Do Bondholders Value Senior Loan Lender Control Rights? [1]

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Abstract

We find that senior loan lender control is positively associated with a firm's corporate bond yield spread at issuance. A one standard deviation change in the number of covenants on the strictest loan on a firm's balance sheet is associated with a 15 basis points higher yield spread at bond issuance. Our results are invariant to using the number of financial covenants or covenant strictness to measure senior loan lender control. Using lender-specific shocks for identification produces consistent results. We further find that the positive association of loan lender control and bond yield is more pronounced for risky issuers and for issuers with dispersed bondholders but less pronounced in the presence of relationship lenders.

Keywords: Creditor conflict; lender control rights; covenants; syndicated loans; corporate bonds; creditor governance.

JEL classification: G30, G33, G34

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1. Introduction

Classical banking theories suggest that all lenders enjoy the benefits of delegated monitoring by banks, whose sizable share of the loan and reputational concerns related to originating debt, enhance their incentives to monitor (Leland and Pyle, 1977; Diamond, 1984 & 1991; Rajan and Winton, 1995). Close monitoring by senior loan lenders, such as banks, may even create value for shareholders in companies with severe agency problems (James, 1987). The near-universal practice of awarding bank loans the highest priority over other classes of debt seems efficient and can allow the firm to reduce its overall cost of capital (Welch, 1997). Accordingly, bondholders (as dispersed, junior creditors) may be willing to accept a lower yield or looser terms on their own debt contract in exchange for the monitoring benefits that senior loan lenders provide.[2] This argument is referred to as the cross-monitoring hypothesis. Using bank debt on balance sheets as a measure of effective monitoring, Datta, Iskandar-Datta, and Patel (1999) find that bank monitoring is associated with lower at-issue yield spreads for public bond offers.[3]

Covenants often serve as major monitoring and negotiation devices for senior lenders. Consequently, a loan contract with restrictive covenants grants significant control rights to loan lenders against the borrower (Rajan, 1992). Such covenants, however, may limit the company's ability to invest or grow. Alternatively, they may encourage the firm to invest too conservatively, thereby jeopardizing lower priority claim holders. Further, upon violations of covenants, senior loan lenders may immediately stop lending, terminate commitments, require accelerated loan payments, call for default, or exert direct influence on corporate policies and management (Beniesh and Press, 1993; Chen and Wei, 1993; Carey and Gordy, 2008; Chava and Roberts, 2008; Roberts and Sufi, 2009; Wight, Cooke, and Gray, 2009;

[2] We use the terms "senior" and "junior" creditor loosely since most of our observations of both loans and bonds are classified as senior debt. However, the more extensive use of covenants, greater incentives to monitor, and increased power in cases of financial distress serve to make loan lenders "senior" in the sense of maintaining stronger control rights.
[3] Booth (1992) and Houston, Lin, and Wang (2014) provide further evidence consistent with the cross-monitoring hypothesis.

Nini, Smith, and Sufi, 2012; Ozelge and Saunders, 2012; and Zhang, 2014).[4] Senior loan lenders may even request delay of interest or principal payments to junior creditors when they are due[5] and their bargaining advantage over other creditors strengthens in out-of-court restructurings (Becker and Josephson, 2016). Bank lenders are also known not to make concessions unless public bondholders also restructure their debt (James, 1995). In a distress situation, senior lenders' liquidation bias may prompt fire sales and inefficient liquidation in their own interests, at the expense of other claimants (Jenkins and Smith, 2014). Therefore, strong control rights possessed by senior loan lenders through restrictive covenants can be costly to bondholders, who may negatively price these rights and demand higher yield as a result.

How do junior creditors view the tradeoff of monitoring benefits vs. excessive control that strict loan covenants grant to senior lenders? As senior lenders impose loan covenants, the monitoring benefits (such as prevention of *risk shifting*[6]) that these loans provide to junior creditors strengthen. After reaching a certain threshold, however, one can imagine that further enhancement of senior lender control results in only a marginal benefit to junior creditors. However, restrictive loan covenants may put severe constraints on investments and grant senior lenders significant negotiation power against managers, to the potential detriment of junior creditors. For example, covenant violations can be more easily triggered when many covenants are imposed or when their thresholds are tight. As a result, strict covenants may directly affect the investment decisions of managers so that their preferences align with senior creditors' bias towards choosing *overly safe* projects. While overly safe projects may secure senior creditors'

[4] In particular, Nini, Smith, and Sufi (2012) document that for a sample of 239 covenant negotiations they trace from Dealscan, more than 6% of the violators exit the sample due to distress related reasons.

[5] For example, Sport Authority skipped a $21 million interest payment on the subordinated mezzanine debt due to pressure from senior lenders. The company spokesperson stated, "Although Sports Authority currently has sufficient liquidity to conduct its business operations and to make the current interest payment on the subordinated mezzanine debt, after consultation with our senior lenders, we elected not to make the interest payment while we continue these discussions." ("*Dick's Shares Rise on Sports Authority Woes*", CNBC, January 21, 2016).

[6] Risk shifting refers to manager's tendency to undertake risky projects that carry lower NPV as opposed to less risky projects that carry higher NPV to transfer wealth from debtholders to equityholders (Jensen and Meckling, 1976).

payments, their limited upside potential may reduce payoffs to junior creditors.[7] In this paper, we empirically examine the opposing benefits and costs of senior loan lender control on bond pricing, and draw inferences on how these control rights are perceived by bondholders. In particular, we ask whether bondholders are willing to sacrifice yield or require additional compensation when restrictive covenants are imposed on the firm by senior lenders.

Using a sample of 4,754 public bond issuances by U.S. companies from 1992 to 2012, we find a positive association between basis point spread (bps) at issuance and senior lender control rights, which are primarily measured by the number and severity of covenants associated with the loan. Specifically, we consider the covenant intensity of the loan (Bradley and Roberts, 2004) and the number of financial maintenance covenants (Demiroglu and James (2010) and Billett, Elkamhi, Popov, and Pugaliya (2014)). A one standard deviation increase in covenant intensity, for instance, is associated with approximately a 15 bps increase at issuance. This positive relation is robust to the inclusion of bond characteristics, borrower quality, industry conditions, year fixed effects, industry fixed effects, and year interacted with industry fixed effects. Furthermore, we find that bond yield spread is not positively (or even negatively) associated with the initial addition of covenants. The positive association becomes statistically significant only after the number of (financial) covenants increases to three or more. Our results suggest that bondholders value the monitoring benefits as covenants are initially imposed. However, excessive control by senior lenders is perceived to have a detrimental effect on bondholders.

A potential concern is that both bond yield spread and covenant design may be related to unobservable characteristics influencing the credit quality of the borrower, even after we control for various measures of firm default risk. In an alternative approach, we rely on the assumption that lender-specific shocks at loan initiation should not directly affect the bond price at issuance, but may alter how the lender chooses to design loan covenants for borrowers. We capture lender shocks using changes in

[7] We provide numerical illustrations to describe how junior creditors view the benefits vs. the costs of senior loan lender control in the Appendix.

the Tier 1 Capital held by the lead banks providing loan facilities to our sample firms. Tier 1 Capital fluctuations reflect changes in the credit quality of the loan portfolio that banks hold and/or regulatory requirements. These supply-side factors may alter the way banks write debt and other financial contracts, irrespective of an individual borrower's characteristics (Murfin, 2012; Subrahmanyam, Tang, and Wang, 2014). This identification strategy is further supported by the observation that there are on average more than two years between the loan initiation and the time of bond issuance in our sample. It is highly unlikely that lender-specific shocks at loan initiation should directly affect the pricing of bonds that are issued more than two years later. The results of our instrumented two-stage least-squares estimation confirm that bondholders negatively price the control rights of senior loan lenders.

As an additional test, we use Murfin's (2012) covenant strictness measure to indicate how close the firm is to various covenant thresholds included in the terms of its loans. In contrast to our other methods that measure senior lender control at the time the loan is issued, proximity to covenant thresholds can be measured at the time of subsequent bond issues, thereby allowing for changes in the strength of senior lender control due to firm performance. For each bond issued when covenant strictness is high (i.e. closer to covenant thresholds) we find matched issues with low loan covenant strictness using issuance year, industry, and closest distance-to-default. We confirm that firms with high loan covenant strictness offer greater yield on their bonds.

We conduct additional analyses to examine whether the relation between bond yield and senior lender control varies with the riskiness of the borrower, the presence of a relationship lender, and the potential cost of debt renegotiation. Our results show that the relation is more pronounced for firms with higher default risk (i.e. low distance-to-default), suggesting that the conflicts of interests may be more severe when the last dollar of debt is risky. Furthermore, we find that bondholders require less compensation for tight covenants in firms with relationship lenders. These lenders may be more effective monitors due to their information advantage. They are also more likely to help firms work towards

resolving distress rather than prompt liquidation (Demiroglu and James, 2015; Li and Wang, 2016). Moreover, we find that the association between bond yield and lender control depends on the coordination costs of junior creditors, which we measure by the level of bondholder dispersion. It is more difficult for junior creditors to protect their claims when their bargaining position against senior lenders is weak. As a result, they require additional yield as compensation. This finding helps further our understanding of the dynamic relationship between senior lender control rights and bond pricing in the presence of elevated renegotiation costs.

Our study contributes to the growing literature on creditor control rights and creditor conflicts. Closest to our work is the study by Feldhutter, Hotchkiss, and Karakas (2016), who show that creditors value their control rights. The creditor control premium they document is primarily associated with credit events such as defaults, bankruptcies, and covenant violations, which result in a transfer of control from shareholders to creditors. In contrast, our study examines the effect of senior lender control rights on the pricing of other debt securities in the absence of distress.

Our study also contributes to the literature and policy debate on senior lender control in bankruptcy. Existing bankruptcy studies suggest that senior lenders possess strong control power in bankruptcy, which may prompt inefficient liquidation and fire sales (Shleifer and Vishny, 1992; Ayotte and Morrison, 2009; Jenkins and Smith, 2014). Further, a recent commission of the American Bankruptcy Institute reviewed Chapter 11 proceedings and documented several instances in which junior and senior creditors were in conflict during the reorganization process.[8] For example, senior lenders exert power against the debtor and other claimants in bankruptcy by imposing strict covenants and roll-up provisions in post-petition financing. Different from these studies and discussions, we examine whether creditor conflicts influence *ex ante* debt pricing in the absence of financial distress.

[8] See http://business-finance-restructuring.weil.com/wp-content/uploads/2014/12/Ch11CommissionReport.pdf accessed April 1, 2015.

Our paper is also related to prior studies on designing optimal debt structure (Bolton and Scharfstein, 1996; Bris and Welch, 2005; Rauh and Sufi, 2010; von Thadden, Berglöf, and Roland, 2010; Colla, Ippolito, and Li, 2013). We do not intend to investigate whether the classes of debt chosen by our sample firms are optimal, instead we take the firm's choice of debt structure as given. Furthermore, we make no claim as to how the higher bond yields that we witness in the presence of strong loan covenants influence the firms' overall cost of capital. As a primary consequence, a firm may reduce the costs of these loans by accepting tighter covenants on syndicated loans. However, if tight covenants raise the cost of borrowing from public bondholders as a secondary consequence, the implication for the overall cost of debt remains unclear. In this paper, our goal is simply to document how the tension between different classes of creditors relates to bond pricing. Strict loan contracts designed by senior lenders may have unintended consequences on junior classes of creditors.

The next section of the paper describes our data, key variables and provides summary statistics. Section 3 formalizes our hypothesis and presents the alternative methodologies and identification strategy used to test it. Section 4 discusses our empirical results while Section 5 concludes the paper.

2. Data Sample and Variable Construction

2.1. Bond Issuance and Loan Samples

We draw our initial sample of public bonds issued between 1992 and 2012 from the Mergent Fixed Income Securities Database (FISD).[9] We remove bonds issued by financial institutions given that the determinants of credit quality and default for these firms are not comparable to firms in other industries. This initial screening results in 52,143 bond issues. We require each bond to be denominated in U.S. dollars, be issued by a U.S. company, be non-convertible, have non-missing information on yield, maturity, and amount of proceeds, and have more than one year to maturity. This second screening

[9] We choose 1992 as the starting year because the loan facility files from DealScan that are required to construct the covenant tightness measures were not well populated until the early 1990s.

results in a total of 26,685 public bonds in the sample. Next, we merge the bond issuance sample with the CRSP/Compustat merged annual files, and then with the DealScan database. We use the DealScan-Compustat Link file available through WRDS, the starting and ending dates of loan facilities, and the firm fiscal year-end date, to remove observations without outstanding loans at the time of bond issuance. After requiring availability of key control variables we are left with a sample of 4,754 public bonds.[10] For each firm-year immediately prior to bond issuance, we keep all outstanding loan facilities as of fiscal year-end.[11] Our main dependent variable, bond yield spread at issuance, is the difference between bond yield and the yield on a matching Treasury bond or note with the closest maturity, which is obtained from the website of the Federal Reserve Bank.

2.2 Covenant-Based Measures of Senior Lender Control

For each loan facility outstanding at the time of bond issuance we construct three primary measures of *ex ante* senior lender control using covenants embedded on loan contracts: covenant intensity (*CovIntensity*) following Bradley and Roberts (2004), the number of financial covenants (*FinancialCov*) following Demiroglu and James (2010),[12] and covenant strictness (*CovStrictness*) following Murfin (2012). These measures and all variables used in our analysis are summarized in the Appendix.

Covenant intensity is a broad measure of covenant usage that captures the degree to which senior lenders restrict managerial actions using both financial and non-financial covenants in the loan contract. The covenant intensity index assigns one point for each of six types of covenants: security, dividend restrictions, two or more restricted financial covenants, asset sweep, debt sweep, and equity sweep.[13]

[10] See Chava and Roberts (2008) for a detailed description of the link file. Further, our empirical results stay the same if we include bonds issued by firms that do not have outstanding loans at issuance and treat loan covenant intensity as zero.
[11] For example, for the fiscal year 2005 (ending on December 31, 2005) of firm *XYZ*, we keep all loans that were initiated before December 31, 2005 and would mature after December 31, 2005.
[12] Studying financial covenants alone is motivated by Billett, et al. (2014) and is supported by the fact that covenant-lite loans typically refer to loans without financial covenants rather than loans without covenants at all.
[13] The six specific covenants fall into four groups: security, dividend, financial, and prepayment. In particular, the prepayment group includes covenants that require early retirement of the loan conditional on an event, such as an asset sale, debt issuance, equity issuance, or liquidation. These provisions are referred to as "sweeps" in DealScan. Sweeps are stated

The index increases in the number of covenants included in a contract and ranges in value from 0 to 6. To capture the initial potential monitoring benefits of senior lender control to junior creditors through imposing covenants, we define a set of indicator variables that take a value of one if the covenant intensity equals one (*CovIntensity*_1), two (*CovIntensity*_2), three (*CovIntensity*_3), or more than three (*CovIntensity*_above3), respectively. This enables us to check for differential effects depending on precisely how many covenants are employed. Covenant intensity is measured as of loan initiation.

Financial covenants are often referred to as "trip wires" that can alter the bargaining power between lender and borrower. They are primarily tied to a firm's financial performance, debt obligations, and capital spending. These covenants explicitly define violation thresholds that are tied to specific financial ratios such as Debt-to-EBITDA, interest coverage, leverage, fixed charge ratio, current ratio, and capital expenditure. We create an index that counts the number of unique financial covenants in a loan contract. The index (*FinancialCov*) ranges in value from 0 to 7 in our sample. Similar to the indicator variables we assign to covenant intensity, we define a set of indicator variables that take a value of one if a loan contract has only one financial covenant (*FinancialCov*_1), two financial covenants (*FinancialCov*_2), three financial covenants (*FinancialCov*_3), or more than three financial covenants (*FinancialCov*_above3), respectively. Financial covenants are measured as of loan initiation.

We adopt covenant strictness from Murfin (2012) as the third measure of senior lender control. This measure requires information on both loan covenants and borrower financial ratios, and is based on the trigger threshold specified by each financial covenant and the firm's proximity to these thresholds for the corresponding financial ratios. The covenant strictness measure has the unique feature of incorporating both the covenant slackness and scale by normalizing ratios by their respective variances.

as percentages and require the fraction of the loan that must be repaid in the event of a covenant violation. For example, a loan contract with a 30% debt sweep implies that if a firm issues new debt, it must repay 30% of the principal value of the loan to the existing/senior creditors.

Suppose a loan contract contains more than one financial covenant with an $N \times 1$ vector of relevant financial ratios r and an $N \times 1$ vector of covenant thresholds $\underline{r}$. We first construct the covenant slackness $(r - \underline{r})$ using borrowers' actual financial ratios from Compustat and the loan covenant thresholds reported in DealScan. The covenant strictness measure *CovStrictness* is obtained through the following relation:

$$CovStrictness \equiv p = 1 - F_N(r - \underline{r})$$

where p represents the *ex ante* probability of senior lender control according to Murfin, and F_N is the multivariate normal cumulative distribution function with mean 0 and variance $\sum$. The covariance matrix $\sum$ is calculated from yearly changes in the logged financial ratios of Compustat firms. As a result, the covenant strictness measure allows for cross-time variation in the distance to a specific covenant threshold, which could account for shocks that affect the financial condition of borrowers. In contrast to the other two measures that are identified as of loan issuance, covenant strictness is measured as of bond issuance.

A company often has multiple loan facilities outstanding in a given firm-year, typically carrying covenants of varying degrees of intensity or strictness. To construct a unique value of senior lender control among various loan facilities outstanding in each fiscal year, we keep the loan that has the highest number of covenants to measure (*CovIntensity)*, the highest value of financial covenants to measure (*FinancialCov),* and the highest value of strictness to measure (*CovStrictness)* in a regression that relies on these variables of interest respectively.[14] In cases where multiple facilities have the same level of

[14] Using the maximum rather than the mean or median is intuitive because a firm violating the most binding covenant rather than the average level would trigger covenant violation. Our main results remain unchanged if we construct all covenant measures among multiple loan facilities using the average value across all facilities. Alternatively, we consider loan maturity when constructing the measures. In particular, we calculate a weighted average of financial covenants, covenant intensity, and covenant strictness using time-to-maturity as weights. Our results remain invariant to this alterative measure. Moreover, in unreported tests, we instead consider the covenant of the loan contract that has the longest term-to-maturity to measure senior lender control and find that our results are qualitatively similar.

financial covenants or covenant intensity, we select the loan that has the lead lender's information available from DealScan.

2.3. Variables Controlling for Bond Subordination

Bonds, which are often senior and unsecured, generally receive lower priority than similarly ranked (i.e. senior unsecured) loans in distress/bankruptcy restructuring. Carey (1995), for instance, finds that 99% of loans within his sample from DealScan include a senior priority clause giving them priority over other senior lenders. Ayotte and Morrison (2009) suggest that these senior lenders exert control through their loan agreements with debtors in distress while dispersed bondholders are not traditionally active participants in bankruptcy proceedings. Therefore, between two otherwise identical firms, bondholders of a firm that carries more loans in its capital structure are subordinate to a greater extent than bondholders of a firm that has a smaller amount of loans relative to its assets. Consequently, it is possible that these bondholders require higher yield spread as compensation for their reduced priority.

To distinguish senior loan lender power arising from the presence of covenants from a simple subordination effect for firms with large levels of loans in their debt capital structure, we construct two measures of bond subordination. These measures control for the proportion of loans held within the firm's overall capital structure, including loan-to-assets (total amount of loans outstanding scaled by book assets) and loan-to-liability (total amount of loans outstanding scaled by total liabilities). These additional variables allow us to control for differences in borrowers' debt capital structures that may influence bond yield.

2.4. Variables Controlling for Determinants of Bond Price

In our regressions, we control for additional determinants of bond prices at issuance that have been suggested by earlier studies (e.g. Datta, Iskandar-Datta and Patel, 1999; Ortiz-Molina, 2006). The issue characteristics include the dollar amount offered (in natural logarithms), maturity, a dummy variable indicating whether the bond is secured, bond ratings assigned by S&P at issuance (ranging in

value between one and ten with lower values indicating better ratings), and a dummy variable indicating whether there are any bond covenants restricting the company's actions related to future investments, dividends, subsequent financing, and\or corporate events.

Turning to firm-level variables, we aim to control for the firm's debt capacity, growth potential, profitability, and default risk. We use firm size (the natural logarithm of total assets), the leverage ratio (total debt over total assets), and interest coverage (EBITDA to interest expense) to measure debt capacity. We measure growth potential using the market-to-book ratio while using return on assets for profitability. Since larger firms, more profitable firms, firms with higher interest coverage, or those with better growth prospects may be better able to service the debt they issue, we expect these variables to be negatively related to yield spread. In contrast, it is expected that existing leverage of the company will be positively associated with yield spread.

We include distance-to-default as measured by the naïve approach of Bharath and Shumway (2008) as our primary control for the firm's default risk. This measure is calculated using some simplifications from Merton's (1974) approach. The market value of debt, for instance, is replaced with its face value and the expected return on the firm's assets is approximated by past stock return. Despite its simplifications, the naïve approach relies on the same functional form and achieves comparable or slightly improved predictive performance.

In addition, we control for business conditions in each of the issuers' industries, which may directly affect the issuer's default risk. In particular, we create an *industry distress dummy* that takes on the value of one if the median stock return of firms in the issuer's two-digit SIC industry is -30% or less in a given year, following Acharya, Bharath, and Srinivasan (2007). We expect the industry distress indicator to be positively related to yield spread. We further include high dimensional fixed effects based on interactions of industry and year in all our regressions. Borrower fixed effects are included in some specifications to further control for unexplained variation in risk.

2.5. Sample Overview

Table 1 presents summary statistics for our bond issuance sample from 1992-2012. Panel A tabulates bond issues by year. The issuance sample is equally distributed over two decades with 47% occurring from 1992-2002 and the remaining 53% occurring from 2003-2012. Panel B shows that the average bond offering yield is 6.69% and the spread over the most comparable Treasury bond is 2.29%. The median offering size is $446 million. These public bonds are long-term debt with an average maturity of 12 years. Panel C shows that the vast majority of the public bonds issued are senior unsecured (85.8%), while senior secured bonds account for only 9.7% of the sample.

We follow Smith and Warner (1979) and Chava, Kumar, and Warga (2010) to categorize bond covenants by the nature of their restrictions on managerial actions and present them in Panel D. While the bond covenant dummy indicates that 75% of bonds have covenants, investment and subsequent financing restrictions tend to be the most common. Financial covenants are almost never imposed in a bond indenture. Panel E shows that only a quarter of bonds covered by our sample fall below the investment grade threshold.

Table 2 summarizes features of the loans at initiation and borrower characteristics while Figure 1 plots the distribution of the three covenant measures used in our sample. We see from the table that the average value of covenant intensity is 2.37 for the loan with the most significant covenant usage for each sample firm. Covenant usage is quite variable however, with over 15% of firms having the maximum value of 6 for covenant intensity while approximately 30% of firms have a covenant intensity measure of 0 for all outstanding loans. Table 2 shows that the mean number of financial covenants is 1.36 for the outstanding loan with the most financial covenants at the time of bond issuance while Figure 1 shows that there are approximately 23% of loans with only one financial covenant, 26% of loans with two financial covenants, 10% of loans with three financial covenants, and 7% of loans with more than

three financial covenants. About one third of loans do not have any financial covenants attached.[15] Within our sample, financial covenants tied to firm's level of debt-to-EBITDA are the most common and appear in 35% of loan contracts. This is followed by an interest coverage covenant (30% of loans) and a leverage covenant measured by debt to capitalization (18% of loans). Net worth and fixed charges covenants account for 17% and 16% respectively, of loans in our sample. Covenants related to capital expenditures are less common and attached to roughly 8% of loans.

Table 2 further shows that the average value of *CovStrictness* is 0.28. However, this measure is highly skewed. Over forty percent of loans have a *CovStrictness* value of zero indicating that either threshold levels are nowhere near binding for these firms or they do not have any financial covenants in place. The remaining observations are evenly distributed across the spectrum with fewer than 5% of observations in any one category.

Our untabulated statistics show that our sample loans have a mean maturity of approximately five years, and are initiated on average 2.84 years prior to the bond issuance (i.e. the difference between loan maturity and time to maturity at the time of bond issuance). The loan facility amount is on average 959 million and the median amount is 500 million, in comparison to a smaller mean value of $446 million and median value of $300 million for bond issues. While a direct comparison between loan and bond terms is hampered by the respective databases reporting contract characteristics differently, we find that bondholders tend to put restrictions on investments and subsequent financing while loan lenders focus on financial conditions. This is consistent with syndicated loan lenders being more active monitors of a firm's financial condition and making use of stricter covenants to trigger renegotiation or repayment.

[15] The fraction of these so-called covenant-lite loans in our sample is higher than that reported in Billet et al. (2016) as their sample is composed of leveraged loans while three quarters of our bond issuers are investment grade firms. It is also possible that the low fraction of covenant-lite loans may be due to DealScan's limited coverage or errors. However, such potential data issues should be biased against our findings.

Table 2 also shows that the median loan to assets ratio is 38%, suggesting that most of our sample firms have enough assets to cover loan payments. The importance of loans within our firms' debt capital structure is also clear with the average firm in our sample having 58% of its liabilities in loans.

Our sample firms are fairly large, reflecting the fact that public bonds tend to be issued by mature firms with significant tangible assets (Faulkender and Petersen, 2006). Further, our sample firms are profitable (mean ROA of 14%), reasonably leveraged and have healthy interest coverage at an average over 11 times. Consistent with the strong credit ratings assigned to the sample bonds at issuance we see that the median distance to default for firms in the sample, as measured by one year prior to the bond issue, is 6.72. About 11% of bond issuers' industries are in distress at the time of issuance.

3. Empirical Methodology

Our goal is to identify the effect of senior loan lender control on bond pricing. The null hypothesis is that creditors view various debt contracts in isolation and design their contracts independently such that the terms of one contract do not influence the pricing of the other. Covenants imposed by existing senior loan lenders, therefore, should not influence the price of a subsequent bond issued by the firm. As a baseline model, we estimate the following OLS regression:

$$YS_{i,t} = \alpha_1 + \beta_1 X_{i,t-1} + \omega_1 B_{i,t} + \gamma_1 C_{i,t} + \lambda_{1t} + \theta_{1ind} + \lambda_{1t} * \theta_{1ind} + \varepsilon_{1it} \quad (1)$$

where $YS_{i,t}$ is the bond yield spread at issuance; $X_{i,t-1}$ is a vector of control variables including the firm's debt capital structure, financial health, and industry conditions, lagged by one year; $B_{i,t}$ is a vector of the newly issued bond's terms; $C_{i,t}$ is the degree of senior lender control, which is measured by a loan's covenant intensity, number of financial covenants, or covenant strictness; λ_{1t} represents a set of year fixed effects, and θ_{1ind} represents the full set of 2-digit SIC industry fixed effects; $\lambda_{1t} * \theta_{1ind}$ represents year

times industry fixed effects; ε_{1it} is a stochastic error term. Our empirical test centers on whether γ_1, the coefficient for senior lender control rights, is statistically different from zero. A negative value for γ_1 suggests that restrictive covenants on loans enhance monitoring and provide benefits that serve to protect other creditors, most notably unsecured bondholders – consistent with the cross monitoring hypothesis. In contrast, a positive value for γ_1 indicates that excessive control imposed by senior loan lenders is detrimental to bondholders, who require additional compensation as a result.

The baseline OLS regression shown in equation (1) suffers from endogeneity problems. The major concern is that omitted, unobservable firm heterogeneity may simultaneously affect the terms of the loan contract and the bond price at issuance. We adopt three additional estimation strategies for identification, recognizing that each has its own advantages and disadvantages.

First, we adopt two-stage least-squares estimation with an instrumental variable. Our identification relies on the assumption that specific shocks to lenders at loan initiation may alter how they design the loan contract but are unlikely to relate to individual borrowing firm characteristics that may affect subsequent bond pricing. The resulting estimation can be written as:

$$C_{i,t} = \alpha_2 + \beta_2 X_{it-1} + +\omega_2 B_{i,t} + \mu LShock_{i,t-j} + \lambda_{2t} + \theta_{2ind} + \lambda_{2t} * \theta_{2ind} + \varepsilon_{2it} \quad (2)$$

$$YS_{i,t} = \alpha_3 + \beta_3 X_{it-1} + \omega_3 B_{i,t} + \gamma_3 \hat{C}_{i,t} + \lambda_{3t} + \theta_{3ind} + \lambda_{3t} * \theta_{3ind} + \varepsilon_{3it} \quad (3)$$

Equation (2) stands for the first-stage regression for the covenant intensity or number of financial covenants of the most restrictive loan. Equation (3) stands for the second-stage regression for bond yield spread with the predicted covenant measure from the first stage included. The coefficient of interest is γ_3 which, similar to equation (1), is negative if bondholders benefit from enhanced senior lender control rights and positive if these same rights exacerbate conflicts between senior and junior creditors.

Our instrument $LShock_{i,t-j}$ in equation (2) is measured by the change in the amount of Tier 1 Capital in billions of dollars that is maintained by the lead banks offering the syndicated loan (i.e. lead arrangers,

book runners, and agent banks etc.) from the calendar year prior to loan initiation to the year of loan initiation, where *t-j* captures the year of loan initiation, occurring *j* years prior to the bond issuance at time *t*. Tier 1 Capital for lead banks is obtained from Bankscope through WRDs.[16] Our instrument is motivated by Subrahmanyam, Tang, and Wang (2014), who use lender Tier 1 Capital as an instrument to study the effect of CDS trading on the default risk of reference firms.[17] Similar to their logic, we posit that the change in Tier 1 Capital is in response to the overall health of the lending portfolio, and/or the required level imposed by regulators. These factors may influence a bank's incentive to design tight covenants. Therefore, the change in Tier 1 Capital relates to the bank's preference for covenant usage across all loans, regardless of an individual borrower's default risk. Further, given that we include year fixed effects in all regressions, the effect of Tier 1 Capital changes on covenant design is captured within year and across banks, reflecting shocks to a specific lender's portfolio rather than negative time-varying economic shocks that affect all lenders.

Since a loan often has several major lenders involved, we first identify the lead lenders and then other major participants as identified by DealScan.[18] We cross-reference these to the Bankscope database from which we obtain information on Tier 1 Capital. Since not all lenders of syndicated loans are covered in Bankscope, our sample size is reduced in these tests. We identify the lead lender with the largest drop (i.e., the smallest increase) in their Tier 1 Capital level because these lenders face more binding capital requirements from year to year and consequently may be most inclined to impose strict covenants as a

[16] Bankscope covers approximately 32,000 public and private banks and provides information on the type of bank (commercial, investment etc.). To the extent that the lender is a non-bank financial institution, they are unlikely to be included in the database, thereby biasing the sample included in our two-stage analysis. To examine the impact of this bias, we download the SIC codes for our sample lenders and classify them as bank or non-bank financial institutions. We find that almost 89% of the lenders can be classified as banks, suggesting that restricting analysis to institutions with Tier 1 Capital in Bankscope will not dramatically change the nature of our sample in the two-stage tests.

[17] More specifically, Subrahmanyam et al. (2014) examine whether the presence of CDS trading for a given borrower alters the borrower-lender relationship in ways related to lender monitoring and borrower risk taking. They suggest that Tier 1 Capital reflects the financial condition of the lender and when this condition is weak, the lender may be more motivated to trade in the CDS market to hedge their credit risk regardless of the underlying credit quality of the borrowing firm.

[18] Lead lenders often carry titles such as lead arranger, book-runner, lead manager, administrative agent, agent, arranger, and sole lender (see *A Guide to the U.S. Loan Market* by Standard and Poor's, 2012).

precautionary measure to ensure the strength of their loan portfolio.[19] We expect the coefficient μ on the change in Tier 1 Capital measure in equation (2) to be negative. As lenders experience increases to Tier 1 Capital when their financial strength improves, they are more inclined to permit lax debt contracts.

One potential concern of relating loan covenants at initiation to the pricing of subsequent bond issuance is that the covenants may be renegotiated prior to bond issuance, and therefore do not capture the true covenants underlying the loan at bond issuance. While this is possible, Denis and Wang (2014) and Roberts (2015) suggest that changes to covenants are most commonly related to the accounting measures (e.g. thresholds) rather than the number of covenants. For instance, tight financial covenants set at loan initiation are frequently loosened to enhance borrower flexibility. We do not have detailed information on possible loan amendments made between loan initiation and bond issuance. However, to shed some light on the extent to which a firm's financial condition evolves before bond issuance, we plot the mean leverage, interest coverage, and cash to assets of sample firms in the five years before bond issuance in Figure 2. We find that the mean level of all three measures is remarkably stable during this period. Given the relatively strong financial health of the bond issuers in our sample, it is unlikely that loan covenants would be amended drastically before the bond issuance.

Another potential concern of using lender shocks as an instrument for covenant usage is that bank distress may affect bond pricing not only via the lender control channel but also the risk channel. Prior research (e.g. Chava and Purnanandam, 2011) shows that banks experiencing negative shocks may alter interest rates and the supply of loans, in addition to designing tighter covenants (Murfin, 2012). Bank distress may then affect bond pricing by limiting borrowers' supply of capital that in turn will influence subsequent investment and performance. While this possibility exists, the effect of a specific lender shock on a borrower's investment and financing cost is expected to be short-lived. Borrowers will alter

[19] The estimation results remain unchanged if we instead use the average Tier 1 Capital change across all lead and major lenders.

their financing policy to resort to other sources of capital as a response to reductions in loan provisions arising from a particular lender. This response, in the years between loan and bond initiation, should help to mitigate the potential influence of a lender shock on firm investment and performance, however the precise terms of the loan and its covenants remain in effect. As a result, the predominant long-lasting effect of lender shocks on bond pricing is likely to be through the monitoring and lender control channel.

Second, since our third measure of senior lender control (*covenant strictness*) is measured at bond issuance rather than loan initiation, we are unable to apply the above instrumented variable approach using loan lender shocks. Instead, we apply a matched sample approach using year, industry, and distance-to-default as characteristics for matching. For each bond issued by a firm that has its loan covenant strictness ranked in the top quartile in our sample (the treated bond) indicating that the firm is closer to its covenant thresholds, we look for a bond in the rest of the sample issued by another firm in the same year and industry that has the closest distance-to-default to the treated bond issuer. We allow multiple matches in cases where observations have equally close distances-to-default. Using this approach, we intend to match on both unobservable characteristics tied to year and industry and the observable default risk of the issuer, all of which should directly impact bond yield and capture the risks reflected by covenant strictness. We then repeat our regressions using these matches to estimate the effect of senior lender control rather than default risk on bond pricing.

We further verify that our results are driven by senior lender control rather than default risk by interacting the level of DTD with our measures of covenant usage. Our purpose is to examine whether the creditor control effect is stronger when the last dollar for bondholders becomes risky. In final tests, our subsamples identify situations in which senior lender control may have both a weaker influence on bond yield, such as when the loan is provided by a relationship lender, and situations when it may have a stronger influence, for instance when bondholders are more disperse and debt structure more complicated.

4. Empirical Results

4.1. Covenant Intensity and Financial Covenants

Table 3 presents the OLS regression results of bond yield spread at issuance on the covenant intensity and number of financial covenants. The first column examines the association between bond yield spread and the covenant intensity index while controlling for bond and firm characteristics, industry distress, and high dimensional fixed effects interacting industry and year fixed effects. Standard errors in all regressions are clustered at the issuer level.

Column (1) shows that greater use of covenants on a firm's loans is associated with a higher bond yield spread. The positive association is statistically significant at the one percent level. According to our coefficient estimates, a one standard deviation change in *CovIntensity* (2.208) translates into a 15 bps increase in bond yield spread.

In Column (2) we include four dummy variables for the covenant intensity index, *CovIntensity_1*, *CovIntensity_2*, *CovIntensity_3*, and *CovIntensity _above3*. The benchmark category is loans without covenants. Column (2) shows a pattern of increasing coefficients for the dummy variables, suggesting that the positive relationship between senior loan lender control and bond yield is most significant when loan lenders make extensive use of covenants to control borrower behaviour. While the coefficients corresponding to the covenant intensity dummies are positive, the most significant association is for those loans with covenant intensity measures greater than three.

Columns (3) and (4) repeat the analysis for the number of financial covenants and the corresponding financial covenant dummies. Similar patterns emerge as for covenant intensity. For instance, Column (3) shows that a one standard deviation increase in the number of financial covenants (1.28) translates into a 7 bps increase in bond yield spread. While the smaller economic impact is understandable given that financial covenants are a subset of the possible covenants that may be in place

on the loan, it remains statistically significant at the 5 percent level. Turning to the dummy variables in Column (4), we see that the coefficient on *FinancialCovSum_1* is negative and statistically significant while *FinancialCovSum_2* is statistically insignificant compared to the omitted category of zero financial covenants. As the number of financial covenants increase, the significantly positive association between loan covenants and bond yield spread returns and reaches its highest level for those loans with more than three financial covenants. These results suggest that bondholders initially enjoy the benefits of strict financial covenants on loans when they are put in place and thus require lower yield. It is only when these covenants become numerous that senior lender control is detrimental for bondholders and they require additional compensation as a result.

Figure 3 illustrates this result and its relation to bond yield spread more explicitly. Across the horizontal axis, the figure plots the largest number of financial covenants on a loan held by the firm while the vertical axis relates this value to the yield on its bonds. When the number of financial covenants is 0, the figure shows that the average bond yield spread is just under 1.6%. Introducing a single financial covenant to enhance the ability of the loan lenders to monitor the firm leads to a reduction in bond yield by 16 basis points. Bondholders are willing to accept a lower yield on the bond, keeping bond and firm characteristics constant, when senior lenders enhance their monitoring through this initial covenant. The addition of a financial covenant increases yield spread but, incrementally, it remains less than the yield on bonds for firms without financial covenants on their loans. The addition of a third financial covenant increases yield by 13 basis points suggesting that the benefits of cross-monitoring become secondary to the additional control rights and potential conflicts that excessive covenants award loan lenders over junior creditors. In the extreme case, when loans have more than three financial covenants, the increase in bond yield due to covenants is an additional 30 bps.

Throughout all columns in Table 3 control variables behave largely as expected. Larger bond issues with greater maturity or lower ratings require higher yields as do bonds issued by firms in

industries experiencing distress. Firms with higher levels of market to book, return on assets, or a greater distance to default, issue bonds with lower yields. The presence of restrictive bond covenants is also strongly related to lower yield spread. If covenants solely capture risk, we would have expected the same sign on both loan and bond covenants.

Secured bonds require higher yields however our examination of these bonds suggests that this may be due to bondholders requiring collateral if the issuer is perceived to be risky. In fact, our untabulated statistics show that firms issuing secured bonds tend to have lower ratings, ROA, and z-scores, and higher leverage than those issuing unsecured bonds. Our results are robust to removing secured bonds from our sample (untabulated).

We examine whether the positive association between loan covenants and bond yield spread is driven by cases in which the firm's debt capital structure is heavily oriented towards loans, thereby making bonds more subordinate (See Table 4). In each column of Table 4, we include one of our measures of bond subordination, namely the value of loans to assets and loans to total liabilities. Columns (1) and (2) use the covenant intensity measure as the primary measure of senior lender control while Columns (3) and (4) use the more limited measure focused on financial covenants alone. All columns include our standard bond issue, firm, and industry distress controls in addition to year, industry, and year by industry fixed effects. Table 4 demonstrates that there is a weak relation between debt capital structure and bond yields. Results are largely consistent with the findings of Table 3. Covenant intensity remains significantly related to bond yield spread at the one percent level or lower, regardless of which bond subordination measure is included.

Table 5 presents our two-stage least-squares estimation using loan lender-specific shocks as an instrument. The first-stage regression results estimating the *CovIntensity* and *FinancialCov* measures respectively are presented in Columns (2) and (4). Columns (1) and (3) present the second-stage regression results relating the predicted values of these covenant measures to bond yield spread. Results

presented for the first-stage regression show that the change in Tier 1 Capital is a valid instrument. Not only is it strongly associated with covenant intensity and financial covenants, but it also passes both the weak identification and weak instrument tests. Our results suggest that as banks experience improvements in their equity and/or disclosed reserves (primarily retained earnings) they become more lenient in their covenant requirements on the loans they initiate.

The second stage regressions presented in Columns (1) and (3) confirm that the instrumented loan covenant intensity and financial covenants are positively associated with subsequent bond yield spreads at issuance. The positive association, statistically significant at the five and ten percent levels for *CovIntensity* and *FinancialCov* respectively, confirms that bondholders require additional compensation when contracting with firms with strict loan covenants. As in previous tables, we see that bond issue maturity and size continue to be associated with yield spread as does the presence of industry distress. Profitability, DTD and the existence of bond covenants are again associated with lower yields.

4.2. Covenant Strictness

We next explore Murfin's (2012) measure of how close a firm is to its covenant thresholds, *CovStrictness*. The advantages of using this as a measure of senior lender control are: (1) it is a relative measure of a firm's financial condition to the trigger points of covenant violations and therefore better captures the likelihood of senior lenders enforcing control; (2) it is measured at the time of bond issuance rather than loan initiation. However, since the measure is related to both firm underlying financial conditions and covenant trigger points, it is likely that covenant strictness captures a firm's performance and underlying default risk to a large extent. Therefore, in addition to running our OLS regressions with industry-interacted-with-year high-dimensional fixed effects, we perform matched regressions based on a firm's perceived default risks. For each bond with a high level of covenant strictness (suggestive of being closer to covenant thresholds) we find a bond issued in the same year by a firm in the same industry with the closest distance to default but a low level of covenant strictness.

Table 6 reports the regression results. Column (1) provides results based on the inclusion of bond issue, firm, and industry condition controls in addition to year, industry, and year interacted with industry fixed effects. It confirms that within the full sample of observations, this third measure of senior lender control is strongly associated with bond yield spread. We find that the coefficient of *CovStrictness* is positive and statistically significant at the one percent level.

Column (2) reveals matched sample results focusing on bonds issued by firms with covenant strictness falling in the top 25% of all observations and their matched bonds. The table shows that *CovStrictness* continues to be significantly associated with bond yield. This would not be the case if covenant strictness were simply a proxy for default risk rather than senior lender control and proximity to tripwires that may further enhance this control.

4.3. Interactions with Default Risk

While these results suggest that our findings are driven by lender control rather than the general risk of default faced by the firm, we explore in more detail the interplay between covenants and default risk in Table 7. Columns (1) through (3) include the full sample of observations and one of our three measures of covenant usage (*CovIntensity*, *FinancialCov*, and *CovStrictness*) both independently and interacted with the DTD variable. Our rationale is that senior lender control is particularly worrisome to bondholders when the firm's debt is riskier. When debt is relatively safe and the prospect of covenant violation low, the influence of senior lenders is limited. As a result, bondholders should require less compensation for covenants on loans when distance to default is great. Table 7 shows evidence that is consistent with this reasoning. As in all previous cases, DTD remains negatively related to bond yield spread while the three measures of loan covenant usage are positively associated with bond yield. Interacting DTD with covenant usage however produces a negative coefficient that is statistically significant for all three covenant measures at the one percent level indicating that compensation for senior lender control is significantly less for safer levels of debt.

4.4 Relationship Lenders

The relationship banking literature suggests that relationship bank lenders assist borrowers when their transparency is low (e.g., Berger and Udell, 1995) and provide favorable loan terms to borrowers even when they are in distress (Li, Lu, and Srinivasan, 2013). Relationship lenders are not expected to "pull the trigger" to accelerate loan payment upon violations of covenants or inefficiently liquidate the firm upon bankruptcy filing, to the detriment of junior creditors. In fact, relationship bank lenders tend to work with their borrowers to resolve distress (Demiroglu and James, 2015; Li and Wang, 2016). Since relationship lenders are less likely to exploit their control through covenants in a way that is detrimental to junior creditors, we expect the positive association between covenant intensity and bond yield spread to be weaker for firms whose loans are provided by relationship lenders. We follow Bharath, Dahiya, Saunders, and Srinivasan (2011) to identify relationship lenders. A relationship lender is a major loan lender who provided any type of loans to a borrower in the prior five-year period. We perform a subsample analysis based on firms with relationship lenders in place and those without.

Table 8 presents our results. Columns (1) and (2) provide results when loan covenants are measured by *CovIntensity*, Columns (3) and (4) by *FinancialCov*, and Columns (5) and (6) by *CovStrictness.* Columns (1), (3), and (5) present the results using the subsample of firms with relationship lenders while Columns (2), (4), and (6) show the results using the subsample of firms without relationship lenders. We find that in the presence of a relationship lender in a loan syndicate, bond yield spread remains positively associated with covenant intensity but is not significantly related to financial covenants or covenant strictness. In contrast, all three measures of senior lender control are positively associated with bond yield spread in the absence of a relationship lender. Our results suggest that in the presence of relationship lending, the potential detriment to junior creditors may be less severe.

4.5. Bondholder Negotiating Power

Gertner and Scharfstein (1991) and Bolton and Scharfstein (1996) theoretically show that coordination problems among creditors may lead to investment inefficiencies in debt restructurings and directly impact the restructuring outcomes. Davydenko and Strebulaev (2007) empirically document that frictions associated with creditor renegotiation influence bond spreads. In our context, senior lenders may be more likely to advocate for overly safe projects or premature liquidation of the firm to avoid the need for extensive or difficult negotiations with junior creditors. Similarly, bondholders may anticipate that their negotiating power will be weaker when ownership of the bonds is widely dispersed rather than concentrated. We examine this possibility by following Davydenko and Strebulaev in measuring the dispersion (i.e. 1- HHI concentration) of a company's bonds.[20] We obtain information on debt structure from Capital IQ and verify it using firm balance sheets from Compustat. We anticipate that the more disperse the company's bonds, the greater the additional compensation new bondholders will require for loan covenants enhancing senior lenders' control.

We divide our sample firms into those with high and low levels of bondholder dispersion corresponding to those firms above and below the median level of dispersion respectively. Table 9 provides OLS regression results for each of the two dispersion groups across our three covenant-based measures of senior lender control. Specifically, Columns (1) and (2) examine the influence of covenant intensity on bond yields across the two levels of bond dispersion while Columns (3-6) do the same for financial covenants and covenant strictness respectively. Our standard bond issue, firm, industry, and year controls are included in each column.

Table 9 demonstrates that senior lender control is more strongly related to bond yield in cases where bond holdings are widely dispersed, suggesting that these investors require additional compensation when their *ex ante* bargaining strength is weak. As bond holdings become more

[20] The concentration ratio (HHI) is measured as the sum of the squared face value of each bond divided by the squared sum of aggregate face value across all of the firm's bonds. Note that we must divide by the sum of aggregate face value in order to translate from a bond's individual face value to its proportion. In contrast, lender and shareholder concentration did not require this step as we already had each lender and shareholder's holdings in proportionate form.

concentrated, a reflection of an increase in the bargaining power, the coefficient that relates loan covenants to bond yield declines. The coefficients on financial covenants and covenant strictness are no longer significant for firms with the most concentrated bond holdings.

5. Conclusion and Discussion

While power struggles between senior and junior creditors have been examined for firms in financial distress, we know little about whether or how these conflicts influence the pricing of debt contracts in the absence of financial distress. We study whether senior lender control, gained by designing loan contracts with tight covenants, influences the pricing of corporate bonds at issuance. Despite the relatively strong financial health of bond issuers, we find that tight loan covenants are associated with higher bond yield spreads at issuance. Our results are robust to the use of an instrumental variable estimation and risk pair matched analysis.

We further find that the relation between loan covenants and bond yield is weaker in the presence of significant relationship lenders. Moreover, we perform subsample analyses to examine whether the relation between senior lender control and bond pricing is strengthened when bondholders are less concentrated. Our results show that the sensitivity of a bond's price to outstanding loan covenants is greater for firms with more dispersed bond ownership consistent with their weaker bargaining position.

We acknowledge that our empirical approaches, instrumental variable estimation, and risk pair matched analysis, have advantages and limitations. We cannot completely rule out the risk channel through which covenants may influence bond pricing but rather try to provide convincing evidence that senior control rights play a role when all three approaches and subsample analyses show consistent results. The use of alternative measures of senior lender control based on syndicate composition confirms our finding that senior lender power is reflected in bond yield spread.

Our research is among the first to document the influence of the specific terms of one type of debt contract on the pricing of another type of debt contract. It is unclear *ex ante* whether debt contracts are viewed independently by investors so that they are priced in isolation. Our findings suggest they are not, and demonstrate a negative externality arising from strong senior creditor control.

Appendix. A Simple Numerical Illustration on the Effect of Senior Lender Control on Junior Creditors

This section provides a numerical illustration of the potential benefits and costs of strong senior lender control for junior creditors.[21] Our goal is to illustrate the intuition motivating our empirical exercise rather than present a theoretical model. We use the prevention of risk-shifting, the tendency for managers to undertake risky projects with higher potential payoffs for shareholders at the expense of jeopardizing debtholders' claims, as a way to measure monitoring *benefits* derived from senior lender control. Potential *costs* to junior creditors are illustrated by senior lenders' preference for the firm to undertake overly safe projects. Since these projects may have limited upside potential, they could jeopardize the probability of full repayment for junior creditors in certain scenarios.

Consider a firm with three classes of claimants in place: senior debtholders, junior debtholders, and equityholders. We assume that management's personal preferences align most closely with those of equityholders. Suppose that the face values of senior and junior debt are each $10. Assume there are three investment projects from which a firm can choose and they carry the same costs. Further assume that there are three equally likely states of the world representing high, medium, and low levels of economic activity. The payoffs in each of the three states and the resulting project present value (PV) assuming the same (zero) discount rate, are illustrated in the table below:

States of Economic Activity	Risk-neutral probabilities	Project A Payoffs	Project B Payoffs	Project C Payoffs
High state	1/3	$25	$27	$31
Mid state	1/3	$14	$20	$17
Low state	1/3	$12	$4	$0
PV		**$17.00**	**$17.00**	**$16.00**

The ranking of the PV of the three projects follows A = B > C. Without frictions or conflicts of interest, the socially optimal projects A or B would be undertaken. However, we can easily see that

[21] We are indebted to Xuewen Liu for his insightful suggestions on the theoretical background of our empirical exercise.

project C, which carries the lowest PV as well as the most variable payoffs, would be chosen by equity maximizing managers. This scenario can be interpreted as the classic risk-shifting problem suggested by Jensen and Meckling (1976). Close monitoring by senior loan lenders through restrictive loan covenants that allow lenders to frequently examine the operations and performance of the borrower, can prevent managers from choosing project C. It is clear from the table below, which provides the payoff of each project for the three types of claimant, that junior debtholders are better off when the manager is prevented from undertaking the riskiest investment. In this case, management selects project B as its next best project after project C is eliminated (Chava and Roberts, 2008; Nini, Smith, and Sufi, 2009).

	Expected Payoffs*			
Claimants	**Project A**	**Project B**	**Project C**	**Ranking**
Senior debtholders	$10.00	$8.00	$6.67	A>B>C
Junior debtholders	$5.33	$6.67	$5.67	B>C>A
Equityholders/Managers	$1.67	$2.33	$3.67	C>B>A

* Expected payoff to a certain class of claimants when a project is undertaken is calculated as 1/3*(payoff to the claimant in high-state) + 1/3*(payoff to the claimant in mid-state) + 1/3*(payoff to the claimant in low state).

While effective monitoring by senior debtholders may result in the selection of socially optimal project B, project A is, in fact, is most preferred by senior lenders as it provides full principal repayment across all three states. In contrast, project A is least preferred by junior debtholders as its limited upside, particularly in the medium state of economic activity, reduces their expected payoff. Project B ranks lower for senior debtholders as it results in a transfer of wealth from themselves to junior debtholders and equityholders.

If senior lenders maintain sufficient power to negotiate effectively with, or exert substantial influence over, the investment decisions, they would prevent the firm from choosing project B. This power shifting arises if the firm violates a covenant, or management perceives that it may be required to renegotiate a covenant in the near future. In particular, when numerous strict covenants are put in place, the occurrence of covenant violations becomes more likely even if the firm is not yet financially distressed. Violations of covenants can trigger technical defaults of the borrower, through which senior lenders gain significant power when renegotiating the loan contracts. They can also promote actions

against the borrower's best interest, such as acceleration of loan payments. They may even exert direct influence on corporate policies by requiring excess levels of cash holdings, which may prompt the firm to undertake overly safe projects and limit their investment (Nini, Smith, and Sufi, 2012). Lenders may effectively pressure the firm to invest in project A. An extreme scenario would be premature liquidation, especially when firms have insufficient amounts of cash to pay all creditors. Senior creditors' incentive to exercise premature liquidation leads to the transfer of wealth from junior debtholders and equityholders to senior debtholders.

Relatedly, managerial concern with respect to job turnover or personal income loss upon violation of debt covenants, lead them to pursue Project A and forgo Project B and "play it safe" in making corporate investment decisions (Eckbo, Thorburn, and Wang, 2016; Gormley and Matsa, 2016). Returning to our numerical example and assuming that covenant violation occurs when the project value falls below \$12,[22] only Project A would ensure no violations across all three economic states. Managers therefore have incentives to avoid Project B as they are concerned about the probability of job loss when the low state occurs. This type of agency problem can also lead to managers choosing the overly safe project, hurting junior creditors in the process.

To summarize, without close monitoring by senior lenders, equity maximizing managers would always choose Project C. When senior lenders start to impose close monitoring, safer projects would be chosen and junior creditors benefit. However, as senior lenders further strengthen their control, perhaps as a result of covenant violations, the safest project may be chosen. Our example illustrates that senior lender control can benefit junior creditors through prevention of risk-shifting in some contexts. However, when senior lenders are granted strong power to impose excessive risk prevention in investment decisions, junior creditors are negatively impacted as a result. Taken together, junior creditors may price such wealth transfer induced by strong senior lender control ex ante.

[22] In practice, these are the financial covenants tied to enterprise value and cash flows.

Appendix B: Variable Definitions

This table defines all key variables used in the paper.

Bond characteristics (source: Mergent FISD)	
Yield spread	The difference between offering yield of a bond and the yield on a Treasury Bond/Note, matched with the closest time to maturity.
Log (offering amount)	The natural logarithm of the bond issue amount in millions of dollars.
Bond maturity	The maturity of the bond issued, measured in number of years.
Bond secured dummy	An indicator variable that takes a value of one if a bond is secured.
Bond issuance rating	A continuous variable that captures the credit rating associated with bond issuance, which takes a value of one if the issuer has an AAA rating from all credit rating agencies, and takes a value of two if the issuer has an AA rating from all credit rating agencies. The highest rating is one and the lowest rating is ten, where ten indicates unrated bonds. If there are different ratings issued by agencies, we use the most conservative rating as our benchmark.
Bond cov dummy	An indicator variable that takes a value of one if a bond covenant contains any investment restrictions, dividend restrictions, subsequent financing restrictions, or event-related restrictions.
Loan characteristics at initiation (source: Dealscan)	
CovIntensity	The covenant intensity index assigns one point to each of six types of loan covenants: security, dividend restrictions, two or more restricted financial ratios, asset sweep, debt sweep, and equity sweep, and then calculates the sum (following Bradley and Roberts (2004)). The index ranges between zero and six.
CovIntensity_1	An indicator variable that takes a value of one if CovIntensity is one.
CovIntensity_2	An indicator variable that takes a value of one if CovIntensity is two.
CovIntensity_3	An indicator variable that takes a value of one if CovIntensity is three.
CovIntensity_above3	An indicator variable that takes a value of one if CovIntensity is greater than three.
FinancialCov	The total number of financial covenants contained in the loan facility.
FinancialCov_1	An indicator variable that takes a value of one if FinancialCovSum is one.
FinancialCov_2	An indicator variable that takes a value of one if FinancialCovSum is two.
FinancialCov_3	An indicator variable that takes a value of one if FinancialCovSum is three.
FinancialCov_above3	An indicator variable that takes a value of one if FinancialCovSum is greater than three.
CovStrictness	The probability a loan contract breaches its covenant threshold, which follows Murfin's (2012) measure.
Loan-to-asset	Loan-to-asset is equal to the amount of bank loans divided by the total assets at the end of the fiscal year of bond issuance.
Loan-to-liability	Loan-to-liability is equal to the amount of bank loans divided by the total liabilities of the firm at the end of the fiscal year of bond issuance.

Relationship lender dummy	Equals one if there is any loan provided by the same lender in the previous 5 years before the loan initiation, which follows Bharath, Dahiya, Saunders, and Srinivasan (2011).
Instrumental variable (source: Bankscope)	
Change Tier 1	The smallest annual change of the amount of Tier 1 Capital (in billions of dollars) among major lenders in a loan facility. If there is more than one loan facility outstanding at each bond issuance date, we use the loan facility with the strictest covenant if the identities of major lenders are available, or the next strictest loan if the lender identities of the most strict loan are not available.
Borrower and industry characteristics (source: Compustat and CRSP)	
Size	The natural logarithm of book assets in millions of dollars.
Leverage	Book value of total debt divided by book value of assets.
Market-to-book	The ratio of market value of assets (total book assets minus book value of equity plus market value of equity) to total assets.
Interest coverage	EBITDA divided by the interest expense.
ROA	The ratio of EBITDA to total assets.
DTD	The distance-to-default measure calculated according to Bharath and Shumway (2008).
Industry distress dummy	An indicator variable that takes a value of one if the median stock return of firms in a two-digit SIC industry is -30% or less in a given year.
Debt structure (source: Mergent FISD and CapIQ)	
Bondholder dispersion	One minus the Herfindahl-Hirschmen Index (HHI) of bonds outstanding (HHI of bonds outstanding is defined as the sum of squared values of each outstanding bond amount divided by the total bond outstanding amount).

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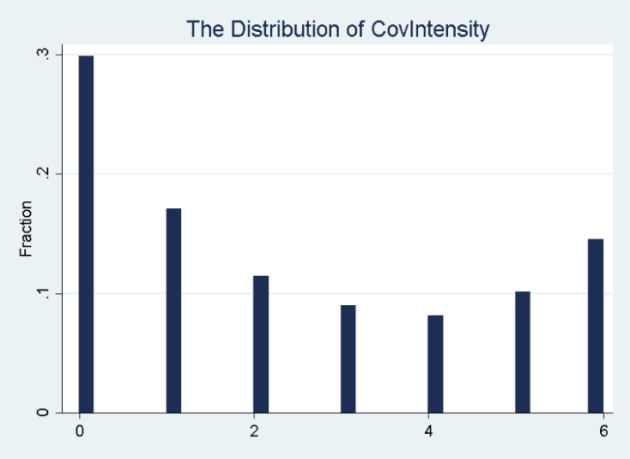
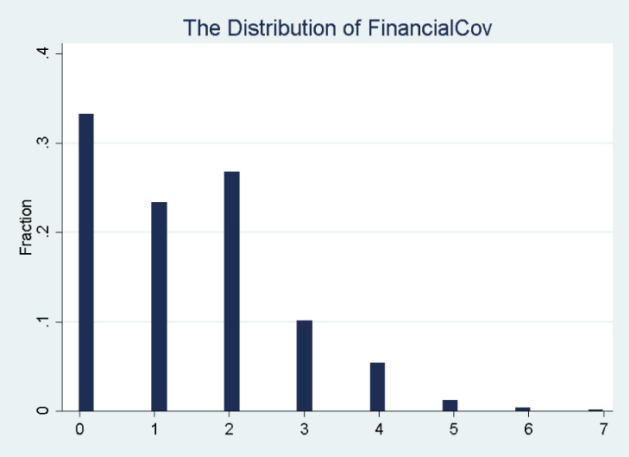
Figure 1: The Distribution of Covenant Intensity, Financial Covenants, and Covenant Strictness

The figure shows the distribution of three measures of senior loan lender control based on covenants for loans in our sample. The first measure, *CovIntensity*, counts the number of covenants in six categories following Bradley and Roberts (2004). The second measure, *FinancialCov*, counts the number of financial covenants in the loan contract. Higher values of either measure represent stricter covenants. The third measure provides an indication of how close a firm is to threshold measures used in its financial covenants. Higher values of this measure, *CovStrictness*, suggest that the firm is closer to threshold boundaries.





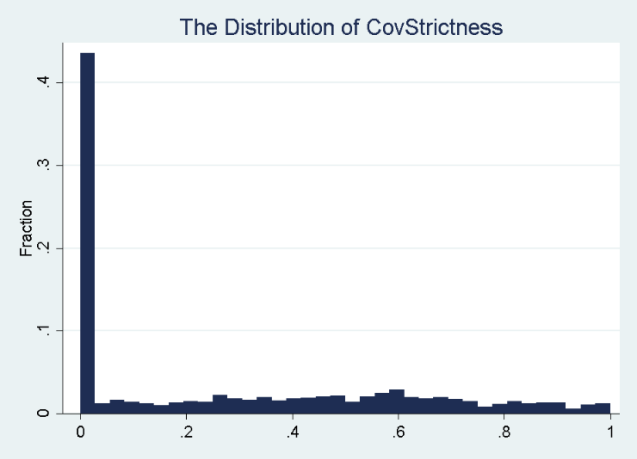
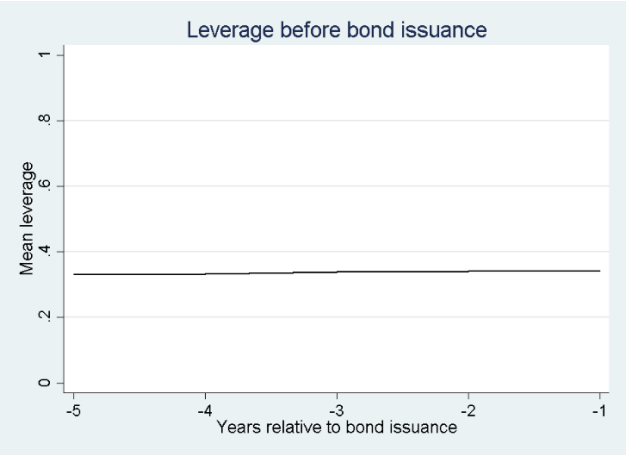
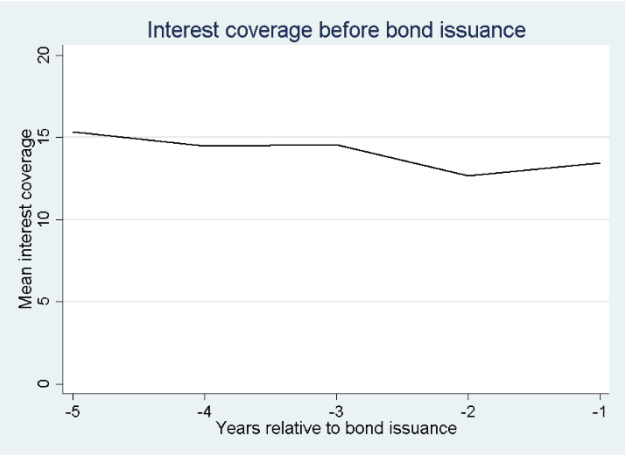


Figure 2: Mean Leverage, Interest Coverage, and Cash to Assets before Bond Issuance

The figures plot the average values of leverage (total debt to total assets), interest coverage (EBITDA to interest expense) and cash to total assets in the years before a bond issue. Negative numbers represent the number of years prior to the issue.





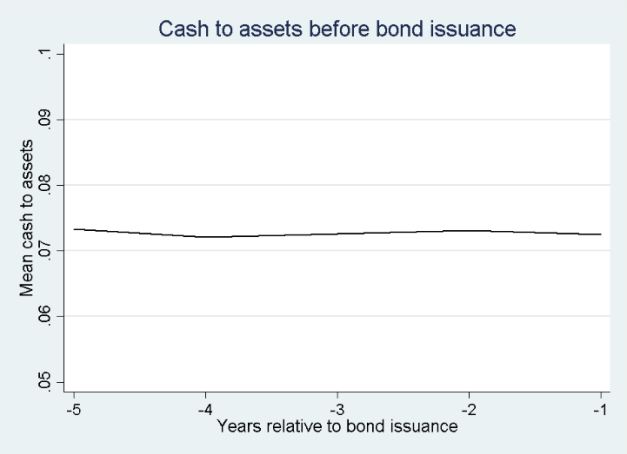


Figure 3: The Relationship between *FinancialCov* and Predicted Bond Yield Spread

The figure presents the incremental influence of additional financial covenants on bond yield spread. The horizontal axis indicates the number of financial covenants on a loan, ranging from 0 to 4 or greater. Loans without covenants have a yield spread just under 1.6%. To this value, we add the coefficient estimates for each incremental financial covenant as provided by estimates in Table 3. Note that the incremental effect of increasing loan financial covenants on bond yields shown here is after controlling for bond, firm, and industry characteristics in addition to year and industry fixed effects.

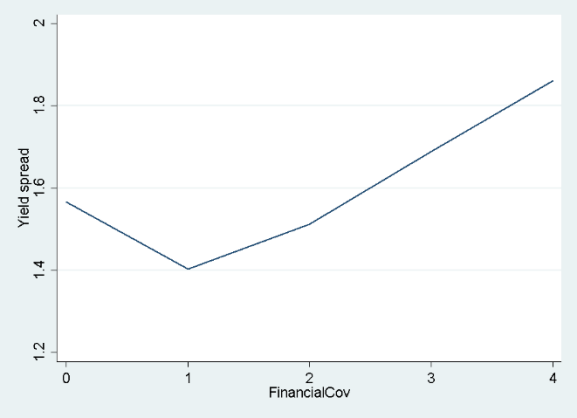


Table 1: Bond Issuance Sample

This table presents bond characteristics by year. Our sample comprises firm years in Mergent FISD from 1992 to 2012. Statistics reported in Panel A are the number of bonds issued and the unique number of issuers across years. Panel B displays bond characteristics; Panel C displays the seniority of bonds issued; Panel D displays summary statistics for the four major types of bond covenants, based on Smith and Warner (1979) and Chava, Kumar, and Warga (2010); Panel E displays the distribution of bond ratings above and below investment grade.

Panel A: Annual distribution

Year	# of issuance	# of unique issuers
1992	126	82
1993	74	56
1994	123	88
1995	164	113
1996	244	150
1997	314	192
1998	245	159
1999	145	92
2000	264	183
2001	248	167
2002	271	190
2003	224	167
2004	194	125
2005	175	123
2006	216	138
2007	220	123
2008	359	230
2009	348	243
2010	330	194
2011	327	201
2012	143	88
Total	4,754	3,104

Panel B: Bond characteristics

	N	Mean	SD	Median
Offering yield (%)	4,754	6.689	2.310	6.694
Yield spread (%)	4,754	2.288	1.932	1.825
Offering amount ($ million)	4,754	300.000	401.350	445.761
Bond maturity	4,754	12.126	10.303	10.014

Panel C: Bond seniority

	N	Percent
Senior secured	459	9.66%
Senior unsecured	4,081	85.84%
Senior subordinate	165	3.47%
Subordinate	49	1.03%

Panel D: Bond covenant

	N	Mean	SD	Median
Bond cov dummy	4,754	0.753	0.431	1.000
Investment restrictions	4,754	0.685	0.465	1.000
Dividend restrictions	4,754	0.097	0.297	0.000
Subsequent financing restrictions	4,754	0.696	0.460	1.000
Event-related restrictions	4,754	0.540	0.498	1.000

Panel E: Issuer bond ratings

	N	Percent
Investment grade	3,524	74.13%
Non-investment grade	1,230	25.87%

Table 2: Summary Statistics on Loans and Borrowers

This table presents the number of observations (N), mean, standard deviation (SD), and median of loan characteristics at initiation and borrower characteristics. All variables are defined in the appendix. The loan characteristics are from the loan with the highest level of covenant usage for firms who issued bonds in the sample described in Table 1 originating from Mergent FISD and the years 1992 to 2012.

Variables	N	Mean	SD	Median
Loan characteristics at initiation				
CovIntensity	4,754	2.369	2.208	2.000
CovIntensity_1	4,754	0.171	0.376	0.000
CovIntensity_2	4,754	0.114	0.318	0.000
CovIntensity_3	4,754	0.090	0.286	0.000
CovIntensity_above3	4,754	0.327	0.469	0.000
FinancialCov	4,754	1.363	1.280	1.000
FinancialCov_1	4,754	0.232	0.422	0.000
FinancialCov_2	4,754	0.267	0.443	0.000
FinancialCov_3	4,754	0.100	0.300	0.000
FinancialCov_above3	4,754	0.069	0.253	0.000
CovStrictness	4,754	0.282	0.313	0.165
Loan-to-assets	4,754	0.385	0.394	0.252
Loan-to-liability	4,754	0.577	0.535	0.402
Relationship lender dummy	4,420	0.489	0.344	0.500
Borrower characteristics				
Size	4,754	8.606	1.521	8.674
Leverage	4,754	0.343	0.194	0.314
Interest coverage	4,754	11.431	17.520	6.503
Market-to-book	4,754	1.409	0.836	1.161
ROA	4,754	0.145	0.076	0.140
DTD	4,754	6.984	4.201	6.716
Industry distress dummy	4,754	0.114	0.318	0.000

Table 3: Loan Covenants and Bond Yield Spread

This table presents OLS regression estimates for the relationship between loan covenant intensity or the number of financial covenants and bond yield spread at issuance. CovIntensity refers to the covenant intensity measure of Bradley and Roberts (2004). FinancialCov equals the sum of financial covenants in a loan facility. Dummy variables representing the precise score on both measures are provided in Columns (2) and (4). Full variable definitions are provided in the appendix. Our sample comprises firm years in Mergent FISD from 1992 to 2012. High dimensional fixed effects based on interactions of industries and year dummies are included in Columns (1) to (4). Standard errors are clustered at the firm level and displayed in parenthesis below. Superscripts ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	(1) OLS Yield spread	(2) OLS Yield spread	(3) OLS Yield spread	(4) OLS Yield spread
CovIntensity	0.068***			
	(0.013)			
CovIntensity_1		0.039		
		(0.069)		
CovIntensity_2		0.045		
		(0.078)		
CovIntensity_3		0.130		
		(0.091)		
CovIntensity_above3		0.325***		
		(0.067)		
FinancialCov			0.052**	
			(0.024)	
FinancialCov_1				-0.158***
				(0.058)
FinancialCov_2				-0.046
				(0.069)
FinancialCov_3				0.134
				(0.107)
FinancialCov_above3				0.310**
				(0.124)
Log (offering amount)	0.208***	0.212***	0.226***	0.228***
	(0.041)	(0.041)	(0.041)	(0.041)
Bond maturity	0.007***	0.007***	0.007***	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)
Bond secured dummy	0.498**	0.506**	0.526**	0.478**
	(0.203)	(0.203)	(0.205)	(0.206)
Bond issuance rating	0.032***	0.031***	0.036***	0.036***
	(0.010)	(0.009)	(0.010)	(0.010)
Bond cov dummy	-0.453***	-0.457***	-0.474***	-0.457***
	(0.065)	(0.065)	(0.065)	(0.065)
Size	-0.444***	-0.453***	-0.462***	-0.462***
	(0.027)	(0.027)	(0.027)	(0.027)
Leverage	0.824***	0.848***	0.883***	0.839***
	(0.179)	(0.178)	(0.180)	(0.180)
Interest coverage	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Market-to-book	-0.159***	-0.165***	-0.168***	-0.170***
	(0.043)	(0.043)	(0.044)	(0.043)
ROA	-2.992***	-2.978***	-3.024***	-2.991***
	(0.492)	(0.493)	(0.492)	(0.490)
DTD	-0.109***	-0.110***	-0.112***	-0.109***
	(0.009)	(0.009)	(0.009)	(0.009)
Industry distress dummy	0.639***	0.637***	0.662***	0.683***
	(0.107)	(0.108)	(0.107)	(0.108)
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry × year fixed effects	Yes	Yes	Yes	Yes
Observations	4,754	4,754	4,754	4,754
Adjusted R-squared	0.682	0.682	0.680	0.682

Table 4: Loan Covenants and Bond Yield Spread with Bond Subordination Controls

This table presents OLS regression estimates for the relationship between loan covenant usage and bond yield spread at issuance. CovIntensity is the sum of six independent categories of covenants, as defined by Bradley and Roberts (2004). FinancialCov is the number of financial covenants included on the loan. Each column includes an additional measure of the degree of bond subordination as reflected by the debt capital structure of the firm. Specifically, these are the level of loan to assets and loan to liabilities. All our variables are defined in the appendix. Our sample comprises firm years in Mergent FISD from 1992 to 2012. High dimensional fixed effects based on interactions of industries and year dummies are included in all models. Standard errors are clustered at the firm level and displayed in parenthesis below. Superscripts ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	(1) OLS Yield spread	(2) OLS Yield spread	(3) OLS Yield spread	(4) OLS Yield spread
CovIntensity	0.067***	0.067***		
	(0.014)	(0.014)		
FinancialCov			0.043*	0.042*
			(0.025)	(0.025)
Loan-to-assets	0.005		0.107	
	(0.097)		(0.095)	
Loan-to-liability		0.009		0.080
		(0.064)		(0.061)
Log (offering amount)	0.208***	0.208***	0.223***	0.222***
	(0.041)	(0.041)	(0.042)	(0.041)
Bond maturity	0.007***	0.007***	0.007***	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)
Bond secured dummy	0.498**	0.499**	0.524**	0.532***
	(0.203)	(0.204)	(0.204)	(0.205)
Bond issuance rating	0.032***	0.032***	0.036***	0.036***
	(0.010)	(0.010)	(0.010)	(0.010)
Bond cov dummy	-0.454***	-0.454***	-0.475***	-0.476***
	(0.065)	(0.065)	(0.065)	(0.065)
Size	-0.444***	-0.443***	-0.455***	-0.452***
	(0.028)	(0.028)	(0.028)	(0.029)
Leverage	0.820***	0.821***	0.805***	0.858***
	(0.188)	(0.179)	(0.190)	(0.180)
Interest coverage	0.000	0.000	0.000	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Market-to-book	-0.159***	-0.159***	-0.166***	-0.167***
	(0.043)	(0.043)	(0.043)	(0.043)
ROA	-2.994***	-2.994***	-3.059***	-3.037***
	(0.491)	(0.491)	(0.492)	(0.491)
DTD	-0.109***	-0.109***	-0.112***	-0.112***
	(0.009)	(0.009)	(0.009)	(0.009)
Industry distress dummy	0.639***	0.639***	0.657***	0.658***
	(0.107)	(0.107)	(0.107)	(0.107)
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry × year fixed effects	Yes	Yes	Yes	Yes
Observations	4,754	4,754	4,754	4,754
Adjusted R-squared	0.682	0.682	0.680	0.680

Table 5: Two-Stage Least Squared Regressions for Covenant Tightness

This table presents the instrumental variable regression to address the potential endogeneity in covenant usage. FinancialCov is the sum of financial covenants in a loan facility. CovIntensity is the sum of six independent categories of covenants, as defined by Bradley and Roberts (2004). Change in Tier 1 is used as the instrument, which is equal to the change in the amount of Tier 1 Capital in billions on the balance sheet of the major lender with the smallest change in Tier 1 Capital in the loan facility with the strictest covenants. First-stage regression for Column (1) is reported in Column (2); first-stage regression for Column (3) is reported in Column (4). All first-stage and second-stage regressions control for firm and industry characteristics. F-tests for weak identification and weak instruments are presented. All our variables are defined in the appendix. Our sample comprises firm years in Mergent FISD from 1992 to 2012. Year, industry, and high dimensional fixed effects based on the interaction of year and industry are included in all regressions. Standard errors are clustered at the bond issuance level and are displayed in parentheses below. Superscripts ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)
	Yield spread	CovIntensity	Yield spread	FinancialCov
	2nd stage	*1st stage*	*2nd stage*	*1st stage*
CovIntensity (predicted)	0.297**			
	(0.149)			
FinancialCov (predicted)			0.939*	
			(0.557)	
Change Tier 1		-0.043***		-0.014**
		(0.008)		(0.005)
Log (offering amount)	0.175*	0.507***	0.150	0.186***
	(0.092)	(0.082)	(0.123)	(0.056)
Bond maturity	0.010***	-0.004	0.011***	-0.002
	(0.003)	(0.004)	(0.003)	(0.002)
Bond secured dummy	0.520*	0.969***	0.284	0.557***
	(0.313)	(0.299)	(0.433)	(0.209)
Bond issuance rating	0.023	0.084***	0.029	0.020
	(0.019)	(0.022)	(0.021)	(0.014)
Bond cov dummy	-0.283***	-0.427***	-0.268**	-0.151*
	(0.109)	(0.130)	(0.134)	(0.083)
Size	-0.256***	-0.610***	-0.054	-0.408***
	(0.098)	(0.053)	(0.230)	(0.036)
Leverage	-0.021	2.074***	-0.644	1.318***
	(0.382)	(0.330)	(0.775)	(0.205)
Interest coverage	-0.002	0.005	-0.001	0.000
	(0.003)	(0.004)	(0.003)	(0.003)
Market-to-book	-0.127	-0.223***	0.052	-0.261***
	(0.082)	(0.081)	(0.164)	(0.055)
ROA	-1.687*	-3.325***	-1.745*	-0.990
	(0.887)	(1.029)	(0.945)	(0.728)
DTD	-0.118***	-0.082***	-0.107***	-0.037***
	(0.020)	(0.019)	(0.029)	(0.013)
Industry distress dummy	0.716***	0.223	0.834***	-0.055
	(0.147)	(0.184)	(0.163)	(0.117)
Weak identification test				
Cragg-Donald Wald F statistic	26.120		6.142	
Stock-Yogo weak ID test critical values	16.380		16.380	
Weak instrument test				
Anderson-Rubin Wald test p-value	0.049		0.049	
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry × year fixed effects	Yes	Yes	Yes	Yes
Observations	2,226	2,226	2,226	2,226
Adjusted R-squared	0.635	0.643	0.476	0.619

Table 6: Covenant Strictness and Bond Yield Spread

This table presents matching regression estimates for the relationship between covenant strictness and bond yield spread at issuance. This table reports the matching regression estimates with CovStrictness used as the variable of interest. CovStrictness is the probability that a firm breaches any of the financial covenant thresholds, as defined by Murfin (2012). Column (1) reports the regression estimates for the unmatched sample. Column (2) presents results for firms in the top 25% of CovStrictness and their matches. Firms are matched using the closest year, one-digit SIC industry, and distance-to-default. Variables are defined as in the appendix. Our sample comprises firm years in Mergent FISD from 1992 to 2012. High dimensional fixed effects based on interactions of industries and year dummies are included in all models. Standard errors are clustered at the firm level and displayed in parenthesis below. Superscripts ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	(1) OLS Yield spread Unmatched sample	(2) OLS Yield spread Treated in top 25%
CovStrictness	0.311***	0.211*
	(0.103)	(0.119)
Log (offering amount)	0.156***	0.166**
	(0.043)	(0.068)
Bond maturity	0.011***	0.009***
	(0.001)	(0.002)
Bond secured dummy	0.159	0.369
	(0.281)	(0.424)
Bond issuance rating	0.040***	0.043*
	(0.013)	(0.023)
Bond cov dummy	-0.129*	-0.180*
	(0.066)	(0.105)
Size	-0.243***	-0.489***
	(0.060)	(0.113)
Leverage	0.183	0.527
	(0.352)	(0.647)
Interest coverage	-0.000	0.001
	(0.002)	(0.005)
Market-to-book	-0.154***	-0.326***
	(0.048)	(0.114)
ROA	-2.255***	-3.484***
	(0.630)	(1.231)
DTD	-0.066***	-0.081***
	(0.009)	(0.021)
Industry distress dummy	0.436***	0.234
	(0.097)	(0.186)
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Industry × year fixed effects	Yes	Yes
Observations	4,754	2,792
Adjusted R-squared	0.787	0.851

Table 7: Interations with Distance-to-Default

This table presents regression estimates for the relationship between covenant intensity, financial covenants, and covenant strictness and bond yield for firms with different credit risk. FinancialCovSum equals the sum of financial covenants in a loan facility. CovIntensity is the sum of six independent categories of covenants, as defined by Bradley and Roberts (2004). CovStrictness is the probability that a firm breaches any of the financial covenant thresholds, as defined by Murfin (2012). All three measures of covenant usage (CovIntensity, FinancialCov, and CovStrictness) are interacted with the DTD variable. All our variables are defined in the appendix. Our sample comprises firm years in Mergent FISD from 1992 to 2012. High dimensional fixed effects based on interactions of industries and year dummies are included in all models. Standard errors are clustered at the firm level and displayed in parenthesis below. Superscripts ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	(1) OLS Yield Spread	(2) OLS Yield spread	(3) OLS Yield Spread
CovIntensity	0.141***		
	(0.023)		
CovIntensity*DTD	-0.012***		
	(0.003)		
FinancialCov		0.146***	
		(0.039)	
FinancialCov*DTD		-0.018***	
		(0.005)	
CovStrictness			0.756***
			(0.165)
CovStrictness*DTD			-0.101***
			(0.019)
Log (offering amount)	0.213***	0.234***	0.235***
	(0.041)	(0.041)	(0.042)
Bond maturity	0.007***	0.007***	0.007***
	(0.002)	(0.002)	(0.001)
Bond secured dummy	0.432**	0.482**	0.462**
	(0.203)	(0.204)	(0.204)
Bond issuance rating	0.032***	0.035***	0.035***
	(0.009)	(0.010)	(0.010)
Bond cov dummy	-0.435***	-0.461***	-0.454***
	(0.065)	(0.065)	(0.065)
Size	-0.450***	-0.475***	-0.482***
	(0.027)	(0.027)	(0.026)
Leverage	0.756***	0.843***	0.854***
	(0.179)	(0.180)	(0.180)
Interest coverage	-0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)
Market-to-book	-0.156***	-0.168***	-0.175***
	(0.043)	(0.043)	(0.044)
ROA	-3.031***	-3.031***	-3.024***
	(0.491)	(0.492)	(0.494)
DTD	-0.080***	-0.089***	-0.086***
	(0.011)	(0.011)	(0.010)
Industry distress dummy	0.632***	0.657***	0.647***
	(0.108)	(0.108)	(0.108)
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Industry × year fixed effects	Yes	Yes	Yes
Observations	4,754	4,754	4,754
Adjusted R-squared	0.684	0.682	0.683

Table 8: The Role of Relationship Lender

This table reports the results for the subsample analysis of the role of relationship lender. The relationship lender dummy is equal to one if there is a relationship loan obtained by the same major lender in the past 5 years, and equals zero otherwise. FinancialCov equals the sum of financial covenants in a loan facility. CovIntensity is the sum of six independent categories of covenants, as defined by Bradley and Roberts (2004). CovStrictness is the probability that a firm breaches any of the financial covenant thresholds, as defined by Murfin (2012). All our variables are defined in the appendix. Our sample comprises firm years in Mergent FISD from 1992 to 2012. The dependent variable in all regressions is bond yield spread. High dimensional fixed effects based on interactions of industries and year dummies are included in all models. Standard errors are clustered at the firm level and displayed in parentheses below. Superscripts ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Relationship lender dummy =1	Relationship lender dummy =0	Relationship lender dummy =1	Relationship lender dummy =0	Relationship lender dummy =1	Relationship lender dummy =0
	Yield spread	Yield spread	Yield spread	Yield spread	Yield spread	Yield spread
	OLS	OLS	OLS	OLS	OLS	OLS
CovIntensity	0.086***	0.091***				
	(0.022)	(0.024)				
FinancialCov			0.062	0.084**		
			(0.042)	(0.040)		
CovStrictness					0.066	0.420***
					(0.141)	(0.158)
Log (offering amount)	0.106*	0.316***	0.132**	0.341***	0.138**	0.340***
	(0.063)	(0.068)	(0.063)	(0.069)	(0.064)	(0.069)
Bond maturity	0.010***	0.006**	0.010***	0.006**	0.010***	0.006*
	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)
Bond secured dummy	0.115	0.903***	0.140	0.946***	0.149	0.933***
	(0.363)	(0.283)	(0.368)	(0.285)	(0.368)	(0.284)
Bond issuance rating	0.031**	0.036**	0.034**	0.041**	0.035**	0.038**
	(0.015)	(0.017)	(0.015)	(0.017)	(0.015)	(0.017)
Bond cov dummy	-0.377***	-0.559***	-0.407***	-0.576***	-0.413***	-0.590***
	(0.101)	(0.107)	(0.101)	(0.106)	(0.102)	(0.106)
Size	-0.445***	-0.403***	-0.475***	-0.426***	-0.494***	-0.432***
	(0.044)	(0.042)	(0.045)	(0.043)	(0.044)	(0.042)
Leverage	0.884***	0.471*	0.942***	0.526*	1.018***	0.455
	(0.291)	(0.285)	(0.303)	(0.289)	(0.296)	(0.294)
Interest coverage	0.003	-0.002	0.003	-0.002	0.003	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Market-to-book	-0.180***	-0.034	-0.191***	-0.037	-0.202***	-0.044
	(0.060)	(0.087)	(0.061)	(0.089)	(0.061)	(0.087)
ROA	-2.979***	-3.185***	-3.017***	-3.361***	-3.021***	-3.215***
	(0.763)	(0.834)	(0.779)	(0.831)	(0.784)	(0.834)
DTD	-0.088***	-0.147***	-0.091***	-0.152***	-0.092***	-0.151***
	(0.014)	(0.016)	(0.014)	(0.016)	(0.014)	(0.016)
Industry distress dummy	0.587***	0.772***	0.603***	0.812***	0.599***	0.788***
	(0.160)	(0.190)	(0.161)	(0.188)	(0.162)	(0.189)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry × year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,533	1,887	2,533	1,887	2,533	1,887
Adjusted R-squared	0.712	0.761	0.710	0.759	0.709	0.759

Table 9: The Role of Bondolder Dispersion

This table presents the analysis of covenant intensity, financial covenants, and covenant strictness and bond yield in subsamples with different levels of renegotiation frictions. The dependent variable in the regressions is bond yield spread and the key variables of interest are three measures of covenant usage. FinancialCovSum equals the sum of financial covenants in a loan facility. CovIntensity is the sum of six independent categories of covenants, as defined by Bradley and Roberts (2004). CovStrictness is the probability that a firm breaches any of the financial covenant thresholds, as defined by Murfin (2012). High bondholder dispersion is indicated for dispersion levels in the top 50% of the sample. The dispersion measure follows the renegotiation measures in Davydenko and Strebulaev (2007). All our variables are defined in the appendix. Our sample comprises firm years in Mergent FISD from 1992 to 2012. Year, industry, and high dimensional fixed effects are included in all regressions. Standard errors are clustered at the firm level and displayed in parentheses below. Superscripts ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	High bondholder dispersion	Low bondholder dispersion	High bondholder dispersion	Low bondholder dispersion	High bondholder dispersion	Low bondholder dispersion
	Yield spread	Yield spread	Yield spread	Yield spread	Yield spread	Yield spread
	OLS	OLS	OLS	OLS	OLS	OLS
CovIntensity	0.118***	0.043**				
	(0.023)	(0.020)				
FinancialCov			0.086*	0.049		
			(0.047)	(0.035)		
CovStrictness					0.257**	0.182
					(0.123)	(0.144)
Log (offering amount)	0.216***	0.146*	0.249***	0.154**	0.256***	0.154**
	(0.049)	(0.077)	(0.050)	(0.076)	(0.050)	(0.076)
Bond maturity	0.011***	-0.000	0.011***	-0.000	0.011***	-0.000
	(0.002)	(0.004)	(0.002)	(0.004)	(0.002)	(0.004)
Bond secured dummy	0.659**	0.555*	0.705**	0.561*	0.703**	0.567*
	(0.307)	(0.323)	(0.321)	(0.323)	(0.320)	(0.323)
Bond issuance rating	0.011	0.039**	0.022*	0.040**	0.022	0.040**
	(0.013)	(0.018)	(0.013)	(0.018)	(0.013)	(0.018)
Bond cov dummy	-0.412***	-0.537***	-0.448***	-0.541***	-0.446***	-0.549***
	(0.102)	(0.097)	(0.104)	(0.097)	(0.104)	(0.097)
Size	-0.279***	-0.533***	-0.305***	-0.537***	-0.316***	-0.542***
	(0.044)	(0.047)	(0.047)	(0.047)	(0.044)	(0.047)
Leverage	0.437	0.863***	0.577*	0.872***	0.607**	0.876***
	(0.289)	(0.261)	(0.307)	(0.263)	(0.294)	(0.262)
Interest coverage	-0.000	0.001	0.001	0.001	0.001	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Market-to-book	0.007	-0.220***	-0.006	-0.224***	-0.012	-0.229***
	(0.065)	(0.066)	(0.066)	(0.066)	(0.066)	(0.066)
ROA	-3.199***	-2.654***	-3.339***	-2.669***	-3.269***	-2.625***
	(0.610)	(0.766)	(0.618)	(0.764)	(0.626)	(0.766)
DTD	-0.110***	-0.114***	-0.119***	-0.116***	-0.121***	-0.115***
	(0.015)	(0.014)	(0.015)	(0.015)	(0.015)	(0.015)
Industry distress dummy	0.889***	0.584***	0.882***	0.604***	0.851***	0.598***
	(0.178)	(0.166)	(0.179)	(0.166)	(0.178)	(0.167)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry × year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,331	2,331	2,331	2,331	2,331	2,331
Adjusted R-squared	0.745	0.702	0.740	0.701	0.740	0.701