How does the creditor conflict affect bond IPO underpricing?

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ABSTRACT

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In this paper, we find that the conflict of interest between loan holders and bondholders is positively related to bond IPO underpricing, which serves as compensation to the initial bond investors. We construct four proxies for the conflict between loan holders and bondholders, namely a loan covenant index, the outstanding loan amount, the number of lead banks, and the loan remaining maturity. Our empirical tests show that all four variables are positively related to bond IPO underpricing, indicating that the loan structure of firms has a real impact on the pricing of their bond IPOs.

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1. Introduction

Large first-day stock returns surrounding Initial Public Offerings (IPOs) have attracted considerable interest in finance literature to explain the existence of underpricing. [1] For example, some studies link underpricing to information problems (e.g., Baron, 1982; Rock 1986; Allen and Faulhaber 1989), while other studies relate this to corporate governance or ownership structure (e.g., Brennan and Franks 1997; Ljungqvist and Wilhelm 2003; Lowry and Murphy 2007), market sentiment (e.g., Derrien 2005; Ljungqvist, Nanda, and Singh 2006), and after-market liquidity (Ellul and Pagano 2006). As documented by Ritter and Welch (2002), an average stock IPO raises $78 million, a figure that pales when compared with a bond IPO that on average raises $432 million, approximately 5.5 times that of the stock IPO. Although public bonds have become the dominant approach to U.S. corporate external financing, very few papers have studied bond IPOs in comparison with the numerous ones focused on stock IPOs. [2] Among the papers that try to explain or analyze bond IPO underpricing, Datta, Iskandar-Datta, and Patel (1997) and Cai, Helwege, and Warga (2007) propose and find strong evidence that information asymmetry, which is also a determinant for stock IPO underpricing, is a key to this problem. Nevertheless, the pricing of bond market IPOs might be different from those of the equity market due to firms' existing loan structure. In this paper, we explore whether the interaction between loan holders and bondholders affects the pricing of firms' bond IPOs.

A firm's existing loan structure might affect its bond IPO pricing through multiple channels. As proposed in Diamond (1984) and Fama (1985), bank cross-monitoring resolves information asymmetry and benefits other debtholders, suggesting that bank monitoring should reduce bond IPO underpricing. However, Fama (1985) and Lummer and McConnell (1989) suggest that banks usually have access to superior inside information. Inside information makes banks capable of influencing the management teams for the banks' own benefit (Rajan 1992). As senior creditors, banks can liquidate an ongoing project to keep their own investment safe while making junior

[1] Ritter and Welch (2002) document that the average first trading day return for IPO stock is 18.8%, which corresponds to an average of $17.02 million per deal in absolute value.

[2] By the end of year 2012, the total market capitalization of U.S.-listed non-financial firms was about 16 trillion (18 trillion including financial firms) while, at the same time, American corporate debt for non-financial firms exceeded 60 billion. And, between loans and bonds as the sources of debt financing, bank loans only attribute to one tenth of the total amount outstanding. This information is available at the following links: https://research.stlouisfed.org/fred2/series/MVEONWMVBSNNCB; https://research.stlouisfed.org/publications/es/13/ES_31_2013-11-15.pdf; http://data.worldbank.org/indicator/CM.MKT.LCAP.CD/countries.

debtholders worse off (Park 2000), and they usually allow for less compromise in reorganizations due to their senior and collateralized claims (Asquith, Gertner, and Scharfstein 1991), or even press management to postpone payments to junior creditors (Li, Purda, and Wang 2016). Furthermore, the situation is aggravated by the fact that banks are usually cohesive lenders and are good at fighting for their own interests, even at the expense of bondholders (Welch 1997). Therefore, their senior creditor could expropriate value from bondholders when conflict of interest between the two creditors exists. This conflict can be another factor that affects the pricing of firms' bond IPOs, and in contrast to the monitoring this conflict should increase underpricing.

In this paper, we first investigate whether bond IPO underpricing exists in firms with outstanding private loans. Our empirical results show that IPO underpricing does exist in these firms. On average, the underpricing is 72.37 bps. We then focus on whether outstanding private loans play a role in bond IPO underpricing and what their effect is on underpricing. We develop two competing hypotheses: the monitoring hypothesis and the conflict-of-interest hypothesis. The monitoring hypothesis predicts that bank monitoring of the management of the firm and the firm's performance resolves information asymmetry, benefiting bond investors, and therefore lowers the underpricing of bond IPOs. In contrast, the conflict-of-interest hypothesis assumes that bond investors know ex-ante that banks will expropriate junior creditors, so firms have to underprice their bond IPOs to attract potential bond investors.

In order to test our hypotheses, we build four firm-level proxies, namely a loan covenant index, the outstanding loan amount, the number of lead banks, and the remaining maturity of the loan. The loan covenant index is constructed on the firm level by counting the total number of different loan covenants in a firm. The outstanding loan amount is the aggregate outstanding loan amount on the bond IPO date. The number of lead banks signifies the total number of different senior participants in all syndicated loans for a given firm. The remaining maturity of the loan measures the time remaining to maturity of a firm's (last-ending) loan facility.

We select these proxies to allow us to disentangle the effects between bank monitoring and conflict of interest among debtholders. If the monitoring effect dominates, we expect to observe a negative relationship between the proxies and bond IPO underpricing, while a positive relationship signifies that the conflict effect dominates.

On the monitoring side, the rationale for why the four proxies can represent bank monitoring is discussed below. First, according to Rajan and Winton (1995), covenants are set to motivate banks to collect information and monitor borrowers; therefore we are able to measure the aggregate level of monitoring by building a firm-level covenant index. Second, based on the principal-agent theory, banks have stronger motives to monitor when their own share in borrowing firms is bigger, meaning that the bigger the outstanding loan amount the more monitoring. In addition, if banks monitor borrowers, we should see more monitoring by banks when either the loan's remaining maturity is longer or there are more lead banks.[3] Since bank monitoring benefits public bondholders by resolving information asymmetry, we should find a negative relationship between proxy variables and bond underpricing in the empirical test.

The literature also suggests that these variables may represent the conflict of interest between loan holders and bondholders. First, loan covenants stipulate when loan holders can step in and take control of the firm, suggesting that more covenants typically means that there is a higher possibility that loan holders may take control of the firm. When controlling the firm as senior debtholders, loan holders may act in their own interest and hurt junior bondholders' interests. Therefore, a higher loan covenant index should lead to higher bond IPO underpricing. Second, Bulow and Shoven (1978) suggest that a larger loan amount means banks have greater rights in making bankruptcy decisions. Once they decide to file bankruptcy, junior debtholders are worse off: the conflict between loan holders and bondholders is stronger if the loans are bigger. Third, Bolton and Scharfstein (1996) propose that liquidation value are lower when there are more creditors. Therefore, in liquidation which involves more loan holders, junior bondholders will be left with lower remaining value. In addition, if banks can expropriate junior bondholders' interests more, the longer the remaining maturity of loans. These considerations indicate that the four proxies can stand for the conflict between loan holders and bondholders, and we should observe a positive relationship between proxy variables and bond IPO underpricing, which is served as a compensation for the conflict.

Ordinary least squares (OLS) regressions, with standard errors clustered at the firm level, show that the relationship between proxy variables and underpricing is significantly positive, even after we apply the fixed-time effect and control for known issuer-specific and issue-specific

3 Preece and Mullineaux (1996) argue that baking regulation requires each participants of the lending syndicate to conduction monitoring responsibility as if each were the sole lender.

determinants. The positive relationship confirms the hypothesis that the conflict of interest between loan holders and bondholders increases bond IPO underpricing. Specifically, a one-unit increase in the covenant index is associated with an increase in underpricing by around 10 bps, and a one billion dollar increase in loan amount will increase underpricing by around 12 bps. A one-unit increase in the number of lead banks is associated with an increase in underpricing by approximately 5 bps, and a one-percent increase in loan remaining maturity is associated with a 0.21 bps increase in bond IPO underpricing. For two of the proxies, the loan covenant index and the number of lead banks, our subsample analysis shows that the conflict is stronger among bonds with lower ratings.

We repeat our tests using seasoned bond offerings (SBOs) and find SBOs have much lower underpricing (35.02 bps) than that of IPO bonds (72.31 bps). In addition, we find that the impact of the conflict between loan holders and bondholders on SBO underpricing is mainly insignificant. This is likely due to the fact that SBO firms rely less on loan financing and that banks possess fewer exploitable information advantages over bondholders.

To support our analysis, we then check the performance of an IPO bond compared to that of a SBO on the secondary market immediately after the 7-day event window. We find that a month after the initial event window, an IPO bond earns a yield spread about 25 bps higher than a SBO under similar circumstance. This result suggests that IPO bondholders will demand compensation even on the secondary market.

Our paper relates to three strands of literature. First, this paper contributes to the literature on IPO underpricing. In the context of bond IPO underpricing, we show that existing loan structures and loan holders impose an effect on bond IPO underpricing. Similar to other important stakeholders (e.g., Chua and Booth 1996; Brennan and Franks 1997), loan holders can influence security underpricing.

Second, this paper also contributes to the literature on bond pricing. By focusing on firms with outstanding loans but no bonds, in this clean setup we are able to disentangle the interactions between loan holders and bondholders and their effects on bond pricing. We further demonstrate that after controlling for factors that affect yield spread on the immediate secondary market such as issuer and issue characteristics, market liquidity, default risk, and interest rate term structure, IPO bonds of public firms are at discount compared to SBO bonds, and IPO holders can earn

compensation for the senior creditor's control right. This finding is different from Datta, Iskandar-Datta, and Patel (1999) who show that IPO bonds earn lower yields due to monitoring by the banks.

Third, our work is also related to the literature on creditor rights. Creditor rights have substantial impact on firms. Previous studies show that after covenant violations, creditor rights can influence firms' investment decisions (Chava and Roberts 2008) and financing decisions (Roberts and Sufi 2009) and improve corporate governance, stock performance, and operating performance (Nini, Smith, and Sufi 2012). Even outside covenant violations, creditor rights can still exert influence on operating and financing policies (Denis and Wang 2014) and investment policy (Nini, Smith, and Sufi 2009). In our work, we demonstrate that senior creditor rights result in conflict between creditors, and that junior IPO bond pricing is therefore underpriced. Beyond this, previous studies on creditor rights usually focus on debt covenants (e.g., Denis and Wang 2014; Chava and Roberts 2008; Roberts and Sufi 2009) or debt maturity (Brunnermeier and Oehmke 2013; Bao and Hou 2016). However, our paper portrays creditor rights using multiple dimensions of the debt contract.

To conduct this research, we classify creditor claims into junior bonds and senior loans. By doing so, we acknowledge the heterogeneity of debt instruments and align with Diamond (1991, 1993), Park (2000), Bolton and Freixas (2000), DeMarzo and Fishman (2007), and Rauh and Sufi (2010). Instead of giving an explanation for the heterogeneity, our research provides evidence supporting this heterogeneous view by demonstrating the fundamental conflict between different classes of creditors.

In Section 2, we review the literature, discuss related empirical research, and build proxies. In Section 3, we describe the data. Section 4 describes our empirical methodology. Section 5 presents our primary results. Section 6 provides our conclusions.

2. Literature Review and Proxy and Hypotheses Development

2.1. Information asymmetry and IPO underpricing

A large volume of the studies on IPO underpricing relates to information asymmetry to some extent. Baron (1982) proposes that the information asymmetry between investment bankers and IPO issuers increases stock IPO underpricing. Later studies by Rock (1986), Allen and Faulhaber (1989), Benveniste and Spindt (1989), etc., develop their models based on information asymmetry between different market participants. However, due to the sheer size of the underpricing—on average 18.8% on the first day—Ritter and Welch (2002) argue that information asymmetry is unlikely to be the primary determinant of stock IPO underpricing.

Compared with the numerous papers on stock IPO underpricing, papers on bond IPO underpricing are few in number and in them information asymmetry is shown to be a pivotal determinant of underpricing.[4] First, empirical work on bond IPOs by Datta, Iskandar-Datta, and Patel (1997) finds that speculative grade bonds are underpriced while investment-grade bonds are overpriced. The authors find that information asymmetry, which is represented by investment banker quality and bond ratings, positively affects bond IPO underpricing. The paper by Cai, Helwege, and Warga (2007) finds that underpricing generally exists in bond IPOs and again confirms that information asymmetry is positively linked to bond IPO underpricing. They show that information asymmetry between managers and bondholders contributes to bond IPO underpricing and that underpricing is high for private firms.

2.2 Bank monitoring and the conflict between debtholders

Bank monitoring is generally regarded as the mechanism used to resolve information asymmetry. Bank monitoring results from the fact that banks invest in firms and must keep the principal intact. By screening the borrowers' qualities ex-ante and supervising borrowers' activities ex-post, banks perform their monitoring duty and the safety of the investment principal is guaranteed. In the monitoring process, information on the firm is gradually acquired by the banks. In banking literature, the monitoring concept is first described by Schumpeter (1939), then discussed by Leland and Pyle (1977), and systematically developed by Diamond (1984) and Fama (1985). Diamond (1984) proposes that the monitoring process benefits borrowers by resolving their information problems. Fama (1985) proves that banks acquire firms' inside

[4] As proposed in both Datta, Iskandar-Datta, and Patel (1997) and Cai, Helwege, and Warga (2007), although there are some papers on initial bond return or initial bond yield, most of them don't differentiate between bond IPOs and SBOs.

information and that banks' efficient monitoring will lower the monitoring costs of other later-issued debt. Traditional bank monitoring theories predict that bank monitoring should reduce bond IPO underpricing by resolving information asymmetry.

Later research extends these basic models in several ways. Some papers focus on other problems caused by bank lending. Since banks usually hold senior secured claims, their creditor rights can therefore bring up conflict with other debtholders, impair bondholders' interests, and affect bond IPO pricing. In this subsection, we summarize the related studies.

First, Rajan (1992) models the scenario that, when monitoring borrowers, banks can influence management toward their own benefit and extract economic rent from borrowers by exerting the bank's bargaining power over a firm's profits. Banks' bargaining power derives from two aspects: private information on the firm and renegotiation of the loan. In contrast, bondholders can only access public information and renegotiation of public debt is almost impossible; thus, they do not enjoy the same privileges. Bargaining power serves as the necessary premise for banks to expropriate bondholders' interests, and banks can do so by either pressing the management team directly or persuading management to work with them.

Second, the seniority status of bank loans may overprotect banks but it impairs bondholders' interests. Park (2000) depicts bank monitoring from a different angle. In his paper, bank monitoring does not always keep a company operating, but it deters moral hazard, meaning that banks will liquidate their loan and demand their principal back whenever they spot any signs indicating that their investment is not safe. Also proposed in his paper is that debt is structured this way so that banks are given the highest seniority to motivate their monitoring incentives, whereas bondholders are only junior because of the free-rider problem among them. An implication of his model is that, when the investments of senior banks are not intact and liquidation is needed, the situation for junior bonds should only be worse off. The situation for bondholders is aggravated since banks usually have inside information (Fama 1985) that makes them able to choose more favorable timing to demand back their investment.

Third, in bankruptcy, liquidation or reorganization, collateral and seniority covenants can keep bank loans safe while making bondholders particularly vulnerable. To reduce banks' losses in bankruptcy and to motivate banks to collect information ex-ante, bank loans are usually collateralized (Rajan and Winton 1995). As Welch (1997) proposes that for U.S. firms, even in a

bankruptcy that drags on for years, loan holders can still get their investment back because their claims are "so deep in the money." This implies that in bankruptcy banks don't need to make a true compromise to reach a final reorganization, but that junior debtholders might have to yield, and quite a few papers support this argument. For example, Diamond (1993) argues that since junior debt claims (public bonds) usually exist in the firm, senior short-term lenders (banks) never make concessions to avoid liquidations. A similar idea is also discussed by Gertner and Scharfstein (1991). Asquith, Gertner, and Scharfstein (1994) suggest that, compared with public bonds, bank loans are senior and secured, which make banks more prone to forcing bankruptcy; in fact, banks only make very limited concessions compared with bondholders, even when public debt has been restructured. James (1995) finds that during reorganization, in a firm with both bank loans and public bonds, banks make compromises—such as taking equity in exchange for debt—only after the public bondholders have restructured their claims. The author also shows that in reorganizations banks receive more equity and reduce less percentage of the principal, in sharp contrast to bondholders. Becker and Josephson (2016) assume that senior loan creditors of a distressed firm will do better than the firm's bondholders, and document that bondholders often suffer larger losses than banks in restructurings.

Finally, differences in nature between public bondholders and loan holders aggravate this conflict. Welch (1997) builds his model based on the different "fighting abilities" of bondholders and loan holders. He argues that banks are "more cohesive" in nature and intrinsically "better organized" than bondholders. He also dubs the banks "better fighters" because banks are professional and efficient in pressuring firms to obtain their own interests, although the fighting process may jeopardize junior claims. Welch documents a case involving the First National Bank of St. Paul (FNB), which possessed inside information about the insolvency of American Lumber Company (ALC), the borrower. FNB successfully took control of ALC and forced ALC to change FNB's unsecured loan into a secured one. Due to the insolvency, changing the secured status of the bank loan expropriated the interests of any other debtholders besides FNB, and the money that originally should have been allocated to other creditors would be diverted to FNB. Among other debtholders, junior bondholders would be the worst off because they get paid last, based on their seniority. Welch (1997) attributes this outcome to the fact that bondholders are usually dispersed and non-cohesive, and that the large number of bondholders makes it hard for them to coordinate and to react promptly to the actions of loan holders.

Based on this analysis, banks' senior creditor rights endow them with a stronger ability to fight for their own interests at the expense of bondholders. We term this relationship the conflict of interest between loan holders and bondholders. For firms with outstanding loans, potential bond investors would demand a premium to compensate for this conflict; therefore firms need to underprice their bond IPOs to attract investors.

Bond IPOs also provide a unique opportunity to test this conflict due to their simple debtholder structure. SBOs are less compelling for testing this conflict because those firms involve more classes of debtholders—namely SBO investors, existing public debtholders, and banks—which tends to complicate the analysis (Datta, Iskandar-Datta, and Patel 1999).

2.3 Proxies and hypotheses

In the previous subsection, we argue that when a firm borrows from the bank, both the bank monitoring effect and conflict-of-interest effect exist. Bank monitoring should decrease bond IPO underpricing since it resolves information asymmetry, whereas conflict of interest between debtholders should increase bond IPO underpricing since initial buyers will require compensation for this conflict. In order to determine the dominant effect, we build four proxies that could stand for the two effects.

2.3.1. Covenants index

Previous literature suggests that debt covenants give debtholders protection against unfavorable future states. Covenants can protect the value of debt by limiting managerial behaviors (Jensen and Meckling 1976; Smith and Warner 1979) and can give the creditor the right to take control of the firm when certain states have been realized (Aghion and Bolton 1992; Dewatripont and Tirole 1994). Empirical research supports this argument. For example, Chava and Roberts (2008) suggest that covenants give debtholders effective protection. The authors find that financial covenant thresholds indeed serve as crucial "trip wires" and that technical default after covenant violations can result in either the transfer of the control rights of the firm to debtholders or the decline of the investment capital. Either of these is costly to firms. Demiroglu and James (2010) argue that covenant violations give banks the right to accelerate loan payments or even terminate the loan. Although banks may choose to either waive or renegotiate loan contracts, covenant violations provide banks with control rights on the borrowing firm's investment and financial policies. However, since senior banks would waive the violation when the default is transient but

would choose to accelerate loan payments or terminate the loan at a real crisis, giving protections and rights to senior debtholders could be a danger to junior bondholders and cause conflict between creditors. Beyond this, Denis and Wang (2014) demonstrate that covenant renegotiations represent an important channel through which creditors exert control outside of default, and that debt contract renegotiation is pervasive (Robert and Sufi 2009). For firms with more types of loan covenants, banks are given more protection and have more chances to take advantage of debt renegotiation, and are more likely to take control of the firm in the future. Therefore we propose that more loan covenants should cause more conflict between different classes of creditors and should result in higher underpricing.

On the other hand, collecting information about borrowers and assessing whether borrowers have violated covenants require banks to monitor borrowers. Rajan and Winton (1995) argue that banks monitor their borrowers through covenants. Thus, more covenants suggest that banks should do more monitoring.

To measure how strong the conflict is between debtholders, or how much monitoring is done by banks through loan covenants on the firm level, we build a loan covenant index. There are several kinds of covenant indexes in the literature: examples include the covenant intensity index (Bradley and Roberts 2015); the covenant tightness index (Demiroglu and James 2010); the index focusing on sub-covenant categories (Chava, Kumar, and Warga 2010); and the covenant index based on violation probability (Murfin 2012). Helwege, Huang, and Wang (2015) categorize loan and bond covenants into 30 types and construct their firm-level aggregate index. In this work, we adopt similar method by counting the number of different loan covenants since only the loans exist before the bond IPOs.

2.3.2. Outstanding loan amount

Principal-agent theories state that agents will spend more effort monitoring on behalf of the principals when the agent's interest in the transaction is larger. If we regard banks as agents that monitor borrowers, solve information asymmetry and benefit all classes of debtholders, we should expect more monitoring from banks if their own lending shares are larger. Therefore, the bank monitoring effect suggests that the bigger the bank loan amount, the less underpricing there will be.

Regarding conflicts of interest, Jenkins and Smith (2014) propose that the U.S. Bankruptcy Code gives secured creditors rights in exerting control over the bankruptcy process, including a decision supporting early liquidation or sale of the firm. Bulow and Shoven (1978) argue that when firms are in default or financial crisis, banks, which are different form non-cohesive public bondholders, are able to renegotiate the covenants. Especially for banks with big loans, they hold the absolute right to decide whether to force bankruptcy by demanding the principal back, or to keep the firm operating by supplying additional cash. Therefore, it is banks that make bankruptcy decisions and the bigger the loan to a firm, the greater the rights that are allocated to the bank. Since bank's loans are usually senior and secured, the right to decide bankruptcy will undermine the interests of junior bondholders who only hold unsecured claims. Thus, a bigger loan granted to the firm will cause stronger conflict and therefore higher underpricing.

2.3.3. Number of lead creditors (banks) in a firm

A syndicated loan, which involves a number of creditors, typically consists of two levels of participants, namely the lead banks and junior participants. [5] To make the loan syndicated, lead banks arrange the loan and sell a portion of the loan to other junior participants before the initiation of the loan. After the loan begins, the junior participants may sell a portion or their whole possesion of the loan on the secondary market.[6] However, senior participants (lead banks) in syndicated loans will generally keep a big portion of a loan. Drucker and Puri (2009) propose that banks will not sell the entire loan due to the agency problem; instead, they just sell small fractions of the loan on the secondary market. For the proportion of the loan kept by the lead bank (lead share), Figure 1 in Ivashina and Scharfstein (2010) shows that, from April 1990 to April 2009, although there are peaks and troughs, the lead share makes up approximately 29% of a loan on average and there is no significant evidence or trend showing that the lead share increases or decreases.

Dennis and Mullineaux (2000) propose that monitoring responsibility at the time of loan origination and due diligence after initiation are both delegated to the lead banks, and that lead banks will hold the information problematic part of this syndicated loan. Preece and Mullineax (1996) propose that FDIC's Manual of Examination Policies require that all banks evaluate the

[5] In our sample, all the loan facilities are syndicated.

[6] Several papers focus on the benefits and effects of loan secondary market trading (e.g., Gupta, Singh, and Zebedee 2008; Santos and Nigro 2009; Drucker and Puri 2009; Wang and Xia 2014).

loan as if each were the sole lender and therefore lead banks cannot "free ride" each other. They argue that as the number of lead banks increases the quality of monitoring should increase. Therefore, in the context of monitoring, more lead banks should produce less underpricing.

However, Bolton and Scharfstein (1996) propose that liquidation value are lower when there are more creditors. Therefore, in liquidation, a firm's value should be lower after more loan creditors claim their interests back and lower value would be left for bondholders. In this sense, more lead banks will associate with more conflict between loan holders and bondholders, and we will observe higher underpricing.

2.3.4. Loan remaining maturity

Loan remaining maturity stands for the remaining maturity of the loan facility when the firm makes its bond IPO (or SBO). In previous sections, we argue that the existence of either conflict or monitoring is based on the existence of both loans and bonds in the same firm; when a loan ends, both of these effects would no longer exist. Based on the monitoring hypothesis, longer loan remaining maturity suggests more bank monitoring in the future and should therefore reduce underpricing. In reference to conflicts of interest, longer loan remaining maturity implies more conflict between debtholders in the future and should therefore increase underpricing.

2.4. Hypotheses

H1: Bank monitoring will decrease bond IPO underpricing.

Bank monitoring will resolve information asymmetry and thus decrease underpricing, meaning that we will observe a negative relationship between underpricing and proxy variables.

H2: Conflict of interest between loan holders and bondholders will increase bond IPO underpricing.

Borrowing from banks causes conflict between pre-existing loan holders and new bondholders. This conflict will hurt bondholders' interests; thus bond issues are underpriced to attract bondholders, meaning that we will observe a positive relationship between underpricing and proxy variables.

3. Data

3.1. Bond IPO/SBO identification and underpricing calculation

We use three sources, namely the Enhanced Historical TRACE of the Financial Industry Regulatory Authority (FINRA), the Mergent Fixed Investment Securities Database (FISD) and Datastream, to identify corporate bond IPOs/SBOs, get trading volume, price and bond characteristics, and calculate underpricing. We restrict our IPO/SBO sample period to the ten-year period from January 2002 to December 2011. In this ten-year period, bond price and trading volume are available from Enhanced Historical TRACE.[7] Below, we will discuss how to build the IPO sample and SBO separately.

FISD provides information on bond issues such as offering date, offering price, maturity date, coupon information and principal amount. To identify the bond IPOs, we first exclude agency bonds and government bonds from the FISD. Then we identify the first bond issuance(s) of each firm.[8] We check Moody's Annual Bond Record to remove the firms that issued their bonds before 1995.[9] The same bond IPO identification method is also used by Cai, Helwege, and Warga (2007). We exclude the following kinds of bonds from the first bond issuance sample: private placements, pay-in-kind bonds, corporate pass-thru trusts, bond issues of financial firms, perpetuals, unit deal bonds, regulation S bonds, 144A bonds and pay-in-kind bonds.[10] We also delete the issues with an empty offering date, maturity date or offering price. Next, we matched the initial rating information of each issue from FISD with the bond IPOs. We get an issue's rating from rating agencies, using its rating from within 90 days of the offering date. If an issue has rating information from more than one rating agency, we choose S&P when available, Moody's second, and Fitch last. If no rating information is available from within 90 days, we mark an issue as non-rated. The detailed procedure is documented by Cai, Helwege, and Warga (2007). Table 3 Panel B shows the rating distribution of our IPO sample. In Panel B, we see that BAA-rated bonds and non-rated bonds each account for about one-quarter of the sample, B rated bonds are about one-fifth of the sample, while there are only 2.07% AA-rated bonds and no AAA-rated bonds. In Panel C of Table 3, we see that investment grade bonds attribute to 41.45% of our sample, junk bonds attribute to 34.72%, and non-rated bonds account for the remainder.

[7] Enhanced Historic TRACE is updated till mid of year 2012.
[8] Some firms have more than one IPO issue on the same day.
[9] We check Moody's Annual Bond Record because FISD records begin in 1995.
[10] After we apply all criteria, our IPO sample consists of only two kinds of bonds: CCOV (U.S. corporate convertible) and CDEB (U.S. corporate debentures).

To calculate benchmark-adjusted IPO underpricing, we use Barclays Capital U.S. Corporate Bond Index from Datastream as our benchmark index. Barclays Corporate Bond Index was previously known as the Lehman Brothers Index and was rebranded as Barclays Capital U.S. Corporate Bond Index in 2008.[11] Barclays Capital U.S. Corporate Bond Index is a series of indexes and can be broken down into three main categories, namely investment-grade, higher-yield and non-rated; each category can be further broken down into intermediate and long-term. Investment-grade and higher-yield indexes combined cover rating categories from AAA to D. For investment-grade and higher-yield bonds, we match them with Barclay benchmark indexes by specific rating category (from AAA to D) and maturity (intermediate/long term). For non-rated bonds, we match them with the benchmark by maturity.

Price and trading volume data are obtained from TRACE Enhanced. Since duplicate records in TRACE Enhanced may cause bias regarding trading volume (Dick-Nielson 2009), we use the code in the appendix of Dick-Nielsen (2014) to clean it. We then calculate the trading volume-weighted daily average price of each bond and match the calculated prices with corresponding IPO issue information and benchmark indexes. IPO underpricing is calculated using formula (1), (2) and (3) below. $\mathrm{HPR_{i,t}}$ stands for the benchmark-adjusted holding period return for bond i on the t-th trading day since its IPO offering date, and we use $\mathrm{HPR_{i,t}}$ as underpricing in our study. We choose our event window to be 7 calendar days, corresponding to 5 trading days. The similar method is also adopted by Cai, Helwege, and Warga (2007).

$$R_{Bond_{i,t}}=(P_{Bond_{i,t}}-P_{Bond_{i,0}})/P_{Bond_{i,0}}\ , (1)$$

$$R_{Index_{k,t}}=(P_{Index_{k,t}}-P_{Index_{k,0}})/P_{Index_{k,0}}, (2)$$

$$HPR_{i,t}=(R_{Bond_{i,t}}-R_{Index_{k,t}})/TradingDay(1,t). \ (3)$$

Formula (1) calculates the bond return for bond i on day t. We regard the bond offering price from FISD as the price on day 0 and use $\mathrm{P_{Bond_{i,0}}}$ to stand for it. $\mathrm{P_{Bond_{i,t}}}$ is the volume-weighted average daily price calculated using TRACE for bond i on day t (IPO offering date is treated as day 1). Formula (2) calculates the index return for index k on day t, and index k is the index benchmark corresponding to bond i and is matched by specific rating category and maturity

[11] Details can be found at: http://index.barcap.com/Benchmark_Indices/Aggregate/Bond_Indices; https://index.barcap.com/indices/download?rebrandingDoc.

(same as Cai, Helwege, and Warga 2007). $P_{Index_{k,0}}$ stands for the price of index k on day 0 (the trading day preceding the IPO offering day) and $P_{Index_{k,t}}$ stands for the price of index k on day t. In formula (3), $HPR_{i,t}$ stands for the benchmark-adjusted holding period return of bond i during the period from offering date to day t, divided by the number of trading days between offering date and day t.

We build our SBO sample through similar procedures. After excluding agency bonds and government bonds, we identify the bond IPO(s) of each issuer and delete these IPO bonds from the sample. Then we delete foreign issues, bonds issued by financial firms, private placement bonds, perpetuals, unit deal bonds, regulation S bonds, 144A bonds, pay-in-kind bonds, corporate pass-thru trusts, and bond issues with an empty offering date, maturity date or offering price.[12] We match the initial rating with bond SBOs (the same procedure as for the IPO sample). To calculate bond SBO underpricing in the seven-day event window, we match TRACE with bond SBOs. Last, we match the SBO sample with Barclays Index by maturity and rating, and calculate underpricing for SBOs using formula (1), (2) and (3) above.

3.2. Loan data

We obtain corporate loan data from Loan Pricing Corporation's (LPC) Dealscan. The Dealscan database contains comprehensive historical information on loan pricing and contracts of loan facilities made by banks and non-bank institutions to U.S. companies since 1987. Carey and Hrycray (1999) propose that during the early 1990s, the Dealscan database covered between 50% and 75% of the value of all commercial loans in the U.S., and that after 1995 the percentage of commercial loans reported by Dealscan rose to a higher percentage.

In Dealscan, a typical loan package is composed of several facilities. Loan facility initiation date, end date, facility amount and lender information are directly available from Dealscan. Due to the nature of our study, we only need to keep the loan facilities of a firm that are still outstanding when this firm makes its bond IPO(s) or SBOs. We also delete the facilities with no record of either the initiation date or the end date. Since seniority matters, in addition to all these criteria we require that loan facilities have equal or higher seniority than the new-issue bonds in the same firm.

[12] We check the bond types in our SBO sample and eliminate issues with the following bond types: preferred stocks (PSTK), preferred security (PS), foreign currency debenture (CCUR), and trust preferred capital security (TPCS).

3.3. Proxy variables

To build the four proxies mentioned in previous sections, we proceed as follows:

We construct the loan covenant index using a similar methodology to that of Helwege, Huang, and Wang (2015). In contrast to Helwege, Huang, and Wang (2015), we use only loan covenant information from Dealscan to compile the loan covenant index. We categorize loan covenants of the firms into 30 categories[13] and calculate the aggregate number of loan covenants at the firm level by month. Then we match the covenant with firms that issue bond IPOs. We get the average value of the monthly loan covenant index of a firm by taking the average of the covenant index in the period between six months before the IPO and the IPO offering date. For bond SBOs, we build two sets of covenant indexes. One set is the same as the loan covenant index for IPOs, whereas the other index consists of both loan and bond covenants (the same as Helwege, Huang, and Wang 2015). We first identify the outstanding bonds and then get the bond covenants. We use the following criteria to identify the outstanding bonds of a firm: outstanding bond offering date< bond SBO offering date< outstanding bond maturity date. We term the result the debt covenant index.

To calculate an outstanding loan amount, we first deduct the principal payments[14] from the facility amount. Since some of the loan facilities are not denominated in U.S. dollars, we multiply the outstanding facility amount by the exchange rate provided by Dealscan. Last, we aggregate the remaining principal amounts of all the outstanding facilities in a firm, and we term the result the outstanding loan amount. For SBOs, in addition to the outstanding loan amount, we also calculate the outstanding amount of both bonds and loans. To calculate the total outstanding bond amount, we first adjust the outstanding bond principal using FISD information and then sum up the adjusted principal amounts.[15] Finally, we sum up the amount of outstanding loans and bonds, and term the result the outstanding debt amount.

In Dealscan, the LENDERSHARES dataset provides good coverage of the roles of banks or non-bank institutions for each syndicated loan facility when the facility is initiated. We identify the

[13] Details of the categories can be found in Table II of Helwege, Huang, and Wang (2015).

[14] Principal payment information is documented in the dataset FACILITYPAYMENTSCHEDULE from Dealscan.

[15] Since some bonds involve payment of the principal before maturity, FISD provides bonds' outstanding principal on some specific dates. We adjust the outstanding bond principal on offering date to be the amount outstanding on the closest date preceding the offering date provided by FISD. In this procedure, we also identify and eliminate bond issues that have been fully paid before their maturity on a SBO offering date.

lead bank using methods developed by Ivashina (2009) and Ivashina and Scharfstein (2010). The lead bank is the bank that is documented as the administrative agent in LENDERSHARES; if there is no administrative agent for a syndicated loan, the lead bank role is assigned to the bank that serves as agent, arranger, book runner, lead arranger, lead bank, or lead manager. For a firm with multiple facilities, the firm is very likely to have different lead banks for different facilities. To get the total number of lead banks, we count the number of all the different lead banks in a firm. We calculate lead banks for each IPO and SBO.

To calculate the remaining maturity period of the loan for each bond IPO/SBO, we do the following: We first keep the loan facility records for firms with only one facility outstanding. For a firm with multiple facilities, we sort the facility end dates of all the facilities in each firm, and only choose the facility that ends last. The loan's remaining maturity period is just the difference between the end date of a firm's last-ending facility and the bond IPO/SBO date. Again, for SBOs we build an extra variable that includes both bond information and loan information; we term it the debt remaining maturity. This variable is built by choosing the last-ending debt (could be either a bond or a loan) and using the difference between the maturity date and the offering date of the SBO.

3.4. Firm-level information

We get issuer-specific (firm-level) information from Compustat. We identify the bond IPO offering date, and then we match the bond issues with the previous fiscal year-end financial report data from Compustat. We use leverage, market-to-book ratio, firm size, profitability, and z-score as firm-level control variables. The description of and statistics on firm-level variables are in Table I and Table II.

3.5. Data sample and summary of statistics

To construct the dataset for our analysis, for IPOs we limit our sample to firms whose issuer-specific information, bond IPO information and loan information are all available. After applying all other filters and criteria, we identify 193 bond IPOs issued by 165 IPO firms. Among these, 143 firms have 1 bond IPO, 16 firms have 2 bond IPOs, and 6 firms have 3 bond IPOs offered on the same date. We also match 616 loan facilities with bond IPOs. In our sample, on average each bond IPO firm has 3.73 loan facilities outstanding on the IPO date. For the SBO sample, we limit our analysis to firms that have both loans and bonds outstanding, while at the same time issuer-

specific information is also available. In this way, we have 1952 issues made by 471 firms, and the number of SBOs in a firm varies from 1 (147 firms) to 34 (2 firms) in our SBO sample. Table I gives the definitions of the variables and Table II shows the summary statistics for them.

3.6. Univariate analysis

We present the univariate analysis of bond IPO underpricing in Panel A of Table III, and SBO underpricing in Panel B of Table III.

For IPOs, the whole sample underpricing is 72.31 bps. In Table 3, Panel A documents the number of bonds traded and the corresponding initial return on each day. For trading activities, Panel A shows 64.25% of bond IPOs traded for more than one day and 23.32% of IPOs traded on all five trading days. The initial return is monotonically decreasing from the 1st day to the 5th day of trading, and underpricing on the 1st day, 72.31 bps, is more than triple the initial return on the 5th day.[16] Panel B shows that bond IPO underpricing is generally increasing with decreasing bond ratings, except for CAA bonds that give lower underpricing, probably due to the fact that there are too few observations in the CAA category to draw a solid statistical conclusion. Consistent with Panel B, Panel C shows that underpricing is largest for non-rated bonds, second for high-yield bonds, and smallest for investment bonds. In Panel E, F and G, we find that option features in bonds—whether putable, callable or convertible—will increase underpricing. In Panel H, underpricing for bonds without covenants almost triples that of bonds with covenants, and the difference in underpricing between the two classes of bonds can be because covenant bonds are better protected from loan holders' expropriation or because of the different risk of the two classes of issues, and multivariate analysis will be needed to draw further conclusions. In Panel I, we see that more than 80% of our sample are senior, but few of them are secured. This finding is consistent with Asquith, Scharfstein, and Gartner (1991), in which 10.5% of their sample bonds are secured but those secured public bonds usually do not have the first lien on firms' assets.

In the bond SBO sample, the whole sample underpricing is 36.87 bps, about one-half of IPO underpricing. In Panel B of Table III, we find that the underpricing pattern in each classification is generally the same for SBOs as it is for IPOs. The exceptions are in the bond classifications of callable/non-callable and covenants/without covenants. Although we observe lower SBO

[16] Although we calculate initial return on each day of the event window, our multivariate analysis on IPO/SBO underpricing is only focused on the first trading day return as in Cai, Helwege, and Warga (2007).

underpricing for callable bonds, we cannot conclude that call option embedded in bonds reduces underpricing since the callable feature is usually associated with the putable feature and convertible covenants, both of which may affect underpricing. However, whether bond covenants increase underpricing should be more strictly tested using the multivariate regression model.

4. Research Methodology

According to the analysis in Section 2, in order to test the hypothesis and access the influence of loan holders on bond IPO/SBO underpricing, we estimate the following OLS model.

$$Undepricing_i = \alpha_1 + \beta_1 * LoanCovenantsIndex_j + \gamma_1 * Bond_i + \delta_1 * Firm_j + \lambda_1 * Year_t + \varepsilon_i, \quad (4)$$

$$Undepricing_i = \alpha_2 + \beta_2 * OutLoanAmount_j + \gamma_2 * Bond_i + \delta_2 * Firm_j + \lambda_2 * Year_t + \epsilon_i, \quad (5)$$

$$Undepricing_i = \alpha_3 + \beta_3 * LeadBankNumber_j + \gamma_3 * Bond_i + \delta_3 * Firm_j + \lambda_3 * Year_t + \zeta_i, \quad (6)$$

$$Undepricing_i = \alpha_4 + \beta_4 * LoanRemainingMaturity_j + \gamma_4 * Bond_i + \delta_4 * Firm_j + \lambda_4 * Year_t + \eta_i, \quad (7)$$

where the subscripts i, j and t stand for the observation corresponding to bond IPO/SBO i which is issued by firm j in year t. Since some firms have multiple issues, the standard deviations of the OLS estimated parameters are clustered by firm.

The definitions of all components of the four models are given below.

$Undepricing_i$ is the dependent variable of the model and it stands for (first trading day) underpricing of bond i. The proxy variables, $LoanCovenantsIndex_j$, $OutLoanAmount_j$, $LeadBankNumber_j$ and $LoanRemainingMaturity_j$ stand for firm-level loan covenant index, outstanding loan amount, number of lead bank, and loan remaining maturity of firm j. $Bond_i$ stands for issue-level (bond-level) control variables set for bond I, which includes offering amount, maturity and coupon rate, and qualitative variables such as putable bond dummy, callable bond dummy, convertible bond dummy, senior-secured bond dummy, bond covenant dummy, investment-grade bond dummy, high-yield bond dummy, non-rated bond dummy, and AA and A-rating dummy. $Firm_j$ stands for issuer-level control variable sets of the issuer firm j. Issuer-level control variables include market-to-book ratio, z-score, leverage, profitability and

firm size. $Year_t$ represents the year dummy variable set. The year dummy equals one if the bond is offered in year t, otherwise it is zero.

For SBO analysis, besides the four regression models above, we add another three regressions that use proxy variables designed for both outstanding loans and bonds.

$$Undepricing_i = \alpha_5 + \beta_5 * DebtCovenantsIndex_j + \gamma_5 * Bond_i + \delta_5 * Firm_j + \lambda_5 * Year_t + \omega_i, \quad (8)$$

$$Undepricing_i = \alpha_6 + \beta_6 * OutDebtAmount_j + \gamma_6 * Bond_i + \delta_6 * Firm_j + \lambda_6 * Year_t + \tau_i, \quad (9)$$

$$Undepricing_i = \alpha_7 + \beta_7 * DebtRemainingMaturity_j + \gamma_7 * Bond_i + \delta_7 * Firm_j + \lambda_7 * Year_t + \kappa_i, \quad (10)$$

In model (8), (9) and (10), $DebtCovenantsIndex_j$ stands for the debt (loans and bonds combined) covenant index for firm j. $OutDebtAmount_j$ stands for the amount of outstanding debt firm j has. $DebtRemainingMaturity_j$ stands for debt remaining maturity.

5. Empirical Results

5.1. IPO underpricing analysis

In this section, we wish to determine the effect of outstanding loans on bond IPO underpricing. One possibility is that loan holders monitor the IPO firm and resolve information asymmetry, which reduces underpricing. Another hypothesis is that loan holders may harm the interests of new bond investors, which increases underpricing. We find that the loan covenant index, outstanding loan amount, number of lead banks, and the natural log of the loan remaining maturity are all positively related to IPO underpricing, meaning that the conflict of interest between loan holders and bondholders increases IPO underpricing. We report the estimated coefficients in Table IV.

5.1.1. Loan covenant index

In Panel A of Table IV, we report the results of the ordinary least squares regression on the loan covenant index. As the loan covenant index increases IPO underpricing increases, suggesting that the conflict of interest between loan holders and bondholders increases IPO underpricing. In Column (1), we present the univariate regression results. A one-unit increase in the loan covenant index will increase underpricing by 12.10 bps and the estimated coefficient is significant at 1%.

In Column (2), we controlled all potential factors on both the issue-specific and issuer-level that could affect IPO underpricing. The results show that a one-unit increase in the loan covenant index will cause a 9.34 bps increase in IPO underpricing and the estimated coefficient for the loan covenant index is significant at the 5% level.

We present the subsample results in the third and fourth column. In the third column, we restrict our subsample to the IPO issues that have no bond covenant clauses. Our conjecture is that since bond covenant clauses give bondholders protection, bondholders should suffer more from loan holders if there are no bond covenant clauses to protect them, which would give rise to higher underpricing. The estimated coefficient of the loan covenant index confirms our hypothesis. The estimated coefficient is 13.10 and significant at 1%, which is larger and more significant than the one in Column (2). We also run a regression on the subsample composed of IPOs that have bond covenant clauses; because the estimate of the loan covenant index is small (4.59) and insignificant, we do not report the result.

In Column (4), we restrict the subsample to junk bonds. For junk bonds, we observe a significant and stronger relationship between the loan covenant index and underpricing, whereas for non-junk bonds (estimated coefficients are not reported) the estimated coefficients for the loan covenant index are both smaller and insignificant. This is consistent with our above analysis: Since bank loans are usually senior secured claims and better protected than public bonds when facing bankruptcy, the conflict between debtholders should be stronger for the junk bond group, which involves a higher bankruptcy risk. From another perspective, junk bond issuers usually are involved with higher risk; thus banks may try to influence those issuers more, which results in more conflict and more underpricing.

Previous work suggests that covenants convey private information regarding the potential future prospects of firms, which is known by borrowers, and that covenants are negotiated based on this private information (Garleanu and Zwiebel 2009). Thus, similar to bank monitoring, a covenant index could be viewed as a mechanism to resolve information asymmetry. If this is the case, the estimated coefficient of the loan covenant index should be negative, which means that more covenants lead to less information asymmetry and thus less underpricing. However, this is contrary to our results in Table IV. Our results on the covenant index are in line with Demiroglu and James (2010) such that the intensity index has little private information concerning the firm's

future performance. Another possible argument is that underpricing relates to issuer-specific risk or issue-specific risk. For a riskier firm or bond issue, there would be more covenants that protect loan holders and thus more underpricing to compensate for the higher risk. Therefore, we control for z-score (issuer-specific risk) and bond ratings (issue-specific risk), but the estimated coefficient for the loan covenant index is still positively significant.

5.1.2. Outstanding loan amount

Panel B of Table IV shows the estimated coefficients of the outstanding loan amount regression. In both models, the estimated coefficients of the outstanding loan amount are significantly positive. This result indicates that, after controlling for other factors that influence underpricing, bigger loans cause bigger conflicts between loan holders and bondholders and increase IPO underpricing. The full sample results in Column (1) show that a one-billion dollar increase in the outstanding loan amount will enlarge underpricing by about 10.80 bps, and the estimated coefficient is significant at the 5% level.

Since loan amount affects the right to decide on bankruptcy (Bulow and Shoven 1978), we would expect to observe a stronger influence from loan holders when the outstanding loan amount is bigger. In Column (2), we restrict our sample to the bond issues that have smaller offering amounts than the outstanding loans of the same firm. The reason is that if the loans are too much smaller than the bonds, the firm may first meet the needs of the bondholders instead of loan holders'. Consistent with our hypothesis, we observe a bigger estimated coefficient for the explanatory variable (15.24) and a higher significance level (1%), which indicate that there is stronger conflict when the loan is bigger than the IPO bond.

5.1.3. Number of lead banks

The first two columns in Panel B of Table IV report the estimated coefficient of formula (6), in which the number of lead banks is the proxy variable. The estimated coefficients of the number of lead banks are positive, which confirms the hypothesis that the conflict between loan holders and bondholders will increase IPO underpricing.

In these two columns, we control issue-specific and issuer-specific variables. In Column (1), the results show that increasing the number of lead banks by one increases IPO underpricing by 3.92 bps. The estimated coefficient is significant at the 5% level. In Column (2), we also applied the year-fixed effect model to rule out the possibility that any observed effect of the lead bank

number is due to time-invariant heterogeneity between years. The significance level reduces to 10% but the estimated coefficient gets bigger (4.37).

5.1.4. Loan remaining maturity

The statistics from our sample show that, within a firm, loan facilities usually end before IPO bonds mature. On average, on the date when a firm makes its bond IPO, its loan facilities have 3.54 years until their end dates while the IPO bond still has 8.1 years until maturity after loan facilities end. The last two columns in Panel C of Table IV present the estimated coefficients for the natural log of loan remaining maturity. The positive signs indicate that longer loan remaining maturity leads to more underpricing. According to the previous analysis, this positive relationship indicates that loan holders will expropriate bondholders' interests before the loan matures. The expropriations cause the conflict of interest, and increased bond IPO underpricing serves as compensation for bond investors.

In Column (3), the univariate results show that a one-percent increase in loan remaining maturity leads to a 0.2373 bps increase in underpricing. In Column (4), after we control for both issuer-specific and issue-specific variables, a one-percent increase in loan remaining maturity gives a 0.2194 bps increase in underpricing. In these two columns, the estimated coefficients of the natural log of loan remaining maturity are significant at the 5% level.

5.2. SBO underpricing analysis

In this section, we also supplement our research with further tests on SBOs because, on SBO dates, potential bond investors may again evaluate the price of conflict in SBO underpricing. As SBOs involve more parties, making the conflict of interest between different parties hard to isolate, they are not the best mechanism with which to test this conflict, as are IPOs. Nevertheless, the conflict between loan holders and SBO bondholders is still testable because we can separate the debt structure of the firm into the loan holder's claim and bondholder's claim. However, as Hale and Santos (2007) suggest, after the bond IPO, a firm will shift its debt financing from loans toward bonds. Sample statistics suggest that, on the SBO date, the total existing bond claim (6.54 billion) is about 1.3 times the claim of loan holders (5 billion), meaning that bond financing has become the dominant way of debt financing. This situation is in sharp contrast to that on the IPO date, when the average bond IPO size is about 0.43 billion but at the same time the loan holders' claim is 1.58 billion, about 3.7 times that of IPO bondholders. These

facts imply that due to the growing importance of bond financing, on the SBO date the firm may equally weigh new bondholders and loan holders, and that the comparable size of bond and loan may eliminate or reduce the privilege previously enjoyed by loan holders. On the other hand, as SBO firms frequently have access to the bond market, their information is widely shared among investors. In this way, the information monopoly enjoyed by loan holders on the IPO date (Hale and Santos 2007) no longer exists. Thus, we should observe a weaker effect of existing loans on SBOs underpricing.

The results in Table V confirm that the influence of loan structure on SBO underpricing is weaker than on IPO underpricing. The estimates are much smaller and less significant than are those for the IPO sample (Table IV). For the outstanding loan amount, although we observe significant positive signs, the estimated coefficient is only about 1/8 of the corresponding coefficient in the IPO sample (Column (1) in Panel B of Table IV).

Since in SBOs the conflict between loan holders and bondholders does not significantly affect underpricing, we want to further analyze the effect of the existing debt (bonds and loans combined) structure on SBO underpricing. The proxy variables—debt covenant index, debt amount outstanding, debt remaining maturity—are built based on the aggregate bonds and loans structure of a SBO firm. The results in Table VI suggest that SBO underpricing is only positive and significant related to total debt outstanding. Again, this estimate is too small compared with the estimated coefficient in the IPO sample.

In SBO analysis, bond features such as the bond offering amount, coupon rate, and convertible feature are positive and significantly related to SBO underpricing, whereas putable features are negatively related to SBO underpricing. Although the statistics in Panel B of Table III suggest that underpricing is higher in bonds with covenants and callable features, this relationship is not significant in multi-variate regression. For issuer-specific variables, profitable, high book-to-market ratio, low z-score, and bigger firms results in lower SBO underpricing.

5.3. Yield Spread Analysis

Since the above analysis shows that the conflict-of-interest effect dominates bond IPO underpricing, now we want to further test our hypothesis and also to evaluate whether this conflict is a risk factor that affects bond yield spread on the secondary market. We then compare the yield spread of IPO bonds with that of SBOs in the one-month period after the 7-day event

period. Since IPO bonds are usually smaller in amount than SBOs, IPO bondholders will be more disadvantaged by senior loan holders than by SBO bondholders will be. IPO bondholders will therefore demand more premiums, and the conflict-of-interest effect will give an IPO bonds a higher yield spread compared to a similar SBO.

We identify the trade from TRACE for each IPO and SBO bond at the first month-end after the 7-day event window, which is equivalent to the 36th day from its offering date (day 0 is the offering date). Since bonds trade fewer times, in order to maintain a proper sample size we first use all bond trades within the 5-day period before the month-end, which is equivalent to the period from 32nd to 36th day from their corresponding offering date, and then only keep the volume-weighted daily price of the closest day to the 36th day. To get the dirty price, we then add accrued interest to the clean trading price, and the yield-to-maturity is the discount rate that equates the present value of its future payments to its dirty price. We then obtain the yield spread by subtracting the yield-to-maturity of the closest term constant maturity Federal bond.

Very little research has studied the yield spread of IPO bonds. The only paper to our knowledge is by Datta, Iskandar-Datta, and Patel (1997) and they find that a longer banking relationship is associated with lower IPO yield spread at offering date; they also attribute the reduction to bank cross-monitoring. In related research by Hale and Santos (2009), they determine that IPO bonds have underwriting costs greater than subsequent SBOs issued by the same firm.

In our analysis, in addition to the issuer and issue characteristics that affect yield spread, we control for other important factors. Since many studies have proved that secondary market liquidity will affect default premiums (e.g., Longstaff, Mithal, and Neis 2005; Chen, Lesmond, and Wei 2007; Helwege, Huang, and Wang 2014), we include the Amihud ratio as the measure of liquidity. We use the natural log of firm age to approximate the firm's reputation, as in Cai, Helwege, and Warga (2007). As in Campbell, Hilscher, and Szilagyi (2007), we approximate a firm's distress risk with stock volatility. We also include the difference in credit spread between Moody's BBB and AAA corporate bonds, the TED spread, and the slope of the treasury yield (e.g., Chen, Lesmond and Wei 2007; Becker and Ivashina 2015). Rating dummies are included in all specifications. Fixed-year effects are applied in column (2) and (3), while industry dummies are also considered in column (3). The results show that even after the IPO event window, IPO bonds are still at discount compared with SBOs. The yield spread of an IPO bond is about 25 bps

higher than a SBO under the same circumstance. The higher yield of the IPO bond suggests that, as smaller claim holders, IPO bond holders will demand a premium on the secondary market to compensate for the conflict between them and loan holders.

6. Conclusion

Previous papers suggest that by resolving information asymmetry, bank monitoring will reduce IPO underpricing. However, the literature also suggests that banks, which hold senior creditor rights, can exert substantial influence on management teams and that their senior secured claims and cohesive nature may aid them in expropriating junior debtholders' interests, causing conflict between loan holders and bondholders. Consequently, bond IPOs have to be underpriced to attract initial buyers. In this paper, we develop two competing hypotheses, namely the monitoring hypothesis and the conflict-of-interest hypothesis, and build four proxies to test our hypotheses empirically. The empirical results confirm the conflict-of-interest hypothesis. The results show that a one-unit increase in the covenant index will increase underpricing by 9.34 bps; a one-unit increase in the number of lead banks will increase underpricing by 4.37 bps; a one-billion-dollar increase in outstanding loan amount will increase underpricing by 10.80 bps; and a one-percent increase in loan remaining maturity will raise underpricing by 0.22 bps. On the secondary market, the yield spread of IPO bonds is about 25 bps higher than that of similar SBOs. These results suggest that bond IPO underpricing serves as a premium to compensate the initial bond investors for the conflict that arises between them and loan holders, and compensation for IPO bondholders still exists on the secondary market.

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Appendix

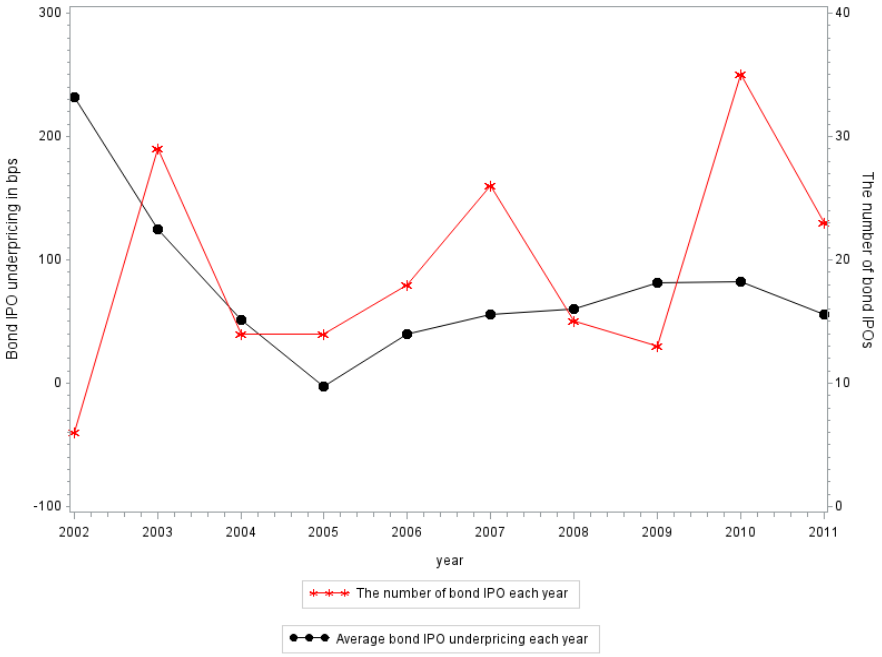

Figure 1 (a) Average bond IPO Underpricing and Number of Bond IPOs Each Year (2002-2011)

Figure 1 (a) shows the average bond initial public offering (IPO) underpricing and the number of IPOs each year from January 2002 to December 2011. We build our IPO sample through the following procedures. We identify the first bond issue(s)[17] of each issuer, and then we exclude agency bonds, government bonds, foreign issues, bond issues of financial firms, preferred securities, private placements, pay-in-kind bonds, corporate pass-thru trusts, perpetuals, unit deal bonds, regulation S bonds, 144A bonds, pay-in-kind bonds, and issues with empty offering date, maturity date or offering price from the first bond issuance(s) sample. We merge the irst issuance(s) sample with Enhanced Historical TRACE, Compustat and Dealscan. We restrict our IPO sample to the bond issues which have both issuer-specific information and loan information and are traded at least once in the 7-day event window since IPO date. The IPO sample includes 193 bond IPOs issued by 165 firms. To get IPO underpricing, we adjust the first trading-day initial return of each SBO with Barclay's corporate benchmark. Details of the procedures are shown in equations (1) to (3) in Section 3.1. IPO underpricing is winsorized at 1% and 99%.

[17] Some firms offer more than one issue on their bond IPO offering date.

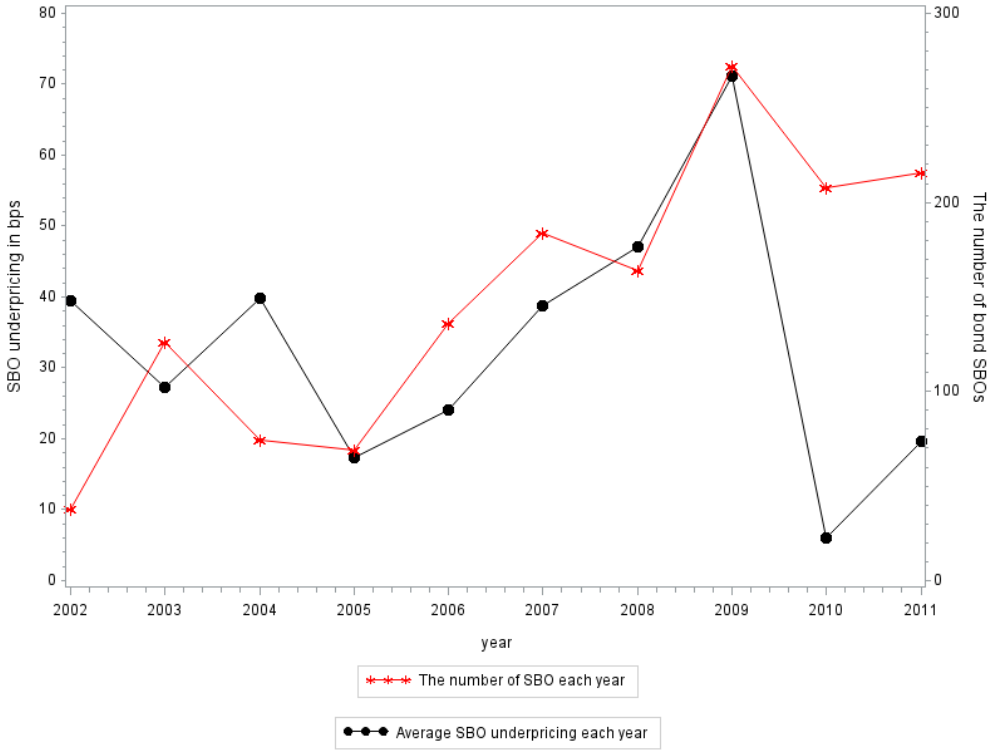

Figure 1 (b) Average SBO Underpricing and Number of SBOs Each Year (2002-2011)

Figure 1 (b) shows the average seasoned bond offering (SBO) underpricing and the number of SBOs each year from January 2002 to December 2011. We build our SBO sample through the following procedures. We delete the first bond issues of all issuers, and then we also delete agency bonds, government bonds, foreign issues, bonds issued by financial firms, private placement bonds, perpetuals, unit deal bonds, regulation S bonds, 144A bonds, pay-in-kind bonds, corporate pass-thru trusts, and bond issues with empty offering date, maturity date or offering price. We merge the remaining bonds with Enhanced Historical TRACE, Compustat and Dealscan. We restrict our SBO sample to the bond issues which have both issuer-specific information and loan information and are traded at least once in the 7-day event window since SBO date. The SBO sample includes 1487 SBOs issued by 417 firms. To get SBO underpricing, we adjust the first trading-day initial return of each SBO with Barclay's corporate benchmark. Details of the procedures are shown in equations (1) to (3) in Section 3.1. SBO underpricing is winsorized at 1% and 99%.

Table I Variable definitions

Variable names	Definitions
Panel A: Dependent variables	
IPO Underpricing	Initial public offering (IPO) first trading-day benchmark-adjusted return, in bps. The event window is 7 calendar days.
SBO Underpricing	Seasoned bond offering (SBO) first trading-day benchmark-adjusted return, in bps. The event window is 7 calendar days.
Panel B: Explanatory variables	
Loan covenant index	We first count the number of different loan covenants in a firm each month. The loan covenant index is the average of the monthly covenant index during the 6-month period before IPO.
Debt covenant index	We first count the number of different loan covenants and bond covenants in a firm each month. The debt covenant index is the average of the monthly covenant index during the 6-month period before SBO.
Outstanding loan amount	The total amount of outstanding loan facilities and bond issues of a firm on IPO date. Loan payments are deducted from the loan principle amount and exchange rates are adjusted if the loan is not denominated in U.S. dollars.
Outstanding debt amount	The total amount of outstanding loan facilities and bond issues of a firm on SBO date. Loan payments are deducted from loan principle amount and exchange rates are adjusted if the loan is not denominated in U.S. dollars. Only for SBO sample.
Number of lead banks	The total number of different lead banks in all outstanding loan facilities of a firm.
LN (Loan remaining maturity)	Natural log of loan remaining maturity. Loan remaining maturity is defined as the remaining maturity of a firm's last-ending loan on its bond IPO date.
LN (debt remaining maturity)	Natural log of debt remaining maturity. Debt remaining maturity is defined as the remaining maturity of a firm's last-ending loan or bond on its bond SBO date.
Panel C: Bond/issue-specific variables	
LN (bond offering amount)	The natural log of an IPO/SBO issue's offering amount. The bond offering amount is in billion dollars.
Duration	An IPO/SBO issue's Macaulay duration (in years).
Coupon	An IPO/SBO issue's coupon rate (in percent).
D_senior-secured	Dummy variable. Equals 1 if an IPO/SBO issue is senior-secured, otherwise 0.
D_covenants	Dummy variable. Equals 1 if an IPO/SBO issue has covenant clauses, otherwise 0.
D_putable	Dummy variable. Equals 1 if an IPO/SBO issue is putable, otherwise 0.
D_callable	Dummy variable. Equals 1 if an IPO/SBO issue is callable, otherwise 0.
D_convertible	Dummy variable. Equals 1 if an IPO/SBO issue is convertible, otherwise 0.
Panel D: Corporate/issuer-specific variables	
Firm size	Natural log of sales (in million dollars, measured at fiscal year end) divided by monthly CPI (CPI is obtained from the Federal Reserve Bank of St. Louis).
Leverage	Total debt plus preferred shares, minus convertible debt, and then scaled the result by total assets, measured at fiscal year end.
Market-to-book ratio	Market value of total assets divided by the book value of total assets measured at fiscal year end. Market value of total assets is defined as total assets minus book value of equity plus market value of equity.
Profitability	Return on assets divided by total assets (total assets is in billion dollars).
Z-score	Altman's z-score is defined as 1.2*(current assets-current liability)/total assets+1.4*retained earnings/total assets+3.3*EBIT/total assets+0.6*market value of equity/total debt+sales/total assets.

Table II Summary of Statistics
Panel A IPO Sample

Definitions of all variables are given in Table I.

Variable names	N	Mean	SD	P25	P50	P75
IPO underpricing (in bps)	193	72.31	118.28	1.21	41.89	112.21
Covenant index	136	4.27	3.35	2.00	3.96	7.00
Outstanding loan amount	193	1.58	2.01	0.31	0.85	2.02
Number of lead banks	193	2.04	2.34	1.00	2.00	2.00
LN (loan remaining maturity)	193	1.05	0.76	0.75	1.24	1.52
LN (bond offering amount)	193	8.50	0.33	8.30	8.48	8.70
Duration	193	7.84	4.82	4.55	6.70	7.91
Coupon	193	5.33	2.54	3.38	5.00	6.88
D_senior-secured	193	0.03	0.16	0.00	0.00	0.00
D_bond covenants	193	0.66	0.48	0.00	1.00	1.00
D_putable	193	0.17	0.38	0.00	0.00	0.00
D_callable	193	0.84	0.36	1.00	1.00	1.00
D_convertible	193	0.35	0.48	0.00	0.00	1.00
Firm size	193	15.02	2.13	13.87	15.01	16.14
Leverage	193	0.51	0.22	0.34	0.52	0.65
Market-to-book ratio	193	1.90	1.01	1.18	1.57	2.42
Profitability	193	-0.06	1.53	0.00	0.01	0.05
Z-score	193	3.72	3.35	1.59	2.88	4.80

Table II Summary of Statistics
Panel B SBO Sample

Definitions of all variables are given in Table I.

Variable names	N	Mean	SD	P25	P50	P75
SBO underpricing (in bps)	1487	35.02	80.58	-6.83	19.45	61.39
Loan covenant index	969	2.79	2.43	1.00	2.00	3.67
Outstanding loan amount	1487	3.44	4.49	1.00	2.00	4.00
Number of lead banks	1487	1.68	1.40	1.00	1.00	2.00
LN (loan remaining maturity)	1487	0.91	0.86	0.56	1.08	1.44
Debt covenant index	1094	8.29	3.68	6.00	7.17	10.00
Outstanding debt amount	1487	9.87	17.09	2.84	6.05	11.87
LN (debt remaining maturity)	1487	1.29	0.40	1.12	1.26	1.49
LN (bond offering amount)	1487	-0.77	0.66	-1.20	-0.77	-0.29
Duration	1487	7.13	3.79	4.55	7.10	7.94
Coupon	1487	5.40	1.97	4.25	5.60	6.50
D_senior-secured	1487	0.01	0.10	0.00	0.00	0.00
D_bond covenants	1487	0.97	0.16	1.00	1.00	1.00
D_putable	1487	0.03	0.16	0.00	0.00	0.00
D_callable	1487	0.92	0.27	1.00	1.00	1.00
D_convertible	1487	0.05	0.22	0.00	0.00	0.00
Firm size	1487	16.75	1.63	15.64	16.67	17.92
Leverage	1487	0.63	0.17	0.52	0.61	0.72
Market-to-book ratio	1487	1.69	0.73	1.19	1.47	1.95
Profitability	1487	0.00	0.09	0.00	0.00	0.01
Z-score	1487	2.67	1.68	1.51	2.45	3.54

Table III Univariate Analysis of Underpricing: IPO Sample

This table documents the univariate statistics of the dependent variable, bond initial public offering (IPO) underpricing (in bps). IPOs are identified using the Fixed Income Securities Database (FISD). Bond characteristics are obtained from FISD. The bond price and trading volume are obtained from the Enhanced Historical TRACE. We use the volume-weighted average price to calculate underpricing. Bond IPO underpricing is defined as the first trading-day benchmark-adjusted return in the 7-day event window since IPO date and is calculated by the equation (1)-(3) in Section 3.1. IPO underpricing is winsorized at 1% and 99%. In Panel A, *initial return on 1st trading day* indicates first trading-day return. *Initial return on 2nd, 3rd, 4th or 5th trading day* indicates the initial return on the corresponding days of a bond which trades for more than one day during the 7-day event window. Bond initial rating categories are obtained from S&P ratings where available, Moody's rating next, or Fitch's ratings last. *Investment-grade bonds* have ratings of BBB or higher, *junk bonds* have ratings of BB or lower, and *non-rated bonds* are bonds with no rating information. *Long-term bonds* are bonds with a maturity of longer than 7 years; *intermediate-term bonds* are bonds with a maturity equal to or shorter than 7 years. *With covenants* means the bond has bond covenant clauses; *without covenants* means a bond has no bond covenant clauses. *Bond seniority* indicates an IPO's seniority. ***, **, * indicate statistical significance at the 1%, 5% or 10% level, respectively.

	N	Mean	t-statistics	Percentage
Full sample	193	72.31***	8.49	100.00%
Panel A: Order of trade				
Initial return on 1st trading day	193	72.31***	7.35	100.00%
Initial return on 2nd trading day	124	42.90***	6.34	64.25%
Initial return on 3rd trading day	112	32.57***	6.62	58.03%
Initial return on 4th trading day	94	30.97***	4.89	48.70%
Initial return on 5th trading day	45	23.21***	3.33	23.32%
Panel B: Initial rating category				
AA	4	0.36	0.01	2.07%
A	27	14.36	1.37	13.99%
BAA	49	35.65***	3.46	25.39%
BA	19	72.80***	4.08	9.84%
B	40	114.75***	4.89	20.73%
CAA	8	79.07**	2.52	4.15%
Non-rated	46	113.36***	5.16	23.83%
Panel C: Investment /Junk /Non-rated bonds				
Investment-grade bonds	80	26.70***	3.61	41.45%
Junk bonds	67	98.6***	6.40	34.72%
Non-rated bonds	46	113.36***	5.16	23.83%
Panel D: Maturity				
Long-term bonds	105	66.79***	5.88	54.40%
Intermediate-term bonds	88	78.90***	6.13	45.60%
Panel E: Putable bonds				
Putable bonds	33	108.46***	5.73	17.10%
Non-putable bonds	160	64.86***	6.90	82.90%
Panel F: Callable bonds				
Callable bonds	163	77.99***	8.02	84.46%
Non-callable bonds	30	41.46***	3.12	15.54%
Panel G: Convertible bonds				
Convertible bonds	67	91.06***	6.65	34.72%
Non-convertible bonds	126	62.35***	5.80	65.28%
Panel H: Covenant-protected bonds				
Without covenants	66	124.98***	7.71	34.20%
With covenants	127	44.94***	5.02	65.80%
Panel J: Bond seniority				
Senior Secured	5	78.50*	2.67	2.59%
Senior	162	63.02***	7.64	83.94%
Senior Subordinate	23	147.39***	3.91	11.92%
Non-senior	3	-11.63	-0.27	1.55%

Table III Univariate Analysis of Underpricing: SBO Sample

This table documents the univariate statistics of the dependent variable, seasoned bond offering (SBO) underpricing (in bps). SBOs are identified using the Fixed Income Securities Database (FISD). Bond characteristics are obtained from FISD. The bond price and trading volume are obtained from the Enhanced Historical TRACE. We use volume-weighted average price to calculate underpricing. SBO underpricing is defined as the first trading-day benchmark-adjusted initial return in the 7-day event window since SBO date and is calculated by the equation (1)-(3) in Section 3.1. SBO underpricing is winsorized at 1% and 99%. In Panel A, *initial return on 1st trading day* indicates first trading-day initial return. *Initial return on 2nd, 3rd, 4th or 5th trading day* indicates the initial return on the corresponding days of a bond which trades for more than one day during the 7-day event window. Bond initial rating categories are obtained from S&P ratings where available, Moody's rating next, or Fitch's ratings last. *Investment-grade bonds* have ratings of BBB or higher, *junk bonds* have ratings of BB or lower, and *non-rated bonds* are bonds with no rating information. *Long-term bonds* are bonds with a maturity of longer than 7 years; *intermediate-term bonds* are bonds with a maturity equal to or shorter than 7 years. *With covenants* means the bond has bond covenant clauses; *without covenants* means a bond has no bond covenant clauses. Bond seniority indicates a SBO's seniority. ***, **, * indicate statistical significance at the 1%, 5% or 10% level, respectively.

	N	Mean	t-statistics	Percentage
Full sample	1487	36.87***	14.98	100.00%
Panel A: Order of trade				
Initial return on 1st trading day	1487	36.87***	14.98	100.00%
Initial return on 2nd trading day	1428	38.02***	14.79	96.03%
Initial return on 3rd trading day	1348	26.92***	18.95	90.65%
Initial return on 4th trading day	1182	22.94***	18.59	79.49%
Initial return on 5th trading day	816	17.17***	15.57	54.88%
Panel B: Initial rating category				
AAA	3	-35.30	-1.16	0.20%
AA	33	51.30***	3.54	2.22%
A	408	28.50***	8.75	27.44%
BAA	722	30.50***	10.44	48.55%
BA	158	34.10***	6.62	10.63%
B	117	49.20***	5.36	7.87%
CAA	28	138.32***	4.73	1.88%
CA_D	2	124.80	1.44	0.13%
Non-rated	16	97.73**	2.78	1.08%
Panel C: Investment /Junk /Non-rated bonds				
Investment-grade bonds	1166	30.22***	13.86	78.41%
Junk bonds	305	50.06***	9.22	20.51%
Non-rated bonds	16	97.73**	2.78	1.08%
Panel D: Maturity				
Long-term bonds	899	35.10***	12.44	60.46%
Intermediate-term bonds	588	34.88***	11.42	39.54%
Panel E: Putable bonds				
Non-putable bonds	1448	34.76***	16.71	97.38%
Pubable bonds	39	44.61**	2.25	2.62%
Panel F: Callable bonds				
Callable bonds	1368	32.82***	16.03	92.00%
Non-callable bonds	119	60.20***	5.44	8.00%
Panel G: Convertible bonds				
Convertible bonds	79	124.34***	7.62	5.31%
Non-convertible bonds	1408	30.00***	15.58	94.69%
Panel H: Covenants-protected bonds				
Without covenants	38	19.28*	1.69	2.56%
With covenants	1449	35.43***	16.69	97.44%
Panel I: Bond seniority				
Senior Secured	16	39.05***	3.46	1.08%
Senior	1400	34.04***	16	94.15%
Senior Subordinate	58	53.60***	3.92	3.90%
Non-senior	13	52.45*	1.94	0.87%

Table IV Loan Structure on Bond IPO Underpricing
Panel A Loan Covenant Index

Panel A reports the estimated coefficient for equation (4), which examines the relationship between *IPO underpricing* and *loan covenant index*. Column (1) and (2) report full sample results. Column (3) reports the results of the subsample composed of IPO issues without bond covenants. Column (4) reports the results of the subsample composed of junk bonds. The dependent variable is *IPO underpricing,* which is the first trading-day return of an IPO issue. IPO underpricing is calculated by equations (1)-(3) in Section 3.1 and is winsorized at 1% and 99%. *The loan covenants index* is the monthly average of the number of different loan covenants in a firm during the 6-month period before IPO and IPO offering date. *LN (bond offering amount*), *duration* and *coupon* stand for the natural log of the bond offering amount, the Macaulay duration, and the coupon rate of the issue, respectively. *D_senior-secured, D_bond covenants, D_callable, D_putable or D_convertible* are dummy variables which indicate that a bond issue is senior-secured, has bond covenants, is putable, is callable or is convertible. *Firm size* is the natural log of sales adjusted with CPI. *Leverage* is defined as total debt plus preferred shares, minus convertible debt and then divided by total assets. *Market-to-book ratio* is defined as market value of total assets divided by total assets, and market value of total assets is defined as total assets minus book value of equity plus market value of equity. *Profitability* is defined as return on assets divided by total assets (total assets is in billion dollars). *Z-score* is Altman`s z-score. We also control bond ratings with dummy variables created for the major rating categories of our sample and the estimated coefficients are not reported. The estimated standard deviations are clustered by firm. ***, **, * indicate statistical significance at the 1%, 5% and 10% level, respectively.

	Full sample		**IPOs without bond covenants**	**Junk bond**
	(1)	**(2)**	**(3)**	**(4)**
Loan covenant index	12.10*** (3.81)	9.34** (2.23)	13.00*** (3.52)	21.63** (2.21)
LN (bond offering amount)		2.61 (0.06)	-22.50 (-0.30)	67.11 (0.67)
Duration		-1.52 (-0.58)	-2.48 (-0.60)	0.99 (0.20)
Coupon		5.22 (0.78)	17.56 (1.35)	10.87 (0.89)
D_senior-secured		-100.35** (-2.31)	60.12 (1.08)	-145.26 (-1.64)
D_bond covenants		-33.57 (-1.42)		30.17 (0.62)
D_putable		28.95 (0.6)	100.27* (1.68)	48.33 (0.58)
D_callable		60.26 (1.21)	125.57* (1.68)	97.97 (1.48)
D_convertible		28.97 (0.53)	98.97 (1.11)	
Firm size		5.66 (0.98)	8.20 (0.73)	1.05 (0.10)
Leverage		-47.51 (-0.80)	-210.52* (-1.95)	-38.96 (-0.3)
Market-to-book ratio		-1.01 (-0.06)	112.23** (2.43)	-55.69 (-1.35)
Profitability		-9.78** (-2.21)	-162.22 (-1.63)	-19.57** (-2.23)
Z-score		-0.20 (-0.05)	-2.95 (-0.27)	11.38 (1.22)
Constant	-27.37 (-1.15)	-166.40 (-0.42)	-179.09 (-0.26)	-708.82 (-0.75)
Obs	136	136	51	51
Year dummies	Yes	Yes	Yes	No

Table IV Loan Structure on Bond IPO Underpricing
Panel B Outstanding Loan Amount

Panel B reports the estimated coefficient for equation (5), which examines the relationship between *IPO underpricing* and *outstanding loan amount*. Column (1) reports the full sample results; Column (2) reports the results of the subsample composed of IPO issues that have smaller offering amounts than the same firm's loan amounts. The dependent variable is *IPO underpricing,* which is the first trading-day return of an IPO issue, calculated by equation (1)-(3) in Section 3.1 and winsorized at 1% and 99%. *The outstanding loan amount* is the total amount of outstanding loan facilities of a firm on IPO date. Loan payments are deducted from the loan principle amount, and the exchange rate is adjusted if the loan is not denominated in U.S. dollars. *LN (bond offering amount*), *duration* and *coupon* stand for the natural log of the bond offering amount, the Macaulay duration, and the coupon rate of the issue, respectively. *D_senior-secured, D_bond covenants, D_callable, D_putable and D_convertible* are dummy variables which indicate that a bond issue is senior-secured, has bond covenants, is putable, is callable, or is convertible. *Firm size* is the natural log of sales adjusted with CPI. *Leverage* is defined as total debt plus preferred shares, minus convertible debt, then divided by total assets. *Market-to-book ratio* is defined as the market value of total assets divided by total assets, and market value of total assets is defined as total assets minus book value of equity plus market value of equity. *Profitability* is defined as return on assets divided by total assets (total assets are in billion dollars). *Z-score* is Altman`s z-score. We also control bond ratings with dummy variables created for the major rating categories of our sample and the estimated coefficients are not reported. The estimated standard deviations are clustered by firm. ***, **, * indicate statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	**(2)**
Outstanding loan amount	10.80**	15.24***
	(2.05)	(2.71)
LN (Bond offering amount)	26.93	-23.98
	(0.58)	(-0.73)
Duration	-1.24	-3.91*
	(-0.66)	(-1.84)
Coupon	8.21	6.66
	(1.55)	(1.25)
D_senior-secured	-28.42	-9.89
	(-0.50)	(-0.19)
D_bond covenants	-26.86	2.47
	(-1.2)	(0.11)
D_putable	25.04	5.67
	(0.66)	(0.16)
D_callable	53.23	90.17**
	(1.55)	(2.56)
D_convertible	10.44	71.46
	(0.17)	(1.4)
Firm size	-8.31	-1.1
	(-0.92)	(-0.23)
Leverage	-26.48	-112.8*
	(-0.48)	(-1.84)
Market-to-book ratio	-16.34	-7.68
	(-0.91)	(-0.46)
Profitability	-4.93	3.15
	(-1.22)	(1.28)
Z-score	4.55	-1.48
	(0.78)	(-0.21)
Constant	-140.19	176.62
	(-0.47)	(0.66)
Obs	193	159
Year dummies	Yes	Yes

Table IV Loan Structure on Bond IPO Underpricing
Panel C Number of Lead Banks and Loan Remaining Maturity

In Panel C, Column (1) and (2) report the full sample regression results of equation (7), which examines the relationship between *IPO underpricing* and *number of lead banks*. Column (3) and (4) report the full sample regression results of equation (8), which examines the relationship between *IPO underpricing* and *LN (loan remaining maturity)*. The dependent variable is *IPO underpricing,* which is the first trading-day return of an IPO issue. IPO underpricing is calculated by equation (1)-(3) in Section 3.1 and is winsorized at 1% and 99%. *The number of lead banks* is the total number of different lead banks in all the loan facilities of a firm. *LN (loan remaining maturity*) is the natural log of the loan remaining maturity, and the loan remaining maturity is defined as the remaining maturity of a firm's last-ending loan on its bond IPO date. *LN (bond offering amount*), *duration* and *coupon* stand for the natural log of the bond offering amount, the Macaulay duration, and the coupon rate of the issue, respectively. *D_senior-secured, D_bond covenants, D_callable, D_putable or D_convertible* are dummy variables which indicate that a bond issue is senior-secured, has bond covenants, is putable, is callable, or is convertible. *Firm size* is the natural log of sales adjusted with CPI. *Leverage* is defined as total debt plus preferred shares, minus convertible debt, then divided by total assets. *Market-to-book ratio* is defined as the market value of total assets divided by total assets, and market value of total assets is defined as total assets minus book value of equity plus market value of equity. *Profitability* is defined as return on assets divided by total assets (total assets are in billion dollars). *Z-score* is Altman`s z-score. We also control bond ratings with dummy variables created for the major rating categories of our sample and the estimated coefficients are not reported. The estimated standard deviations are clustered by firm. ***, **, * indicate statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)
Number of lead banks	3.92**	4.37*		
	(2.29)	(1.66)		
LN (loan remaining maturity)			23.73**	21.94**
			(2.37)	(2.19)
LN (bond offering amount)	50.61	38.54		42.24
	(1.24)	(0.81)		(0.96)
Duration	-1.42	-1.43		-1.81
	(-0.77)	(-0.76)		(-1.00)
Coupon	12.09**	8.77		9.17*
	(2.27)	(1.62)		(1.74)
D_senior-secured	-43.56	-29.76		-23.2
	(-0.86)	(-0.52)		(-0.42)
D_bond covenants	-45.67**	-27.04		-26.09
	(-2.32)	(-1.2)		(-1.19)
D_putable	18.07	27.72		29.51
	(0.43)	(0.73)		(0.78)
D_callable	49.43	45.03		42.8
	(1.35)	(1.31)		(1.29)
D_convertible	48.41	8.58		6.38
	(0.82)	(0.14)		(0.11)
Firm size	0.32	-5.44		-3.44
	(0.04)	(-0.61)		(-0.41)
Leverage	-36.97	-24.62		-37.42
	(-0.68)	(-0.44)		(-0.7)
Market-to-book ratio	-27.65*	-16.98		-11.93
	(-1.7)	(-0.95)		(-0.69)
Profitability	-8.41**	-5.40		-5.84
	(-2.21)	(-1.34)		(-1.47)
Z-score	6.16	4.75		4.32
	(1.06)	(0.81)		(0.76)
Constant	-425.9	-263.54	30.75	-344.54
	(-1.50)	(-0.87)	(0.95)	(-1.19)
Obs	193	193	193	193
Year dummies	No	Yes	Yes	Yes

Table V Loan Structure on SBO Underpricing

In Table V, Column (1) documents the estimated coefficients of equation (4), which analyzes the relationship between *SBO underpricing* and *loan covenant index.* Column (2) documents the estimated coefficients of equation (5), which analyzes the relationship between *SBO underpricing* and *outstanding loan amount*. Column (3) documents the estimated coefficients of equation (6), which analyzes the relationship between *SBO underpricing* and *number of lead banks*. Column (4) documents the estimated coefficients of equation (7), which analyzes the relationship between *SBO underpricing* and *LN (loan remaining maturity).* The dependent variable is *SBO underpricing,* which is the first trading-day return of an SBO issue. *SBO underpricing* is calculated by equations (1)-(3) in Section 3.1 and is winsorized at 1% and 99%. *The loan covenant index* is the monthly average of the number of different loan covenants in a firm during the 6-month period before SBO and SBO offering date. *The outstanding loan amount* is the total amount of outstanding loans of a firm on SBO date. Loan payments are deducted from the loan principle amount, and the exchange rate is adjusted if the loan is not denominated in U.S. dollars. *The number of lead banks* is the total number of different lead banks in all the loan facilities of a firm. *LN (loan remaining maturity*) is the natural log of the loan remaining maturity, and the loan remaining maturity is defined as the remaining maturity of a firm's last-ending loan on its bond IPO date. *LN (bond offering amount*), *duration* and *coupon* stand for the natural log of the bond offering amount, the Macaulay duration, and the coupon rate of the issue, respectively. *D_senior-secured, D_bond covenants, D_callable, D_putable or D_convertible* are dummy variables which indicate that a bond issue is senior-secured, has bond covenants, is putable, is callable, or is convertible. *Firm size* is the natural log of sales adjusted with CPI. *Leverage* is defined as total debt plus preferred shares, minus convertible debt,then divided by total assets. *Market-to-book ratio* is defined as the market value of total assets divided by total assets, and market value of total assets is defined as total assets minus book value of equity plus market value of equity. *Profitability* is defined as return on assets divided by total assets (total assets are in billion dollars). *Z-score* is Altman`s z-score. We also control bond ratings with dummy variables created for the major rating categories of our sample and the estimated coefficients are not reported. The estimated standard deviations are clustered by firm and the year-fixed effect model is applied in all the columns. ***, **, * indicate statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)
Loan covenant index	0.03			
	(0.02)			
Outstanding loan amount		1.38**		
		(2.08)		
Number of lead banks			1.35	
			(0.84)	
LN (loan remaining maturity)				2.00
				(0.70)
LN (bond offering amount)	11.44*	10.53**	13.15**	13.49**
	(1.74)	(1.99)	(2.4)	(2.50)
Duration	1.91*	1.79**	1.78**	1.75**
	(1.93)	(2.16)	(2.13)	(2.1)
Coupon	7.61***	6.40***	6.23***	6.24***
	(3.08)	(3.08)	(2.99)	(3.00)
D_senior-secured	2.88	12.82	11.91	13.09
	(0.25)	(1.13)	(1.02)	(1.15)
D_bond covenants	-12.56	8.01	10.66	9.99
	(-0.60)	(0.52)	(0.69)	(0.66)
D_putable	-68.89***	-60.42***	-59.47***	-59.01***
	(-2.71)	(-2.89)	(-2.78)	(-2.74)
D_callable	-25.00**	-24.62***	-24.18***	-24.39***
	(-2.21)	(-2.78)	(-2.71)	(-2.74)
D_convertible	103.99***	111.05***	109.01***	108.86***
	(4.27)	(5.36)	(5.23)	(5.22)
Firm size	-6.67	-7.29**	-5.99*	-5.99*
	(-1.62)	(-2.17)	(-1.79)	(-1.8)
Leverage	17.72	31.01	28.85	28.71
	(0.65)	(1.57)	(1.46)	(1.45)
Market-to-book ratio	-14.70**	-9.16	-8.88	-8.66
	(-1.98)	(-1.6)	(-1.56)	(-1.51)
Profitability	-146.93***	-38.22	-38.64	-38.31
	(-3.13)	(-0.7)	(-0.71)	(-0.71)
Z-score	9.15**	7.04**	6.17**	6.10**
	(2.55)	(2.44)	(2.19)	(2.16)

Table V Loan Structure on SBO Underpricing

In Table V, Column (1) documents the estimated coefficients of equation (4), which analyzes the relationship between *SBO underpricing* and *loan covenant index.* Column (2) documents the estimated coefficients of equation (5), which analyzes the relationship between *SBO underpricing* and *outstanding loan amount*. Column (3) documents the estimated coefficients of equation (6), which analyzes the relationship between *SBO underpricing* and *number of lead banks*. Column (4) documents the estimated coefficients of equation (7), which analyzes the relationship between *SBO underpricing* and *LN (loan remaining maturity).* The dependent variable is *SBO underpricing,* which is the first trading-day return of an SBO issue. *SBO underpricing* is calculated by equations (1)-(3) in Section 3.1 and is winsorized at 1% and 99%. *The loan covenant index* is the monthly average of the number of different loan covenants in a firm during the 6-month period before SBO and SBO offering date. *The outstanding loan amount* is the total amount of outstanding loans of a firm on SBO date. Loan payments are deducted from the loan principle amount, and the exchange rate is adjusted if the loan is not denominated in U.S. dollars. *The number of lead banks* is the total number of different lead banks in all the loan facilities of a firm. *LN (loan remaining maturity*) is the natural log of the loan remaining maturity, and the loan remaining maturity is defined as the remaining maturity of a firm's last-ending loan on its bond IPO date. *LN (bond offering amount*), *duration* and *coupon* stand for the natural log of the bond offering amount, the Macaulay duration, and the coupon rate of the issue, respectively. *D_senior-secured, D_bond covenants, D_callable, D_putable or D_convertible* are dummy variables which indicate that a bond issue is senior-secured, has bond covenants, is putable, is callable, or is convertible. *Firm size* is the natural log of sales adjusted with CPI. *Leverage* is defined as total debt plus preferred shares, minus convertible debt,then divided by total assets. *Market-to-book ratio* is defined as the market value of total assets divided by total assets, and market value of total assets is defined as total assets minus book value of equity plus market value of equity. *Profitability* is defined as return on assets divided by total assets (total assets are in billion dollars). *Z-score* is Altman`s z-score. We also control bond ratings with dummy variables created for the major rating categories of our sample and the estimated coefficients are not reported. The estimated standard deviations are clustered by firm and the year-fixed effect model is applied in all the columns. ***, **, * indicate statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	**(2)**	**(3)**	**(4)**
Constant	148.59**	84.31	71.21	73.25
	(1.39)	(1.59)	(1.32)	(1.37)
Obs	969	1487	1487	1487
Year dummies	Yes	Yes	Yes	Yes

Table VI Debt (Loan and Bond) Structure on SBO Underpricing

In Table VI, Column (1) documents the estimated coefficients of equation (8), which analyzes the relationship between *SBO underpricing* and *debt covenant index.* Column (2) documents the estimated coefficients of equation (9), which analyze the relationship between *SBO underpricing* and *Outstanding debt amount*. Column (3) documents the estimated coefficients of equation (10), which analyze the relationship between *SBO underpricing* and *LN (debt remaining maturity).* The dependent variable is *SBO underpricing,* which is the first trading day return of an SBO issue. *SBO underpricing* is calculated by equation (1)-(3) in Section 3.1 and is winsorized at 1% and 99%. *Debt covenants index* is the monthly average of the number of different loan and bond covenants in a firm during the 6-month period before SBO and SBO offering date. *Outstanding debt amount* is the total amount of outstanding loan and bond of a firm on SBO date, Loan payments are deducted from loan principle amount and exchange rates is adjusted if the loan is not denominated in US dollar. *Number of lead banks* is the total number of different lead banks in all the loan facilities and bonds of a firm. *LN (debt remaining maturity*) is the natural log of debt remaining maturity, and the debt remaining maturity is defined as the remaining maturity of a firm's last ending loan or bond on its bond IPO date. *LN (bond offering amount*), *Duration* or *Coupon* stands for the natural log of bond offering amount, Macaulay duration or the coupon rate of the issue respectively. *D_senior-secured, D_bond covenants, D_callable, D_putable or D_convertible* is dummy variable which indicates that a bond issues is senior-secured, has bond covenants, is putable, is callable or is convertible respectively. *Firm size* is natural log of the sales adjusted with CPI. *Leverage* is defined as total debt plus preferred shares, minus convertible debt and then divided by total asset. *Market-to-book ratio* is defined as market value of total assets divided by total assets, and market value of total assets are defined as total assets minus book value of equity plus market value of equity. *Profitability* is defined as return on assets divided by total assets (total assets are in billion dollar). *Z-score* is Altman`s z-score. We also control bond ratings with dummy variables created for major rating categories of our sample and the estimated coefficients are not reported. The estimated standard deviations are clustered by firm and the year-fixed effect model is applied in all the columns. ***, **, * indicates statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)
Debt covenant index	-0.97		
	(-1.07)		
Outstanding debt amount		0.42**	
		(2.17)	
LN (debt remaining maturity)			-3.78
			(-0.68)
LN (bond offering amount)	15.50**	11.52**	13.65**
	(2.55)	(2.22)	(2.54)
Duration	2.13**	1.76**	1.80**
	(2.15)	(2.12)	(2.13)
Coupon	7.01***	6.53***	6.27***
	(2.90)	(3.15)	(3.01)
D_senior-secured	15.64	12.23	12.75
	(1.37)	(1.08)	(1.11)
D_bond covenants	7.20	8.97	9.41
	(0.34)	(0.58)	(0.62)
D_putable	-57.98**	-62.91***	-60.04***
	(-2.25)	(-2.99)	(-2.8)
D_callable	-28.52***	-23.98***	-24.55***
	(-2.61)	(-2.72)	(-2.75)
D_convertible	106.57***	111.15***	108.97***
	(4.69)	(5.36)	(5.23)
Firm size	-8.00**	-7.98**	-5.99*
	(-2.08)	(-2.32)	(-1.79)
Leverage	25.53	33.67*	29.29
	(0.99)	(1.69)	(1.49)
Market-to-book ratio	-14.51**	-10.62*	-8.56
	(-2.09)	(-1.82)	(-1.49)
Profitability	-125.03**	-38.78	-37.09
	(-2.4)	(-0.71)	(-0.68)
Z-score	9.65***	7.36**	5.93**
	(2.78)	(2.51)	(2.09)
Constant	116.54*	94.88*	80.27
	(1.77)	(1.77)	(1.51)
Obs	1094	1487	1487

Table VI Debt (Loan and Bond) Structure on SBO Underpricing

In Table VI, Column (1) documents the estimated coefficients of equation (8), which analyzes the relationship between *SBO underpricing* and *debt covenant index.* Column (2) documents the estimated coefficients of equation (9), which analyze the relationship between *SBO underpricing* and *Outstanding debt amount*. Column (3) documents the estimated coefficients of equation (10), which analyze the relationship between *SBO underpricing* and *LN (debt remaining maturity).* The dependent variable is *SBO underpricing,* which is the first trading day return of an SBO issue. *SBO underpricing* is calculated by equation (1)-(3) in Section 3.1 and is winsorized at 1% and 99%. *Debt covenants index* is the monthly average of the number of different loan and bond covenants in a firm during the 6-month period before SBO and SBO offering date. *Outstanding debt amount* is the total amount of outstanding loan and bond of a firm on SBO date, Loan payments are deducted from loan principle amount and exchange rates is adjusted if the loan is not denominated in US dollar. *Number of lead banks* is the total number of different lead banks in all the loan facilities and bonds of a firm. *LN (debt remaining maturity*) is the natural log of debt remaining maturity, and the debt remaining maturity is defined as the remaining maturity of a firm's last ending loan or bond on its bond IPO date. *LN (bond offering amount*), *Duration* or *Coupon* stands for the natural log of bond offering amount, Macaulay duration or the coupon rate of the issue respectively. *D_senior-secured, D_bond covenants, D_callable, D_putable or D_convertible* is dummy variable which indicates that a bond issues is senior-secured, has bond covenants, is putable, is callable or is convertible respectively. *Firm size* is natural log of the sales adjusted with CPI. *Leverage* is defined as total debt plus preferred shares, minus convertible debt and then divided by total asset. *Market-to-book ratio* is defined as market value of total assets divided by total assets, and market value of total assets are defined as total assets minus book value of equity plus market value of equity. *Profitability* is defined as return on assets divided by total assets (total assets are in billion dollar). *Z-score* is Altman`s z-score. We also control bond ratings with dummy variables created for major rating categories of our sample and the estimated coefficients are not reported. The estimated standard deviations are clustered by firm and the year-fixed effect model is applied in all the columns. ***, **, * indicates statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	**(2)**	**(3)**
Year dummies	Yes	Yes	Yes

Table VII IPO and SBO yield spread analysis

Table VII tests the difference in yield spread between IPO bonds and SBO bonds. The dependent variable is the yield spread and is defined as the difference between the yield-to-maturity of a corporate bond and the yield-to-maturity of its closest term constant maturity Treasury bond. The yield-to-maturity of the corporate bond is the discount rate that sets the present value of its future payments equal to its trading price plus the accrued interest. The yield spread is in percentage. The main independent variable is D_ipo, which equals 1 if a bond is an IPO bond issue, other wise 0. *LN (bond offering amount)* or *LN (bond remaining maturity)* stand for the natural log of the bond offering amount or natural log of the bond remaining maturity. *D_senior-secured*, *D_bond covenants*, *D_callable*, *D_putable*, and *D_convertible* are dummy variables indicating whether a bond issue is senior-secured, covenant-protected, putable, callable or convertible. *Firm size* is the natural log of sales adjusted with CPI. *Leverage* is defined as total debt plus preferred shares, minus convertible debt, divided by total assets. *Market-to-book ratio* is defined as market value of total assets divided by total assets, and market value of total assets is defined as total assets minus book value of equity plus market value of equity. *Profitability* is defined as return on assets divided by total assets (total assets are in billion dollars). *Z-score* is Altman`s z-score. *Amihud* stands for the daily Amihud ratio, which is the average absolute value of bond return divided by the dollar trading volume (in million dollars) within the day. *Stock volatility* stands for stock volatility in the 6 months prior to the bond trading execution date. *LN (firm age)* is the natural log of the difference between a firm's first day in Compustat and the bond trading execution date. *AAA-BBB*, *Ted Spread*, and *Slope* stand for the difference in yield spread between Moody's AAA and BBB bonds, the difference between the 3-month Eurodollar rate and the 3-month T-Bill rate, or the difference between the 10-year and 2-year Treasury rates (Term Slope). We also control for bond ratings with dummy variables for major rating categories. Column (2) includes fixed-year effect, and Column (3) includes industry dummies and fixed-year effect. The estimated coefficients for these dummy variables are not reported. The estimated standard deviations are clustered by firm. Variables are winsorized at 1% and 99%. ***, **, * indicate statistical significance at the 1%, 5% and 10% level, respectively.

Variables	(1)	(2)	(3)
D_IPO	0.26**	0.25**	0.23*
	(2.22)	(2.13)	(1.88)
LN (Bond offering amount)	0.28***	0.25***	0.23***
	(4.33)	(3.62)	(4.10)
LN (Bond remaining maturity)	0.19***	0.18***	0.15***
	(6.03)	(5.82)	(4.85)
D_senior-secured	-0.13	-0.11	-0.27
	(-0.65)	(-0.59)	(-1.50)
D_bond covenants	0.06	0.05	0.06
	(0.41)	(0.33)	(0.42)
D_putable	0.42	0.49	0.40
	(0.73)	(0.80)	(0.65)
D_callable	-0.03	-0.06	0.08
	(-0.18)	(-0.42)	(0.49)
D_convertible	-1.59***	-1.74***	-1.63***
	(-3.41)	(-3.71)	(-3.51)
Firm size	-0.30***	-0.28***	-0.30***
	(-6.69)	(-6.38)	(-6.80)
Leverage	0.67**	0.67**	0.67**
	(2.48)	(2.42)	(2.37)
Market-to-book ratio	-0.17**	-0.15**	-0.29***
	(-2.38)	(-1.98)	(-3.33)
Profitability	-4.16	-4.39	-3.55
	(-1.37)	(-1.44)	(-1.17)
Z-score	-0.07**	-0.07**	-0.07*
	(-2.34)	(-2.32)	(-1.73)
Amihud	8.46	8.21	2.87

	(0.63)	(0.58)	(0.22)
Stock volatility	36.57***	38.72***	41.71***
	(7.96)	(7.99)	(8.80)
LN(Firm age)	-0.07	-0.07	-0.05
	(-1.24)	(-1.36)	(-0.8)
AAA-BBB	0.72***	0.60***	0.52***
	(6.59)	(4.31)	(4.77)
Ted spread	0.38***	0.26**	0.26**
	(6.16)	(2.57)	(2.51)
Slope	0.11***	-0.06	-0.05
	(4.12)	(-0.78)	(-0.59)
Constant	-0.71	-0.12	-0.26
	(-0.65)	(-0.10)	(-0.26)
Rating dummies	Yes	Yes	Yes
Year dummies	No	Yes	Yes
Industry dummies	No	No	Yes
R-square	0.76	0.77	0.79
obs	1275	1275	1275