How does the conflict of interest between loan holders and bondholders affect bond IPO underpricing?

Jaewon Choi

University of Illinois Urbana-Champaign

Jingzhi Huang

Pennsylvania State University

Huayi Tang

Concordia University

Yuan Wang[1]

Concordia University

[1] Corresponding author: yuan.wang@concordia.ca

ABSTRACT

In this paper, we find that the conflict of interest between loan holders and bond holders is positively related to bond IPO underpricing which serves as a compensation to the initial bond investors. We construct four proxies for the conflict between loan holders and bond holders, namely, loan covenants index, loan amount, number of lead banks, and loan remaining maturity. And 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.

1. Introduction

Huge first day return of IPO stocks[2] has attracted a large number of papers to explain the existence of underpricing. For example, Baron (1982), Rock (1986) and Allen and Faulhaber (1989) link underpricing to information problems, some other papers relate underpricing with corporate governance or ownership structure (for example, Brennan and Franks (1997), Ljungqvist and Wilhelm (2003), Lowry and Murphy (2007)), some link underpricing to market sentiment (for example, Derrien (2005), Ljungqvist, Nanda, Singh (2006)), or the after-market liquidity (Ellul and Pagano (2006)). As documented in Table 1 of Ritter and Welch (2002), on average a stock IPO raises $78 million per deal, but this figure is paled when compared to a bond IPO which raises $4.32 billion per deal[3], 55 times the amount of money raised by stock IPO. Also suggested by the data that public bond has become the dominant way for US corporate to obtain external financing[4] and average dollar value of mispricing per deal in corporate bond is larger than that of equity IPO[5], compared to the numerous papers focused on IPO stock, very few papers focus on bond IPOs. Among the papers which try to give a solution to bond IPO underpricing, Datta, Iskandar-Datta and Patel (1997) and Cai, Helwege and Warga (2007) propose and prove that information asymmetry, which is also a determinant for stock IPO underpricing, is a key to this problem. But the pricing of bond market IPOs might be different from that of equity market due to firms' debt structure, or in order words, when making their bond IPO, some firms may have private debt outstanding, and may being held or traded by a group of banks. In this paper, we are particularly interested in whether the interaction between loan holders and bond holders affects the pricing of firms' bond IPOs.

As pointed out in Diamond (1984) and Fama (1985), bank cross-monitoring resolves information asymmetry and benefits other debtholders, meaning that monitoring by banks should reduce bond IPO underpricing. However, banks usually have access to superior inside information (Fama (1985)), which makes them able to influence management team for banks' own benefits (Rajan (1992)), liquidate ongoing project to keep their own investment safe while making junior debtholders worse off (Park (2000)) and

---

[2] Ritter and Welch (2002) documents 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.

[3] See Table 2 for deal information.

[4] Debt financing is the most common way of for a US firm to obtain external financing. By the end of year 2012, the total market capitalization of US listed non-financial firms is about 16 trillion (18 trillion including financial firms), while at the same time, American corporate debt for non-financial firms exceed 60 billion. And between loan and bond as a source of debt financing, bank loan only attributes to one tenth of the total amount outstanding. This information is available at 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.

[5] As mentioned in Kozhanov, Ogden and Vaghefi (2011), dollar value mispricing of a US corporate debenture is larger on average than that of equity IPO. In Kozhanov, Ogen and Vaghefi (2011), dollar value mispricing of corporate bond (including both bond IPOs and bond SBOs) is 25 million in total per deal, while equity IPO dollar value mispricing in Ritter and Welch (2002) is 17 million per deal.

make almost no compromise in re-organizations because of their senior and collateralized claims (Asquith, Gertner, Scharfstein (1991)). Situation aggravates due to the facts that banks are usually cohesive lenders and are good at fighting for their own interests, even at the expense of the bondholders' interest (Welch (1997)). Therefore, as more senior debtholders, banks could expropriate bond holders when there is a conflict of interest between the two classes of debtholders. This conflict can be another factor that affects the pricing of firms' bond IPOs, and different from bank 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 firms with outstanding loans. On average, first trading day underpricing is 72.37 bps. Underpricing is higher for bonds with no covenants, bonds with low grading or bonds with option features. Since the bond IPO underpricing exists, we then focus on whether outstanding private loans play a role and what is their effect on IPO underpricing. We develop two competing hypotheses: the monitoring hypothesis and the conflict-of-interest hypothesis. The monitoring hypothesis predicts that banks' monitoring over the management of the firm and firm's performance resolves information asymmetry, benefiting bond investors, and therefore lowers the underpricing of bond IPOs. Whereas the conflict-of-interest hypothesis assumes that bond investors know ex-ante that banks will expropriate junior debtholders, so the 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, loan covenants index, total loan amount, number of lead banks, and remaining maturity of the loan. Loan covenants index is the firm-level covenants index, constructed by counting the total number of different loan covenants in a firm. Total loan amount is the aggregated outstanding loan amount on bond IPO date. Number of lead banks stands for the total number of different senior participants in firms' all syndicated loans. Remaining maturity of the loan measures the remaining maturity of a firm's (last-ending) loan facility.

These proxies are particularly chosen for that they could stand for both the bank monitoring and conflict of interest. If monitoring effect dominates, we will observe negative relationship between proxies and underpricing, and vice versa, we will otherwise observe positive relationship, if conflict effect dominates.

For the monitoring side, according to Rajan and Winton (1995), covenants are set to motivate banks to collect information and monitor the borrowers and thus we could measure the aggregated level of bank monitoring by building firm-level covenants index. Based on principal-agent theory, banks' motives to monitor the firm are bigger when its own share in the borrowing firm is bigger, meaning that the bigger total loan amount the more monitoring. If banks monitor the borrowers, we should see more monitoring by

banks either the loan remaining maturity is longer or there are more lead banks. Since bank monitoring could benefit other public bond holders by resolving information asymmetry, we will find negative relationship between proxy variables and bond underpricing in the empirical test.

But literature also suggests that these variables can stand for the conflict of interest between loan holders and bondholders. Since the loan covenants stipulate when loan holders can step in and take control of the firm, indicating that more covenants means higher possibility that loan holders may take control of the firm. As senior debtholders, loan holders' actions when controlling the firm in crisis may act for their own interest and hurt junior bondholders' interest, causing conflict between debtholders and thus higher covenants index should lead to more underpricing. Bulow and Shoven (1978) suggests that bigger loan amount means banks have bigger rights in making bankruptcy decision. When senior debtholders decide to file for bankruptcy, junior debtholders can only be worse and therefore conflict is stronger if the loans are bigger. If bank can expropriate junior bondholders' interest, longer loan remaining maturity and more senior banks should magnify the conflict between loan holders and bondholders. Since this conflict hurt bond holders and compensation need to be given to attract bond buyers, we will observe positive relationship between proxy variables and bond IPO underpricing, if conflict indeed plays a role in determining underpricing.

Using OLS with clustering standard deviation and fixed effects, in Section 4, we find that the relationship between proxy variables and underpricing is significantly positive even after we control for known firm-level and bond-level determinants which affect bond underpricing. The positive relationship confirms the hypothesis that the conflict of interest between loan holders and bondholders increase the underpricing. Specifically, one unit increase in covenant index will increase underpricing by about 10 bps, one unit increase in the number of lead banks will increase underpricing by 5 bps, one billion dollars increase in loan amount will increase underpricing by 12 bps, and one percent increase in loan remaining maturity is associate with 0.21 bps increase in bond IPO underpricing. For two of the proxies, covenants index and lead bank numbers, sub-sample analysis shows that conflict are stronger among bonds with lower ratings.

Our paper contributes to the literature in two ways. First, this paper shed light on the IPO underpricing literature that the conflict between bondholders and loan holders affects bond IPO underpricing. Second, this paper also contributes to the bond pricing literature by focusing on firms with outstanding loans but no bonds, which is a clean setup to investigate how the interaction between loan holders and bondholders affects bond pricing.

In Section 2, we summarize the previous theories on the relationship between loan holders and bondholders, discuss related empirical research and build proxies. In Section 3, we describe the data. Sections 4 describes our empirical methodology. Section 5 presents our primary results. Section 6 concludes.

2. Literature Review and Proxy and Hypotheses Development

2.1. Information asymmetry and equity IPOs

Datta, Iskandar-Datta and Patel (1997) and Cai, Helwege and Warga (2007) show that information asymmetry is priced in bond IPOs, but the pioneering work which links information asymmetry to underpricing is done by Baron (1982) in stock IPOs who assumes that the information asymmetry between investment bankers and the issuers affects underpricing. There are some other famous model built on information asymmetry, for example, the "winner's curse" by Rock (1986), signaling model by Allen and Faulhaber (1989) and book-building model by Benveniste and Spindt (1989) etc. Literature review on IPO by Ritter and Welch (2002) gives a good summary and comment on all kinds of existing model built on asymmetric information.

Compared to the numerous papers on stock IPO underpricing, papers on bond IPO underpricing are few in number[6] and in these work, information asymmetry is a pivot determinant of underpricing. First empirical work on bond IPO, Datta, Iskandar-Datta and Patel (1997), finds that speculative grade bonds are underpriced while investment grade bonds are overpriced. They find that investment banker quality and bond ratings, which both affect information asymmetry, are important determinants of bond IPO underpricing. Paper by Cai, Helwege and Warga (2007) finds that underpricing generally exists in bond IPOs and confirms the hypothesis that information asymmetry is positively linked to underpricing. Their findings suggest that bond IPO underpricing is high for private form and the information problem in bond IPO is in manager/bondholder asymmetric information form. Rather than analyzing underpricing, Datta, Iskandar-Datta and Patel (1999) focus on bond IPO yield spreads and they find that by resolving information asymmetry, bank monitoring can reduce the yield spreads of bond IPOs.

2.2. Bank monitoring and the conflict between debtholders

Bank monitoring literature suggests that banks are inarguably the best intermediations to perform the information generating duty. Bank monitoring results from the fact that banks invest in the firms and must keep the principal intact. By screening the borrowers' qualities ex-ante and supervising borrowers' activities ex-post, banks perform monitoring duty and the safety of the investment principal is guaranteed. In the monitoring process, information of 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 (1997) and

[6] As pointed out 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.

systematically developed by Diamond (1984) and Fama (1985). Diamond (1984) points out that the cost of producing and gathering information from its borrowers is low for financial intermediation because of the diversification effect within an intermediation and that monitoring process benefit borrowers by resolving their information problems. Fama (1985) proves that banks acquire firms' inside information and the information advantage makes them perform efficient monitoring which will lower the monitoring costs of other later issued debt. For public bond holders, reducing their monitoring cost means that they will demand lower yield spread on the bond issues. Traditional bank monitoring theories predicts that bank monitoring should reduce bond IPO underpricing by resolving information asymmetry.

Later research extends basic models in several ways. Some papers focusing on some other effects caused by borrowing from the banks and these effects can cause conflict between different classes of debtholders, impairing bondholders' interest and affecting bond IPO pricing. In this subsection, we summarize the related work in details.

First, as Rajan (1992) argues that banks can influence management teams towards banks' own benefit when monitoring the borrowers and that banks enjoy the privilege of extracting economic rent from borrowers by using bargaining power over banks' profits. The bargaining power serves as the necessary premise for the banks to expropriate bondholders' interest by either pressing the management team directly or persuade the management to work with them. Banks' bargaining power comes from two aspect, namely, the private information from the firm and the renegotiation of the loan. While bondholders only hold public information and renegotiation of public debt is almost impossible and thus bondholders don't enjoy this privilege, and this feature adds imbalance towards bondholders.

Second, senior status of bank loans may overprotect banks, whereas it impairs bondholders' interest. Park (2000) depicts bank monitoring from a different angle. In his paper, banks are given the highest seniority to motivate their monitoring incentives, because banks, specialized in monitoring, can get the full return from monitoring if the seniority structure is stipulated in this way, whereas the free rider problem among bondholders make them only junior debtholders. The core idea in Park's paper is that bank monitoring is not always to keep company operating, but to deterrent moral hazard, meaning that banks will liquidate their loan and demand their principal back from firms whenever the banks spot any signs indicating that their investment is not safe. An implication in his model is that when senior bank investments are potentially harmed and choose liquidation, the situation for junior bond can only be worse off. Situation for bondholders aggravates when we consider that banks usually have the inside information (Fama (1985)) which makes them able to choose more favorable moment towards them to demand their investment back.

Third, in bankruptcy, liquidation or reorganization, seniority and collateral covenants together can keep the bank loans safe while making bondholders particularly vulnerable. Rajan and Winton (1995) argues that to reduce banks' losses in bankruptcy and to motivate banks to collect information, bank loan are usually collateralized. As pointed out by Welch (1997) that for US firms, even the bankruptcy drag on for year, the loan holders can still get their investment back since their claim is "so deep in the money". This implies that in bankruptcy cases banks will not make true compromise to reach a final reorganization, but junior debtholders usually have to give some way. Quite a few papers provide support for this opinion. 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. Similar idea is also discussed by Gertner and Scharfstein (1991). Asquith, Gertner and Scharfstein (1994) suggests that compared to public bondholders' junior and unsecured claims, bank loans are senior and secured which make banks more prone to force bankruptcy and the bank only make very limited concessions compared to bondholders even when the public debt restructures. James (1995) finds that in reorganization when a firm have both bank loans and public bonds, banks only make compromise, such as taking equity in exchange of debt, after the public bondholders have restructured their claims. James also shows that in reorganizations banks receive more equity and reduce less principal as in sharp contrast with bondholders.

Lastly, differences in nature between public bondholders and loan holders (banks) aggravate this conflict. Welch (1997) builds his model on "conflict theory" and derives the solution of the model based on the differences in "fighting abilities" between bondholders and loan holders. He argues that banks are "more cohesive" in nature and intrinsically "better organized" than bondholders, and terms the banks as "better fighters" which means that banks are professional and efficient at pressuring the firms for banks' own interest, although this fighting process may jeopardize junior bondholder' claims. He documents a case in which the First National Bank of St. Paul (FNB), which processed inside information about the insolvency of the borrower, successfully took control of American Lumber Company (ALC) and forced ALC to change FNB's unsecured loan into secured loan. Changing the secured status of the bank loan will expropriate the interest of any other debtholders beside FNB who only had unsecured claim previously and the money which previously should be allocated to other debtholders would be diverted to FNB. Among other debtholders, junior bondholders' situations would be the worst, because based on their seniority, they will get paid last. Welch (1997) attributes this outcome to the fact that bondholders are usually disperse and non-cohesive and the large number of bondholders makes them hard to coordinate and react to loan holders action promptly.

Banks' influence on management team, loans' senior and secured status, and banks' cohesive nature endow the banks superior power to fight for their own interest even at the expense of the bondholders' interest.

We term this relationship between bondholders and loan holders as "conflict of interest between loan holders and bondholders". For firms with outstanding loan, since new coming bondholders should demand a premium to compensate this conflict, the bond IPOs need to be underpriced to attract the investors. And this conflict is unique to bond IPOs.

Not only as we argued above that conflict of interest between bondholders and loan holders should positively affect bond IPO underpricing, but also bond IPO is also an ideal mechanism to test this conflict. Our reason is similar to the one given by Datta, Iskandar-Datta and Patel (1999). Different from the firms which make bond IPOs, firms that make seasoned bond offerings (SBOs) may involve three classes of debtholders, namely, new coming SBO bondholders, previous public debtholders (bond IPOs or previous bond SBOs) and banks (bank loans), and the interaction between either of the two parties will complicate the analysis. Since there is no other public bondholders at the time of bond IPO, our research design can isolate the effect of conflict between loan holders and bondholders on bond underpricing.

2.3. Proxies and hypotheses

In the previous subsection, we argue that both bank monitoring effect and conflict of interest between debtholders exist in firms. Bank monitoring should decrease bond IPO underpricing, since it resolves information asymmetry, while conflict of interest between debtholders should increase bond IPO underpricing, since initial buyers will require a compensation for this conflict and both of them are the effects of borrowing from banks. In order to determine the dominant effect, we build four proxies which could stands for the two effects.

2.3.1. Covenants index

Previous literature suggests that debt (bond/loan) covenants give debtholders both the protection against unfavorable future states and the right to take control of the firm. Papers by Jensen and Meckling (1976) and Smith and Warner (1979) first argue that covenants can protect debtholders' interest by limiting managerial behavior which could reduce the value of debt. By setting specific covenants, debtholders may seize the control rights of the firm when certain unfavorable states realized (e.g., Aghion and Bolton (1992) and Dewatripont and Tirole (1994)). Paper by Chava and Roberts (2008) suggests that covenants give debtholders effective protection. Their findings show that financial covenant thresholds indeed serve as crucial "trip wires" and covenants violation leads to technical default which results in either transfer of the control right of firm to debtholders or the decline of the investment capital. Either change in control or reduction of investment is costly for firms. As argued by Demiroglu and James (2010) 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 the loan contracts, violations provide banks control rights which can

affect the borrowing firm's investment and financial policies significantly or make tight covenant choices when the firms renegotiate with the bank. But giving protections and rights to senior debtholders could be harmful to the junior bond holders and cause conflict between debtholders. Since bank could waive the violation if the default is transient but choose to accelerate loan payments or terminate the loan at real crisis. In the later situation, junior debtholders may in even worse situation and bond has to be underpriced more to attract initial buyers. For firms with more loan covenants, the banks are given more protection and more likely to take control of the firm in the future and this means more loan covenants could cause more conflict between loan holders and bondholders and give higher underpricing.

On the other hand, collecting information about borrowers and accessing whether the borrowers has violated the covenants require banks to monitor the borrowers. As Rajan and Winton (1995) argue that bank monitoring its borrower though covenants and thus more covenants means banks need to do more related work about firms' status and more monitoring. Therefore more loan covenants should also reflects stronger monitoring from bank.

To measure how strong the conflict between debtholders or much monitoring is given to the debtholders by the covenants on the whole firm level, we build loan covenants index. Several kinds of covenants index are used in literature. For example, the covenants intensity index by Bradley and Roberts (2015), the covenants tightness index by Demiroglu and James (2010), the index by Chava, Kumar and Warga (2010) which focus on sub-covenants categories or the covenants index based on default probability by Murfin (2012). In this paper, we classify loan covenants into 30 categories to construct a firm-level index. Our method is similar to Helwege, Huang and Wang (2015), but different from Helwege, Huang and Wang (2015), we count the number of the loan covenants, since only the loan exists before bond IPO.

2.3.2. Total loan amount

The principal-agent theories state that agents will spend more effort in monitoring on behalf of the principals when the agents' interest in the transaction is larger. If we regard the banks as an agent who monitors the borrowers, solving information asymmetry and benefiting the whole public, we would expect more monitoring effort from banks if the banks' own lending shares are larger. Therefore, we would observe more bank monitoring when loans from bank are bigger, meaning that larger loans should be associated with less underpricing.

For the conflict-of-interest side, Bulow and Shoven (1978) supports that bigger loan could lead to more conflict. They argue that when the firms are in default or financial crisis, banks, different form noncohesive public bondholders, are able to renegotiate the covenants and especially for the banks with big loans, they hold the right to decide whether to force bankruptcy or to give extra cash supply to keep the firm operating.

Therefore, it is banks which hold bankruptcy decision and the bigger loan to a firm the more rights will be allocated to banks. Since bank's loans are usually senior and secured, the right to decide bankruptcy will undermine interest of junior bondholders who only hold unsecured claims. Thus bigger loans granted to the firm will cause stronger conflict between bondholders and loan holders and end up with higher underpricing.

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

This proxy is built based on the fact that, in our sample, all the loan facilities are syndicated and senior participants (lead banks) of the syndicated loans will always hold a portion of the loans. A syndicated loan, which involves a number of creditors, typically consists of two levels of participants, namely, the lead banks and junior participants. To make the loan syndicated, lead banks usually arrange the loan and sell a portion of the loan to other junior participants before the initiation of the loan. After the loan starts, the junior participants may sell a portion or whole part of the loan they possess on the secondary market[7]. For lead banks, things are different, they usually keep a big portion of the loan, although it is possible to trade on the secondary market. Drucker and Puri (2009) points out that bank will not sell the entire loan due to agency problem, instead, they just sell small fractions of the loan on secondary market. For the proportion of the loan kept by the lead bank (lead share), as Figures 1 in Ivashina and Scharfstein (2010) shows that, from April 1990 to April 2009, although there are peaks and troughs, lead share makes approximately 29% of the loans on average and there is no significant evidence or trend that the lead share is increasing or decreasing.

As point out in Dennis and Mullineaux (2000), the monitoring responsibility at the loan origination or due diligence stage after the loan starts is delegated to the managing agents (lead banks) of the syndicate loan and lead banks will hold the information problematic part of the syndicated loan. As participants who monitor the borrowers, lead banks can perform better monitoring when there are more of them. Since monitoring borrower is costly and requires effort, if the lead banks actually monitoring the borrowers, synergy between the lead banks could produce better monitoring outcome. In this sense, more lead banks should produce less underpricing.

But as pointed out in Welch (1997), banks are fundamental are better fighters than public bondholders in protecting their interest, so for a loan with more lead banks, we would see stronger influence on management team and better results when fighting for the banks' own right, meaning that more lead banks will cause more conflict between loan holders and bondholders and increase underpricing.

---

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

Data by Dealscan suggests that there are usually a large number of participants in a loan facility but the number of lead bank is typically small[8]. We only argue that when lead bank number is small and free-rider problem among the lead banks are not significant, we can observe strong aggregated effect of monitoring or conflict. When the number of the lead bank is particularly large, lead banks may free-ride each other and decrease the aggregated effect. And in this paper we don`t focus our analysis on the total number of junior and senior participants of the syndicated loan, since either the junior participants may either sell the whole part of the loan they have on the secondary market or just act as free-riders in fighting for the loan holders aggregate benefit.

2.3.4. Loan remaining maturity

Loan remaining maturity stands for the remaining maturity of loan facility when the firm makes its bond IPO issue(s). Previously we argue that the existence of either the conflict or monitoring is based on the existence of both loans and bonds in the same firm, so it means that when loans end, both of these two effects would no longer exist. From the monitoring side, longer loan remaining maturity means more bank monitoring and should reduce underpricing. From the conflict-of-interest side, longer loan remaining maturity means more conflict of interest between debtholders and should increase underpricing.

2.4. Hypotheses

H1: Bank monitoring will decrease the bond IPO underpricing.

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

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

Borrowing from banks also causes conflict between pre-existing loan holders and new coming bondholders. This conflict will harm bondholders' interest and the bond issues are underpriced to attract the bondholders, meaning that we will observe positive relationship between underpricing and proxy variables.

3. Data

3.1. Bond IPO identification, bond benchmark index and underpricing calculation

[8] In our sample the mean and median of lead banks on firm level are 2.04 and 2, on the contrary, mean and median of participant banks on firm level are 16.55 and 14.

We use three sources, namely, Enhanced Historical TRACE of the Financial Industry Regulatory Authority (FINRA), the Mergent Fixed Investment Securities Database (FISD) and Datastream, to identify corporate bond IPO, get trading volume, price and bond characteristics, and calculate underpricing.

FISD contains detailed information about corporate bonds, preferred stocks, U.S Treasury Bills and U.S. Ageny Bonds etc. From FISD, we obtain the information on bond issues, such as offering date, offering price, maturity date, coupon information, principal amount and rating etc. We restrict our IPO 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[9]. To identify bond IPOs, we first use FISD to find the first bond issuance of each firm and then exclude all bonds that have following features such as foreign issues, private placements, pay-in-kind bonds and corporate pass-thru trusts from the first bond issuance sample. We check Moody's Annual Bond Records to remove the firms which have issued their bond before 1995[10]. Same IPO identification method is also used by Cai, Helwege and Huang (2007).

The initial ratings for the IPO are obtained from FISD. We get an issue's rating by using its rating from rating agencies within 90 days since the offering date. If an issue has rating information from more than one rating agencies, we choose S&P when available, Moody's second, Fitch third and Duff and Phelps last. If no rating information is available within 90 days, we mark an issue as non-rated. Similar rating methodology is used by Cai, Helwege and Warga (2007). The rating distribution of our IPO sample is shown in Table 3 Panel B. From Panel B, we can see that BAA rated bonds and non-rated bonds each account for about one quarter of the sample, B rated bonds account for about one-fifth of the sample, while there are only 2.07% AA rated bonds and no AAA rated bonds. From Panel C of Table 3, we can see that investment grade bonds attribute to 41.45% of our sample, junk bonds attribute to 34.72% of our sample and non-rate bonds account for rest.

To calculate benchmark-adjusted IPO underpricing, we use Barclays Capital U.S. Corporate Bond Index, obtained from Datastream, as our bond benchmark indexes. Barclays Corporate Bond Index was previously known as Lehman Brother 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 index and can be broken down into three big categories, namely, investment-grade, higher-yield and non-rated categories and each category can be further broken down into intermediate and long-term indexes. For investment-grade and higher-yield indexes, they provide specific rating categories from AAA to D. For investment-grade and higher-yield

[9] Enhanced Historic TRACE is updated till mid of year 2012.
[10] We check Moody's Annual Bond records because FISD records start from 1995.
[11] Detail of the information can be found on the link:
http://index.barcap.com/Benchmark_Indices/Aggregate/Bond_Indices,
https://index.barcap.com/indices/download?rebrandingDoc.

(rated) bonds, we match them with Barclay benchmark indexes by specific rating category (from AAA to D) and maturity (intermediate/long term). For non-rated bond, we matched them with benchmark by maturity.

Price and trade volume data of corporate bonds are obtained from Enhanced Historic TRACE. Enhanced TRACE data now has several improvements over the previous TRACE data. Improvements include dissemination of transactions in formerly non-disseminated bonds (except 144A bonds), uncapped transaction volumes and historical buy-sell side information. Since duplicated observations in Enhanced Historical TRACE may cause bias regarding trading volume (Dick-Nielson (2009)), we use the code in the appendix of Dick-Nielsen (2014) to clean Enhanced Historical TRACE. Then we calculate trading volume-weighted daily average price for each bond and match the calculated prices with corresponding IPO issue information from FISD and benchmark index from Datastream. IPO underpricing is calculated using the formula (1), (2) and (3) below. $HPR_{i,t}$ stands for benchmark-adjusted holding period return for bond i on t-th trading day since its IPO offering day and we use $HPR_{i,t}$ 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 bond return for bond i on day t. We regard the bond offering price as the price on day 0 and use $P_{Bond_{i,0}}$ to stand for it. The bond offering price is directly available from FISD. $P_{Bond_{i,t}}$ is volume-weighted average daily price calculated using TRACE for bond i on day t (IPO offering day is treated as day 1). Formula (2) calculates 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. $P_{Index_{k,0}}$ stands for the price of index k on day 0 (the trading day preceding the IPO offering day) and $P_{Index_{k,t}}$ stand for price for index k on day t. In formula (3), $HPR_{i,t}$ stands for benchmark-adjusted holding period return for bond i during period from offering day to day t and divided by the number of trading days between offering date (day 1) and day t.

3.2. Loan data

Corporate loan data is obtained from Loan Pricing Corporation's (LPC) Dealscan. Dealscan database contains comprehensive historical information on loan pricing and contracts details of loan facilities made

by banks and non-bank institutions to U.S. companies since 1987. Dealscan compiles loan facility data information from SEC filings (13Ds, 14Ds, 13Es, 10Ks, 10Qs, 8Ks, and registration statements) as well as other internal sources. Carey and Hrycray (1999) point out that during the early 1990s, Dealscan database covers between 50% and 75% of the value of all commercial loans in the U.S. and that after 1995 the percentage of commercial loan reported by Dealscan rises to an even higher percentage.

In Dealscan, a typical loan package is usually composed of several facilities. Loan facility initiate date, end date, facility amount and lender/lenders information are directly available from Dealscan. Due to the nature of our study, we only need to keep the facilities that are still outstanding when firms make their bond IPOs. We compare each company's facility initiate date and facility end date with its bond IPO offering date and we select the loan facilities which satisfy the following criteria, facility initiate date< bond IPO offering date< end date. We also delete the facility with no record of either the initiate date or end date.

To build the four proxies mentioned in previous sections, we use the following procedure.

We construct the firm-level loan covenant index using the similar methodology by Helwege, Huang and Wang (2015). Different from Helwege, Huang and Wang (2015), we only use Dealscan to compile the loan covenant index. We categorize loan covenants of the firms into 30 categories[12] and calculated aggregate number of the covenants at the firm level by month. Then we match the covenant with the firms that issue bond IPOs. We get the average value of the monthly loan covenants index of a firm by taking average of the covenants index in the period between 6-month before IPO and IPO offering date.

To calculate total loan amoun, we first sum up the loan principal of all the facilities which haven't ended in a firm. Then we deduct the principal payments documented in the data set FACILITYPAYMENTSCHEDULE. At last, since some of the loan are not denominated in US dollar, we multiply total facility amount outstanding by the exchange rate offered by Dealscan and we term this result as total loan amount.

In Dealscan, LENDERSHARES data set gives a good coverage of the roles of banks or non-bank institutions in each syndicated loan facility when the facility is syndicated. We identify lead bank using the method by Ivashina (2009) and Ivashina and Scharfstein (2010). In Ivashina (2009) and Ivashina and Scharfstein (2010), lead bank is the bank which is documented as administrative agent in LENDERSHARES and if there is no administrative agent in the syndicated loan, then the lead bank is assigned to the banks which 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

[12] Detail information of the categories can be found in Table 2 of Helwege, Huang and Wang (2015).

facilities. We count the number of all the different lead banks in a firm has to get the total number of lead banks.

To calculate remaining maturity of loan for each bond IPO, we do the following steps. We first keep the loan facility records for firm with only one facility outstanding. For a firm with multiple facilities, we sort the facility end dates for all the facilities in each firm and then only choose the facility which ends last. The loan remaining maturity is just the difference between the end date of a firm's last ending facility and bond IPO date.

3.3. Issuer-level information

We get issuer-level (firm-level) information from Compustat. We identify the bond IPO offering date, and then we match the bond issue with previous fiscal year end financial report data from Compustat. We use leverage, market-to-book ratio, firm size, profitability and z-score as issuer level control variables. Data sample and summary of statistics.

3.4. Data sample and summary of statistics

To construct the data base for our analysis, we limit our sample to firms whose firm level information, bond IPO information and loan information are all available. After applying all other filters and criteria mentioned before, we identify 193 bond IPOs issued by 165 IPO firms. In our sample, 143 firms have 1 bond IPO, 16 firms have 2 bond IPO and 6 firms have 3 bond IPO offered on the same date. We also match 616 loan facilities with bond IPO issues. In our sample, each bond IPO firm (193 bond IPOs and 165 IPO firms) has 3.73 loan facilities outstanding on IPO date. Table 1 gives the definitions of the variables and Table 2 shows the summary statistics of each variable.

Table 3 summarizes the univariate results of bond IPO underpricing. Panel A documents the number of bonds traded and corresponding initial return on each day. For the trading activities, as shown in Panel A, 64.25% of bond IPOs traded for more than one day and 23.32% of IPOs traded on all five trading days and that size of initial return is monotonic decreasing from the 1st day to the 5th day of trading, and that underpricing on 1st day, 72.37 bps, is more than triple that on 5th day. Panel B shows that bond IPO underpricing is generally increasing with decreasing bond ratings, except for CAA bonds which give lower underpricing probably due to the fact that too few observations in CAA category to draw solid statistical conclusion. Consist 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 bond will increase underpricing. In Panel H, underpricing for bonds without covenants almost triples that of bonds with covenants, the difference in underpricing between two classes of bonds can either be

explained as covenant bonds are better protected from loan holders or explained by the different risk of the two classes of issues, and multivariate analysis will be need to draw further conclusion. From Panel I, we see can see that more than 80% of our sample are senior bond, but few of them is secured bond. This finding is consistent with Asquith, Scharfstein and Gartner (1991) in which 10.5% bonds of their sample are secured bond but those secured public bond usually don't have the first lien on firms' asset.

3.5. Correlation matrix

Table 4 provides Pearson and Spearman rank correlations between underpricing, proxy variables and all the control variables used in the regression model. We report Pearson correlations below the main diagonal and Spearman correlations above the diagonal. From the table, we can see that loan covenants has significant positively correlation (Pearson and Spearman) with underpricing, while for lead bank number or log loan remaining maturity, the positive correlation (Pearson and Spearman) with underpricing is not significant. The correlation (Pearson and Spearman) between total loan amount and underpricing is negative, and Spearman correlation is significant at 5% level, while Pearson is not.

4. Research Methodology

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

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

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

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

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

where the subscripts i, j and t stand for observation corresponding to bond IPO i which is issued by firm j in year t. The standard deviations of the OLS estimated parameters are clustered by firm.

The definitions of all components of the model are given below.

$Undepricing_i$ is the dependent variable of the model and it stands for (first trading day) underpricing of bond i. For the proxy variables, $CovenantsIndex_j$, $TotalLoanAmount_j$, $LeadBankNumber_j$ and $LoanRemainingMaturity_j$ stand for firm-level covenants index, total loan amount, number of lead bank

and loan remaining maturity of firm j which issues bond i, respectively. The constructions of the four proxy variables are the same as described in section 3. $Bond_i$ stands for control variables set of bond (issue level) characters for bond i, including 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 rating category dummies (AA and A grade bond dummy). $Firm_j$ stands for issuer-level (firm-level) control variables sets of the issuer firm j which issues bond i. Issuer-level control variables include market-to-book ratio, z-score, leverage, profitability and firm size. $Year_t$ represents the year dummy variable sets. Year dummy equals one if the bond is offered in year t, otherwise zero.

5. Empirical Results

5.1. Loan covenants index

Table 5 reports the estimated coefficients of formula (4), the regression model for loan covenants index.

The estimated coefficient of loan covenants index are positive and significant in all the columns. According to previous analysis, the positive signs support the conflict-of-interest hypothesis, meaning that conflict between loan holders and bondholders increase underpricing and higher the covenants index, stronger the conflict and more underpricing. On average, one unit increase in covenants index will give about 10 bps (8.82 bps-13.99 bps, depending on model specification) increase in underpricing as a compensation for initial bond buyers.

For all the column in Table 5, we use underpricing (initial benchmark-adjusted holding period return) calculated by formula (1) to (3) as dependent variable which is winsorized at 1% and 99%, and fixed-year effect is used in Column 2, 4, 6, and 7, not in Column 1, 3, 5. In Column 1, the univariate regression result shows that coefficient of loan covenants index is positively significant at 1% level, and increase the covenants index by 1 unit will increase underpricing by approximately 13.94 bps, and in the corresponding fixed-year effect regression model in Column 2, the estimated coefficient of covenants index is 12.10, which is slightly less than the estimation in Column 1 and still significant at 1% level.

In Column 3 and 4, we control issuer (firm) level information. The estimated coefficient in these two Columns are approximately the same as in Column 1 and 2, in Column 3 (no fixed-year effect model), the estimated coefficient for covenants index is 11.81 and significant at 10% confidence level. In Column 4 (fixed year effect model), the estimated coefficient for covenant index is 10.34 and significant at 1% confidence level.

In Column 5 and 6, we control bond IPO issue characteristics. In Column 6, we use fixed-year effect while not in Column 6, the estimated coefficient of Column 5 and 6 are 11.19 and 8.87 respectively and they each are significant at 1% and 5% confidence level.

In Column 7, we control both issuer (firm) information and issue characteristics. The estimated coefficient for covenants index is significant at 5% confidence level, with 9.34 bps increase in underpricing when covenants index increase by one unit.

For the coefficients of control variables, firm's profitability is significant negative across all the specifications, this result could be explained as the in better or more profitable firms, the conflict should be weaker, since these debtholders are less likely to fight with each other in the bankruptcy, giving less IPO underpricing. Senior secured bond dummy are significant negative in Column 6 and 8, this result is consistent with our hypothesis that although bank's senior and secured status will harm bondholders interest, by setting bond are senior secured as loan, conflict between the two classes could be lessened in some extent. Bond covenants dummy is positive significant in Column 5 and 7, because covenants for bond could be interpreted as protection given to bondholders, and supposedly should reduce conflict and diminish underpricing. Callable bond dummy is also positive significant in Column 5 and 6, this is consistent with the notion that for the bond buyers callable bond could be interpreted as straight bond plus a short call option which benefit the issuers and thus, higher return for the buyer.

Column 8 and 9 split the sample into two parts, bond IPO issues with covenants and bond IPO issues without covenants, respectively. Our conjecture is that since loan covenants gives loan holders protection and rights, thus, bond covenants should give bondholders corresponding protection and rights. Since protection are given to these covenants protected bond issues, supposedly, less negative effects for the bond issues with covenants than bond issues without covenants and less underpricing for the covenants protected bonds. In Column 9, for bond IPO with bond covenants protection, underpricing is not significantly related to covenants index, but for bond without covenants protection, in Column 8, underpricing is strongly related to IPO with 13.59 bps and significant level less than 1%. Results in Column 8 and 9 not only confirm our previous hypothesis that stronger conflict leads to more underpricing but also suggest that bond covenants can be an effective mechanism to mitigate the conflict between two classes of debtholders and reduce bond IPO underpricing.

In Column 10 and Column 11, we split the sample into junk bond and non-junk bond. For junk bond, we observe stronger relationship between conflict and underpricing, while for non-junk bond, the estimated coefficient for covenants index are both smaller and not significant. This is consistent with our analysis above that since bank loan are usually senior and secured claim and in better position than public bond

when facing bankruptcy and junk bond issuers have higher bankruptcy risk, the conflict between debtholders should be stronger for the junk bond group. From another aspect, to deal with higher bankruptcy risk for junk bonds, banks will perform more, and thus more conflict and more underpricing.

Previous work suggests that covenants conveys private information regarding potential future prospect of the firms known by the borrowers and the covenants are negotiated based on this private information (Garleanu and Zwiebel (2009)). Thus, similar to bank monitoring, covenants index could be viewed as a mechanism to resolve information asymmetry. If so, the estimated coefficient of loan covenants index should also be negative which means that more covenants lead to less information asymmetry and thus less underpricing, which is contrary to our results in Table 5. And our results on covenants index is similar to Demiroglu and James (2010) that intensity index has private information concerning firm's future performance. Another possible conjecture is that underpricing related to firm's risk, and for riskier firm, there would be more covenants to protect loan holders and thus more underpricing to compensate for the potential higher risk. In order to reject this hypothesis, we control z-score (issuer-level risk) and bond rating (issue-level risk) which serve as proxy for firm's risk and the estimated coefficient for loan covenants index is still positively significant.

5.2. Total loan amount

In previous part, we point out that total loan amount could stand for both bank monitoring and conflict of interest. Table 6 shows that the estimated coefficient of total loan amount are significantly positive in all Columns. This results confirm that conflict-of-interest hypothesis and that stronger the conflict between two classes of debtholders (more loan granted to the firm by banks), more underpricing which is consistent with Bulow and Shoven (1978). The same as Table 5, in Table 6 dependent variable is still underpricing and is winsorized at 1% and 99% percentile. On average, one billion increase in loan amount will increase underpricing by about 12 bps. In Column 1 and 2, we run regression on the full sample. Fixed-year effect used in Column 2, while not applied in Column 1 and the estimated parameters for loan amount in these two specifications are significant at 5% significance level.

Since loan amount affect decision right of bankruptcy, we would expect to observe stronger influence of loan holder when the loan amount is bigger than the bond offering amount. The reason is obvious that if the loan is too small compared to bond, the firm will meet the need of the bond holders first. Therefore, we would expect to see stronger conflict between two classes of debtholders, when we only focus on the loan which have bigger amount than the bond issues. In Column 3 to 6, we limit our sample to the observations which has bigger loan than the bonds. In Column 3 to 6, we find that the effect of loan amount becomes stronger, and estimated coefficients are bigger when compared with Column 1 and 2. Fixed-year effect is

used in Column 4 and 6. In Column 3 and 4, we control bond issue characteristics, and estimated coefficients for loan amount are 11.31 and 12.59 respectively. In Column 5 and 6, we control both issuer (firm) information and bond issue characteristics, the estimated coefficients are significant at 1% confidence level, the estimated parameters are 13.42 and 15.11 respectively, which are bigger than corresponding full sample regression in the first two Columns. In Column 7, we focus on the issues whose amount is smaller than the firm's total loan, and the estimated coefficient for loan amount is both smaller than previous 6 columns and insignificant.

For the control variables, we find that covenants dummy is significantly negative related to underpricing and callable dummy is significantly positive related to underpricing. These finding are consistent with the results and the discussions in section 5.1. We also find that junk dummy is significantly positive related to underpricing and this result is consistent with the notion that junk bond has more information problems and should have higher underpricing.

5.3. Number of lead banks

Table 7 gives the estimated coefficient and t-values of formula (6), in which the number of lead banks is the proxy variable. The estimated coefficients of proxy variable, number of lead banks, are positive, confirming the hypothesis that the conflict between loan holders and bondholders will increase IPO underpricing.

Dealscan provides us information about participants of syndicated loans when the loan is initiated, and we identify a bank as lead banks if it is documented as agent, arranger, book runner, lead arranger, lead bank, or lead manager in LENDERSHARES data set, following the method by Ivashina (2009) and Ivashina and Scharfstein (2010). As summary of statistics in Table 2 shows that lead bank number is usually small, with mean equals to 2.04 and median equals 2.

In Table 7, we present the OLS estimation for different sets of control variable, in Column 2, 4 and 6, we also use fixed-year effect to rule out the possibility that any observed effect of lead bank number is due to time-invariant heterogeneity between years, and the estimated coefficient for Number of Lead Bank is statistically and economically significant in all specification, with the estimated coefficient vary from 3.81 bps to 5.74 bps and an average of 5 bps increase in underpricing with one increase in lead bank number.

In Column 1 and Column 2, we only control issuer (firm) characteristics. The estimated coefficient of lead bank are significant at 1% and 5% level respectively. Column 3 and Column 4 only controls bond characteristics. The estimated parameters are both significant at 5% level.

Column 5 and Column 6 controls bond characteristics and firm level variables. Column 5 doesn't control fixed year effect, and the estimated coefficient of lead bank is significant at 1% level. In Column 6, we used fixed year effect regression, and the estimated coefficient of lead bank is significant at 5% level.

For the control variables, we find LN (Bond maturity) is significantly negative in Column 3, 4 and 6. Since bonds usually end later than loans, and longer the bond maturity implies longer time period in which loans mature but the bond still exists, this suggests that longer bond maturity leads to longer time period in which the conflict between bondholders and loan holders doesn't exist. Thus, longer bond maturity should be associated with less underpricing. For the other control variables, consists with our discussion in section 5.1, covenants dummy is significantly negative related to underpricing and callable dummy is significant negatively related to underpricing. Firm size, market-to-book ratio and profitability are significantly negatively related to underpricing, meaning that firm quality reduces underpricing.

5.4. Loan remaining maturity

As the statistics shows in our sample, in the same firm loan facilities usually end before bonds mature. Table 2 shows that on average, on bond IPO date, loan facilities have 3.54 years till end dates and bonds still have 8.1 years till maturity after loans end. According to previous analysis, loan remaining maturity stands for the time period in which, based on the information available at bond IPO date, banks can expropriate bondholders' interests or monitoring the borrowers. The positive signs confirm the hypothesis that conflict of interest increase IPO bond underpricing and longer loan remaining maturity supposedly will lead to higher underpricing.

In Table 8, we present the estimated coefficients for loan remaining maturity. We used fixed-year effect to capture the unobserved heterogeneity effect between years and all the estimated standard deviations are clustered by firm. The dependent variable is winsorized at 1% and 99%. The results in Table 8 support we our analysis. In general, longer loan remaining maturity gives more underpricing, with one percent increase in loan remaining maturity leading to 0.21 bps increase in underpricing.

The full sample results are shown in Column 1 to 4. Univariate regression result is in Column 1, for Column 2 and 3 each uses issue or issuer level information as control variables respectively, and in Column 4, we control both issue and issuer information. The estimated coefficient for log loan remaining maturity ranged from 44.7 bps to 54.6 bps depending on model specification and the estimated coefficients for log loan

From Column 5 to 10, we split sample into two parts. For Column 5, 6 and 7, we present the results for non-investment grade bond, while Column 8, 9 and 10, we present the results for investment grade bond. Similar to the sub-sample analysis on loan covenants index, we observed bigger and significant results in

non-investment bond (besides Column 5 which is approximated the same coefficient as full sample regression), while smaller and insignificant results in the other three columns. This again confirms the finding in 5.1. that for worse qualities issues, conflicts between two class of debtholders are stronger and higher compensation are allocated to initial bond buyers.

The positive sign of loan remaining maturity also refute the suggestions that underpricing is positively related to firm risk. Since the loan remaining maturity can also measures the time period in which banks monitor the borrowers and usually reduce the risk of the firm. Therefore, for a firm is supervised in longer time period by the bank, we would observe less underpricing, which contradicts to our finding.

For the control variables, LN (Bond maturity) is significantly negative as results in section 5.3, profitability is significantly negative related underpricing and similar to the results for junk dummy, non-rated dummy is also significantly positive related to underpricing.

6. Conclusion

Previous papers suggest that by resolving information asymmetry, bank monitoring will reduce IPO underpricing. But previous literature also suggests that banks, as senior loan holders, can exert substantial influence on management team and their senior secured claims and cohesive nature may facilitate them to expropriate junior debtholders' interest, causing conflict between loan holders and bondholders. Therefore bonds IPO have to be underpriced to attract initial buyers. In this paper, we develop two competing hypotheses, namely, the monitoring hypothesis and conflict-of-interest hypothesis and build four proxies to test our hypotheses empirically. The empirical results confirm the conflict-of-interest hypothesis. The results shows that one unit increase in covenants index will increase underpricing by about 10 bps, one unit increase in the number of lead banks will increase underpricing by about 5 bps, one billion increase in loan amount will increase underpricing by about 12 bps and one percent increase in loan remaining maturity is will increase underpricing by 0.21 bps. The results suggests that bond IPO underpricing serves as a premium to compensate the initial bond buyers for the conflict between them and loan holders. Furthermore, for two of the proxies variables, loan covenants index and loan remaining maturity, we find stronger relationship between the conflict and IPO underpricing in low rating sample, and these results could be caused by bondholders' unequal power against banks in the potential bankruptcy.

Reference

Aghion, Philippe, and Patrick Bolton. "An incomplete contracts approach to financial contracting." *The review of economic Studies* 59.3 (1992): 473-494.

Allen, Franklin, and Gerald R. Faulhaber. "Signalling by underpricing in the IPO market." *Journal of financial Economics* 23.2 (1989): 303-323.

Asquith, Paul, Robert Gertner, and David Scharfstein. “Anatomy of financial distress: An examination of junk-bond issuers.” *Quarterly Journal of Economics* 109 (3) (1994), 625–658., 1991.

Baron, David P. "A model of the demand for investment banking advising and distribution services for new issues." *Journal of Finance* (1982): 955-976.

Bebchuk, Lucian Arye, Jesse M. Fried, and David I. Walker. “Managerial power and rent extraction in the design of executive compensation.” No. w9068. National bureau of economic research, 2002.

Benveniste, Lawrence M., and Paul A. Spindt. "How investment bankers determine the offer price and allocation of new issues." *Journal of Financial Economics* 24.2 (1989): 343-361.

Bradley, Michael, and Michael R. Roberts. "The structure and pricing of corporate debt covenants." *The Quarterly Journal of Finance* (2015): 1550001.

Brealey, Richard, Hayne E. Leland, and David H. Pyle. "Informational asymmetries, financial structure, and financial intermediation." *The journal of Finance* 32.2 (1977): 371-387

Brennan, Michael J., and Julian Franks. "Underpricing, ownership and control in initial public offerings of equity securities in the UK." *Journal of Financial Economics* 45.3 (1997): 391-413.

Bulow, Jeremy I., and John B. Shoven. "The bankruptcy decision." *The Bell Journal of Economics* (1978): 437-456.

Cai, Nianyun Kelly, Jean Helwege, and Arthur Warga. "Underpricing in the corporate bond market." *Review of Financial Studies* 20.6 (2007): 2021-2046.

Carey, Mark, and Mark Hrycray. "Credit flow, risk, and the role of private debt in capital structure." *Unpublished working paper, Federal Reserve Board* (1999).

Chava, Sudheer, Praveen Kumar, and Arthur Warga. "Managerial agency and bond covenants." *Review of Financial Studies* 23.3 (2010): 1120-1148.

Chava, Sudheer, and Michael R. Roberts. "How does financing impact investment? The role of debt covenants." *The Journal of Finance* 63.5 (2008): 2085-2121.

Datta, Sudip, M. A. I. ISKANDAR-DATTA, and Ajay Patel. "The pricing of initial public offers of corporate straight debt." *the Journal of Finance* 52.1 (1997): 379-396.

Datta, Sudip, Mai Iskandar-Datta, and Ajay Patel. "Bank monitoring and the pricing of corporate public debt." *Journal of Financial Economics* 51.3 (1999): 435-449.

Datta, Sudip, Mai Iskandar-Datta, and Ajay Patel. "Some evidence on the uniqueness of initial public debt offerings." *Journal of Finance* (2000): 715-743.

Demiroglu, Cem, and Christopher M. James. "The information content of bank loan covenants." *Review of financial Studies* 23.10 (2010): 3700-3737.

Dennis, Steven A., and Donald J. Mullineaux. "Syndicated loans." *Journal of financial intermediation* 9.4 (2000): 404-426.

Derrien, Francois. "IPO pricing in “hot” market conditions: Who leaves money on the table?." *The Journal of Finance* 60.1 (2005): 487-521.

Dewatripont, Mathias, and Jean Tirole. *The prudential regulation of banks*. No. 2013/9539. ULB--Universite Libre de Bruxelles, 1994.

Diamond, Douglas W. "Financial intermediation and delegated monitoring." *The Review of Economic Studies* 51.3 (1984): 393-414.

Diamond, Douglas W. "Seniority and maturity of debt contracts." *Journal of Financial Economics* 33.3 (1993): 341-368.

Dick-Nielsen, Jens. "Liquidity biases in TRACE." *Journal of Fixed Income* 19.2 (2009).

Dick-Nielsen, Jens. "How to Clean Enhanced TRACE Data." *Available at SSRN 2337908* (2014).

Ellul, Andrew, and Marco Pagano. "IPO underpricing and after-market liquidity."*Review of Financial Studies* 19.2 (2006): 381-421.

Fama, Eugene F. "What's different about banks?." *Journal of monetary economics* 15.1 (1985): 29-39.

Garleanu, Nicolae, and Jeffrey Zwiebel. "Design and renegotiation of debt covenants." *Review of Financial Studies* 22.2 (2009): 749-781.

Helwege, Jean, Jing-Zhi Huang, and Yuan Wang. "Debt Covenants and Cross-Sectional Equity Returns." *Available at SSRN 2024755* (2013).

Ivashina, Victoria. "Asymmetric information effects on loan spreads." *Journal of Financial Economics* 92.2 (2009): 300-319.

Ivashina, Victoria, and David S. Scharfstein. "Loan syndication and credit cycles." *American Economic Review, Forthcoming* (2010).

James, Christopher. "When do banks take equity in debt restructurings?."*Review of Financial Studies* 8.4 (1995): 1209-1234.

Jensen, Michael C., and William H. Meckling. "Theory of the firm: Managerial behavior, agency costs and ownership structure." *Journal of financial economics* 3.4 (1976): 305-360.

Kozhanov, Igor, Joseph P. Ogden, and Farindokht Vaghefi. "Are New Corporate Bonds Actually Overpriced? Ex Ante and Ex Post Empirical Analyses."

Ljungqvist, Alexander, and William J. Wilhelm Jr. "IPO pricing in the dot-com bubble." *Journal of Finance* (2003): 723-752.

Ljungqvist, Alexander, Vikram Nanda, and Rajdeep Singh. "Hot Markets, Investor Sentiment, and IPO Pricing*." *The Journal of Business* 79.4 (2006): 1667-1702.

Lowry, Michelle, and Kevin J. Murphy. "Executive stock options and IPO underpricing." *Journal of Financial Economics* 85.1 (2007): 39-65.

Murfin, Justin. "The Supply-Side Determinants of Loan Contract Strictness."*The Journal of Finance* 67.5 (2012): 1565-1601.

Park, Cheol. "Monitoring and structure of debt contracts." *The Journal of Finance* 55.5 (2000): 2157-2195.

Rajan, Raghuram G. "Insiders and outsiders: The choice between informed and arm's-length debt." *The Journal of Finance* 47.4 (1992): 1367-1400.

Rajan, Raghuram, and Andrew Winton. "Covenants and collateral as incentives to monitor." *The Journal of Finance* 50.4 (1995): 1113-1146.

Ritter, Jay R., and Ivo Welch. "A Review of IPO Activity, Pricing, and Allocations." *The Journal of Finance* 57.4 (2002): 1795-1828.

Rock, Kevin. "Why new issues are underpriced." *Journal of financial economics*15.1 (1986): 187-212.

Schumpeter, Joseph Alois. *Business cycles*. Vol. 1. New York: McGraw-Hill, 1939.

Smith, Clifford W., and Jerold B. Warner. "On financial contracting: An analysis of bond covenants." *Journal of financial economics* 7.2 (1979): 117-161.

Welch, Ivo. "Why is bank debt senior? A theory of asymmetry and claim priority based on influence costs." *Review of Financial Studies* 10.4 (1997): 1203-1236.

Table 1

Variable definitions

The definitions and sources of all the variables in this paper. Note: Some variables are not used in regression, but we present the description of the variables here to facilitate further discussion.

Variable name	Defination	Source
Dependent variable		
Underpricing	Benchmark-adjusted IPO initial return (holding period return, in bps).	FISD, TRACE, Datastream
Bond character variables		
D_Senior-secured	Dummy variable. Equals 1 if the IPO bond issue is senior-secured, otherwise 0.	FISD
D_covenants	Dummy variable. Equals 1 if the IPO bond issue has covenants, otherwise 0.	FISD
D_investment	Dummy variable. Equals 1 if the IPO bond issue belongs to investment grade bonds, otherwise 0.	FISD
D_junk	Dummy variable. Equals 1 if the IPO bond issue belongs to junk bonds, otherwise 0.	FISD
D_non-rated	Dummy variable. Equals 1 if the IPO bond issue has no initial rating, otherwise 0.	FISD
D_AA_A	Dummy variable. Equals 1 if the IPO bond issue's initial rating category belongs to AA or A, otherwise 0.	FISD
D_putable	Dummy variable. Equals 1 if the IPO bond issue is putable, otherwise 0.	FISD
D_callable	Dummy variable. Equals 1 if the IPO bond issue is callable, otherwise 0.	FISD
D_convertible	Dummy variable. Equals 1 if the IPO bond issue is convertible, otherwise 0.	FISD
Bond maturity	IPO bond issue's maturity (in year).	FISD
Bond offering amount	IPO bond issue's offering amount (in billion dollar).	FISD
Coupon rate	IPO bond issue's coupon rate (in percent).	FISD
Corporate variables		
Leverage	Leverage is defined as total debt plus preferred shares and minus convertible debt and then divided by total asset.	Compustat
Market-to-book ratio	Market-to-book ratio is defined as market value of total asset dvided by total asset. Market value of total asset is defined as total asset minus book value of equity plus market value of equity.	Compustat
Z-score	Z-score is Altman's z-score. It is defined as 1.2*(current asset-current liability)/total asset+1.4*retained earning/total asset+3.3*EBIT/total asset+0.6*market value of equity/total debt+sales/total asset.	Compustat
Profitability	Profitability is defined as return on asset divided by total asset (total asset is in billion dollar).	Compustat
Firm size	Firm size is define as the natural log of total asset divided by monthly CPI (in million dollar).	Compustat
Loan variables		
Covenants index	Firm-level loan covenants index.	Dealscan
Total loan amount	Summing up all the outstanding facilities and deducting payment (in billion dollar).	Dealscan
Number of creditor	Total number of different creditors a firm has.	Dealscan
Number of lead bank	Total number of different lead banks a firm has.	Dealscan
Loan remaining maturity	Time different between end date of firm's last ending loan facility and bond IPO date (in years).	Dealscan
Bond excess maturity	The remaining maturity of bond when all the firm's loan facilities mature (in years).	Dealscan
Other variable		
CPI	Consumer Price Index: Total All Items for the United States, Seasonally Adjusted, Monthly, Index 2010=1.00	Federal Reserve Bank of St. louis

Table 2
Summary of statistics
Definitions of each variables are given in Table 1. Bond offering amount and total loan amount are dominated in dollar, while firm size is in billion dollar.

Variable name	N	Mean	StdDev	P25	P50	P75
Underpricing	193	72.37	118.28	1.21	41.89	112.21
D_Senior-secured	193	0.03	0.16			
D_covenants	193	0.66	0.48			
D_investment	193	0.41	0.49			
D_junk	193	0.35	0.48			
D_non-rated	193	0.24	0.43			
D_AA_A	193	0.16	0.37			
D_putable	193	0.17	0.38			
D_callable	193	0.84	0.36			
D_convertible	193	0.35	0.48			
Bond offering amount	193	432552093.26	437934012.81	200000000.00	300000000.00	500000000.00
Bond maturity	193	2.76	0.78	2.03	2.72	2.73
Coupon rate	193	5.33	2.54	3.38	5.00	6.88
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
Z-score	193	3.72	3.35	1.59	2.88	4.80
Profitability	193	-0.06	1.53	0.00	0.01	0.05
Firm size	193	21.04	1.81	19.94	21.08	22.04
Covenants index	136	4.27	3.35	2.00	3.96	7.00
Total loan amount	193	1583633467.13	2007261233.51	305000000.00	845000000.00	2023039565.25
Number of creditor	193	16.55	12.56	7.00	14.00	24.00
Number of lead bank	193	2.04	2.34	1.00	2.00	2.00
Loan remaining maturity	193	3.54	2.26	2.12	3.45	4.56
Bond excess maturity	193	8.10	8.27	2.95	5.60	9.05

Table 3

Univariate results

This table shows the univariate analysis results for the dependent varaible, underpricing. Initial public offerings (IPOs) are identified using Fixed Income Securities Database (FISD). Bond characteristics are obtained from the FISD and the bonds prices and volume are from Enhanced Historical TRACE. Bond initial rating categories are obtained from S&P ratings where available, otherwise we use Moody's or Fitch's ratings and Duff and Phelps last. ''Investment-Grade'' bonds have ratings of BBB or higher, ''junk'' bonds have ratings of BB or lower and Non-Rated bonds are issues with no rating information. Long-term bond are issues whose maturity longer than 7 years, while Intermediate-term are issues whose maturity are equal to or shorter than 7 years. Putable bond means the issue is putable, Callable bond means the issue is callable, and Convertible bond means the issue is convertible. With covenants means the issue has covenants clauses. Senior secured, Senior and Senior subordinate identified from FISD. Underpricing is winsorized at 1% and 99%. ***, **, * indicates statistical significance at 1%, 5% and 10% level, respectively.

	Number	Mean	t-statistics	Percentage
Full sample	193	72.37***	8.51	100.00%
Panel A: Order of trade				
1st day with trading	193	72.37***	7.35	100.00%
2nd day with trading	124	42.9***	6.34	64.25%
3rd day with trading	112	32.57***	6.62	58.03%
4th day with trading	94	30.97***	4.89	48.70%
5th day with trading	45	23.21***	3.33	23.32%
Panel B: Initial Rating Category				
AA	4	0.36	0.01	2.07%
A	27	14.5	1.39	13.99%
BAA	49	35.73***	3.47	25.39%
BA	19	72.8***	4.08	9.84%
B	40	114.75***	4.89	20.73%
CAA	8	79.07**	2.52	4.15%
Non-rated Bond	46	113.45***	5.17	23.83%
Panel C: Investment/ High yield/ Non-rated bonds				
Investment Bond	80	26.79***	3.63	41.45%
Junk Bond	67	98.6***	6.4	34.72%
Non-rated Bond	46	113.45***	5.17	23.83%
Panel D: Maturity				
long	105	66.87***	5.89	54.40%
intermediate	88	78.94***	6.13	45.60%
Panel E: Putable bonds				
Pubable bond	33	108.46***	5.73	17.10%
Non-putable bond	160	64.93***	6.9	82.90%
Panel F: Callable bonds				
Callable bond	163	78.04***	8.03	84.46%
Non-callable bond	30	41.58***	3.14	15.54%
Panel G: Convertible bonds				
Convertible bond	67	91.12***	6.66	34.72%
Non-convertible bond	126	62.41***	5.81	65.28%
Panel H: Covenants protected bonds				
Without covenants	66	124.98***	7.71	34.20%
With covenants	127	45.03***	5.04	65.80%
Panel : Bond seniority				
Senior Secured	5	78.5*	2.67	2.59%
Senior	162	63.09***	7.66	83.94%
Senior Subordinate	23	147.39***	3.91	11.92%
Non-senior	3	-11.63	-0.27	1.55%

Table 4

Correlations matrix for underpricing, proxy variables and control variables.

Definitions of variables are in Table 1. Spearman correlations are reported above the main diagonal and Pearson correlations are reported below the main diagonal. Number of observations for all the variable is 193, except for covenants index, which is 136. ***, **, * indicates statistical significance at 1%, 5% and 10% level, respectively.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
(1)	Underpricing		0.28***	-0.16**	0.02	0.05	0.05	-0.37***	0.18**	0.08	0.16**	-0.34***	0.18**	0.19***	-0.26***	-0.14**	0.06	0.15**	-0.09	-0.17**	-0.20***	-0.08	-0.06
(2)	Covenants index	0.40***		-0.22**	0.14*	0.37***	0.09	-0.24***	-0.05	-0.19**	0.14*	-0.46***	0.36***	0.08	-0.45***	-0.41***	-0.07	0.18**	0.11	-0.22***	-0.50***	-0.24***	0.19**
(3)	Total facility amount	-0.08	-0.23***		0.31***	0.08	-0.07	0.28***	-0.35***	-0.02	-0.43***	0.60***	-0.18**	-0.50***	0.38***	0.61***	-0.12*	0.09	0.05	0.04	0.71***	0.03	-0.22***
(4)	Number of lead bank	0.02	0.17*	0.60***		0.20***	-0.06	0.04	-0.19***	-0.09	-0.14*	0.07	0.04	-0.13*	-0.02	0.01	-0.07	0.16**	0.26***	-0.15**	0.15**	-0.13*	0.02
(5)	LN(loan remaining maturity)	0.10	0.34***	0.04	0.16**		-0.12*	0.01	-0.01	-0.08	0.09	-0.12	0.16**	-0.04	-0.26***	-0.17**	0.08	0.11	0.27***	-0.16**	-0.18**	-0.26***	0.06
(6)	D_senior-secured	0.01	0.08	-0.05	-0.04	-0.07		-0.02	-0.07	0.07	-0.12*	-0.07	0.16**	-0.09	-0.07	0.00	-0.08	0.20***	0.10	-0.09	-0.04	-0.15**	-0.21***
(7)	D_covenants	-0.32***	-0.28***	0.24***	0.08	0.01	-0.02		-0.11	-0.13*	-0.05	0.43***	-0.37***	-0.08	0.17**	0.20***	-0.07	-0.21***	-0.01	0.21***	0.25***	0.12*	0.01
(8)	D_putable	0.14*	-0.05	-0.25***	-0.11	-0.04	-0.07	-0.11		0.19***	0.59***	-0.27***	-0.01	0.33***	-0.12*	-0.20***	0.57***	-0.43***	-0.12*	0.16**	-0.25***	0.17**	0.14*
(9)	D_callable	0.11	-0.16*	-0.05	-0.01	-0.02	0.07	-0.13*	0.19***		-0.47***	0.22***	0.04	-0.30***	0.11	0.11	0.37***	0.30***	-0.15**	0.09	-0.01	0.14*	0.04
(10)	D_convertible	0.12	0.10	-0.33***	-0.11	0.01	-0.12*	-0.05	0.59***	-0.47***		-0.53***	-0.07	0.69***	-0.26***	-0.40***	0.15**	-0.64***	-0.05	0.03	-0.33***	0.04	0.08
(11)	D_investment	-0.33***	-0.43***	0.49***	0.13*	-0.07	-0.07	0.43***	-0.27***	0.22***	-0.53***		-0.61***	-0.47***	0.52***	0.49***	-0.04	-0.08	-0.05	0.21***	0.57***	0.14*	-0.08
(12)	D_junk	0.16**	0.37***	-0.21***	-0.06	0.14*	0.16**	-0.37***	-0.01	0.04	-0.07	-0.61***		-0.41***	-0.32***	-0.17**	0.04	0.45***	0.18**	-0.29***	-0.28***	-0.20***	0.00
(13)	D_non-rated	0.19***	0.05	-0.33***	-0.09	-0.07	-0.09	-0.08	0.33***	-0.30***	0.69***	-0.47***	-0.41***		-0.24***	-0.37***	0.00	-0.41***	-0.14**	0.08	-0.35***	0.06	0.09
(14)	D_AA_A	-0.22***	-0.40***	0.41***	0.22***	-0.24***	-0.07	0.17**	-0.12*	0.11	-0.26***	0.52***	-0.32***	-0.24***		0.37***	-0.07	-0.22***	-0.14*	0.34***	0.51***	0.31***	-0.09
(15)	LN(Bond amount)	-0.08	-0.39***	0.57***	0.26***	-0.12*	0.01	0.20***	-0.17**	0.10	-0.35***	0.43***	-0.14*	-0.35***	0.38***		0.02	0.02	-0.18**	0.25***	0.61***	0.18**	-0.21***
(16)	LN (Bond maturity)	0.05	-0.06	-0.15**	-0.02	0.08	-0.09	-0.08	0.61***	0.31***	0.27***	-0.09	0.00	0.10	-0.05	-0.05		-0.03	-0.03	0.09	-0.15**	0.07	0.20***
(17)	Coupon	0.18**	0.25***	0.04	0.06	0.14*	0.25***	-0.22***	-0.41***	0.28***	-0.60***	-0.13*	0.46***	-0.37***	-0.23***	-0.02	-0.14**		0.25***	-0.36***	-0.04	-0.28***	-0.08
(18)	leverage	-0.09	0.11	0.06	0.09	0.22***	0.16**	-0.02	-0.13*	-0.16**	-0.04	-0.08	0.19***	-0.12*	-0.13*	-0.16**	-0.11	0.24***		-0.3***	0.08	-0.62***	-0.08
(19)	Market-to-book ratio	-0.15**	-0.20**	0.13*	0.13*	-0.2***	-0.04	0.20***	0.12*	0.06	0.01	0.18**	-0.24***	0.05	0.37***	0.30***	0.05	-0.28***	-0.23***		0.05	0.67***	0.28***
(20)	Firm size	-0.21***	-0.44***	0.63***	0.23***	-0.17**	-0.06	0.27***	-0.19***	0.03	-0.31***	0.53***	-0.28***	-0.29***	0.47***	0.59***	-0.15**	-0.09	0.00	0.10		0.17**	-0.24***
(21)	Z-score	-0.03	-0.20**	0.05	0.02	-0.24***	-0.14**	0.17**	0.15**	0.14*	0.02	0.13*	-0.17**	0.04	0.32***	0.20***	0.06	-0.27***	-0.60***	0.72***	0.14*		0.35***
(22)	Profitability	-0.05	-0.03	0.04	0.03	0.03	-0.45***	0.09	0.06	-0.03	0.07	0.04	-0.10	0.06	0.02	-0.02	0.10	-0.14**	-0.25***	-0.12	0.19***	0.18**	

Table 5

Loan Covenants Index

This table shows the estimated coefficient for equation (4), the regression on the relationship between IPO underpricing and loan covenants index The definition of the variables are given in Table 1. Full sample regressions results are presented from Column 1 to Column 7. Column 8 and 9 give the results for two subsamples, covenants protected bonds and non-covenants protected bonds. Column 10 and 11 give the results for two subsamples, junk bond and non-junk bond. The dependent variable is winsorized at 1% and 99%. The estimated standard deviations is clustered by firm. ***, **, * indicates statistical significance at 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Loan Covenants Index	13.94***	12.10***	11.81*	10.34***	11.19*	8.87**	9.34**	13.59***	4.47	20.61**	-0.93
	(2.70)	(3.81)	(1.70)	(2.63)	(1.67)	(2.27)	(2.22)	(3.34)	(0.80)	(2.14)	(-0.18)
LN(Bond offering amount)					76.21*	23.19	10.90	-1.12	30.69	1.00	86.58*
					(1.91)	(0.65)	(0.25)	(-0.01)	(0.58)	(0.01)	(1.76)
LN(Bond maturity)					-89.73**	-61.96*	-60.58	-105.81	-99.75**	145.49	-132.37***
					(-2.31)	(-1.69)	(-1.55)	(-1.20)	(-2.28)	(0.57)	(-3.15)
Coupon					13.39**	4.98	6.09	18.68	25.19***	10.47	19.90*
					(2.13)	(0.81)	(0.90)	(1.48)	(3.03)	(0.75)	(1.98)
D_Covenants					-51.01**	-37.05*	-29.68			5.63	-49.30*
					(-2.54)	(-1.73)	(-1.30)			(0.11)	(-1.73)
D_Putable					14.95	33.01	42.66	122.41*	68.43	56.13	30.41
					(0.28)	(0.76)	(0.91)	(1.95)	(0.83)	(0.39)	(0.59)
D_AA_A					0.36	0.83	-4.14	-87.53	0.06		
					(0.01)	(0.03)	(-0.15)	(-0.83)	(0.00)		
D_Junk					15.06	48.37	52.33	-34.20	-0.18		
					(0.44)	(1.34)	(1.45)	(-0.33)	(-0.00)		
D_Non-rated					26.54	58.35	61.33	-138.05	8.89		
					(0.71)	(1.44)	(1.42)	(-1.10)	(0.20)		
D_Senior-secured					-87.99**	-65.88	-107.17**	51.06	-281.11***		
					(-2.15)	(-1.62)	(-2.45)	(0.92)	(-3.96)		
D_Convertible					115.02*	33.75	30.18	106.97	79.77	-61.62	145.77**
					(1.77)	(0.65)	(0.57)	(1.32)	(0.90)	(-0.77)	(2.60)
D_Callable					112.67**	77.02*	64.34	134.42*	31.40		55.66
					(2.10)	(1.79)	(1.36)	(1.96)	(0.36)		(1.04)
Firm size			-6.80	-8.10			5.54	9.06	-11.51	9.81	-9.78
			(-0.74)	(-1.05)			(0.83)	(0.69)	(-0.95)	(0.70)	(-0.90)
Leverage			-110.73**	-38.88			-50.81	-235.13**	-85.53	-35.45	-67.71
			(-2.03)	(-0.84)			(-0.86)	(-2.22)	(-1.17)	(-0.25)	(-1.35)
Market-to-book ratio			-24.85*	-10.44			-2.36	109.92***	-4.22	-28.29	-8.01
			(-1.82)	(-0.72)			(-0.15)	(2.93)	(-0.26)	(-0.77)	(-0.63)
Profitability			-9.28***	-6.39*			-9.71**	-149.81	-127.23***	-11.80*	-37.72
			(-2.64)	(-1.94)			(-2.23)	(-1.61)	(-3.38)	(-1.71)	(-0.76)
Z-score			0.26	1.08			-0.39	-3.80	-1.69	8.73	-0.81
			(0.06)	(0.25)			(-0.09)	(-0.34)	(-0.28)	(0.98)	(-0.16)
Intercept	14.64	-27.37	263.90	188.25	-723.41*	-252.41	-237.90	-310.19	-0.19	-395.32	-456.84
	(0.68)	(-1.15)	(1.18)	(1.03)	(-1.90)	(-0.78)	(-0.63)	(-0.43)	(-0.00)	(-0.40)	(-1.38)
Fixed Year Effect	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No	No
Clustered SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.15	0.40	0.22	0.42	0.37	0.53	0.54	0.84	0.42	0.46	0.45
Number of Observations	136	136	136	136	136	136	136	51	85	51	85

Table 6

Total loan amount

This table shows the estimated coefficient for equation (5), the regression model on the relationship between IPO underpricing and total loan amoun. The definition of the variables are given in Table 1. Full sample regressions results are in Column 1 and Column 2 and sub-sample analysis are given from Column 3 to Column 7. From Column 3 to Column 6, we present the sub-sample results for the for the bond issues which have smaller amount than loan. Column 8 gives the results for the bond issues that have bigger amount than the loan. The dependent variable is winsorized at 1% and 99%. The estimated standard deviations is clustered by firm. ***, **, * indicates statistical significance at 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Total loan amount	10.96**	11.16**	11.31**	12.59**	13.42***	15.11***	9.23
	(2.50)	(2.09)	(2.56)	(2.32)	(2.87)	(2.63)	(1.47)
LN(Bond offering amount)	56.19	32.34	-10.88	-31.46	-7.92	-26.65	27.51
	(1.20)	(0.66)	(-0.40)	(-1.03)	(-0.27)	(-0.81)	(0.16)
LN(Bond maturity)	-47.10	-40.34	-39.79	-31.71	-51.69*	-53.20	-172.72
	(-1.55)	(-1.40)	(-1.30)	(-0.98)	(-1.70)	(-1.64)	(-0.43)
Coupon	11.12**	8.54	7.09	5.23	8.01	7.57	5.85*
	(2.09)	(1.59)	(1.50)	(1.09)	(1.63)	(1.37)	(1.71)
D_Covenants	-44.49**	-26.11	-34.92*	-9.00	-22.03	1.64	-4.33
	(-2.03)	(-1.18)	(-1.78)	(-0.41)	(-1.09)	(0.07)	(-0.54)
D_Putable	25.70	31.39	11.33	15.86	5.83	4.17	63.67
	(0.67)	(0.85)	(0.35)	(0.45)	(0.18)	(0.11)	(0.56)
D_AA_A	-13.85	-16.41	-31.07*	-30.00	-19.45	-24.89	75.92
	(-0.66)	(-0.71)	(-1.68)	(-1.40)	(-0.97)	(-1.10)	(0.34)
D_Junk	21.99	37.98	42.77*	49.24*	49.65**	53.57*	-20.17
	(0.87)	(1.31)	(1.67)	(1.74)	(1.99)	(1.92)	(-0.11)
D_Non-rated	77.69	95.81*	40.35	48.57	41.89	41.93	23.33
	(1.56)	(1.79)	(1.15)	(1.35)	(1.23)	(1.16)	(0.87)
D_Senior-secured	-37.98	-29.50	-16.63	-10.60	-22.62	-11.42	-21.02
	(-0.76)	(-0.51)	(-0.35)	(-0.22)	(-0.36)	(-0.21)	(-1.14)
D_Convertible	45.43	11.76	55.39	46.60	63.67	64.09	11.74
	(0.79)	(0.20)	(1.24)	(0.96)	(1.41)	(1.28)	(0.41)
D_Callable	61.99*	57.42*	77.46**	80.09**	84.99**	86.97**	-66.86
	(1.73)	(1.69)	(2.42)	(2.34)	(2.52)	(2.46)	(-0.09)
Firm size	-10.14	-10.75			-0.13	-1.56	-98.46
	(-0.96)	(-0.99)			(-0.03)	(-0.27)	(-1.55)
Leverage	-24.18	-25.98			-101.98*	-109.66*	193.28
	(-0.44)	(-0.46)			(-1.83)	(-1.76)	(1.08)
Market-to-book ratio	-31.12*	-18.77			-25.41*	-10.22	-8.24
	(-1.80)	(-1.02)			(-1.74)	(-0.60)	(-1.33)
Profitability	-6.09	-4.53			62.82***	59.32***	0.44
	(-1.64)	(-1.12)			(3.34)	(3.18)	(0.05)
Z-score	6.92	4.83			1.43	-0.83	8.56
	(1.16)	(0.81)			(0.24)	(-0.12)	(1.37)
Intercept	-243.15	-50.00	60.19	193.82	110.89	239.66	264.66
	(-0.94)	(-0.20)	(0.26)	(0.75)	(0.44)	(0.87)	(0.63)
Fixed Year Effect	No	Yes	No	Yes	No	Yes	Yes
Clustered SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.27	0.34	0.23	0.33	0.29	0.37	0.88
Number of Observations	193	193	159	159	159	159	34

Table 7

Number of lead banks

This table shows the estimated coeffcient of equation (6), the regression model on the relationship between IPO underpricing and the number of lead banks. The definition of the variables are given in Table 1. Full sample regressions results are in Column 1 and Column 6 The dependent variable is winsorized at 1% and 99%. The estimated standard deviations is clustered by firm. ***, **, * indicates statistical significance at 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Number of lead banks	5.74***	5.11**	3.81***	5.21**	4.54*	4.30***
	(3.39)	(2.00)	(2.73)	(2.39)	(1.75)	(2.73)
LN(Bond offering amount)			30.91	12.16	43.87	69.31
			(1.56)	(0.61)	(0.87)	(1.46)
LN(Bond maturity)			-57.03**	-48.63*	-43.16	-50.64*
			(-2.07)	(-1.78)	(-1.52)	(-1.68)
Coupon			11.20**	7.98*	9.18*	12.59**
			(2.31)	(1.72)	(1.67)	(2.29)
D_Covenants			-56.53***	-42.48**	-25.98	-44.29**
			(-3.45)	(-2.44)	(-1.17)	(-2.03)
D_Putable			11.08	9.76	34.25	30.92
			(0.32)	(0.31)	(0.93)	(0.79)
D_AA_A			-24.98	-28.44*	-14.48	-11.29
			(-1.51)	(-1.65)	(-0.60)	(-0.53)
D_Junk			-5.74	5.66	29.12	11.00
			(-0.23)	(0.24)	(0.98)	(0.42)
D_Non-rated			6.83	23.85	85.95	64.27
			(0.23)	(0.82)	(1.59)	(1.28)
D_Senior-secured			-14.94	-7.64	-31.30	-44.25
			(-0.44)	(-0.19)	(-0.54)	(-0.87)
D_Convertible			100.34**	74.42*	9.17	47.03
			(2.12)	(1.76)	(0.15)	(0.81)
D_Callable			73.22**	77.94**	48.73	51.45
			(2.10)	(2.50)	(1.43)	(1.39)
Firm size	-13.68**	-16.09**			-7.47	-6.56
	(-2.18)	(-2.35)			(-0.70)	(-0.64)
Leverage	-46.73	-40.49			-24.38	-24.37
	(-0.92)	(-0.79)			(-0.43)	(-0.44)
Market-to-book ratio	-37.48***	-23.50*			-19.34	-32.11*
	(-2.92)	(-1.88)			(-1.06)	(-1.87)
Profitability	-8.12**	-6.34*			-5.07	-6.82*
	(-2.32)	(-1.93)			(-1.26)	(-1.81)
Z-score	6.84	5.32			5.00	7.00
	(1.35)	(1.09)			(0.84)	(1.16)
Intercept	417.62***	421.11***	-265.08	-128.65	-201.12	-410.06
	(3.19)	(2.77)	(-1.49)	(-0.73)	(-0.78)	(-1.58)
Fixed Year Effect	No	Yes	No	Yes	Yes	No
Clustered SE	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.10	0.21	0.27	0.35	0.33	0.26
Number of Observations	193	193	193	193	193	193

Table 8

LN (Loan remaining maturity)

This table shows the estimated coefficient of equation (7), the regression model on the relationship between IPO underpricing and LN(loan remaining maturity). LN(Loan remianing maturity) is the natural log of loan remaining maturity and natural log is used to capture the non-linear relationship between underpricing and loan remaining maturity. The definition of other variables are given in Table 1. Full sample regressions results are presented from Column 1 to Column 4. Column 5, 6 and 7 give the results for non-investment bonds, while Column 8 to Column 10 show the results for investment-grade bonds. The dependent variable is winsorized at 1% and 99%. The estimated standard deviations is clustered by firm. ***, **, * indicates statistical significance at 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
LN(Loan remaining maturity)	23.73**	20.64*	19.42**	22.37**	21.84*	27.29**	27.90*	9.59	22.05	17.52
	(2.37)	(1.92)	(2.05)	(2.25)	(1.75)	(2.25)	(1.88)	(0.97)	(1.57)	(1.08)
LN(Bond offering amount)		35.73		47.77			48.28			48.00
		(1.30)		(1.02)			(0.61)			(1.44)
LN(Bond maturity)		-47.75*		-50.03*			-117.09*			-28.66
		(-1.79)		(-1.79)			(-1.79)			(-0.75)
Coupon		8.98*		9.67*			1.29			22.4**
		(1.76)		(1.81)			(0.17)			(2.22)
D_Covenants		-26.33		-24.64			-29.50			-59.33**
		(-1.24)		(-1.15)			(-0.96)			(-2.62)
D_Putable		30.10		36.47			70.55			-16.14
		(0.93)		(0.99)			(1.33)			(-0.62)
D_AA_A		-10.17		-5.25						
		(-0.54)		(-0.22)						
D_Junk		37.77		31.49						
		-1.20		(1.05)						
D_Non-rated		99.67*		94.66*			58.54			
		(1.78)		(1.78)			(1.16)			
D_Senior-secured		-19.24		-25.17			-81.85*			77.43*
		(-0.42)		(-0.45)			(-1.79)			(1.84)
D_Convertible		15.38		6.09			-36.60			136.65**
		-0.30		(0.11)			(-0.51)			(2.32)
D_Callable		63.53**		46.50			64.54			-9.76
		(2.21)		(1.41)			(1.35)			(-0.35)
Firm size			-13.20**	-5.30		-7.62	-10.66		11.92	12.82
			(-2.00)	(-0.52)		(-0.67)	(-0.79)		(1.06)	(0.99)
Leverage			-51.51	-37.61		-109.33*	-85.22		-91.99	-67.44
			(-1.01)	(-0.70)		(-1.83)	(-1.25)		(-1.06)	(-0.71)
Market-to-book ratio			-17.37	-14.37		-5.16	-15.24		51.49***	54.34***
			(-1.43)	(-0.81)		(-0.26)	(-0.61)		(2.86)	(2.82)
Profitability			-7.11**	-5.55		-8.37*	-7.90		-35.57	256.52
			(-2.19)	(-1.40)		(-1.87)	(-1.54)		(-0.07)	(0.39)
Z-score			4.76	4.57		1.12	2.24		-20.31**	-19.84**
			-1.00	(0.79)		(0.21)	(0.34)		(-2.21)	(-2.01)
Intercept	30.75	-340.86	342.69**	-299.11	102.74*	304.14	20.11	-19.74	-253.57	-701.59*
	(0.95)	(-1.41)	(2.39)	(-1.21)	(1.77)	(1.15)	(0.04)	(-0.90)	(-1.08)	(-1.72)
Fixed Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.15	0.33	0.21	0.34	0.26	0.31	0.41	0.19	0.26	0.43
Number of Observations	193	193	193	193	113	113	113	80	80	80