

# Cross-Ownership and Corporate Debt Structure\*

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## Abstract

This paper investigates the relationship between the borrowing firm's cross-ownership and its choice between bank loan and public bond when raising new debt capital. We find that cross-ownership significantly reduces the firm's usage of a bank loan when making debt issuance decision. The evidence from a quasi-natural experiment based on financial institution mergers mitigates concerns of reverse causality. Furthermore, the reduction in the likelihood to issue bank loan is more pronounced for firms with greater governance externality and information asymmetry. These findings highlight that the governance and informational roles of cross-ownership have real effects on corporate debt structure.

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***Keywords:*** Cross-ownership, Corporate Debt Structure, Information Environment, Governance Substitution Hypothesis

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# 1 Introduction

Debt financing becomes an increasingly important source of external financing for firms. From 1980 to 2020, Figure 1 shows the non-financial corporate debt of large U.S. companies has increased from US\$0.87 trillion to US\$11.06 trillion. The amount of non-financial corporate debt in 2020 accounts for about 53% of the U.S. GDP. Moreover, DeAngelo and Roll (2015) indicates that more than 50% firm funding in the U.S. comes from debt. Therefore, understanding the determinants of debt structure becomes an interesting topics in corporate finance.<sup>1</sup> Bank loan and public bond financing are two major instruments among debt financing. Despite the fact that costs of public debt financing through arm-length investors are cheaper, firms may still use bank loans for additional monitoring, labeling effect, or especially when they have limited access to public debt markets. Therefore, firms can dramatically change their usage of different debt instruments to meet specific funding needs even maintaining similar leverage (Rauh and Sufi, 2010). A large literature provides evidences that institutional investors, as main capital suppliers in the credit market, play a significant role in a firm's choice of debt structure: capital supply shock (Zhu, 2021), investor base uncertainty (Massa et al., 2013), trading behaviour (Kim and Li, 2021), and ownership structure (Lin et al., 2013). Given the increasing trend that large institutional investors simultaneously hold competing firms in the same industry (henceforth, cross-ownership) in Figure 2, it is important to examine whether the cross-ownership has real effect on the corporate debt structure.

Cross-ownership can affect firms' choice of bank loan or public debt when raising new debt capital through various channels. In particular, cross-ownership can affect the choice of debt structure by improving firms' information environment. Firstly, cross-owners have greater incentives to obtain and interpret new information since the information they col-

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<sup>1</sup>See investor based uncertainty (Massa et al., 2013); external governance substitution (Bharath and Hertzfel, 2019); option tradings (Cao et al., 2020); Credit Default Swap (Chen et al., 2021); institutional herding (Kim and Li, 2021), capital supply shocks (Zhu, 2021).

lected can complement analyses of peer firms (Shroff et al., 2017). Moreover, cross-owners may have chances to participate private meetings with board members as well as management executives for both the underlying company and its peers in the same industry. This allow cross-owners to incorporate private information when evaluate the underlying company (McCahery et al., 2016). Finally, cross-ownership can encourage more voluntary disclosure by reducing the competition (Park et al., 2019).<sup>2</sup> The increase in voluntary disclosure can help investors to forecast future earnings better and evaluate the default probability more accuracy. Information opaque firms have difficulty issuing bond publicly, they instead borrow from banks since banks have superior information processing ability comparing to arm-length investors (e.g., Diamond, 1991; Faulkender and Petersen, 2006; Schwert, 2020). Li et al. (2019) show that exogenous increases in information asymmetry lead firms to substitute away from equity and public debt toward bank debt. We hypothesis that improvements in information environment associated with cross-ownership reduce the demand for superior information processing that bank loans offer. Therefore, cross-ownership is negatively related to the use of bank loan when making new debt issuance decision through information channel.

We then investigate the second channel where cross-ownership can affect firms' debt structure by improving their equity-centered governance. Edmans et al. (2019) use the pure trading model to show that under cross-ownership, investors sell low-quality firms upon a liquidity shock. In a voice model, investors have stronger incentives to monitor since "cutting and running" is less profitable. In addition, in an exit model, managers also have stronger incentives to work due to the greater price impact of investor's selling. Moreover, cross-owners play a stronger monitoring role since for each additional unit of monitoring effort spent on a firm, the cross-owner can benefit not only from an improvement in governance in

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<sup>2</sup>Cross-ownership encourages cooperation between firm and its industry peers (e.g., He and Huang, 2017; Azar et al., 2018) , so cross-owned firms have less concern to disclose proprietary information. The level of disclosure is negatively related to the cost of revealing proprietary information (e.g., Beyer et al., 2010; Ellis et al., 2012).

the company itself, but also from the ensuing improvement in governance in the company's peers that are in its portfolio. He et al. (2019) finds that institutional investor's holdings in peer firms are positively related to the probability that the institution votes against management on shareholder-sponsored governance proposals. Their empirical findings show that cross-ownership can improve shareholder monitoring by internalizing governance externalities. Overall, these evidences suggest that cross-ownership can improve equity-centered governance. Firms managers can be exposed to too much governance (Hermalin and Weisbach, 2012), they attempt to obtain their optimal governance structure dynamically by substituting between different governance mechanisms.<sup>3</sup> Banks provide greater creditor governance than public debt-holders because of the more concentrated ownership of debt claims and greater ability to renegotiate debt contracts. Therefore, the increase in equity-centered governance associated with cross-ownership can reduce the use of creditor governance by switching from bank loan to public bond when making debt issuance decision.

Despite the prediction of an increase in public debt usages, the third channel might encourage firms to use more bank loans when raising new debt capital. A growing literature has shown that cross-ownership can lead to an increase in cooperation among firms and reduce competition since cross-owners have incentives to maximize returns across all firms in their portfolio rather than returns of single firms, which lead them either to actively encourage cooperation between firms or to put less pressure on firm managers to aggressively compete against their peers (He and Huang, 2017). Empirical works of Azar et al. (2018) showed that common ownership within the airline industry resulted in anti-competitive practices. Azar et al. (2016) also find that common ownership reduces bank competition, which ends up in higher interest rates on loans. Cross-ownership creates incentives to reduce product market competition, which further reduce the external governance pressure. According to

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<sup>3</sup>Evidences of substitution in governance mechanisms include the substitution between market based governance and government-sponsored governance (Avedian et al., 2015), the substitution between external governance and creditor governance (Bharath and Hertz, 2019), and the substitution between equity-centered governance and creditor governance (Nini et al., 2012).

the substitution of governance mechanisms hypothesis (Bharath and Hertznel, 2019), firms may consider substituting towards creditor (bank) governance by issuing more bank loan when external governance pressure from product market competitiveness is reduced. Therefore, Firms with higher institutional cross-ownership tend to use more bank loan to raise new debt capital since cross-ownership reduces external governance pressure from product market competitiveness. In summary, cross-ownership can affect debt issuance decisions via channels that have counterbalancing effects. The net effect of cross-ownership on corporate debt structure remains ex-ante unclear and is ultimately a open empirical question.

In this paper, we use the incremental approach (e.g., Denis and Mihov, 2003; Bharath and Hertznel, 2019) by examining the debt issuance decisions in our analysis since our priority of interest is to examine the real effect of cross-ownership on firms' financing decision rather than building the optimal debt structure. Another key benefit is that we can facilitate natural experiments to identify the causal impact of cross-ownership on debt structure by employing the incremental approach.

Using a comprehensive sample of U.S. public firms from 1987 through 2018, we investigate the impact of institutional cross-holdings of same-industry firms on corporate debt structure. We begin by providing baseline result that cross-ownership reduces the usages of bank loan when firms source new debt. We expand the Denis and Mihov (2003) empirical model of debt choice by including cross-ownership as explanatory variable. The dependent variable that captures debt choice is binary variable equals to one if firms issue bank loans, otherwise zero if firms issue bonds in a given fiscal year. Using both logit and linear probability estimation procedures, we find firms with higher cross-ownership have less usage of bank loan when making new debt issuance decision. Specially, one standard deviation increase in cross-ownership can lead to a 3.2% decrease in the probability to use bank loan when firms need debt financing. Our baseline result is robust to alternative empirical specifications and alternative measures of cross-ownership.

To solve the potential endogeneity problem, we employ the difference-in-differences (DiD) approach by using a quasi-natural experiment of financial institution mergers. When two institutions merge, firms block-held by one merging institution tend to increase in cross-ownership when one of its same industry peers is block-held by the other merging institution just before the merger. Therefore, firms in the treatment group exogenously increase their cross-ownership with same-industry peers after the institutional merger. We find that after the merger, treatment group substitute from the bank loan to bond financing when raising new debt capital, which suggests a causal impact of cross-ownership on debt structure.

We examine cross-sectional variation in the relationship between cross-ownership and debt choice to further shed light on the underlying mechanisms of the observed cross-ownership effect. We begin by considering cross-sectional firm characteristics that can generate different effect through information channel. We use abnormal accruals and analyst forecasting dispersion as the proxy of information asymmetry. Consistent with the prediction that the enhanced information environment associated with cross-ownership is more beneficial for firms with greater informational asymmetry, we find that the negative impact of cross-ownership on firms' choice of bank loan is more pronounced for firms with greater abnormal accruals and analyst forecasting dispersion.

Moreover, we also find cross-sectional evidence that cross-ownership affects debt structure through governance channel. Recent theories show that corporate governance externalities rise when managers have better outside opportunity, i.e. greater managerial labor market competition (e.g., Acharya and Volpin, 2010; Dicks, 2012). Using industry homogeneity measure of Parrino (1997) and the number of peer firms in the industry as proxies to capture managers outside opportunity. We find that the negative effect of cross-ownership on the usage of bank loan is more pronounced for firms with greater industry homogeneity measure and more peer firms in the same industry. This is consistent with the prediction that cross-ownership affects debt issuance decision through enhanced equity-centered governance by

internalizing the governance externalities.

Our paper makes several contributions to the literature. Firstly, we contribute to how institutional investors affect the debt structure from the supply side. Institutional investors are the main capital suppliers in the credit market and have significant impact on debt structure. For example, Zhu (2021) find that firms are less likely to issue bond when suffering capital supply shock. Massa et al. (2013) find that the Supply uncertainty of the institutional investor base has a significantly negative effect on the leverage of the firm. In addition, trading behaviour of institutional investors can also affect the optimal debt structure. Cao et al. (2020) find that option tradings encourage the use of more public bond through enhanced information environment and governance. Kim and Li (2021) for show that institutional herding has positive effect on corporate bond issuance by improving information efficiency. Chen et al. (2021) conclude that firms tend to shift to public bond following to the initiation of credit default swap. Our paper is more closely to the work of Lin et al. (2013), which find that the diversity between the control rights and cash-flow rights of a borrowing firm's largest ultimate owner reduce the firm's reliance on bank debt financing due to bank monitoring avoidance channel. While we find that cross-ownership reduce bank loan usage when sourcing new debt through enhanced information environment and equity-centered governance.

Second, our paper contributes to a growing literature examining the economic implications of common ownership. Hansen and Lott (1996) develop a model to show that cross-owners maximize their portfolio values by inducing underlying firms to internalize externalities. Recent studies explore the implications of cross-ownership on corporate governance (He et al., 2019), voluntary disclosure (e.g., Pawliczek and Skinner, 2018; Park et al., 2019), information efficiency of stock prices (Edmans et al., 2018), corporate investment decisions (Gutiérrez and Philippon, 2016), customer-supplier relationships (Freeman, 2019), diffusion of innovation (Kostovetsky and Manconi, 2020), acquisitions (e.g., Matvos and Ostrovsky,

2008; Harford et al., 2011), and product market performance (He and Huang, 2017). There are mixed findings regarding the impact of cross-ownership on product market competition. For example, Azar et al. (2018) finds common ownership within the airline industry resulted in anti-competitive practices while Gilje et al. (2020) and Lewellen and Lowry (2021) question the incentives of institutions to encourage anti-competitive practices. These papers consider the real effect of cross-ownership on equity side. To our best knowledge, our paper is the first one to fill the gap in the literature by exploring the implications of cross-ownership from debt side. Especially, we study the information and governance role of cross-ownership on the choice of new debt capital.

Third, we shed light on the literature by examining how firms dynamically substitute between various governance mechanisms. Firm managers exposed to too much governance (Hermalin and Weisbach, 2012) and substitute of governance hypothesis suggests that firms dynamically substitute the composition of different governance mechanisms to achieve optimal level. Avedian et al. (2015) show that firms substitute away from independent board governance in response to the added external governance pressure arising from the creation of the Securities and Exchange Commission. Bharath and Hertzl (2019) find exogenous increase in external governance pressure has significant negative impact on the use of bank loan. More closely related to our study, Nini et al. (2012) report an increase in CEO turnover following covenant violations and suggest that effective creditor interventions can substitute for equity-centered governance mechanisms. We find that improvement in equity-centered governance associated with cross-ownership substitutes for the bank governance.

The rest of the paper is organized as follows. Section 2 describes the data, key variables, and empirical specification. Section 3 provides empirical results. Section 4 provides cross-sectional evidences. Section 5 concludes.

## 2 Data and Variable Construction

### 2.1 Data

Our primary source of data on institutional holdings is Refinitiv (formerly known as Thomson Reuters). We obtain data from the Refinitiv 13F Institutional Holdings dataset. We obtain the issuance data of corporate bonds from the Mergent FISD dataset and bank loan from Dealscan.<sup>4</sup> Stock price information is obtained from CRSP and we use Compustat for firm level accounting data. Our sample contains U.S. listed firms with common stocks traded on the NYSE, NASDAQ, and AMEX during the period 1987-2018.<sup>5</sup>

### 2.2 Variable Construction

#### 2.2.1 Measuring Cross-ownership

We obtain institutional holdings information from Thomson Financial's 13F database each quarter and define a block holding if it exceeds 5% of the outstanding shares. Cross-holdings arise when an institution simultaneously holds more than one blocks in the same four-digit SIC industry at a given quarter.

Following to He and Huang (2017), we use 4 measurements to capture the cross-ownership status in a given fiscal year. Firstly, *NumConnected*, is the number of same-industry peers that share any common institutional blockholder with the firm. We use the number of unique institutions that cross hold the firm as our second measure, namely *NumCross*. The first two measures capture the extent to which a firm is connected to other same-industry peers through cross-ownership. The third measure, *Avgnum*, is the number of same-industry peers block-held by the average cross-holding institution. Specifically, we first calculate

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<sup>4</sup>The firm-level link between DealScan and Compustat is done through the link table provided by Professor Michael Roberts. For details on the construction of the data, see Chava and Roberts (2008).

<sup>5</sup>We choose 1987 as our sample starting date since Dealscan starts its full coverage in that year.

the number of same-industry firms (other than the one under consideration) block-held by each cross-holding institution during a quarter and then average across all such institutions. This measure incentive to influence the corporate policies of the cross-held companies since it captures the intensity of cross-holding activities for the average institution. The last measure, *Totalcrossown*, is the sum of all cross-holding institutions' percentage holdings in the firm itself. We calculate all four measures in a quarter and then take average across a fiscal year.

### 2.2.2 Control Variables

In examining the relationship between cross-ownership and the choice of debt instruments, we control for several firm characteristics widely used in the debt structure literature including *Blockown*, *Blockdummy*, *FirmSize*, *Leverg*, *Profitability*, *AltmanZ*, *BTM*, *Investgrade*, and *Norates*. *Blockown* is defined as the average percentage ownership by institutional blockholders. *Blockdummy* is binary variable equals to one if a firm is block-held in any of the four quarters prior to the fiscal year-end, otherwise zero. These two variables capture the difference in ownership structure. *FirmSize* is defined as the natural logarithm of the book value of assets. We control for firm size because it captures information asymmetry, which potentially influence the costs of debt issuance (Houston and James, 1996). *Leverg* is defined as the ratio of total liabilities to total assets. we use leverage to control for the potential difference between firm's willingness to use debt financing. *Profitability* is used to capture the creditworthiness of firms, which is important for the debt choice (Blackwell and Kidwell, 1988). *AltmanZ* is Altman's Z-score for financial distress risk. *BTM* is book to market ratio, which captures firms' growth opportunity. *Investgrade* is defined as dummy variable equals to 1 if firm is investment grade, and zero otherwise. *Norates* is dummy variable equals to 1 if firm has credit rating, and zero otherwise. These two variables control for the credit ratings. See appendix for definitions of these variables.

## 3 Empirical Results

### 3.1 Summary Statistics

We provide the summary statistics in Table 1. There are 54,403 total debt issuances during 1980-2018 and 68% of the debt issuances are sourced by bank loan.<sup>6</sup> This is consistent with the fact that bank loans are the main tools when making new debt issuance decisions (e.g., Denis and Mihov, 2003; Bharath and Hertz, 2019; Cao et al., 2020). We follow the model in Denis and Mihov (2003) to use *DummyBankIssue*, binary variable equals to 1 if firm issues bank loan in the year, otherwise 0 if firm issues bonds, as our dependent variable to capture the incremental debt issuance decisions. In Panel A, the dependent variable *DummyBankIssue* shows that 84.4% of the new debt issues over sample period are bank loan and the magnitude is similar with Cao et al. (2020). Besides, most of our variables in Panel A are comparable to the current literature.

We then split our sample for both cross-owned firms and non-cross-owned firms in Panel B. We find that *DummyBankIssue* in cross-owned firms is significant lower than it in non cross-owned sample at 1% level. Besides, most of the firm characteristics are statistically different among these two samples. For instance, cross-owned firms have significant larger firm size, higher profitability, higher credit rating, and lower default risk.

### 3.2 Baseline Results

We extend the empirical model in Denis and Mihov (2003) to obtain the preliminary evidence on the effect of cross-ownership on the choice between bank loans and public bond issuance. Table 2 provides linear probability (Panel A) and logit (Panel B) estimates of the likelihood of a firm issuing a bank loan as a function of 4 different measurements of cross-

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<sup>6</sup>We have slightly lower number of debt issuances comparing to Bharath and Hertz (2019) since we only select U.S. public traded firms with at least one blockholder to have significant impact on firms' new debt issuance decisions.

ownership and firm level control variables. We include industry and year fixed effects in estimation procedures for both Panel A and B. The dependent variable *DummyBankIssue* is binary variable equals to one if firms issue bank loans, otherwise zero if firms issue bonds in a given fiscal year. We use this variable to captures firm’s tendency to switch from bank loan to public bond financing when raising new debt capital.<sup>7</sup>

In Panel A, consistent with the empirical predictions both information and governance channel, we find that cross-ownership has significantly negative effect (For instance, coefficient -0.032 with t-statistics -7.15 from column 1) on the issuance probability of bank loan. This negative effect is robust when we use all these four measures to capture the degree of cross-ownership through columns 1 to 4. Taken these baseline evidences together, Firms tend to substitute from bank loan to public bond financing when making new debt issuance decision. In particular, from column 1 in Panel A, one standard deviation increase in cross-ownership measured using *Numconnect* leads to 3.2% decrease in the probability to use bank loan when firms need debt financing. This translates to about 5% reduction when measured relative to the average likelihood of issuing a bank loan, which is 68% in our sample.<sup>8</sup>

The coefficients of these control variables are mostly consistent with current debt structure studies. Consistent with the hypothesis there firms with severe level of informational asymmetry raise capital through bank borrowing, we find that the coefficient of *FirmSize* is negatively related to the issuance probability of bank loans. Firms facing a higher likelihood of bankruptcy (Altman Z-score lower than -1.81) are more likely to raise debt capital through bank loans. Moreover, firms with investment grade and available credit ratings choose public debt financing. Book-to-Market ratio proxies for the growth opportunity of

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<sup>7</sup>Our dataset is constructed at debt issuance points, we do not include firm fixed effect since conditional Logit model with firm fixed effects will significantly drop sample observations for firms with only loan or only bond issuances in the estimation. In robustness check, we also show that our baseline results also robust when firm fixed effect is included in Table 3 Panel B.

<sup>8</sup>The magnitude is similar to the effect of option trading on the choice between bank and bond financing studies by Cao et al. (2019). They finds that one std increase in option trading volume is associated with a reduction of 2.10% of bank loan issuance as new source of debt financing.

the firm, and firms with stronger growth opportunities have more to lose from the hold-up problem associated with debt-financing.

Our baseline results estimated from conditional Logit model with industry and year fixed effect is provided in Panel B. The results from Logit model are mostly consistent with linear model, where cross-ownership has negative impact on the likelihood to issue a bank loan when sourcing new debt capital.

Figure 3 provides time-series plot for bond issuances at aggregate market level for both cross-owned firms and non-cross-owned firms. Given the increasing trend of cross-ownership in Figure 2, we find that aggregate bond issuance increase over time for cross-owned firms in Figure 3.<sup>9</sup> However, the aggregate bond issuances in non-cross-owned firms are stable. Overall, Figure 3 also supports our baseline results where cross-ownership is negatively associated with the issuance probability of a bank loan when firms raise new debt capital.

Collectively, results in Table 2 and Figure 3 show that firms with higher level of cross-ownership tend to have the lower likelihood to issue a bank loan when sourcing new debt, and this finding is robust to controlling for firm characteristics and year/industry fixed effects.

### 3.3 Robustness Tests

Table 3 provides multiple robustness checks. Firstly, to mitigate the potential concern that the impact of cross-ownership on debt issuance decision is driven by unobserved factors in cross-owned and non-cross-owned firms, we provide our baseline results in cross-owned firms sample only in Panel A. Consistent with our baseline result, we find that the regression coefficients across all four measurements for cross-ownership remain significantly negative for both linear probability and probit model, which confirm the negative impact of cross-ownership on the likelihood to issue a bank loan. Moreover, our results in Panel B are also

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<sup>9</sup>We find that the number of cross-owned firms do not linearly increase throughout time, this rule out the possibility that number of firms drive the increases in aggregate bond issuances.

quantitatively similar when we include firm fixed effect to control for time-invariant unobservable differences among firms. The coefficient for *Numconnect* is -0.019 with t-statistics of -0.289, which suggest that the cross-ownership is negatively correlated with the usage of bank loan at 1% significant level. In Panel C, we create our alternative measurement *GGL* for cross-ownership developed by Gilje et al. (2020), which best captures managerial incentives to internalize externalities.<sup>10</sup> In particular, cross-ownership enhances equity-centered governance mechanism by internalizing governance externalities (He et al., 2019), our governance channel predicts that the negative impact of cross-ownership on the probability of borrowing from bank is driving by the substitution of creditor (bank) governance to equity-centered governance. The result in Panel C shows that our baseline results remain unchanged even if the alternative measurement for cross-ownership accounts for the managerial incentives to internalize externalities.

### 3.4 Identification Using Financial Institution Mergers

Although our results document a strong negative effect of cross-ownership on the likelihood of issuing a bank loan when sourcing new debt capital, the findings are subject to endogeneity concerns. One possibility is that debt issuance decision maybe endogenous to the degree of cross-ownership. Thus while a negative relationship between cross-ownership and the choice of bank loan may indicates the enhancement in informational efficiency or equity-centered governance, a negative relationship may also arose if the choice of bank loan affects the degree of cross-ownership. In addition, our baseline results that the negative correlation between choice of bank debt and cross-ownership may be affected by factors that are not observed.

To solve the reverse casualty and omitted variable concerns, we follow He and Huang

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<sup>10</sup>We assumed the likelihood of investors being informed is linear when create *GGL* measure, we also check that our results are remain unchanged if we use concave or convex assumption.

(2017) to use financial institution mergers as exogenous shocks to the degree of cross-ownership. Financial institutions such as asset management companies, banks, security brokers, etc. usually make merging decision unrelated to the fundamentals of individual firms in their portfolios. When two financial institutions merge, the portfolios of the target institution is taken over by the acquirer and this create exogenous increase in the degree of cross-ownership. Therefore, theses financial institutional mergers provide a good quasi-experimental setting for analyzing the causal effect of cross-ownership on the debt issuance decision. Our assumption for this indentation is that institutions merge for reasons unrelated to the debt issuance decisions of individual firms in their portfolios. We obtain financial institution merges from He and Huang (2017), We define treated firms satisfy two conditions: (i) the firm is blockheld by one of the merging institutions, (ii) the other merging institution does not blockhold the same firm, but blockholds at least one of its same-industry peers. We can see that the cross-ownership exogenously increase after institution mergers. Firms in control group need to satisfy 2 conditions: (i) the firm has to be blockheld by the same institution that blockholds a treated firm, and (ii) the other merging institution does not blockhold any peer firms from the same industry. Our DiD sample contains any debt issuance in 5 years before the shock and 5 years after the shock.<sup>11</sup>

The key advantage of this identification is that there are multiple shocks that affect different companies at different times. Such identification with multiple shocks can mitigate the concern of potential omitted variables coinciding with the shock that directly affect the debt issuance decision when we use single shock as identification.

Table 4 provides the results. We estimate this difference-in-difference regression using both linear probability (Column 1-4) and Probit model (Column 5-8). From Column 1, we find the coefficient of  $TREAT * POST$  estimated from linear model with year and mergers fixed effect is -0.046 with t-statistics of -3.305, which is significant at 1%. This

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<sup>11</sup>We consider this long period event study in the paper to have sufficient observations before and after the shock because the average gap between two debt issuances in our sample is 2.3 years.

coefficient indicates that treated firms after institution mergers tend to have 4.6% lower probability to issue bank loan when raising new debt capital. We find similar result when using Probit model in column 5. For robustness, our results continue to hold when estimating the Difference-in-Difference regression model including firm fixed effect, industry fixed effect in Column 2-4. Overall, we find consistent results that firms suffered exogenous increase in cross-ownership after financial institution merger have more likelihood to issue a bank loan when raising new debt capital.

## **4 Cross-sectional Tests**

Although our findings of an increasing likelihood to issue a bank loan after higher degree of cross-ownership exclude the possibility of the reduction in external governance pressure, the results are consistent with both enhanced information channel and equity-centered governance channel. In this section, we investigate the cross-sectional nature of our sample to further shed light on its potential mechanisms. Particularly, we consider cross-sectional characteristics that expect to generate different effects on informational environment and equity-centered governance to test the potential channel.

### **4.1 Information Channel**

If cross-ownership impact the firm's debt issuance decision by enhancing the informational environment, we would expected more pronounced effects for firms with greater information asymmetry. Section 4.1.1 provides results based on interacting cross-sectional measurements with variables capturing information asymmetry. In section 4.1.2, we provide additional evidence on the information channel by investigating the effect of cross-ownership on bank loan syndicate structure.

### 4.1.1 The effect of Information Asymmetry

We hypothesize that firms use more public debt because institutional cross-holding improves the information environment and reduces the benefit of information production and the signaling role of bank debt. Li et al. (2019) document that the effect of the change in the information environment on debt structure is amplified for firms with a poor information environment; therefore, we expect the negative impact of cross-ownership on bank loans is more profound for firms with high asymmetric information. We use abnormal accruals and analyst forecasting dispersion as the proxy of information asymmetry. We follow Dechow et al. (1995) to use the modified-Jones model to construct abnormal accruals. A higher value of abnormal accruals implies a higher degree of earnings manipulation, thereby higher information asymmetry. We follow Mansi et al. (2011) to construct analyst forecasting dispersion as the standard deviation of analysts' earnings estimates. A higher value of analyst forecasting dispersion implies a higher degree of disagreement among analysts.

Table 5 provides the results. We report the results for abnormal accruals in Panel A and analyst forecast dispersion in Panel B. *HighAbn.Accr* is a dummy variable that equals one if the abnormal accruals are above the median in the given fiscal year. *HighDisp* is a dummy variable that equals one if the analyst forecasting dispersion is above the median in the given fiscal year.

Columns 1 to 4 of Panel A show that the interactions of cross-ownership proxies and high abnormal accrual dummy are all significant except the proxy of *Totalcrossown*. In line with our hypothesis and consistent with the information channel, our results confirm that the effect of common-institutional ownership on bank loans is stronger for firms with high abnormal accruals. We use the logit model and report the results in columns (5) to (8) and find qualitatively unchanged results. Panel B presents the results using the proxy of high analyst forecasting dispersion. The interactions in all columns are significant, which provides further support for our hypothesis.

For robustness, we also follow Brown and Hillegeist (2007) to use analyst forecast error and probability of informed trading as alternative proxies of information asymmetry and find qualitatively unchanged results (untabulated). Overall, we provide strong evidence for the information channel prediction that institutional cross-holding improves the information environment and reduces the benefit of the information production and the signaling role of bank debt.

#### 4.1.2 Cross-ownership and Bank Loan Syndicate Structure

Information asymmetry exists between lead arrangers and participates in syndicated bank loans given that lead arrangers are usually informed lenders and more close to borrowers (Sufi, 2007). Literature find that syndicates participates require informed lead arrangers to take a larger share of the loan when borrowing firm suffers greater information asymmetry to provide incentives for lead arrangers to engage in sufficient level of monitoring and due diligence (e.g., Amiram et al., 2017; Beatty et al., 2019). If cross-ownership reduces firm's information asymmetry, we expect that syndicate participates require lead arrangers to have lower share of the loan when cross-ownership is high. We construct this analysis following Cao et al. (2020) by investigating the effect of cross-ownership on loan share of lead arrangers. *LoanShare* is the percentage of the loan taken by a participate. *Leader* is a binary variables that equals to one for if the participate is a lead arranger, and otherwise zero.

Table 6 provides evidence on this conjecture. The dependent variable *LoanShare* is the percentage of the loan taken by a participate. *Leader* is a binary variables that equals to one for if the participate is a lead arranger, and otherwise zero. Except for firm characteristics, we further control for loan maturity, size, loan spread, and number of lenders. From Column 1-4, the coefficients of the interaction between *Leader* and measurement for cross-ownership are all negatively significant. For example, the coefficient of *Leader \* Numconnect* in Column 1 is -0.433 (with t-statistics -9.312), which is significant at 1% level. This confirmed our

conjecture that cross-ownership reduced the information asymmetry between participates and lead arrangers in a syndicate loan. Overall, our results in syndicate loan structure provide additional evidence that cross-ownership improves firms' informational environment and has real effect on loan markets.

## **4.2 Governance Channel**

In this section, we investigate whether cross-ownership affects firms' debt issuance decision through governance channel. He et al. (2019) show that institutional investor's holdings in peer firms are positively related to the probability that the institution votes against management on shareholder-sponsored governance proposals. Their results suggest cross-ownership improves equity-centered governance by internalizing governance externalities. According to governance substitution hypothesis, the demand for creditor (bank) governance reduced to make sure that firms are not exposed to too much governance. We consider two implications to provide evidences for the governance channel. First, the effect of cross-ownership on the choice of debt issuance should be more pronounced for firms suffer greater governance externalities. Secondly, cross-ownership expects to reduce the strictness of bank loan covenants, which are the direct measure of creditor governance from banks.

### **4.2.1 The Effect of Governance Externalities**

Cross-owners could benefit from monitoring the companies in their portfolio in two ways. The first is the direct gain from the governance improvement of the firm. second, cross-owners could also gain from the improvement in the governance at the peer firms in the portfolio due to governance externalities, where peer firms tend to follow the governance level of the focal firm. The second benefit indicates that cross-owners may have stronger incentives to monitor when governance externalities are more pronounced. Therefore, if cross-ownership reduces the likelihood of issuing bank loan by enhancing the equity-centered governance, we

expect that the effect is more pronounced for firms with greater governance externality.

According to theoretical models such as Acharya and Volpin (2010) and Dicks (2012), corporate governance externalities could arise from firms competing for the same pool of managerial talents. In their model, when the managerial labour market is more competitive, the inefficiencies associated with governance externalities are larger, in the sense that each individual manager has more and better outside choices owing to a higher demand for his or her talent. In order to better compete with peer businesses in keeping and hiring skilled managers, each firm in a competitive managerial labour market implements weaker governance norms than it would otherwise. Because the indirect gain a cross-owner derives from monitoring a portfolio firm increases with the strength of governance externalities, which is determined in this case by the extent of labour market competition, if cross-ownership affects debt issuance decision through governance channel, we expect the negative effect of cross-ownership on the usage of a bank loan is more pronounced when managers face better outside opportunities. Following to He et al. (2019), we use two measures to capture managers' outside options in the labor market. The first measure is the industry homogeneity index developed by Parrino (1997), the higher industry homogeneity index indicates managers' industry-skill are easier to transfer across firms in the same industry. The second measure,  $\ln NumPeers$ , is the natural logarithm of one plus the number of peer firms in the same industry, managers have more opportunity to access to more outside options in the industry.

Table 7 provides these results. In panel A, *HighHomo* is dummy variable takes one if the industry homogeneity index of 2-digit SIC in the given fiscal year is above the median. Consistent with governance channel, the interaction terms estimated from linear probability model with industry and year fixed effects through Column 1-4 remain significantly negative. For example, in Column 2, the coefficient of  $Numcross * HighHomo$  is -0.018 with t-stats 3.474, which is significant at 1% level. Results remain unchanged if we use conditional logit

model with same fixed effects through Column 5 to 8.

In Panel B, the interaction terms between *LnNumPeers* and cross-ownership are still significantly negative at 1% through Column 1 to 8. Overall, our results suggest that negative relationship between cross-ownership and the probability to use bank loan when firms raise new debt capital is more pronounced when governance externalities associated with labour market competitiveness are larger.

#### 4.2.2 Bank Loan Covenant Strictness

Lending banks use loan covenants as one of the most important mechanisms to impose creditor governance and monitoring. If the negative effect of cross-ownership on firms' usage of bank loan is driven by the governance substitution hypothesis where firms substitute enhanced equity-centered governance associated with cross-ownership for creditor governance, we expect the bank loan contracts to have looser covenants.

We use *PVIOL* proposed by Demerjian and Owens (2016) to capture the bank loan covenant strictness, which is the aggregate probability of covenant violation at the loan inception date across all covenants included on a given loan package from the total set of fifteen covenant categories. Except for firm characteristics, we further control for loan characteristics, including loan maturity, size, and whether a loan is secured or not. Besides, we include loan purpose as additional fixed effect to control for unobserved differences among loans issued under different financing purpose.<sup>12</sup>

Table 8 provides the results. We find as the degree of cross-ownership increases, bank loan contract has looser covenant. For example, the coefficient of *Avgnum* in Column 3 is -0.003 (with t-statistics of -2.407), which is significant at 5% level. This negative relationship continues to hold when we use alternative measurements to capture cross-ownership in Column 1, 2, and 4. Consistent with a governance substitution hypothesis, we find that

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<sup>12</sup>Our results remain unchanged if we only include industry and year fixed effects.

covenant strictness reduces as the degree of cross-ownership increases.

## 5 Conclusion

This paper investigates the impact of cross-ownership on corporate debt structure, we find that cross-ownership has significant negative impact on the likelihood to use a bank loan when sourcing new debt capital. To explore the underlying mechanisms of the observed cross-ownership effect, we find this effect is more pronounced for firms with greater information asymmetry. Cross-sectional evidences suggesting that this negative correlation is also stronger for firms whose managers are likely to have more outside job opportunities, which is consistent with managerial labor market competition being a possible driver of governance externalities. These cross-sectional findings provide evidences that cross-ownership plays information and governance role in determining firm's debt structure.

While current literature studies the economic implications of cross-ownership on equity side, including the information efficiency, governance, market competition, and etc., this paper is the first one, to our best knowledge, to provide the real effect of cross-ownership on credit side. Our results show that the enhanced information and governance associated with cross-ownership have spill over effect from equity to creditor side. Moreover, we also find cross-ownership affects the syndicate loan structure and loan covenant through these two underlying mechanisms. Collectively, our paper provide guidance for the future work to study the implications of cross-ownership on bank loan. We also contribute to the understanding of the determinants of debt structure by showing how ownership structure affects firms' choice of debt. Finally, we compliment on the literature studying the governance substitution hypothesis by showing that substitution between equity-centered governance and creditor governance is the main driver of debt issuance decision associated with cross-ownership.

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**Table 1**  
**Summary Statistics**

This table provides summary statistics for variables used in the paper. Panel A report summary statistics in full sample, panel B report summary statistics for cross-owned firms and non-cross-owned firms. Definitions of variables are in Appendix.

	Total Debt Issues	52,603				
	Loans	68%				
	Bonds	32%				
	Time Period	1987-2018				
Panel A: Full Sample	N	Mean	Std. Dev.	p25	Median	p75
DummyBankIssue	25,835	0.844	0.363	1.000	1.000	1.000
Numconnect	25,835	3.716	8.450	0.000	0.500	3.250
Numcross	25,835	0.823	1.037	0.000	0.500	1.250
Avgnum	25,835	2.248	4.486	0.000	0.500	2.375
Totalcrossown	25,835	7.020	9.465	0.000	2.758	11.123
Blockown	25,835	16.956	15.321	5.760	13.619	25.278
Blockdummy	25,835	0.800	0.400	1.000	1.000	1.000
FirmSize	25,835	6.516	1.982	5.080	6.505	7.884
Leverg	25,835	0.314	0.209	0.164	0.296	0.431
Profitability	25,835	0.009	0.133	-0.001	0.035	0.068
AltmanZ	25,835	1.487	1.514	0.678	1.561	2.384
BTM	25,835	0.901	1.800	0.273	0.536	0.931
Investgrade	25,835	0.212	0.409	0.000	0.000	0.000
Norates	25,835	0.163	0.370	0.000	0.000	0.000
Panel B:	CO_Firms		Non CO_Firms		Difference	
	N	Mean	N	Mean		
DummyBankIssue	20,886	0.830	4,949	0.905	-0.075***	
Blockown	20,886	18.997	4,949	8.342	10.654***	
Blockdummy	20,886	0.871	4,949	0.500	0.371***	
FirmSize	20,886	6.802	4,949	5.305	1.497***	
Leverg	20,826	0.308	4,940	0.342	-0.034***	
Profitability	20,885	0.016	4,946	-0.021	0.037***	
AltmanZ	20,886	1.536	4,949	1.279	0.257***	
BTM	20,886	0.908	4,949	0.874	0.033	
Investgrade	20,886	0.239	4,949	0.102	0.137***	
Norates	20,886	0.141	4,949	0.259	-0.118***	

## Table 2 Baseline Results

This table provides baseline results for the impact of cross-ownership on the issuance of bank loan. The dependent variable is *DummyBankIssue*. We use four measures to capture cross-ownership: *Numconnect*, *Numcross*, *Avgnum*, *Totalcrossown*. All these 4 measures for cross-ownership are normalized at mean 0 and variance 1. We control for firm characteristics including *Blockown*, *Blockdummy*, *FirmSize*, *Leverg*, *Profitability*, *AltmanZ*, *BTM*, *Investgrade*, and *Norates*. All independent variables are lagged by one year. Panel A reports regression results using linear model with 2-digit SIC industry fixed effect and year fixed effect. Panel B reports regression results using conditional Probit model with 2-digit SIC industry fixed effect and year fixed effect. Standard errors are clustered by firms. t-statistics are reported in the parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively. Definitions of variables are in Appendix.

Panel A: OLS Model				
Dependent var: <i>DummyBankIssue</i>	(1)	(2)	(3)	(4)
<i>Numconnect</i>	-0.032*** (-7.150)			
<i>Numcross</i>		-0.022*** (-5.228)		
<i>Avgnum</i>			-0.026*** (-6.129)	
<i>Totalcrossown</i>				-0.024*** (-5.665)
<i>Blockown</i>	0.001*** (2.636)	0.001*** (3.250)	0.000 (1.475)	0.001*** (4.068)
<i>Blockdummy</i>	0.000 (0.011)	0.000 (-0.001)	0.005 (0.556)	-0.004 (-0.487)
<i>FirmSize</i>	-0.033*** (-12.099)	-0.034*** (-12.283)	-0.034*** (-12.232)	-0.034*** (-12.251)
<i>Leverg</i>	-0.027 (-1.630)	-0.024 (-1.432)	-0.025 (-1.481)	-0.025 (-1.481)
<i>Profitability</i>	0.040 (1.456)	0.029 (1.040)	0.039 (1.411)	0.03 (1.063)
<i>AltmanZ</i>	0.030*** (10.226)	0.032*** (10.898)	0.031*** (10.467)	0.032*** (10.812)
<i>BTM</i>	0.014*** (9.296)	0.014*** (9.410)	0.015*** (9.566)	0.015*** (9.804)
<i>Investgrade</i>	-0.100*** (-8.345)	-0.098*** (-8.174)	-0.098*** (-8.175)	-0.098*** (-8.175)
<i>Norates</i>	-0.013* (-1.919)	-0.015** (-2.193)	-0.013* (-1.898)	-0.015** (-2.131)
Observations	21,138	21,138	21,138	21,138
R-squared	0.203	0.200	0.201	0.200
Year FEs	Yes	Yes	Yes	Yes
Industry FEs	Yes	Yes	Yes	Yes

Panel B: Probit Model				
Dependent var: <i>DummyBankIssue</i>	(1)	(2)	(3)	(4)
<i>Numconnect</i>	-0.188*** (-6.681)			
<i>Numcross</i>		-0.158*** (-4.810)		
<i>Avgnum</i>			-0.154*** (-5.585)	
<i>Totalcrossown</i>				-0.182*** (-5.319)
<i>Blockown</i>	0.003 (1.272)	0.005* (1.917)	0.001 (0.235)	0.007*** (2.699)
<i>Blockdummy</i>	-0.079 (-0.955)	-0.076 (-0.915)	-0.044 (-0.525)	-0.111 (-1.342)
<i>FirmSize</i>	-0.328*** (-13.386)	-0.332*** (-13.563)	-0.330*** (-13.523)	-0.330*** (-13.524)
<i>Leverg</i>	-0.292* (-1.944)	-0.253* (-1.686)	-0.268* (-1.786)	-0.264* (-1.758)
<i>Profitability</i>	0.158 (0.637)	0.062 (0.252)	0.151 (0.610)	0.066 (0.267)
<i>AltmanZ</i>	0.308*** (11.360)	0.325*** (12.196)	0.312*** (11.546)	0.321*** (12.070)
<i>BTM</i>	0.144*** (6.504)	0.145*** (6.510)	0.147*** (6.655)	0.152*** (6.777)
<i>Investgrade</i>	-0.626*** (-7.309)	-0.605*** (-7.105)	-0.610*** (-7.156)	-0.607*** (-7.137)
<i>Norates</i>	-0.097 (-1.128)	-0.103 (-1.208)	-0.089 (-1.041)	-0.100 (-1.176)
Observations	20,892	20,892	20,892	20,892
R-squared	0.188	0.186	0.187	0.186
Year FEs	Yes	Yes	Yes	Yes
Industry FEs	Yes	Yes	Yes	Yes

### Table 3 Robust Tests

This table provides several robust tests of baseline results for the impact of cross-ownership on the issuance of bank loan. The dependent variable is *DummyBankIssue*. We use four measures to capture cross-ownership: *Numconnect*, *Numcross*, *Avgnum*, *Totalcrossown*. All these 4 measures for cross-ownership are normalized at mean 0 and variance 1. We control for firm characteristics including *Blockown*, *Blockdummy*, *FirmSize*, *Leverg*, *Profitability*, *AltmanZ*, *BTM*, *Investgrade*, and *Norates*. All independent variables are lagged by one year. Panel A reports the baseline results in cross-owned firms only. Panel B include firm fixed effect. Panel C use alternative cross-ownership measure *GGL* proposed by Gilje, Gormley, and Levit (2019). Except for Panel B, regression results using either linear model with 2-digit SIC industry fixed effect and year fixed effect or conditional Probit model with 2-digit SIC industry fixed effect and year fixed effect. Standard errors are clustered by firms. t-statistics are reported in the parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively. Definitions of variables are in Appendix.

Panel A: CO_Firms		OLS				Probit	
Dependent Var:	<i>DummyBankIssue</i>	Coefficient	N	R-square	Probit	N	R-square
<i>Numconnect</i>		-0.032*** (-6.864)	17,124	0.208	-0.193*** (-6.620)	16,929	0.185
<i>Numcross</i>		-0.022*** (-4.827)	17,124	0.205	-0.156*** (-4.457)	16,929	0.182
<i>Avgnum</i>		-0.026*** (-5.910)	17,124	0.207	-0.158*** (-5.594)	16,929	0.183
<i>Totalcrossown</i>		-0.024*** (-5.271)	17,124	0.205	-0.178*** (-4.887)	16,929	0.182
Panel B: Firm Fixed Effect		OLS				Probit	
Dependent Var:	<i>DummyBankIssue</i>	Coefficient	N	R-square	Coefficient	N	R-square
<i>Numconnect</i>		-0.019*** (-3.289)	18,923	0.475	-0.069* (-1.735)	7,467	0.053
<i>Numcross</i>		-0.016*** (-3.417)	18,923	0.475	-0.071* (-1.629)	7,467	0.053
<i>Avgnum</i>		-0.016*** (-3.265)	18,923	0.475	-0.064* (-1.839)	7,467	0.053
<i>Totalcrossown</i>		-0.017*** (-3.545)	18,923	0.475	-0.102** (-2.157)	7,467	0.053
Panel C: Alternative Measure		OLS				Probit	
Dependent Var:	<i>DummyBankIssue</i>	Coefficient	N	R-square	Coefficient	N	R-square
<i>GGL</i>		-0.019*** (-3.819)	11,823	0.225	-0.096*** (-3.224)	11,646	0.187

## Table 4 Diff-in-Diff Results

This table provides baseline the DiD results using institution mergers. The dependent variable is *DummyBankIssue*. We obtain financial institution merges from He, Huang, and Zhao (2020). We define treated firms satisfy two conditions: (i) the firm is blockheld by one of the merging institutions, (ii) the other merging institution does not blockhold the same firm, but blockholds at least one of its same-industry peers. Firms in control group need to satisfy 2 conditions: (i) the firm has to be blockheld by the same institution that blockholds a treated firm, and (ii) the other merging institution does not blockhold any peer firms from the same industry. *TREAT* is binary variable equals to 1 is firms are in treat group, otherwise zero. *POST* is binary variable equals one if the fiscal year if after the shock, otherwise zero. Our DiD sample contains any debt issuance in 5 years before the shock and 5 years after the shock. We control for firm characteristics including *Blockown*, *Blockdummy*, *FirmSize*, *Leverg*, *Profitability*, *AltmanZ*, *BTM*, *Investgrade*, and *Norates*. All independent variables are lagged by one year. Standard errors are clustered by institution merger. t-statistics are reported in the parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively. Definitions of variables are in Appendix.

Dependent Var:	OLS				Probit			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>DummyBankIssue</i>								
<i>TREAT * POST</i>	-0.046*** (-3.305)	-0.047*** (-2.888)	-0.048*** (-3.227)	-0.059*** (-3.452)	-0.332*** (-2.612)	-0.972*** (-2.677)	-0.385*** (-3.290)	-0.772*** (-2.779)
<i>TREAT</i>	0.063 (1.406)	0.037 (0.933)	0.055** (2.341)	-0.028* (-1.719)	0.698 (1.635)	1.449 (1.471)	0.500** (2.351)	-0.350 (-1.527)
<i>POST</i>	-0.036 (-1.474)		-0.030 (-1.126)		-0.317 (-1.541)	0.744* (1.826)	-0.232 (-1.018)	1.005** (2.512)
Observations	2,786	2,625	2,788	2,626	2,718	879	2,549	886
R-squared	0.153	0.546	0.201	0.527	0.168	0.251	0.204	0.163
Year FEs	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Merger FEs	Yes	No	No	Yes	Yes	No	No	Yes
Firm FEs	No	Yes	No	Yes	No	Yes	No	Yes
Industry FEs	No	No	Yes	No	No	No	Yes	No

**Table 5**  
**The effect of Information Asymmetry**

This table provides cross-sectional tests of baseline results for the impact of cross-ownership on the issuance of bank loan. The dependent variable is *DummyBankIssue*. We use four measures to capture cross-ownership: *Numconnect*, *Numcross*, *Avgnum*, *Totalcrossown*. All these 4 measures for cross-ownership are normalized at mean 0 and variance 1. *HighAbn.Accr* is dummy variable takes one if the abnormal accrual proposed by Dechow et al. (1995) is above the median. *HighDisp* is dummy variable takes one if the analyst forecasting dispersion is above the median. We control for firm characteristics including *Blockown*, *Blockdummy*, *FirmSize*, *Leverg*, *Profitability*, *AltmanZ*, *BTM*, *Investgrade*, and *Norates*. All independent variables are lagged by one year. Panel A reports the baseline results interacted with *HighAbn.Accr*. Panel B reports the baseline results interacted with *HighDisp*. Column (1) to (4) use linear model with 2-digit SIC industry fixed effect and year fixed effect. Column (5) to (8) use conditional Probit model with 2-digit SIC industry fixed effect and year fixed effect. Standard errors are clustered by firms. Definitions of variables are in Appendix.

Panel A	OLS				Probit				
	Dependent Var: <i>DummyBankIssue</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Numconnect</i>	-0.025*** (0.005)					-0.137*** (0.034)			
<i>Numconnect * HighAbn.Accr</i>	-0.013** (0.006)					-0.091** (0.037)			
<i>Numcross</i>		-0.016*** (0.005)					-0.101*** (0.038)		
<i>Numcross * HighAbn.Accr</i>		-0.012** (0.005)					-0.123*** (0.042)		
<i>Avgnum</i>			-0.017*** (0.005)					-0.089*** (0.033)	
<i>Avgnum * HighAbn.Accr</i>			-0.018*** (0.006)					-0.128*** (0.038)	
<i>Totalcrossown</i>				-0.020*** (0.005)					-0.138*** (0.039)
<i>Totalcrossown * HighAbn.Accr</i>				-0.009 (0.005)					-0.091** (0.042)
<i>HighAbn.Accr</i>	-0.002 (0.005)	-0.003 (0.005)	-0.003 (0.005)	-0.003 (0.005)	0.001 (0.048)	0.005 (0.048)	0.004 (0.048)	0.004 (0.048)	-0.001 (0.048)
Observations	21,138	21,138	21,138	21,138	21,138	20,892	20,892	20,892	20,892
R-squared	0.199	0.196	0.198	0.196	0.196	0.189	0.187	0.188	0.187
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Industry FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B	OLS				Probit				
	Dependent Var: <i>DummyBankIssue</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Numconnect</i>	-0.016*** (0.006)					-0.100** (0.039)			
<i>Numconnect * HighDisp</i>	-0.028*** (0.007)					-0.140*** (0.045)			
<i>Numcross</i>		-0.007 (0.005)					-0.058 (0.041)		
<i>Numcross * HighDisp</i>		-0.030*** (0.006)					-0.185*** (0.047)		
<i>Avgnum</i>			-0.008* (0.005)					-0.047 (0.037)	
<i>Avgnum * HighDisp</i>			-0.034*** (0.006)					-0.187*** (0.044)	
<i>Totalcrossown</i>				-0.009* (0.005)					-0.080* (0.043)
<i>Totalcrossown * HighDisp</i>				-0.030*** (0.006)					-0.177*** (0.047)
<i>HighDisp</i>	-0.017*** (0.006)	-0.016** (0.006)	-0.018*** (0.006)	-0.016** (0.006)	-0.179*** (0.056)	-0.171*** (0.056)	-0.181*** (0.056)	-0.171*** (0.056)	-0.171*** (0.056)
Observations	21,138	21,138	21,138	21,138	21,138	20,892	20,892	20,892	20,892
R-squared	0.199	0.196	0.198	0.201	0.190	0.188	0.188	0.189	0.189
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Industry FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

**Table 6**  
**Bank Loan Syndicate Structure**

This table provides cross-sectional tests of baseline results for the impact of cross-ownership on the issuance of bank loan. The dependent variable *LoanShare* is the percentage of the loan taken by a participate. We use four measures to capture cross-ownership: *Numconnect*, *Numcross*, *Avgnum*, *Totalcrossown*. All these 4 measures for cross-ownership are normalized at mean 0 and variance 1. *Leader* is a binary variables that equals to one for if the participate is a lead arranger, and otherwise zero. We control for firm characteristics including *FirmSize*, *Leverg*, *Profitability*, *AltmanZ*, *BTM*, *Investgrade*, and *Norates*. Loan characteristics controls including the log of loan maturity, the log of loan size, loan spread, and number of lenders. All independent variables are lagged by one year. We use linear model with 2-digit SIC industry fixed effect and year fixed effect. Standard errors are clustered by firms. Definitions of variables are in Appendix.

Dependent Var: <i>LoanShare</i>	(1)	(2)	(3)	(4)
<i>Numconnect * Leader</i>	-0.433*** (-9.312)			
<i>Numconnect</i>	0.132*** (4.092)			
<i>Numcross * Leader</i>		-3.710*** (-9.696)		
<i>Numcross</i>		0.534*** (2.617)		
<i>Avgnum * Leader</i>			-0.699*** (-8.486)	
<i>Avgnum</i>			.22*** (4.526)	
<i>Totalcrossown * Leader</i>				-0.428*** (-9.218)
<i>Totalcrossown</i>				0.046* (1.934)
<i>Leader</i>	15.966*** (27.060)	17.894*** (23.712)	16.011*** (26.840)	17.582*** (23.914)
<i>NumLenders</i>	-0.096*** (-4.127)	-0.097*** (-4.170)	-0.095*** (-4.096)	-0.098*** (-4.229)
Firm Controls	Yes	Yes	Yes	Yes
Loan Controls	Yes	Yes	Yes	Yes
Observations	50,902	50,902	50,902	50,902
R-squared	0.571	0.575	0.571	0.575
Year FEs	Yes	Yes	Yes	Yes
Industry FEs	Yes	Yes	Yes	Yes

**Table 7**  
**The Effect of Governance Externalities**

provides cross-sectional tests of baseline results for the impact of cross-ownership on the issuance of bank loan. The dependent variable is *DummyBankIssue*. We use four measures to capture cross-ownership: *Numconnect*, *Numcross*, *Avgnum*, *Totalcrossown*. All these 4 measures for cross-ownership are normalized at mean 0 and variance 1. *HighHomo* is dummy variable takes one if the industry homogeneity index of 2-digit SIC in the given fiscal year is above the median. *LnNumPeers* is the natural logarithm of one plus the number of peer firms in the same industry. We control for firm characteristics including *Blockown*, *Blockdummy*, *FirmSize*, *Leverg*, *Profitability*, *AltmanZ*, *BTM*, *Investgrade*, and *Norates*. All independent variables are lagged by one year. Panel A reports the baseline results interacted with *HighHomo*. Panel B reports the baseline results interacted with *LnNumPeers*. Column (1) to (4) use linear model with 2-digit SIC industry fixed effect and year fixed effect. Column (5) to (8) use conditional Probit model with 2-digit SIC industry fixed effect and year fixed effect. Standard errors are clustered by firms. Definitions of variables are in Appendix.

Panel A	OLS				Probit				
	Dependent Var: <i>DummyBankIssue</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Numconnect</i>	-0.025*** (-4.801)					-0.152*** (-4.396)			
<i>Numconnect*HighHomo</i>	-0.014** (-2.380)					-0.066* (-1.907)			
<i>Numcross</i>		-0.013*** (-2.800)					-0.097** (-2.509)		
<i>Numcross*HighHomo</i>		-0.018*** (-3.474)					-0.120*** (-3.154)		
<i>Avgnum</i>			-0.018*** (-3.629)					-0.101*** (-3.039)	
<i>Avgnum*HighHomo</i>			-0.016*** (-2.906)					-0.097*** (-2.788)	
<i>Totalcrossown</i>				-0.017*** (-3.551)					-0.134*** (-3.387)
<i>Totalcrossown*HighHomo</i>				-0.014*** (-2.753)					-0.093*** (-2.400)
<i>HighHomo</i>	0.000 (-0.079)	-0.001 (-0.276)	0.000 (-0.084)	-0.001 (-0.234)	-0.006 (-0.143)	-0.006 (-0.143)	-0.006 (-0.142)	-0.003 (-0.078)	-0.010 (-0.232)
Observations	21,138	21,138	21,138	21,138	20,892	20,892	20,892	20,892	20,892
R-squared	0.203	0.200	0.202	0.200	0.189	0.186	0.187	0.187	0.187
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Industry FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

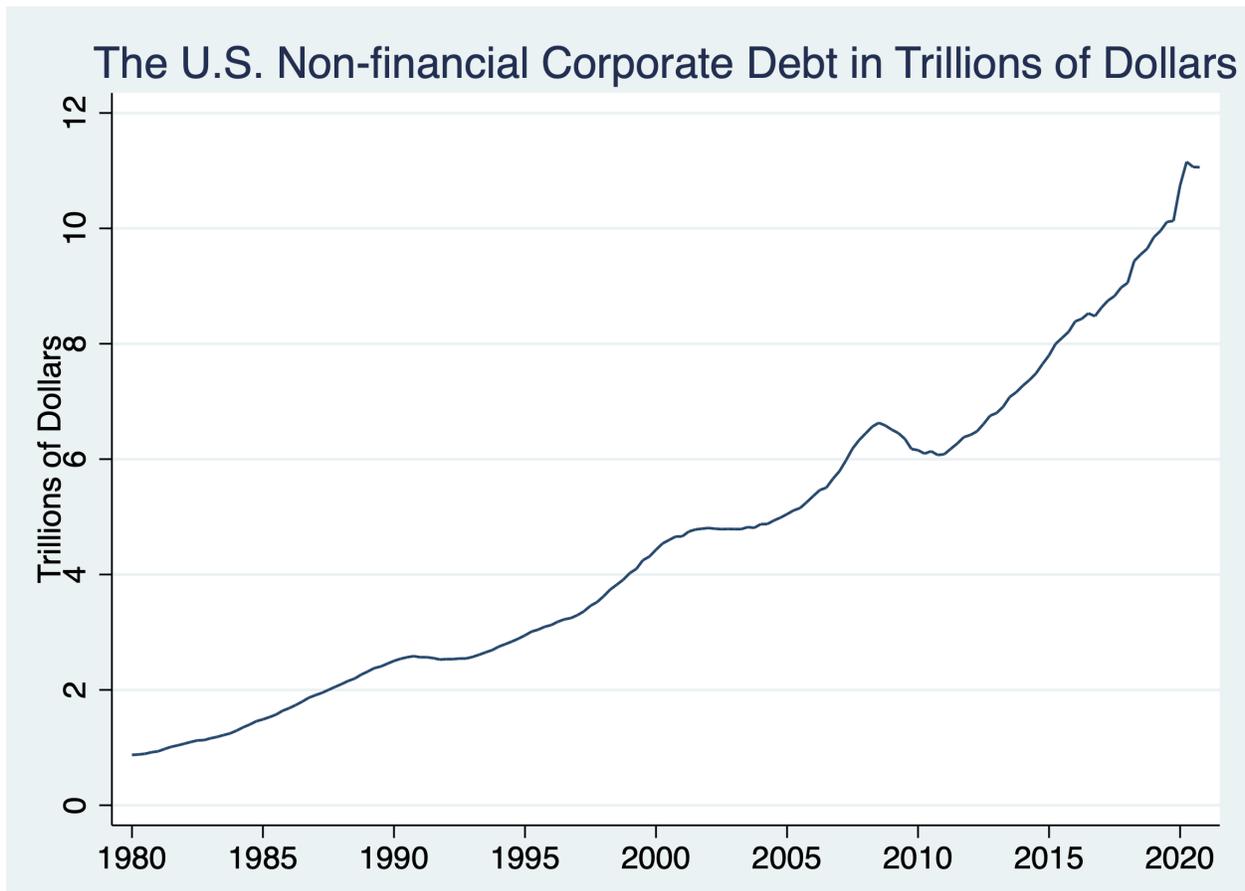
Panel B	OLS				Probit				
	Dependent Var: <i>DummyBankIssue</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Numconnect</i>	-0.019** (-2.237)				0.026 (0.530)				
<i>Numconnect*LnNumPeers</i>	-0.000** (-2.272)				-0.005*** (-5.154)				
<i>Numcross</i>		-0.009 (-1.166)				0.060 (1.182)			
<i>Numcross*LnNumPeers</i>		-0.000*** (-2.984)				-0.006*** (-6.719)			
<i>Avgnum</i>			-0.014* (-1.769)				0.050 (1.072)		
<i>Avgnum*LnNumPeers</i>			-0.000*** (-2.740)				-0.005*** (-5.960)		
<i>Totalcrossown</i>				-0.011 (-1.485)				0.017 (0.320)	
<i>Totalcrossown*LnNumPeers</i>				-0.000*** (-2.937)				-0.005*** (-6.356)	
<i>LnNumPeers</i>	0.000*** (-2.936)	0.000*** (-3.252)	0.000*** (-3.085)	0.000*** (-3.306)	0.000*** (-3.306)	-0.001 (-0.414)	-0.001 (-0.583)	-0.001 (-0.478)	-0.001 (-0.523)
Observations	17,517	17,517	17,517	17,517	17,517	17,392	17,392	17,392	17,392
R-squared	0.195	0.192	0.194	0.192	0.192	0.218	0.217	0.218	0.217
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Industry FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

**Table 8**  
**Bank Loan Covenant Strictness**

This table provides cross-sectional tests of baseline results for the impact of cross-ownership on the issuance of bank loan. The dependent variable *PVIOL* proposed by Demerjian and Owens (2016) to capture the bank loan covenant strictness, which is the aggregate probability of covenant violation at the loan inception date across all covenants included on a given loan package from the total set of fifteen covenant categories. We use four measures to capture cross-ownership: *Numconnect*, *Numcross*, *Avgnum*, *Totalcrossown*. All these 4 measures for cross-ownership are normalized at mean 0 and variance 1. We control for firm characteristics including *FirmSize*, *Leverg*, *Profitability*, *AltmanZ*, *BTM*, *Investgrade*, and *Norates*. Except for firm characteristics, we further control for loan characteristics, including the log of loan maturity, the log of loan size, and whether a loan is secured or not. All independent variables are lagged by one year. We use linear model with 2-digit SIC industry fixed effect and year fixed effect. Standard errors are clustered by firms. Definitions of variables are in Appendix.

Dependent Var: <i>PVIOL</i>	(1)	(2)	(3)	(4)
<i>Numconnect</i>	-0.001* (-1.638)			
<i>Numcross</i>		-0.009* (-1.654)		
<i>Avgnum</i>			-0.003** (-2.407)	
<i>Totalcrossown</i>				-0.001* (-1.689)
<i>FirmSize</i>	0.002 (0.423)	0.002 (0.419)	0.003 (0.463)	0.002 (0.396)
<i>Leverg</i>	0.466*** (14.911)	0.466*** (14.923)	0.466*** (14.902)	0.466*** (14.935)
<i>Profitability</i>	-0.585*** (-9.784)	-0.589*** (-9.881)	-0.585*** (-9.775)	-0.589*** (-9.884)
<i>AltmanZ</i>	-0.017*** (-3.123)	-0.016*** (-3.041)	-0.017*** (-3.111)	-0.017*** (-3.057)
<i>BTM</i>	0.016*** (3.152)	0.016*** (3.187)	0.016*** (3.157)	0.016*** (3.225)
<i>Investgrade</i>	-0.061*** (-3.723)	-0.061*** (-3.731)	-0.060*** (-3.682)	-0.061*** (-3.739)
<i>Norates</i>	0.009 (0.500)	0.008 (0.426)	0.008 (0.455)	0.008 (0.437)
<i>Log(LoanSize)</i>	-0.028*** (-5.729)	-0.027*** (-5.668)	-0.028*** (-5.753)	-0.027*** (-5.648)
<i>Log(LoanMaturity)</i>	-0.007 (-0.759)	-0.007 (-0.745)	-0.007 (-0.750)	-0.006 (-0.737)
<i>Secured</i>	0.123*** (9.713)	0.123*** (9.703)	0.123*** (9.694)	0.123*** (9.713)
Observations	12,695	12,695	12,695	12,695
R-squared	0.275	0.276	0.276	0.276
Year FEs	Yes	Yes	Yes	Yes
Industry FEs	Yes	Yes	Yes	Yes
Loan Purpose FEs	Yes	Yes	Yes	Yes

Figure 1  
Non-financial U.S. corporate debt includes debt securities and loans



Source: Federal Reserve Board of Governors.

Figure 2

Aggregate market level average cross-ownership measures weighted by firm size

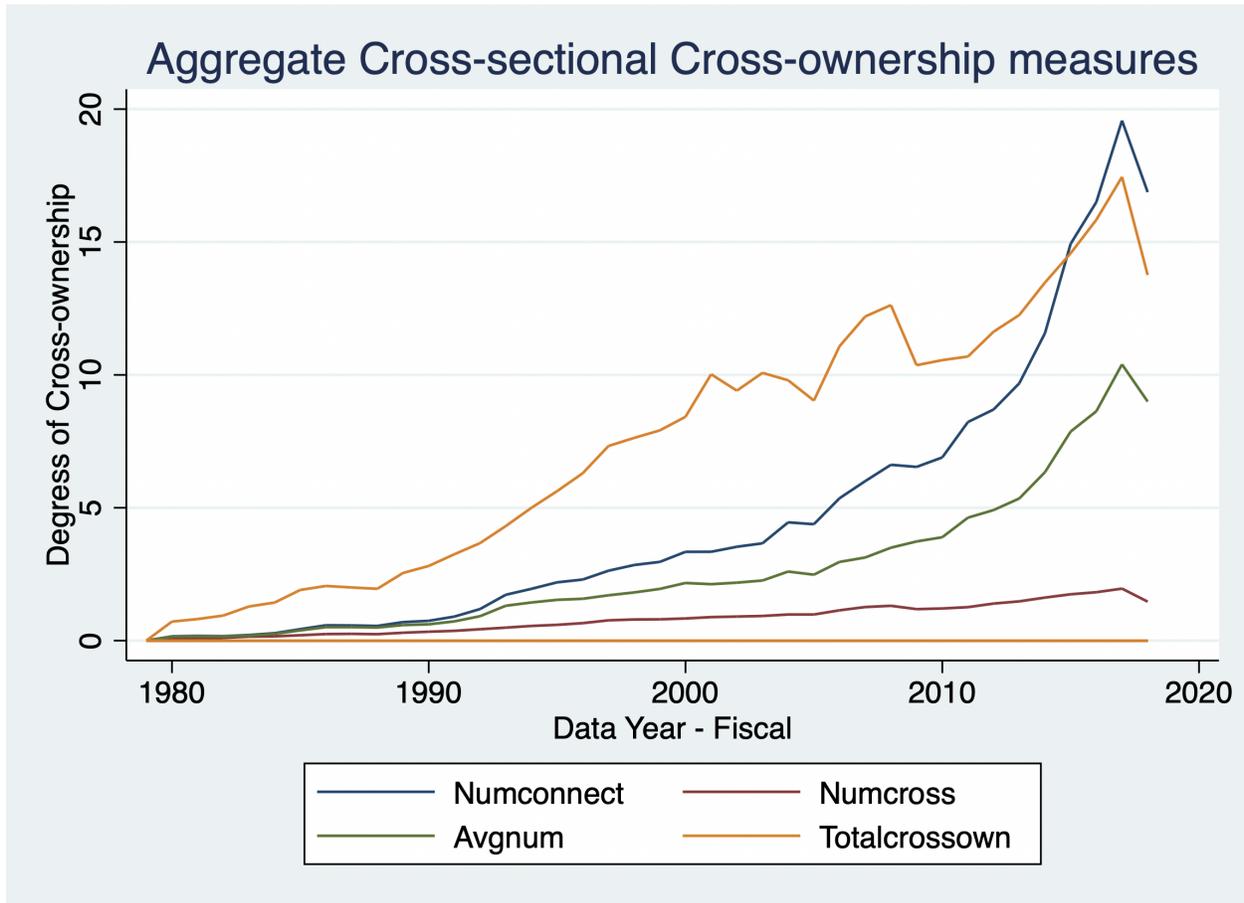
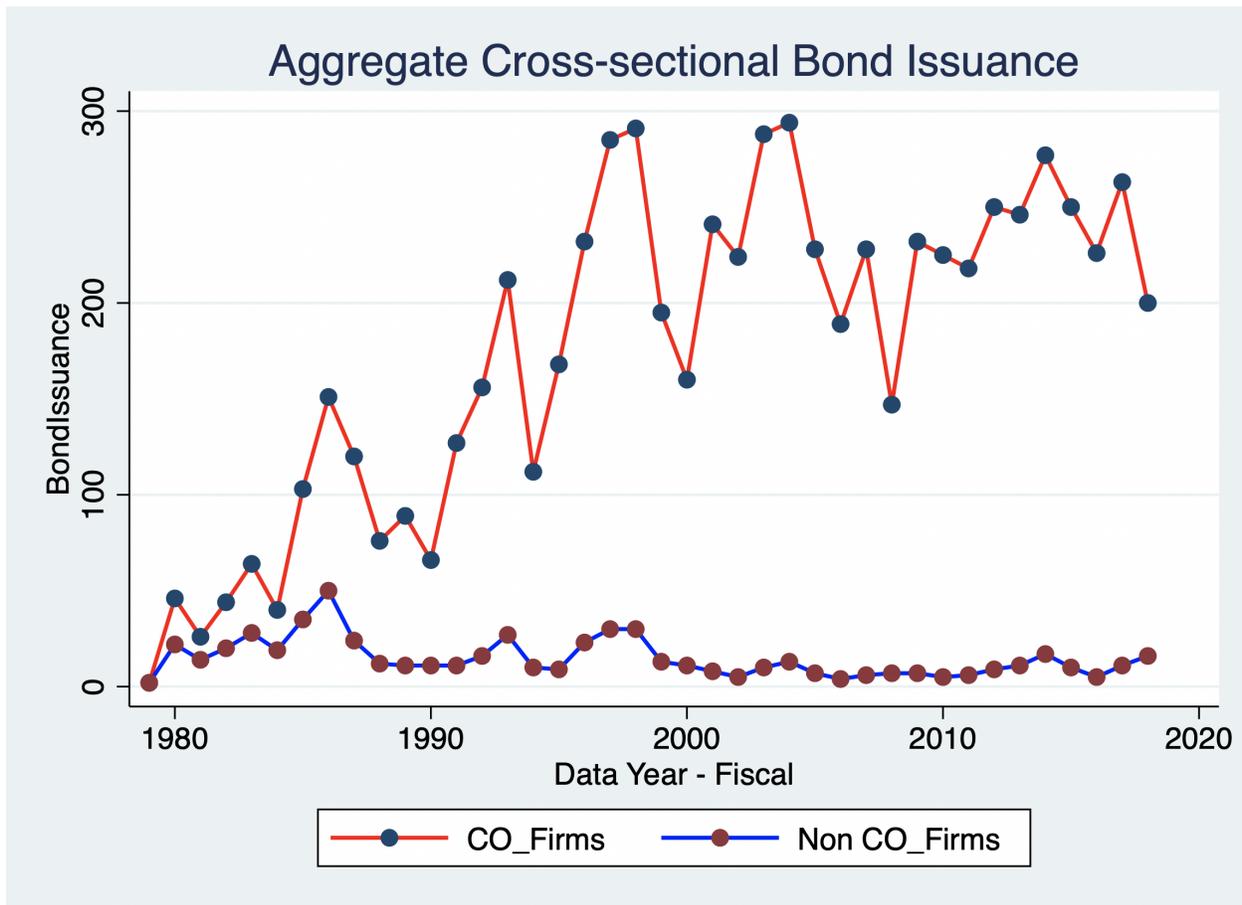


Figure 3  
Aggregate bond issuance in cross-owned firms and non-cross-owned firms



## Appendix A: Variable Definitions

Variable	Definition
<i>DummyBankIssue</i>	Binary variable equals to one if a firm issues bank loans, otherwise zero if a firm issues bonds in a given fiscal year.
<i>NumConnected</i>	The number of same-industry peers that share any common institutional blockholder with the firm
<i>NumCross</i>	The number of unique institutions that cross-hold the firm.
<i>Avgnum</i>	The number of same-industry peers block-held by the average cross-holding institution.
<i>Totalcrossown</i>	The sum of all cross-holding institutions' percentage holdings in the firm itself
<i>Blockown</i>	The average percentage ownership by institutional blockholders
<i>Blockdummy</i>	Binary variable equals to one if a firm is block-held in any of the four quarters prior to the fiscal year-end, otherwise zero.
<i>FirmSize</i>	Natural logarithm of the book value of assets
<i>Leverg</i>	Ratio of long-term debt (DLTT) plus short-term debt (DLC) over the book value of total assets (AT).
<i>Profitability</i>	Ratio of income before extraordinary items (IB) over book value of total assets (AT).
<i>AltmanZ</i>	Altman's Z-score. $(3.3 * \text{Operating income (IOADP)} + \text{Sales (SALE)} + 1.4 * \text{Retained earnings (RE)} + 1.2 * (\text{Current assets (ACT)} - \text{Current Liability (LCT)})) / \text{Book Assets (AT)}$
<i>BTM</i>	Book to Market Ratio. The ratio between book value of equity and market value of equity.
<i>Investgrade</i>	Dummy variable equals to 1 if firm is investment grade, and zero otherwise.
<i>Norates</i>	Dummy variable equals to 1 if firm has credit rating, and zero otherwise.
<i>HighAbn.Accr</i>	Dummy variable takes one if the abnormal accrual proposed by Dechow et al. (1995) is above the median.
<i>HighDisp</i>	Dummy variable takes one if the analyst forecasting dispersion is above the median.
<i>HighHomo</i>	Dummy variable takes one if the industry homogeneity index of 2-digit SIC developed by Parrino (1997) in the given fiscal year is above the median.
<i>LnNumPeers</i>	The natural logarithm of one plus the number of peer firms in the same industry

<i>LoanShare</i>	The percentage of the loan taken by a participate. <i>Leader</i> is a binary variables that equals to one for if the participate is a lead arranger, and otherwise zero.
<i>Leader</i>	Binary variables equals to one for if the participate is a lead arranger, and otherwise zero.
<i>PVIOL</i>	The aggregate probability of covenant violation at the loan inception date across all covenants included on a given loan package from the total set of fifteen covenant categories proposed by Demerjian and Owens (2016).