0.964	0.964	0.964	0.940	0.940	0.940	0.940	0.940
Observations	13,451	13,451	13,451	13,451	13,451	13,416	13,416	13,416	13,416	13,416

The *t*-statistics in parentheses are based on robust standard errors clustered by firm and year. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels respectively (two-tailed). The dependent variable is *TradeCredit*. The variable definitions are provided in the Appendix. The sample is divided into two subsamples: high- and low-risk firms. Firm years with return volatility values above (equal to or less than) the median of each year are classified into high (low) firm risk groups. Columns [1], [2], [3], [4], and [5] show the results for equations (1), (2), (3), (4), and (5) for high firm risk, respectively. Columns [6], [7], [8], [9], and [10] show the results for equations (1), (2), (3), (4), and (5), respectively, for low firm risk. The following regressions are estimated using the subsample:

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it-1} + \beta_2 LiquidCost_{it} + \beta_3 InfoAsym_{it} + \beta_4\ Log(Asset)_{it} + \beta_5 Log(Age + 1)_{it} + \beta_6 MktShare_{it} + \beta_7 POS\_ChgSale_{it} + \beta_8 NEG\_ChgSale_{it} + \beta_9 ROA_{it} + \beta_{10} MTB_{it} + \beta_{11} AltmanZ_{it} + \beta_{12} Leverage_{it} + \beta_{13} CA_{it} + \beta_{14} CL\_XTrade_{it} + \beta_{15} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (1)$$

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it-1} + \beta_2 AQ_{it-1} \times StableSH_{it-1} + \beta_3\ StableSH_{it-1} + \beta_4 LiquidCost_{it} + \beta_5 InfoAsym_{it} + \beta_6 Log(Age + 1)_{it} + \beta_7 MktShare_{it} + \beta_8 POS\_ChgSale_{it} + \beta_9 NEG\_ChgSale_{it} + \beta_{10} ROA_{it} + \beta_{11} MTB_{it} + \beta_{12} AltmanZ_{it} + \beta_{13} Leverage_{it} + \beta_{14} CA_{it} + \beta_{15} CL\_XTrade_{it} + \beta_{16} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (2)$$

$$TradeCredit_{it} = \beta_0 + \beta_1\ AQ_{it-1} + \beta_2\ AQ_{it-1} \times CrossSH_{it-1} + \beta_3 AQ_{it-1} \times OtherStableSH_{it-1} + \beta_4\ CrossSH_{it-1} + \beta_5\ OtherStableSH_{it-1} + \beta_6 LiquidCost_{it} + \beta_7 InfoAsym_{it} + \beta_8 Log(Age + 1)_{it} + \beta_9 MktShare_{it} + \beta_{10} POS\_ChgSale_{it} + \beta_{11} NEG\_ChgSale_{it} + \beta_{12} ROA_{it} + \beta_{13} MTB_{it} + \beta_{14} AltmanZ_{it} + \beta_{15} Leverage_{it} + \beta_{16} CA_{it} + \beta_{17} CL\_XTrade_{it} + \beta_{18} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}. \quad (3)$$

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it-1} + \beta_2 AQ_{it-1} \times StableSHD_{it-1} + \beta_3\ StableSHD_{it-1} + \beta_4 LiquidCost_{it} + \beta_5 InfoAsym_{it} + \beta_6 Log(Age + 1)_{it} + \beta_7 MktShare_{it} + \beta_8 POS\_ChgSale_{it} + \beta_9 NEG\_ChgSale_{it} + \beta_{10} ROA_{it} + \beta_{11} MTB_{it} + \beta_{12} AltmanZ_{it} + \beta_{13} Leverage_{it} + \beta_{14} CA_{it} + \beta_{15} CL\_XTrade_{it} + \beta_{16} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (4)$$

$$TradeCredit_{it} = \beta_0 + \beta_1\ AQ_{it-1} + \beta_2\ AQ_{it-1} \times CrossSHD_{it-1} + \beta_3 AQ_{it-1} \times OtherStableSHD_{it-1} + \beta_4\ CrossSHD_{it-1} + \beta_5\ OtherStableSHD_{it-1} + \beta_6 LiquidCost_{it} + \beta_7 InfoAsym_{it} + \beta_8 Log(Age + 1)_{it} + \beta_9 MktShare_{it} + \beta_{10} POS\_ChgSale_{it} + \beta_{11} NEG\_ChgSale_{it} + \beta_{12} ROA_{it} + \beta_{13} MTB_{it} + \beta_{14} AltmanZ_{it} + \beta_{15} Leverage_{it} + \beta_{16} CA_{it} + \beta_{17} CL\_XTrade_{it} + \beta_{18} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}. \quad (5)$$

Table 8.

Accounting quality and trade credit: High and low financial constraints

	High financial constraint					Low financial constraint				
Variable	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Intercept	-0.081	-0.080	-0.080	-0.079	-0.077	-0.266***	-0.267***	-0.265***	-0.271***	-0.268***
	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)	(0.067)	(0.067)	(0.066)	(0.067)	(0.068)
AQ	0.000*	0.001**	0.001**	0.003**	0.002***	0.000	0.001	0.001*	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
AQ × *StableSH*		-0.002					-0.003*			
		(0.001)					(0.001)			
AQ × *CrossSH*			-0.002					-0.008**		
			(0.002)					(0.003)		
AQ × *OtherStableSH*			-0.002					-0.002		
			(0.001)					(0.001)		
StableSH		-0.004					0.007			
		(0.007)					(0.008)			
CrossSH			-0.000					-0.021*		
			(0.009)					(0.012)		
OtherStableSH			-0.003					0.012		
			(0.009)					(0.008)		
AQ × *StableSHD*				-0.002*					-0.001	
				(0.001)					(0.001)	
AQ × *CrossSHD*					-0.001					-0.001*
					(0.001)					(0.001)
AQ × *OtherStableSHD*					-0.001					0.000
					(0.001)					(0.001)
StableSHD				0.000					0.003	
				(0.003)					(0.004)	
CrossSHD					-0.001					-0.001

					(0.002)					(0.002)
OtherStableSHD					0.000					0.003
					(0.001)					(0.002)
Controls	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*
Firm FE	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*
Year FE	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*	*included*
Adj. R-squared	0.929	0.929	0.929	0.929	0.929	0.952	0.952	0.952	0.952	0.952
Observations	13,605	13,605	13,605	13,605	13,605	13,590	13,590	13,590	13,590	13,590

The *t*-statistics in parentheses are based on robust standard errors clustered by firm and year. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels respectively (two-tailed). The dependent variable is *TradeCredit*. The variable definitions are provided in the Appendix. The sample is divided into two sub-samples: those with high and those with low financial constraints. Firm-years whose values of *AltmanZ score* values are above (equal to or less than) the median of each year are classified into low (high) financial constraint groups. Columns [1], [2], [3], [4], and [5] show the results for equations (1), (2), (3), (4), and (5) for high financial constraints, respectively. Additionally, Columns [6], [7], [8], [9], and [10] show the results for equations (1), (2), (3), (4), and (5), respectively for low financial constraint. The following regressions are estimated using the sub-sample:

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it\text{-}1} + \beta_2 LiquidCost_{it} + \beta_3 InfoAsym_{it} + \beta_4\ Log(Asset)_{it} + \beta_5 Log(Age + 1)_{it} + \beta_6 MktShare_{it} + \beta_7 POS\_ChgSale_{it} + \beta_8 NEG\_ChgSale_{it} + \beta_9 ROA_{it} + \beta_{10} MTB_{it} + \beta_{11} AltmanZ_{it} + \beta_{12} Leverage_{it} + \beta_{13} CA_{it} + \beta_{14} CL\_XTrade_{it} + \beta_{15} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it,} \quad (1)$$

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it\text{-}1} + \beta_2 AQ_{it\text{-}1} \times StableSH_{it\text{-}1} + \beta_3\ StableSH_{it\text{-}1} + \beta_4 LiquidCost_{it} + \beta_5 InfoAsym_{it} + \beta_6 Log(Age + 1)_{it} + \beta_7 MktShare_{it} + \beta_8 POS\_ChgSale_{it} + \beta_9 NEG\_ChgSale_{it} + \beta_{10} ROA_{it} + \beta_{11} MTB_{it} + \beta_{12} AltmanZ_{it} + \beta_{13} Leverage_{it} + \beta_{14} CA_{it} + \beta_{15} CL\_XTrade_{it} + \beta_{16} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (2)$$

$$TradeCredit_{it} = \beta_0 + \beta_1\ AQ_{it\text{-}1} + \beta_2\ AQ_{it\text{-}1} \times CrossSH_{it\text{-}1} + \beta_3 AQ_{it\text{-}1} \times OtherStableSH_{it\text{-}1} + \beta_4\ CrossSH_{it\text{-}1} + \beta_5\ OtherStableSH_{it\text{-}1} + \beta_6 LiquidCost_{it} + \beta_7 InfoAsym_{it} + \beta_8 Log(Age + 1)_{it} + \beta_9 MktShare_{it} + \beta_{10} POS\_ChgSale_{it} + \beta_{11} NEG\_ChgSale_{it} + \beta_{12} ROA_{it} + \beta_{13} MTB_{it} + \beta_{14} AltmanZ_{it} + \beta_{15} Leverage_{it} + \beta_{16} CA_{it} + \beta_{17} CL\_XTrade_{it} + \beta_{18} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}. \quad (3)$$

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it\text{-}1} + \beta_2 AQ_{it\text{-}1} \times StableSHD_{it\text{-}1} + \beta_3\ StableSHD_{it\text{-}1} + \beta_4 LiquidCost_{it} + \beta_5 InfoAsym_{it} + \beta_6 Log(Age + 1)_{it} + \beta_7 MktShare_{it} + \beta_8 POS\_ChgSale_{it} + \beta_9 NEG\_ChgSale_{it} + \beta_{10} ROA_{it} + \beta_{11} MTB_{it} + \beta_{12} AltmanZ_{it} + \beta_{13} Leverage_{it} + \beta_{14} CA_{it} + \beta_{15} CL\_XTrade_{it} + \beta_{16} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}, \quad (4)$$

$$TradeCredit_{it} = \beta_0 + \beta_1\ AQ_{it\text{-}1} + \beta_2\ AQ_{it\text{-}1} \times CrossSHD_{it\text{-}1} + \beta_3 AQ_{it\text{-}1} \times OtherStableSHD_{it\text{-}1} + \beta_4\ CrossSHD_{it\text{-}1} + \beta_5\ OtherStableSHD_{it\text{-}1} + \beta_6 LiquidCost_{it} + \beta_7 InfoAsym_{it} + \beta_8 Log(Age + 1)_{it} + \beta_9 MktShare_{it} + \beta_{10} POS\_ChgSale_{it} + \beta_{11} NEG\_ChgSale_{it} + \beta_{12} ROA_{it} + \beta_{13} MTB_{it} + \beta_{14} AltmanZ_{it} + \beta_{15} Leverage_{it} + \beta_{16} CA_{it} + \beta_{17} CL\_XTrade_{it} + \beta_{18} CashHold_{it} + \beta\ Firm + \beta\ Year + \varepsilon_{it}. \quad (5)$$

Table 9.

Accounting quality and trade credit: Matched sample approach

Panel A. Estimation of propensity score

Variable	[1]
Intercept	0.3795
	(0.837)
Size	-0.1561***
	(-8.936)
Age	-0.7456***
	(-18.639)
ROA	-1.0865**
	(-2.270)
CFO	-0.7167*
	(-1.911)
Debts	-0.5278***
	(-3.364)
Tangibility	-0.0330
	(-0.236)
SdROA	8.2743***
	(11.281)
SdSale	0.6098***
	(2.833)
Growth	0.4347***
	(2.596)
Control Variables	*included*
Industry FE	*included*
Year FE	*included*
Pseudo R-squared	0.387
Observations	20,697

Panel B. Results of covariate balance tests

	[1]	[2]	[3]
	Treatment sample	Control sample	Matched control sample
Variable	Mean	Mean	Mean
Size	10.0281	11.2120***	10.1102
Age	3.3234	4.0268***	3.3019
ROA	0.0286	0.0233*	0.0313
CFO	0.0647	0.0568**	0.0652
Debts	0.1564	0.1692*	0.1576
Tangibility	0.3967	0.4612***	0.4048
SdROA	0.0478	0.0237**	0.0475
SdSale	0.1750	0.1052***	0.1821
Growth	0.0470	0.0206**	0.0489
N	681	19,956	681

Panel C. Accounting quality and trade credit: Propensity matched sample

Variable	[1]	[2]	[3]	[4]	[5]
Intercept	-0.1193**	-0.1139**	-0.1085**	-0.1168**	-0.1127**
	(-2.703)	(-2.647)	(-2.624)	(-2.725)	(-2.704)
AQ	0.0049***	0.0060***	0.0068***	0.0083***	0.0082***
	(3.777)	(3.591)	(4.060)	(4.441)	(4.735)
AQ × *StableSH*		-0.0108			
		(-1.001)			
AQ × *CrossSH*			-0.0742***		
			(-3.065)		
AQ × *OtherStableSH*			-0.0053		
			(-0.551)		
StableSH		0.0295			
		(1.485)			
CrossSH			0.1646**		
			(2.861)		
OtherStableSH			0.0174		
			(0.805)		
AQ × *StableSHD*				-0.0073*	
				(-2.070)	
AQ × *CrossSHD*					-0.0079*
					(-1.898)
AQ × *OtherStableSHD*					-0.0036
					(-1.413)
StableSHD				0.0155**	
				(2.888)	
CrossSHD					0.0203**
					(2.780)
OtherStableSHD					0.0035
					(0.554)
Controls	*included*	*included*	*included*	*included*	*included*
Industry FE	*included*	*included*	*included*	*included*	*included*
Year FE	*included*	*included*	*included*	*included*	*included*
Adj. R-squared	0.474	0.477	0.484	0.484	0.490
Observations	1,362	1,362	1,362	1,362	1,362

***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively (two-tailed). The variable definitions are provided in the Appendix. Panel A reports the estimation results for equation (10). The dependent variable is *NStableSHD*. Asterisks in panel B indicate the statistical significance of the *t*-test for the difference of mean values between the two pairs, which are treatment sample vs. control sample and treatment sample vs. matched control sample). In Panel C, robust standard errors clustered by firm and year are shown in parentheses. The dependent variable is *TradeCredit*. Columns [1], [2], [3], [4], and [5] show the results for equations (1), (2), (3), (4), and (5), respectively.

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it-1} + \beta_2 LiquidCost_{it} + \beta_3 InfoAsym_{it} + \beta_4\ Log(Asset)_{it} + \beta_5 Log(Age + 1)_{it} + \beta_6 MktShare_{it} + \beta_7 POS\_ChgSale_{it} + \beta_8 NEG\_ChgSale_{it} + \beta_9 ROA_{it} + \beta_{10} MTB_{it} + \beta_{11} AltmanZ_{it} + \beta_{12} Leverage_{it} + \beta_{13} CA_{it} + \beta_{14} CL\_XTrade_{it} + \beta_{15} CashHold_{it} + \beta\ Industry + \beta\ Year + \varepsilon_{it}, \quad (1)$$

$$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it-1} + \beta_2 AQ_{it-1} \times StableSH_{it-1} + \beta_3\ StableSH_{it-1} + \beta_4 LiquidCost_{it} + \beta_5 InfoAsym_{it} + \beta_6 Log(Age +$$

$1)_{it} + \beta_7 MktShare_{it} + \beta_8 POS\_ChgSale_{it} + \beta_9 NEG\_ChgSale_{it} + \beta_{10} ROA_{it} + \beta_{11} MTB_{it} + \beta_{12} AltmanZ_{it} + \beta_{13} Leverage_{it} + \beta_{14} CA_{it} + \beta_{15} CL\_XTrade_{it} + \beta_{16} CashHold_{it} + \beta\ Industry + \beta\ Year + \varepsilon_{it}$, (2)

$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it-1} + \beta_2 AQ_{it-1} \times CrossSH_{it-1} + \beta_3 AQ_{it-1} \times OtherStableSH_{it-1} + \beta_4 CrossSH_{it-1} + \beta_5 OtherStableSH_{it-1} + \beta_6 LiquidCost_{it} + \beta_7 InfoAsym_{it} + \beta_8 Log(Age + 1)_{it} + \beta_9 MktShare_{it} + \beta_{10} POS\_ChgSale_{it} + \beta_{11} NEG\_ChgSale_{it} + \beta_{12} ROA_{it} + \beta_{13} MTB_{it} + \beta_{14} AltmanZ_{it} + \beta_{15} Leverage_{it} + \beta_{16} CA_{it} + \beta_{17} CL\_XTrade_{it} + \beta_{18} CashHold_{it} + \beta\ Industry + \beta\ Year + \varepsilon_{it}$. (3)

$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it-1} + \beta_2 AQ_{it-1} \times StableSHD_{it-1} + \beta_3 StableSHD_{it-1} + \beta_4 LiquidCost_{it} + \beta_5 InfoAsym_{it} + \beta_6 Log(Age + 1)_{it} + \beta_7 MktShare_{it} + \beta_8 POS\_ChgSale_{it} + \beta_9 NEG\_ChgSale_{it} + \beta_{10} ROA_{it} + \beta_{11} MTB_{it} + \beta_{12} AltmanZ_{it} + \beta_{13} Leverage_{it} + \beta_{14} CA_{it} + \beta_{15} CL\_XTrade_{it} + \beta_{16} CashHold_{it} + \beta\ Industry + \beta\ Year + \varepsilon_{it}$, (4)

$TradeCredit_{it} = \beta_0 + \beta_1 AQ_{it-1} + \beta_2 AQ_{it-1} \times CrossSHD_{it-1} + \beta_3 AQ_{it-1} \times OtherStableSHD_{it-1} + \beta_4 CrossSHD_{it-1} + \beta_5 OtherStableSHD_{it-1} + \beta_6 LiquidCost_{it} + \beta_7 InfoAsym_{it} + \beta_8 Log(Age + 1)_{it} + \beta_9 MktShare_{it} + \beta_{10} POS\_ChgSale_{it} + \beta_{11} NEG\_ChgSale_{it} + \beta_{12} ROA_{it} + \beta_{13} MTB_{it} + \beta_{14} AltmanZ_{it} + \beta_{15} Leverage_{it} + \beta_{16} CA_{it} + \beta_{17} CL\_XTrade_{it} + \beta_{18} CashHold_{it} + \beta\ Industry + \beta\ Year + \varepsilon_{it}$. (5)