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PII: S0929-1199(20)30243-1

DOI: https://doi.org/10.1016/j.jcorpfin.2020.101799

Reference: CORFIN 101799

To appear in: *Journal of Corporate Finance*

Received date: 25 June 2020

Revised date: 18 November 2020

Accepted date: 19 November 2020

Please cite this article as: S.A. Mansi, Y. Qi and J.K. Wald, Bond covenants, bankruptcy risk, and the cost of debt, *Journal of Corporate Finance* (2020), https://doi.org/10.1016/j.jcorpfin.2020.101799

Bond Covenants, Bankruptcy Risk, and the Cost of Debt

Sattar A. Mansi, Yaxuan Qi, and John K. Wald*

Abstract

Are all covenants equally effective at reducing the bondholder-shareholder conflict? Examining the most frequently used bond covenants, we document that four out of 24 restrictions are associated with significantly higher bankruptcy risk. The use of these Default Indicating covenants can be partly explained by faulty contract design, greater recovery in bankruptcy, or within-creditor conflicts. Firms that use In-House Counsel to help structure their bond issue and those that use Big 4 Auditors are also less likely to include Default Indicating covenants in their bonds. Further tests show that the use of these Default Indicating covenants is associated with higher bond and CDS spreads. Overall, the results help explain the prior evidence on the relation between covenant use and the cost of debt.

JEL Codes: G12, G33, G34

Keywords: Survival analysis, Bond covenants, Bankruptcy risk, Cost of debt

November 16, 2020

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1. Introduction

The decision whether to include covenants in bond contracts is central to the conflict between shareholders and bondholders (Jensen and Meckling, 1976). Any discussion of how to constrain managers from benefiting stockholders to the detriment of bondholders must address this issue.[1] In their seminal work, Smith and Warner (1978) argue that when contracting is costly, debt covenants provide a tradeoff between the reduction in the agency problems associated with debt and the costs of negotiating and enforcing covenants, as well as the potential loss of financial flexibility that covenants entail. This hypothesis implies that the use of more covenants decreases the probability of default, and therefore debt with more covenants has a lower financing cost. Recent research, however, suggests that the use of some covenants is influenced by factors other than those related to the bondholder-shareholder conflict. Chava, Kumar, and Warga (2010), for instance, find that managerial entrenchment and fraud play an important role in the use of bond covenants. Lou and Otto (2020) show that firms with more dispersed debt structure use more covenants in their corporate loans.

We study how the use of individual covenants in bond contracts affects default risk. We focus on publicly traded bonds because, unlike loan agreements, bond covenant violations are generally non-negotiable, typically lead to bankruptcy, and have different effects on firm survival. Dichev and Skinner (2002), in a sample of bank loans, find that covenants are used as trip wires for lenders but are not associated with bankruptcy. Roberts and Sufi (2009) show that loan covenant violations lead to decreases in debt availability, and Denis and Wang (2014) document that even in the absence of violations, loan covenants are frequently renegotiated and are associated with changes in financial and investment policy. In contrast, the bonds we examine are typically widely traded and cannot be renegotiated. If covenants are included in bond contracts to reduce the bondholder-shareholder conflict, then we would expect the inclusion of these provisions to be associated with lower default risk as they reduce the firm's ability to expropriate from bondholders. After all, if a particular covenant is associated with an increase in default risk, this covenant would be detrimental to the bondholders that it is designed to protect.[2] We test the hypothesis that covenants decrease

[1] Possible issues associated with the bondholder–stockholder conflict include large dividend payouts, claim dilution, risk shifting, underinvestment, and acquisitions that increase leverage and affect debt seniority.

[2] One possible mitigating factor is whether some covenants also impact recovery rates. We examine this issue in detail in section 5.2 below.

bankruptcy risk using survival and probit analysis while controlling for other characteristics, using a matched sample analysis, or controlling for firm fixed effects.

Using a large sample of bond covenants over the period 1980-2014, we find that four out of 24 bond covenants are associated with higher default risk. In a survival model, these four covenants have both a statistically significant and an economically large impact on default, with the inclusion of one additional Default Indicating covenant raising the default probability by about 65%. These Default Indicating covenants include rating decline trigger puts, restrictions on investments, net worth maintenance, and restrictions on certain transactions with subsidiaries. The remaining 20 covenants are, as expected, either associated with decreasing default risk or have little measurable effect. Additionally, we find that the use of these Default Indicating covenants can be explained by faulty contract design, greater recovery in bankruptcy, or within creditor conflicts.[3] We further show that these Default Indicating covenants are associated with higher bond and CDS spreads and thus a lower firm value.

Existing theory provides some justification for why some covenants would increase default risk. In the case of rating decline puts, Bhanot and Mello (2006) find that these contracts can lead to inefficient incentives and greater risk, depending on how the rating trigger is structured. In particular, Bhanot and Mello show that these triggers can intensify the asset substitution problem while increasing the probability of bankruptcy. Recently, Gilje (2016) shows that rather than shift to riskier investments, firms that are closer to default are more likely to move to safer investments. Consistent with this finding, we document that covenants that restrict investments, and therefore preclude shifting to safer investments, are associated with a higher probability of default.[4] We also find that the net worth maintenance covenant is associated with greater default risk. While this covenant has not been addressed explicitly in the literature, there is related work that considers whether bankruptcy codes that are overly debtor friendly can cause inefficient liquidation (e.g., Acharya, Sundaram, and John, 2011). A covenant which forces liquidation if assets fall below a certain level may similarly cause reductions in risk taking or inefficient early liquidation leading to an increase in default risk. The last Default Indicating covenant restricts transactions with subsidiaries,

[3] Robin, Wu, and Zhang (2017) show that high-quality auditors are associated with both fewer and looser covenants in loan contracts. More recently, El Ghoul, Guedhami, Pittman, and Rizeanu (2016), in an international study, find that higher-quality audits substitute for short-term debt for monitoring purposes.

[4] Smith and Warner (1979) describe the difficulties in having covenants restricting investments. They write, "investment policy can be very expensive to monitor, since ascertaining that the firm's production/investment policy does not maximize the firm's market value depends on magnitudes which are costly to observer. Solutions to this problem are not obvious." (p. 130)

and this covenant may be associated with an increase in default risk simply because it reduces financial flexibility more than it reduces agency problems.

We provide three hypotheses for the why these Default Indicating covenants are included in bond agreements. First, we consider whether the use of some covenants reflects faulty contract design, where firms add a new covenant to a debt contract in an attempt to innovate, but then over time the market learns that the covenant is not value increasing (e.g., Hillion and Vermaelen, 2004). Second, we analyze whether these covenants limit the firm's ability to waste assets in ways that increase the recovery value of the firm in default. Third, we posit that the Default Indicating covenants are included because of potential conflicts of interest among the different groups of debtholders (e.g., Lou and Otto, 2020). The alternative to these three hypotheses is that the use of Default Indicating covenants reflects some unobserved characteristic of the firms that use them, and we consider a number of specifications and tests to allay, although not necessarily completely remove, this concern.

We test these hypotheses empirically, and find some support for all three possibilities. We find that some Default Indicating covenants, such as rating decline puts, disappear over time, and this pattern is consistent with the faulty contract design hypothesis. We also find that Default Indicating covenants are associated with an increase in recovery rates in default. This finding echoes the findings by Jankowitsch, Nagler, and Subrahmanyam (2014) of an increase in recovery rates associated with certain investment and financing covenants. Default Indicating covenants are also more likely to exist in debt contracts when the firm does not use a Big 4 Auditor and when the firm does not use In-House Counsel. We further show that a more diverse portfolio of debt holdings, i.e., a lower specialization of debt types as measured by Colla, Ippolito, and Li (2013), is associated with significantly more Default Indicating bond covenants, but that specialization is not significantly related to the use of Other bond covenants. In contrast, in the bank loan market, which is characterized by frequent renegotiations, Lou and Otto (2020) find that lower debt specialization leads to more loan covenant use in general. Overall, these findings indicate that the use of Default Indicating covenants can be partly explained by other agency conflicts or a lack of sufficient monitoring when the contract is drafted.[5]

[5] We note the need for monitoring in the bond markets occurs primarily when the contract is written. Bondholders do little active monitoring as bonds and their covenants cannot be renegotiated. Instead, bondholders have an agent who monitors whether covenant violations occur (typically on an annual basis), but there is much less role than in the loan market for active monitoring. Instead, differences in concentration, the use of more active Big 4 Auditors, and the

Lastly, we consider whether these Default Indicating covenants are priced differently from other covenants. Given the costly contracting hypothesis, we expect that, all else equal, more covenants will imply a lower probability of default, and therefore a lower yield spread. However, as all risk factors are not observed, and as covenants and initial spreads are simultaneously determined, the simple relation between covenants and spreads is often positive (Bradley and Roberts, 2015).[6] We find that yield spreads are significantly higher for each Default Indicating covenant used (about 8% using OLS), and in contrast, Other covenants do not imply higher spreads. We repeat these tests using the prior covenants in contracts written by the same issuers' and the underwriters' law firms as instruments (while controlling for the identity of the underwriter). Karpoff, Schonlau, and Wehrly (2017) justify the use of geography as an instrument for antitakeover provisions because companies in a particular area are more likely to use the same law firms. Using the above instruments, we again find a significant positive relation between Default Indicating covenants and yield spreads, and a negative and significant relation between Other covenants and yield spreads. Thus, for bonds, the positive relation between yield spreads and covenants can be largely explained by considering the subset of covenants which also implies greater default risk.

Similar results are obtained using CDS spreads which should primarily reflect concerns about default rather than other issues such as bond liquidity (Longstaff, Mithal, and Neis, 2005). Specifically, we find that each additional Default Indicating covenant is associated with an increase of about 11% to 14% in CDS spreads, while Other covenants have no statistically or economically significant relation with CDS spreads.

One concern regarding our analysis is that there exists some unobserved omitted variable, which is related to default risk while causing firms to increase the use of particular covenants. This omitted variable problem could cause endogeneity between our covenant and bankruptcy measures. However, we find this explanation unlikely for several reasons. First, our results hold under numerous robustness tests designed to reduce the effect of possible unobserved effects. Our results are robust to a matched sample analysis and firm fixed effects. Second, we examine the relation between firms' bankruptcy incidence and covenant use when the bond was issued. The average (median) time span between bond issuance and bankruptcy filing (for those firms that go bankrupt)

use of General Counsel are important when the original bond agreement is written. Thus, dispersed ownership may imply that less effort is taken by investors to negotiate the fine points of the contract, whereas concentrated debt ownership may focus more attention on contract details.

[6] See Reisel (2014) for a study that examines the pricing of individual bond covenants using a treatment effects model.

is roughly 8.9 (5.8) years in our sample. Hence, it is less plausible that some omitted firm characteristic would simultaneously affect the use of covenants at issuance and the bankruptcy filing many years later. Third, the unobserved agency problems that cause firms to use Default Indicating covenants cannot be remedied by the use of these covenants. That is, the Other covenants may also be caused by unobserved agency problems, but if firms include those covenants, that implies a decrease in default risk, whereas the net effect of Default Indicating covenants is an increase in default risk. Thus, under this alternative story, these covenants are still significantly different than other covenants. Fourth, there are reasons to be skeptical of this alternative explanation in that it ignores the theoretical rationales for why some of these covenants are detrimental to bondholders' interests (e.g., Bhanot and Mello, 2006). Thus, we believe this alternative hypothesis is a less likely explanation for our findings.

Our paper is also related to, but distinct from Riesel (2014), who studies the value of restrictive covenants in the public bond market. First, Riesel's research focuses on the magnitude of the price effect of eight covenants that restrict financing activities, investment activities and payouts. Instead, we examine the effect of all 24 available bond covenants on bankruptcy. We decompose covenants into Default Indicating and Other bond covenants, and show that the Default Indicating covenants are priced in the bond market. Second, Riesel's study offers insights into the magnitude of the increase in the cost of debt due to agency problems. We instead consider how some covenants reflect faulty contract design, greater recovery in bankruptcy, or within-creditor conflicts. Third, our study tests whether the relation between bond spreads and covenants also holds in the CDS market. We find that Default Indicating covenants affect CDS spreads as well as the liquidity of CDS contracts.

The remainder of the paper is organized as follows. Section 2 provides a review of the literature on covenant use, default risk, and the cost of debt. Section 3 details data sources, variable definitions, and summary statistics. Section 4 documents the results of the survival analysis and alternative specifications. Section 5 provides theoretical and empirical evidence as to why firms use Default Indicating covenants. Section 6 shows how different covenants are related to bond yield spreads, and section 7 concludes.

2. Literature Review

Covenants are written into debt contracts to mitigate the bondholder-shareholder conflict thereby reducing financing costs, increasing the availability of debt, and increasing overall firm value (Smith and Warner, 1979). The existing literature emphasizes how the use of covenants is determined by the tradeoff between a loss of operational flexibility and a reduction in financing costs combined with an increase in debt capacity. This literature suggests that firms with more severe bondholder-stockholder agency conflicts are more likely to adopt restrictive covenants while those firms with a need for greater operational flexibility will include fewer covenants (Roberts and Sufi, 2009; Chava and Roberts, 2008; Nash, Netter, and Poulsen, 2003). Firms that use more covenants should then be able to borrow more (Billett, King, and Mauer, 2007), and have lower financing costs (Reisel, 2014; Miller and Reisel, 2012).

Our research extends the tradeoff analysis by considering how covenants affect bankruptcy risk and ultimately the cost of debt. While numerous studies have examined the determinants of covenant choice (e.g., Nash, Netter, and Poulson, 2003) none have directly considered how bond covenants are related to the probability of firm survival. Researchers including Ohlson (1980) and Shumway (2001) have considered which factors reliably predict firms entering bankruptcy. A separate literature considers firms' choices of covenants and how these covenants relate to firms' agency problems. By considering how bond covenant choice is related to the probability of bankruptcy, we provide an analysis that bridges these two literatures. We show that certain covenants are reliable predictors of bankruptcy even after controlling for other measures used to forecast default such as Altman's Z-score or Shumway's expected default frequency.

We also extend the literature on the relation between covenants and the cost of debt. Bradley and Roberts (2015) point out that riskier debt issuers are more likely to include covenants, and this therefore implies a positive relation between covenants and spreads. While Bradley and Roberts apply their self-selection analysis to bank loans, Reisel (2014) applies a similar treatment effects model to bonds. Reisel's findings suggest that the inclusion of covenants reduces bondholders' risk, and this allows the issuance of corporate bonds at lower yield spreads. In contrast, we show that the simple positive relation between covenants and spreads is driven by only a few Default Indicating covenants.

The value of covenants to contracting parties is derived from covenants' ability to limit potentially opportunistic actions of managers (see e.g., Malitz, 1986; Begley, 1994; Begley and Feltham, 1999; Nash, Netter, and Poulson, 2003; Billett, King, and Mauer, 2007; Chava, Kumar, and

Warga, 2009). Moreover, numerous authors have shown that these conflicts increase as the firm gets closer to default (e.g., Barnea, Haugen, and Senbet, 1980). Accordingly, the inclusion of covenants that increase default risk seems nonsensical. However, a number of prior studies have documented that the determinant of covenants could be complex (e.g., Bhanot and Mello, 2006; Billett, King, and Mauer, 2007, Chava, Kumar, and Warga, 2009, Beatty, Liao and Weber, 2012). These covenants appear less successful in protecting creditors from default, and we show that their appearance can be partly explained through either faulty contract design, greater emphasis on recovery in bankruptcy, or due to a lack of debt specialization.

3. Data Sources and Sample Overview

3.1. Data sources

We utilize two main datasets in our analysis: Mergent's Fixed Income Securities database (FISD) and Compustat's Industrial Quarterly database (Compustat). The FISD includes issue- and issuer-specific related variables on U.S. corporate bonds. Issue-specific variables include detailed information on bond covenants, bond features, and credit ratings from Moody's, S&P, and Fitch. The Compustat database contains financial information on firm level data. To avoid reverse causation in our analysis, we use firm data from the quarter prior to the bond issue.

We require both FISD and Compustat to have information pertinent to our analysis. Therefore, we exclude bonds without covenant information (i.e. those with "covenant" data flag set to "No", and "subsequent" data flag set to "No"); unit deals, convertible bonds, agency bonds, and foreign currency bonds; medium-term notes (since these mostly have no covenant information); and bonds issued by government agencies. We also exclude observations with missing financial information. Merging the two datasets provides us with a final sample of 13,973 bond issues (2,072 firms) covering the period from 1984 to 2014.

3.2. Bankruptcy data and bond covenants

The FISD database provides information on bond defaults and bankruptcies. To obtain more comprehensive information on bankruptcy, we augment the FISD bankruptcy data using the SDC bankruptcy database, Moody's Default and Recovery Database (2014 version), and Capital IQ's

screen search of bankrupt firms up to December 31, 2014. We merge the bankruptcy data with our bond sample to identify whether a bond is affected by bankruptcy. We exclude those bankruptcies that are filed before a bond issue or after the bond matures. The Cox survival analysis measures the instantaneous survival probability on any day prior to bankruptcy, prior to bond maturity, or before our sample ends, on December 31, 2014. For bonds whose companies went bankrupt more than once, we only consider up to the first bankruptcy filing. Overall, we identify 1,425 bonds out of 13,973 that are associated with a bankruptcy.[7] This default rate is at the bond-level, and some firms have many bonds in the sample; for example, Lehman Brothers has 439 bonds in the sample and American Airlines has 300 bonds in the sample. We verify that our results are maintained if we exclude both Lehman Brother and American Airlines from the analysis.

For covenants, we consider whether the corporate bond issue includes any covenants and if so, the number of covenants, and more specific variables about the types of covenants used. For each issue, the FISD reports more than 50 variables on bondholder protective, issuer restrictive, and subsidiary restrictive covenants. Because often there are multiple covenants that restrict the same activity, we group the covenant variables into 24 dummies, which indicate whether a specific type of activity is restricted.[8] Our construction of these covenant dummies is similar to that of Billet, King, and Mauer (2007), who group FISD's covenants into 15 indicators, as well as Qi, Roth and Wald (2011), who group FISD covenants into 12 indicators. The majority of our analysis is performed using these 24 indicators. Whereas analyses of loan covenants typically consider the strictness of the language employed, bond covenants are much more boilerplate, and therefore more amenable to an analysis that considers only whether or not a particular covenant is used.

The 24 different types of covenants can be grouped into eight major categories. These include payment restrictions, borrowing restrictions, asset and investment restrictions, stock issuance restrictions, default-related covenants, anti-takeover-related covenants, profit maintenance covenants, and rating trigger covenants. Payment restrictions consist of two covenant dummies: dividend related payments and other restricted payments. Borrowing restrictions include eight

[7] Note that bonds, unlike loans (see, e.g., Roberts, 2015), are almost never renegotiated, and bond defaults are almost always associated with a bankruptcy filing.

[8] For example, a dividend payment dummy indicates whether there exists a covenant limiting dividend payments of the issuer or a subsidiary of the issuer. Similarly, a funded debt dummy specifies whether there is a covenant restricting the issuer or a subsidiary of the issuer from issuing additional debt.

dummies that restrict the firm from additional debt activities.[9] Asset and investment restriction covenants include four dummies: limits on asset sales, restrictions on issuer's or subsidiaries' investments, restrictions on asset transfer between the issuer and its subsidiaries, and restrictions on issuers' transaction with its subsidiaries. Stock issuance restrictions consist of three covenants that limit additional common stock issuance, preferred stock issuance, and stock transfers between the issuer and its subsidiaries.

Default-related covenants include cross-acceleration provisions, which allow bondholders to accelerate their debt if any other debt of the issuer has been accelerated due to a default, and a cross default provision. Anti-takeover related covenants include a poison put, which gives bondholders the option to sell back their bonds to the issuer should a change of control occur, and a merger covenant, which restricts the consolidation or merger of the issuer with another entity. The last two covenant categories are profit maintenance, which includes covenants that require the issuer or its subsidiaries to maintain a minimum earnings ratio or net worth, and rating decline put, which includes a put provision in the event of a rating decline and therefore protects bondholders from credit rating changes.

In addition to the 24 covenant indictors, we create an overall covenant index for bondholder protection by summing the indicators for each bond. We further segment the sample into Default Indicating and Other covenant indices (with the Default Indicating covenants defined as those that are associated with an increase in the probability of default, and the Other covenants including those with either a negative or no significant relation to the probability of default). The Default Indicating covenant index includes restrictions on investments, transfers to subsidiaries, net worth, and bond rating decline puts. Table 1 and Appendix A provide a detailed description of how the covenant indicators and indices are constructed.

3.3. Issue-specific, firm-specific, and other variables

We control for issue-specific characteristics in our regression. Specifically, we control for the size of the offering, the maturity, and the relative size of the issue computed as offering amount scaled

[9] Specifically, these restrictions prevent the issuer and/or issuer's subsidiaries from issuing additional debt with a maturity of one year or longer, restrict the issuer from issuing additional subordinate, senior, or secured debt, and limit total leverage. Moreover, these borrowing-related covenants place restrictions on asset sale-and-leaseback transactions, on the acquisition of liens on property, and on the issuance of guarantees.

by outstanding debt (we add one to the denominator so that this variable is not missing if the firm has no prior outstanding debt). In addition, we use dummies to control for secured bonds, callable, putable, Yankee or Canadian bonds, and bond issued under Rule 144a. In further tests, we consider whether the covenant and bankruptcy characteristics vary with the lead underwriter (e.g., Griffin and Maturana, 2016). In these specifications, we control for the seven most common lead underwriters (Goldman Sachs, Lehman Brothers, JP Morgan, Merrill Lynch, Morgan Stanley, Salomon Brothers, and Credit Suisse), and we group other underwriters into a separate category.

We also control for state law variables that are related to covenant choice (Qi and Wald, 2008) including state-level antitakeover variables (AIndex) and payout restrictions (TA Constraint). We control for firm specific variables including firm size, leverage, Q ratio, profitability, R&D ratio, capital expenditures, tangibility, and interest coverage. Firm size is measured as the natural log of total assets. Firm leverage is measured as the ratio of total debt (short-term and long-term debt) divided by total assets. The Q ratio is measured as the book value of debt plus the market value of equity divided by total assets. Firm profitability is measured as the ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) divided by total assets. Firm research and development expenditure (R&D) ratio is measured as R&D expenditures divided by total assets.[10] The capital expenditure ratio is measured as Capex divided by total assets. Tangibility is the firm's property, plant, and equipment (PPE) scaled by total assets. Interest coverage equals the EBITDA divided by the existing interest payments. We also calculate the expected default frequency (EDF) measure as in Bharath and Shumway (2008). EDF is a measure of the probability that a firm will default over a specified period (typically one year). The components of the EDF include market value of assets, level of the firm's obligations, and asset volatility. We winsorize these firm-level controls at the upper and lower 1% to avoid the impact of extreme outliers.

We control for macroeconomic fluctuations with the quality spread, computed as the difference between BAA and AAA bond yields on the date of issuance. This quality spread data is obtained from the St. Louis Federal Reserve Bank and is available starting January 1, 1986. In additional analyses we include several measures related to agency issues. These include whether the borrowing firm uses one of the Big 4 Auditors. We also calculate the debt specialization index using Standard and Poor's Capital IQ data, and this index is used to proxy for within debtholder conflicts. We further collect the issuers' and underwriters' law firms from Thomson's SDC. We consider whether

[10] If the firm does not report R&D, we set this term to zero.

the firm uses an In-House counsel as another measure of agency problems, and we use the prior covenants in bond issues used by the issuer or underwriter law firms as instrumental variables in the spread analysis.[11] Table 1 provides a summary of variable definitions used in the analysis.

3.4. Summary statistics

Panel A of Table 2 presents summary statistics on covenant use. Out of the 24 covenants we consider, four are Default Indicating and the remaining 20 covenants either decrease the probability of default or of no significant relation with the probability of default, and the sum of these 20 covenants not associated with increased defaults is our Other covenant index. Bonds have 4.1 covenants on average, with consolidation or merger restrictions, asset sale restrictions, negative pledge, change in control, and cross acceleration covenants appearing relatively more frequently, and other covenants such as funded debt, senior debt, liens, and rating decline puts appearing less frequently. Approximately 31% of bond issues in our sample have no covenants. The covenants that we classify as Other are more frequently used than the Default Indicating covenants, with means of 3.9 for the Other and 0.21 for the Default Indicating covenants per bond on average.

Panel B of Table 2 provides firm and deal characteristics. The mean bond issue size is $366 million and the median deal equals 14% of the firm's existing debt. The debt in the sample has a mean (median) yield spread of 224 (158) basis points, with an average maturity of 8 years. The sample also has an average CDS spread of about 125 basis points for the 5-year contracts. On average, 5.5% of the sample is secured debt, 74% is callable, and 18% Rule 144a debt. Firms in the sample are on average large with assets of $58.2 billion, have debt specialization of 0.70, and leverage of 38%. In addition, on average 98% of the sample employs a Big 4 Auditor, 16% uses an in-house counsel, 6 analysts follow the stock with a standard deviation of the forecast of about 11%, and the debt has a recovery rate at default of 38%.

Panel C of Table 2 compares issues and firm characteristics for bonds that include at least one Default Indicating covenant against those which include none. Default Indicating covenants are more likely to be included in issues from smaller, higher leverage, and lower rated firms. Bonds with

[11] The most frequently used borrower's law firms are Skadden, Arps, Slate, Meagher & Flom; Davis, Polk & Wardwell; and Latham & Watkins; although many issuing firms also use their in-house general counsel. For underwriters, the most frequently used firms are Davis, Polk & Wardwell; Simpson, Thacher & Bartlett; and Cravath, Swaine & Moore.

Default Indicating covenants are more likely to be callable, and spreads are 45 basis points higher on average for firms with Default Indicating covenants.

Panel D of Table 2 presents the number and percentage of bond issues for each industry group in the sample using one digit SIC codes. The majority of the sample consist of bonds issued by firms in the manufacturing (32%), transportation and communications (25%), wholesale and retail trade (10%), services (10%), mining and construction (9%), and finance, insurance, and real estate (14%) industries. The lowest industry representations are in agriculture, forestry, and fishing (0.3%), and public administration (0.28%).

4. Covenants and bankruptcy risk

4.1. Cox proportional hazard and probit models

We examine the relation between bankruptcy risk and covenant use. Specifically, we investigate whether the firm went bankrupt subsequent to issuing a bond with a particular set of covenants. We consider a survival analysis using a Cox proportional hazard model (described in detail in Cleves et al. 2010) and a probit analysis.[12] The overall relation between covenant use and bankruptcy could be positive or negative, depending on whether the use of a given covenant is associated with an increase or decrease in the probability of default. In this analysis, non-bankrupt firms either exit the sample when the debt matures or on the last day of our dataset (December 31, 2014). The basic specification for the hazard function is

$$h(t) = h_0(t)exp(\beta_0 + \beta_1 Covenants_i + \beta_2 DealFactors_i + \beta_3 FirmFactors_i + \beta_4 RatingDummies_i + \beta_5 IndustryDummies_i + \beta_6 YearDummies_i + \varepsilon_i) \quad (1)$$

where *Covenants* is the individual covenant indicators, *Deal Factors* include issue size, relative size, maturity, optionality, and seniority, and *Firm Factors* include size, leverage, profitability, interest coverage, R&D, capital expenditures, tangibility, and Tobin's Q. We stress the importance of including industry, year, and rating dummies to capture additional effects. In particular, the literature has shown that bondholder-shareholder agency costs increase as the firm approaches default, and therefore the number of covenants also increases significantly for lower rated firms.

[12] The literature provides a variety of models to forecast financial distress including accounting-based models such as Altman (1968) and Ohlson (1980) and reduced form models such as Campbell, Hilscher, and Szilagyi (2008). See also Shumway (2001) for applications of survival analysis to firms.

Thus controlling as accurately as possible for rating is of paramount importance. We also consider a standard probit model with a similar specification in terms of covenants and control variables.

We do not expect reverse causality to be a serious concern since bankruptcy events occur after the bond is issued. In additional tests, we include controls for the lead underwriter, but this has little effect on our coefficients of interest. We also consider the effect of either an individual type of covenant, the sum of all covenants, or the sum of Default Indicating and Other covenants separately. For all regressions, we report robust standard errors adjusted for clustering by firm.

4.2. Survival analysis

Panel A of Table 3 provides a Cox survival analysis and a probit analysis on the relation between covenants and the probability that the firm goes into default while the bond is outstanding. We control for firm characteristics from the quarter prior to the issuance, other issuance characteristics, and we include dummies for each rating category (and a separate dummy for unrated), dummies for each two-digit SIC code, and dummies for the issuance year. For the survival specification in column (1), we follow standard survival model notation and report the coefficients in exponential form. Thus, if a variable has no effect on survival, the estimated coefficient would equal 1.0, and if a variable implied a 50% increase or decrease, that would correspond to coefficients of 1.5 or 0.5, respectively.

Model 1 in Panel A, Table 3, reports the survival regression results for all covenants, and Model 2 reports the coefficients on a similar probit regression. Note that the number of observations is slightly smaller for the probit regression as some year and industry or other controls are perfect classifiers, and perfectly classified observations are dropped from the probit regression. The results in both models show that certain covenants, such as the net worth and investment covenants, are associated with an increase in the probability of default (i.e., with estimated coefficients greater than one in the survival analysis), while others, like the funded debt, asset transfer, and consolidation merger covenants, are associated with a decrease in the probability of default (i.e., with estimated coefficients less than one in the survival analysis). The individual effects of certain covenants are not significant, and this is partly due to a relatively small sample size for some covenants. This analysis allows us to separate out those covenants that are associated with an increase in the probability of default.

We sum the covenants associated with a statistically higher default risk in either Model 1 or 2 into the Default Indicating covenant index. This procedure gives us a subset of four out of the 24 covenants that are associated with a significant increase in default risk. These include transaction, investment, net worth, and rating decline put covenants. We discuss reasons for why these Default Indicating covenants could lead to an increase default risk below, and we provide examples of the language used in these covenants in Appendix B. A number of the other covenants have survival coefficients less than one or negative probit coefficients, and are therefore associated with a decrease in default risk. However, only the funded debt covenant, consolidation merger covenant, and change of control put are significantly negatively related to default. We group the 20 covenants not classified as Default Indicating into the Other covenant index.

As the relation between individual covenants and bankruptcy is not significant for most individual covenants, we also consider the joint hypothesis that the coefficients on the covenant variables are equal to zero. For Model 1 of Table 3, Panel A, we find that all the bond covenants are jointly significantly different from zero at the 1% level (p-value = 0.006). Moreover, the covenants we classify as Default Indicating are jointly significantly different from zero as a group (p-value = 0.003), and the covenants we classify as Other are also jointly significantly different from zero as a group (p-value = 0.01). Thus, while some individual covenants appear irrelevant, together the covenants have significant positive and negative effects on the probability of firm survival. Put differently, the effects we find are not due to adding randomly positive or negative coefficients together.

In Panel B of Table 3, Model 1 is a Cox survival analysis showing how the overall sum of bonds' covenants affects the probability of default while controlling for firm and security characteristics. Models 2 and 3 provide Cox survival and probit regressions separating out the Default Indicating and Other covenants indices. Models 4 and 5 are similar to Models 2 and 3 but also control for two commonly used default measures: Altman (1968) Z-score, and Bharath and Shumway (2008) expected default frequency (EDF). The coefficient on the overall covenant index (Model 1) is less than 1.0. An additional covenant implies a decrease in the probability of default of 2.5%, and this coefficient is significantly different from 1.0 at the 10% level. Thus, the sum of covenants has a small negative relation with the probability of default as this sum masks the individual positive and

negative effects. That is, as expected, adding all types of covenants together dampens the differential impacts of various types of covenants.[13]

In Models 2 through 5, the coefficients on the Default Indicating covenant index are highly significant, and the coefficients on Other covenants are significant with the exception of Model 4. In Model 2 adding one Other covenant is associated with 9.5% decline in the probability of default, whereas each Default Indicating covenant is associated with 65% increase in the probability of default. In Model 4, an additional Other covenant implies a 3.9% decrease in default, whereas an additional Default Indicating covenant implies a 48% increase in the odds of default. The probit regressions imply similar conclusions, thus Default Indicating covenants are associated with significantly greater chances of default, and the use of these covenants can be used to help predict default even when correcting for other well-known default measures such as Z-score and EDF.[14] In unreported regressions, we also control for the issuing investment bank and we consider only rated firms. Our results are consistent throughout all specifications.

We next consider whether other unobserved factors may be causing the positive (negative) relation between Default Indicating (Other) covenants and default. In Panel C of Table 3 we present two tests which address potential selection or omitted variable bias. In Model 1, we consider a matched sample analysis. We first match bonds on the probability that they include any Default Indicating covenants using a 0.001 caliper. We use firm characteristics, industry, rating, and year dummies to estimate these probabilities. For the matched sample, a survival model again shows that Default Indicating covenants imply a 46% increase in default, whereas Other covenants imply a 7% decrease in default, and both of these effects are significant at the 5% level.

In order to account for unobserved firm characteristics, we consider a survival model with firm fixed effects in Model 2. This limits the data set to only those observations where there was a bankruptcy associated with some issues, as otherwise the firm fixed effect is a perfect classifier. We consider a Weibull proportional hazard model for this analysis because the Weibull distribution provides the fit with the lowest Akaike's Information Criterion (AIC) among the proportional hazard models, and because the much smaller sample size implied by firm fixed effects requires a

[13] In unreported regressions, we repeat our tests but exclude those issues that default within a year of issuance, and we find similar results.

[14] Note that these regressions include rating dummies, and the rating agencies use a number of measures such as EDF and firm characteristics to set debt ratings. The marginal significance for EDF in these analysis may be explained because these effects are already captured by the rating agencies.

parametric fit. After correcting for firm-level fixed effects, we find a significant positive effect of the Default Indicating covenants and a negative effect of the Other covenants.

In terms of other controls, we find that Yankee bonds are significantly more likely to default in some specifications. Firms that have more antitakeover protection from state laws are also less likely to default in some specifications, as are firms with higher profitability, or higher Q values. Conversely, leverage and capital expenditures are positively associated with default risk. In unreported results, we add a variable for whether the firm uses a Big 4 Auditor, and we find that auditor choice is not related to survival and our other results are unaffected. In further tests, we examine the results if we exclude Yankee bonds, rule 144A bonds, or bonds issued by utilities or financial firms. The results for the survival and probit analyses (and our key analyses below) are similar for these subsamples.

4.3. Robustness

To ensure the generalizability of our results, we perform several robustness tests. First, we consider several additional variables that may be important determinants of default. These additional controls include the bond seniority (e.g., whether the debt is senior, subordinated, or secured), the identity of the issuing investment bank, although neither of these variables impacts the size or economic magnitude of our estimated coefficients. Second, we consider measures of the firm's top management compensation structure. Specifically, we consider either the percent equity paid to the CEO, the CEO's delta and vega, or the delta and vega of the top-five management team. We calculate delta and vega as in Core and Guay (2002). While the inclusion of these variables decreases our sample size, our overall conclusions on the Default Increasing and Other covenants are unchanged. Third, we consider whether a measure of information quality, as proxied by accrual quality measure from Kothari, Leone, and Wasley (2005), changes the magnitude or significance of our results. However, this accrual measure is not significant in the bankruptcy prediction models and our coefficients of interest are unchanged.

Lastly, a concern with our baseline results is that the time of bankruptcy filing may be subject to managerial discretion. If certain covenants increase firm default risk, they should also be associated with a decrease in credit rating. In unreported regressions, we use credit rating downgrades, which are not determined by the managerial team, as an alternative test. We consider an ordered probit

where the dependent variable is the number of net downgrades (computed as total number of downgrades minus the total number of upgrades) by the S&P rating agency while the bond is outstanding. If a covenant helps control agency problems it should be associated with a decrease in the number of downgrades (or an increase in the number of upgrades), while a Default Indicating covenant would therefore be associated with an increase in the number of downgrades. Consistent with our other findings, we document that Default Indicating covenants imply a significantly increased risk of downgrade, while Other covenants are significantly associated with a decreased risk of downgrades. Thus, the survival and probit results described above can also be found by examining downgrades, with, as expected, the same covenants that were associated with greater default also being associated with more downgrades. Overall, the results from these additional tests corroborate our original findings in the survival and probit analyses.

5. Why do firms use default indicating covenants?

If covenants are designed to maximize firm value as Smith and Warner (1979) suggest, then adding covenants that increase the probability of default seems nonsensical. Bankruptcy has additional costs associated with it, and thus the Default Indicating covenants would decrease the value of the firm. By increasing default risk, these covenants become detrimental to the bondholders that they are nominally designed to protect. We provide three explanations for these covenants. First, we consider whether the use of some covenants reflect faulty contract design (e.g., Hillion and Vermaelen, 2004), where firms add a new covenant to a debt contract in an attempt to innovate, but then over time the market learns that the covenant is not value increasing. Second, we consider whether covenants that increase default also increase the recovery rate in bankruptcy (Jankowitsch et al., 2014). Third, we examine whether the Default Indicating covenants are related to other proxies for agency issues including the use of more reputable auditors (Big 4 Auditor), In-House Counsel, or to potential conflicts of interest among different groups of debtholders (Debt Specialization).

To see whether these theories can help explain the use of Default Indicating covenants, we use several different analyses. For faulty contract design, we examine the incidence of Default Indicating covenants by year. For recovery rate, we consider either the price directly after default or the discounted value of all payments to securities after default. For monitoring or other agency conflicts, we use Poisson analyses where the dependent variable is the number of Default Indicating or Other covenants. The independent variables of interest in these agency analyses are whether the

firm uses a Big 4 Auditor, whether the firm uses In-House Counsel, or the Herfindahl-Hirschman index of the types of debt instrument (Debt Specialization).

5.1. Faulty contract design

Miller (1977) suggests a Darwinian argument for firm characteristics, where firms that make harmful choices die out, while irrelevant characteristics may persist.[15] In this vein, Hillion and Vermaelen (2005) posit that the issuance of privately held floating priced convertibles, a financial innovation used by U.S. firms in the second half of the 1990s, is an example of faulty contract design. They show that the design of these contracts encourages convertible holders to increase their expected returns by shorting and converting. They also show that professional short-sellers can lower the value of the stock by increasing the dilution that results from converting at low stock prices. In the spirit of Hillion and Vermaelen (2005), we posit that certain covenants may be included in debt agreements because of faulty contract design. If so, a Darwinian natural selection argument would suggest that the use of these covenants will decline over time and eventually disappear.

Table 4 reports the incidence of the Default Indicating covenants by year. Included are the mean number of each type of Default Indicating covenant for each year over the sample period 1980-2014. Consistent with bad ideas dying out over time, one type of covenant, the rating decline puts, has disappeared over time (only one rating decline put was included after 2003).[16] The disappearance of the rating decline put could be attributed to the structure of the covenant. Ratings-based triggers are clauses that specify an action when the debt is downgraded to a predetermined level. These include the prepayment of a predetermined proportion of debt via an equity infusion, the prepayment of a predetermined proportion of debt via the sale of assets, and an increase in the coupon rate of debt. Bhanot and Mello (2006) examine the incentive for shareholders to include such triggers, the implications of such triggers for agency conflicts between shareholders and debtholders, and the impact of different types of trigger on the risk profile of the company. They show that the different types of debt triggers produce very different results in moving the firm closer

[15] Luo (1995) offers a more technical examination of the requirements for necessary for natural selection to work in the marketplace. These necessary conditions include infinitesimally small firm size and long time periods before firms with inefficient characteristics die out.

[16] Note that these types of covenants continue to be used in loan contracts; but as we discuss above, the frequent renegotiation of loans relative to the inability to renegotiate bonds makes loan contracts significantly different.

to the value-maximizing policy. They note that for this covenant, it is not just the existence of the debt trigger that matters, but the capital structure effects and the form of financing associated with a specific trigger.[17]

Overall, our survival analysis results support Bhanot and Mello's conclusion that these puts are not optimal and not value enhancing. While faulty contract design offers some explanation for at least one Default Indicating covenant, the justification for the remaining ones that have not disappeared over time require alternative explanations.

5.2. Greater recovery rates

We next consider an efficient explanation for the use of the Default Indicating covenants. Specifically, we analyze the value of the bond one month after default (Recovery Rate at Default), as well as the sum of the cash or settlement value at liquidation or emergence from bankruptcy discounted back to the last date that cash was paid using the bond's effective rate (Ultimate Recovery Rate). Both of these variables are from the Moody's Default and Recovery Database.

Table 5 provides an OLS regression on the Recovery Rate at Default and a Tobit regression on the Ultimate Recovery Rate, as some of these values equal zero. Year, rating, and 2-digit SIC code dummies are included in all regressions, as well as firm and issue characteristics, and standard errors are clustered by firm. In Model 1, the analysis of the Recovery Rate at Default, the coefficient on the Default Indicating covenant index is positive and significant, while the coefficient on the Other covenant index is negative and significant. Similarly, in Model 2, the analysis of Ultimate Recovery Rate, the coefficient on the Default Indicating covenants is positive and significant while the coefficient on Other covenant index is negative and significant. For both models, we can reject the hypothesis that the coefficient on the Other covenants equals the coefficient on the Default Indicating covenants at the 1% level. Thus, these Default Indicating covenants appear to have a more positive effect on values in bankruptcy than other covenants.[18]

A simple calculation comparing the average increase in probability of default against the average increase in recovery suggests that, on average, the increase in bankruptcy risk associated with an

[17] This type of learning from academic literature parallels the changes in stock return predictability after the publication of related academic articles described by McLean and Pontiff (2016).

[18] In unreported regressions, we consider the full covenant index of all 24 covenants, and find that it has an insignificant relation to either measure of recovery.

additional Default Indicating covenant is more detrimental than the 7% average gain in value estimated in Model 2 of Table 5. That said, given these results, there may be bond issues where investors would be willing to trade-off the greater risk of default for the larger recovery associated with these Default Indicating covenants.

5.3. Monitoring

We next examine whether certain types of agency problems, or the lack of better monitors that control these agency problems, can explain the use of Default Indicating covenants. Begley and Feltham (1999) show that managerial entrenchment, notably the fraction of equity held by the CEO, is related to the use of bond covenants, and, in a similar vein, Chava, Kumar, and Warga (2010) show that the length of the CEO's tenure for high leverage firms impacts bond covenants use. We consider in unreported regressions whether measures of managerial entrenchment such as the E-index of Bebchuk, Cohen, and Ferrell (2009) or the G-index of Gompers, Ishii, and Metrick (2003) are associated with Default Indicating or Other covenants. We find no significant results with either of these indexes. We therefore consider three other variables which may be related to poor monitoring: whether the firm uses a Big 4 Auditor, whether the firm uses In-House legal counsel when structuring the bond deal, and the degree of debt specialization.

Specifically, we hypothesize that more experienced and more reputable auditors can reduce the probability of Default Indicating covenants (Robin, Wu, and Zhang, 2017; Mansi, Maxwell, and Miller, 2004). Prior studies (see e.g., Francis and Wilson 1988; Fan and Wong 2005) suggest that factors alleviating information or agency risks act as substitutes for debt covenants. If so, we expect the presence of high-quality auditors, who reduce information and agency risks for lenders, to decrease lenders' demand for Default Indicating covenants. In Models 1 and 2 of Table 6, we consider Big 4 Auditor as an explanatory variable in Poisson regressions, where the dependent variable equals the number of Default Indicating and Other covenants.[19] The estimated coefficient on Big 4 Auditor in the Default Indicating regression (column 1) is negative and significant, whereas the coefficient in the Other regression (column 2) is insignificant. The differences on Big 4 Auditor in the estimated coefficients between these regressions is significant (p-value = 0.012), thus the use of major auditing firms is associated with less frequent use of Default Indicating covenants.

[19] Assuming a negative binomial, rather than a Poisson distribution, produces nearly identical results.

In Models 3 and 4 of Table 6 we consider the effect of using In-House Counsel to represent the firm on the deal. In-House counsel may be better aligned with the firm's interests and more careful about including covenants that are beneficial for the firm. Having internal counsel assisting in drafting of the contract may curtail the tendency for the Default Indicating covenants to be included in the bond contract, either through lack of knowledge or due to conflicts with other stakeholders. In-House Counsel acts as the firm's legal representative in about 13% of the deal issuances in our sample. The negative and significant coefficient in Model 3 is consistent with firms that are advised by internal general counsel being significantly less likely to use Default Indicating covenants. There is some evidence that firms which use In-House Counsel are also less likely to use Other covenants (Model 4), but again the effect on Default Indicating covenants is both statistically (p-value = 0.001) and economically meaningful. Note that in the specifications in columns 3 and 4 we also include dummy variables for the underwriter, the underwriters' law firm, and for the other law firms used by issuers. Excluding these additional controls does not change the results with respect to In-House Counsel.

As the number of bond classes for debtholders increases, renegotiation before or during bankruptcy becomes more difficult (Bolton and Scharfstein, 1996). We hypothesize that greater concentration of debt would imply a decrease in within bondholder conflicts. Beatty, Liao and Weber (2012) show that the use of cross-acceleration provisions increases with conflicts between creditors. Colla, Ippolito, and Li (2013) consider the effects of debt specialization using a Herfindahl-Herschleifer Index (HHI) based on seven debt types (i.e., commercial paper, drawn credit lines, term loans, senior and subordinated bonds and notes, and capital leases). Lou and Otto (2020) use the HHI index of debt types as in Colla et al. and show that firm with more dispersed debt structure use more covenants in their bank loan contract. Therefore, we use the HHI index to proxy for the within debtholder conflict. High debt specialization indicates fewer conflicts of interest among different creditors.

In Models 5 and 6 of Table 6, we consider whether debt specialization is a determinant of Default Indicating and Other covenants for the full sample. The results from Model 5 show that debt specialization has a strong and significant negative effect (at the 1% level) on the use of Default Indicating covenants. On the other hand, the results from Model 6 show that debt specialization has a much smaller and insignificant relation with the use of Other covenants. A formal test is able to reject the hypothesis that the coefficients on debt specialization is equal between Models 5 and 6

(p-value < .001). Thus, debt specialization, or a greater concentration of debt holders, is associated with much less use of Default Indicating covenants but with little difference in the use of Other covenants. Thus, whereas Lou and Otto (2020) find that greater debt heterogeneity is associated with more loan covenants overall, we find that, in the public bond market, greater debt heterogeneity is only related to more Default Indicating covenants. An alternative explanation for our results is that debt concentration could influence the probability of bankruptcy directly, and therefore we test whether debt concentration is an omitted variable in the survival specification. Adding this variable into the survival regressions, we find that it has no significant statistical or economic impact on survival outcomes after correcting for other factors.[20]

We also considered whether a number of other potential measures of agency problems and monitoring were associated with differences in covenant choice. In untabulated regressions, we test whether the Kothari et al. (2005) accruals measure, measures of compensation including delta and vega, whether the firm is rated, whether the firm has a split rating between Moody's and S&P, and whether CEO duality significantly predict the use of Default Indicating covenants differently than Other covenants. We find no evidence that these measures are differentially related to the use of the Default Indicating covenants.

6. Covenant use and the cost of debt

6.1. Evidence on the relation between covenant use and bond yields

We examine whether the Default Indicating and Other covenants are priced differently in the market place. Specifically, we consider regressions where the dependent variable is the log of yield spread of the bond at issuance over treasuries, and the independent variables include other issue characteristics, firm characteristics, financial analyst forecasts, quality spread, Big 4 Auditor, rating dummies, and industry dummies. In addition, we consider spread specifications with the total covenant index or with the Default Indicating and Other covenant indices. We test whether the relation between the Other covenants and spreads is equal to the relation between the Default Indicating covenants and spreads.

Panel A of Table 7 provides regressions on the relation between log of yield spread and various covenants. The independent variables include bond and firm issue characteristics from the quarter

[20] The estimated coefficient on debt specialization in the survival regression is 0.991 with a p-value of 0.985.

prior to the issuance date. Model 1 reports results using the overall covenant index. Model 2 considers the specification when the overall covenant index is segmented by Default Indicating and Other covenants. Model 3 is similar to Model 2 but additionally controls for debt specialization. Model 4 is similar to Model 2 but includes financial analyst forecast dispersion and analyst following. Model 5 considers Default Indicating and Other covenants in a firm fixed effect specification.

The results from Model 1 show that the overall covenant index is positively related to the yield spread. An increase of one covenant is associated with a 1.2% increase in yield spreads, and this translates to about 2.7 basis points on average given the mean spread of 222 basis points. This result reflects differences in risk between deals that use more or fewer covenants, and this overall covenant index regression is consistent with prior findings (e.g., Bradley and Roberts, 2015).

When we segment the effects of Default Indicating and Other covenants (Models 2 through 5), we find that the coefficient on the Default Indicating covenants is consistently positive and significant, whereas the coefficient on the Other covenants index is small and insignificant. Each additional Default Indicating covenant is associated with an increase of about 6.5% to 8% in spreads in the OLS and fixed effect specifications. We can also reject the hypothesis that the coefficients on the Default Indicating and Other covenants indices are equal at the 1% level in these models. Thus, almost all of the positive relation between yield spreads and covenants is due to the Default Indicating covenants. In other words, the relation between the Default Indicating covenants and bankruptcy is not only reflected in rating declines and increases in agency issues, it also appears to be priced by the market at the time of issuance.

The remaining control variables, in general, have their expected signs. We find that firms with a higher concentration of debt have lower yield spreads, albeit marginally. Consistent with the idea that analyst forecast characteristics contribute to the information environment (Mansi, Maxwell, and Miller, 2011), we find that higher forecast dispersion and lower number of analysts following the stock are associated with a higher cost of debt. We also find that firm size, profitability, capital expenditures, and Tobin's Q are inversely related to yield spread, while issue size, relative size, leverage, and higher debt issuance are associated with higher yield spreads. Although the presence of Big 4 Auditor is associated with a lower cost of debt, the coefficient is not statistically significant.

Next, we consider an instrumental variable analysis in Panel B of Table 7, where we instrument for the use of Default Indicating and Other covenants with the fraction of prior deals where the law firm was the same advisor, either for the agent or for the issuer, as the new instruments. For

instance if Cravath, Swain, and Moore is the law firm for the agent on the current deal, we use the average number of Default Indicating covenants in bonds issued in the prior three years where Cravath was also the law firm for the agent as one instrument. This provides us with four instruments, Default Indicating covenants by agent law firm, Default Indicating covenants by issuer law firm, Other covenants by issuer law firm, and Other covenants by agent law firm. Models 1 and 2 provide the first stage regressions, and Model 3 provides the second stage of the instrumental variable analysis.[21]

We believe these are logical variables to use as law firms advise their clients – both the issuer and the agent – on the use of particular language and covenants in the bond agreement. Thus, the logic for the use of these covenants is similar to that given by Karpoff, Schonlau, and Wehrly (2017) for why they use geographic location to identify takeover defenses. However, we are hesitant to use geographical location as a number of recent articles suggest that geography has many effects, and thus geographic location may be less likely to pass the exclusion restriction (see, e.g., Parsons, Sulaeman, and Titman, 2018).

We provide several test statistics for the instrumental variable analysis. In particular, both the Kleibergen-Paap LM statistic and F-tests of excluded instruments are significant at the 1% level. The Hansen's J-statistic cannot reject the hypothesis that the instruments are valid, and a Hausman endogeneity test suggests that IV is appropriate. The F-value for the Other covenants regression is about 10, suggesting that this portion of the analysis is unlikely to cause a weak instrument bias. However, the F-test for the Default Indicating covenants is relatively weak at about 5, suggesting that the results should be interpreted with caution. The findings show that Default Indicating covenants imply significantly higher spreads, whereas Other covenants imply significantly lower spreads, on average about 10 basis points lower for each additional covenant. Moreover, the difference between the estimated coefficients on these two variables is significant at the 5% level.

Overall, the results reconcile the evidence in the literature on the relation between covenant use and the cost of debt. They show that much of the puzzling positive relation between spreads and covenants can be explained by the Default Indicating covenants. These covenants should rationally have higher spreads as they imply greater default risk.

[21] Note that we include the issuer dummies to control for other reputation effects. Thus, the instruments should capture only law firm effects.

6.2. Evidence on the relation between covenant use and CDS Spreads

To ensure that our results are primarily attributed to default risk, we rerun our analysis on Table 7 using the spread on credit default swaps (CDS) as the dependent variable. A CDS contract is a credit derivative, where the buyer of the contract makes periodic payments over the duration of the contract in exchange for protection against default. The seller agrees to compensate the buyer for the difference between the par value and the market value of the reference bond if the issuer experiences a credit event. CDS contracts provide a measure that is primarily related to default risk as their spreads are less affected by other factors such as liquidity risk (Longstaff, Mithal, and Neis, 2005).

The market for many CDS contracts is now relatively liquid. We obtain data on CDS spreads from the Markit Group. We begin our sample starting in 2002 when more CDS contracts were available and use only the 5-year spreads because these contracts are the most liquid and constitute over 85% of the entire CDS market. We merge the firm-level senior unsecured bonds CDS with our bond data using cusip and offering date. Thus, the matched CDS are the issuer's average CDS premium.[22] This final sample has 4,802 contracts on CDS spreads in our primary specification.

We examine whether CDS rates are different following the issuance of a bond with Default Indicating or Other covenants. We consider regressions where the dependent variable is the log of the spread for the 5-year CDS contract, and the independent variables include other issue characteristics, firm characteristics, financial analyst forecasts, quality spread, Big 4 Auditor, and rating and industry dummies. Thus, we test whether the relations between bond spreads and covenants also hold in the CDS market. Additionally, because the existence of CDS contracts can change borrowers' incentives to monitor and lenders' incentives to renegotiate (Bolton and Oehmke, 2011), prior studies have examined whether the existence of CDS contracts is related to other financial outcomes. For instance, Martin and Roychowdhury (2015) find that the presence of CDS contracts leads to a decline in accounting conservatism. We hypothesize that more Default Indicating covenants could lead to a greater demand for CDS contracts. Alternatively, if the large financial institutions that typically write CDS contracts are more aware of the negative implications of Default Indicating covenants than typical bond buyers, this could reduce their willingness to write such contracts. Under this alternative, we would expect to see fewer CDS contracts and lower

[22] While the CDS premiums we examine do not necessarily match up exactly to bonds with particular covenants, we expect the CDS premium on the offering day to primarily reflect the characteristics of the current issue.

liquidity if the bond contains Default Indicating covenants and if these covenants are related to greater information asymmetry. Qiu and Yu (2012) provide a detailed study of liquidity provision in the CDS market, and they find that CDS liquidity responds endogenously to information flow.

Table 8 provides regression results on CDS spreads, the existence of CDS contracts, and their trading depth. The dependent variable in Models 1-3 is the log of the 5-year CDS spread. Model 4 considers a probit regression on whether CDS contracts exist, and Model 5 considers the log of the number of CDS quotes (i.e., the market depth) as dependent variables. Model 1 includes the overall covenant index, while Model 2 includes Default Indicating and Other covenants. Model 3 is similar to Model 2 but additionally controls for analyst forecast dispersion and the number of analysts following the stock.

The results in Models 1-3 corroborate the earlier findings between yield spreads and covenant use. As with bond yields, CDS spreads are positively related to the overall covenant index in Model 1. In Models 2 and 3, the relation between Default Indicating covenants and CDS spreads is positive and significant, whereas the coefficient on the Other covenants index is small and insignificant. Each additional Default Indicating covenant is associated with an increase of about 11% to 14% in CDS spreads in the two specifications. This evidence is consistent with default risk being the primary reason that spreads are higher in bonds with Default Indicating covenants. We can also reject the hypothesis that the coefficients on the Default Indicating and Other covenants indices are equal at the 5% level in these models.

In Models 4 and 5, we test whether Default Indicating covenants lead to more CDS contracts. In Model 4, we find that bonds with Default Indicating covenants are significantly less likely to have CDS contracts written on them, whereas bonds with Other covenants are significantly more likely to have CDS contracts. In Model 5, examining the sample of those bond issues that have CDS contracts, we find that Default Indicating covenants are associated with significantly lower depth, while Other covenants have no significant relation to the depth of the CDS market. Thus, these results are consistent with the Default Indicating covenants having a bigger effect through the supply side of the CDS market. That is, the investment banks and other large institutions which are the main suppliers of CDS contracts appear less willing to provide CDS quotes on bonds which have Default Indicating covenants. This finding is comparable to Qiu and Yu's (2012) results that below investment grade ratings and high stock return volatility are related to lower liquidity in CDS contracts. Overall, the results show that besides the relations between Default Indicating covenants

and bankruptcy risk, bond ratings, and bond yields spreads, these covenants also appear to affect CDS spreads and the existence of CDS contracts.

7. Conclusion

We analyze the relation between bond covenant use and firm default and find that certain bond covenants are associated with higher bankruptcy risk. These Default Indicating covenants include rating decline trigger puts, and restrictions on investments, net worth, and transfers to subsidiaries. We posit that the use of the Default Indicating covenants can be partly explained by faulty contract design, greater recovery rates, or by insufficient monitoring. We test these hypotheses empirically and we find that some Default Indicating covenants, such as rating decline puts, disappear over time, and this pattern is consistent with the faulty contract design hypothesis. On average, we find that Default Indicating covenants are also associated with greater recovery if a default does occur, thus providing an efficiency rationale for including them in some debt contracts (although the overall gain in recovery is insufficient to outweigh, on average, the increase in default risk). We further show firms that use Big 4 Auditors or In-House Counsel (and thus potentially receiving better monitoring) are less likely to use Default Indicating covenants. A more diverse portfolio of creditors is also associated with significantly more Default Indicating bond covenants.

We consider whether bonds with these Default Indicating covenants are priced differently from issues without these covenants. We find that both yield spreads and CDS spreads are significantly higher for bonds and CDS contracts that include Default Indicating covenants. In contrast, covenants that are not associated with an increase in default risk do not imply higher spreads. We repeat these tests using the covenants included in prior issues by the issuer's and underwriter's law firms as instruments, and again find a significant positive relation between the Default Indicating covenants and yield spreads, and a negative relation between the Other covenants and yield spreads. Thus, for bonds, the positive relation between spreads and covenants can be largely explained by considering the subset of covenants which also implies greater default risk. These findings augment the classical view that covenants are efficient mechanisms to increase firm value by restricting the expropriation of bondholder value. They also paint a more complex picture, where at least some covenants are put in place due to other agency conflicts. While greater recovery does provide some positive justification for the use of Default Indicating covenants, the overall relations between higher default rates and higher spreads and these covenants appear to outweigh their potential benefits.

Additionally, the strong findings that better monitored firms avoid these covenants are consistent with Default Indicating covenants having a negative overall impact for creditors and the firm.

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Table 1
Variable definitions

Variable	Description	Source
	Issue/Macro Characteristics	
Yield Spread	The difference between the issue's offering yield and the yield of the benchmark treasury bond	FISD
CDS Spread	The 5-year spread on a credit default swap at the bond issuance date	Markit
CDS Dummy	Dummy variable that equals one if a 5-year or 3-year CDS contract exists at the bond issuance date	Markit
CDS Depth	The number of quotes used to build the composite price data	Markit
Deal Size ($ Millions)	The par value of debt initially issued	FISD
Relative Size	Ratio of offering amount to total debt before the issue	Compustat/FISD
Maturity (in years)	The difference between offering date and the maturity date	FISD
Putable	Dummy that equals one if the issue has a put option	FISD
Callable	Dummy that equals one if the issue has a call option	FISD
Secured	Dummy that equals one if certain assets have been pledged as security for the issue	FISD
Yankee	Dummy that equals one if the issuer is a foreign corporation (including Canadian companies)	FISD
Quality Spread	BAA rates minus AAA rates using seasoned Moody's bonds on the day of issuance	St. Louis Fed
Rule 144A	Dummy that equals one if private placement issue exempt from registration under SEC 144A	FISD
Recovery Rate at Default	Market value of default debt, as a percentage of par, one month after default	Moody's DRD
Ultimate Recovery rate	Sum value of settlements received for each default instrument, taken at emergence or liquidation, divided by total principal defaulted amount of the class, discounted back from emergence or liquidation date to last date cash paid using default instrument's effective rate.	Moody's DRD
	Firm Characteristics	
Firm Size ($ Millions)	Log of total assets	Compustat
Leverage	The sum of long- and short-term debt divided by total assets	Compustat
Market-to-Book	Market capitalization of stock plus total debt divided by total assets	Compustat
Profitability	Earnings before interest, taxes, depreciation, and amortization scaled by total assets	Compustat
R&D	Research and development expense scaled by total assets. Missing R&D values are set to zero	Compustat
Tangibility	Property, Plant, and Equipment divided by total assets	Compustat
Capital Expenditure	Capital expenditures divided by total assets	Compustat
Interest Coverage	EBITDA divided by interest expense	Compustat
TA Constraint	State total asset constraint is the minimum asset-to-debt ratio required for a distribution to shareholders given the firm's state of incorporation	Manual Collection
Entrenchment Index	An index measuring the degree of management entrenchment as in Bebchuk, Cohen, and Ferrell (2009). A high value of the index indicates a poor corporate governance.	ISS
Debt Specialization	A Herfindahl-Hirschman index of the types of debt instrument (see, Colla, Ippolito, Li, 2013). A	Capital IQ

	low value of the index suggests more diversified debt structure.	
Forecast Dispersion	The annual standard deviation of the mean analyst forecast scaled by the absolute value of the mean forecast	I/B/E/S
Analyst Following	The number of analysts following the stock	I/E/B/S
Expected Default Frequency (EDF)	The expected default frequency (EDF) measure is computed as in Bharath and Shumway (2008). EDF is a measure of the probability that a firm will default over a specified period (typically one year). The components of the EDF include the current market value of the firm (market value of assets), the level of the firm's obligations (default point), and the vulnerability of the market value to large changes (asset volatility). $$EDF = N\left[-\left(\frac{\ln\left((E+F)/F\right)+\left(r_{i,t-1}-0.5\sigma_V^2\right)}{\sigma_V}\right)\right]$$ where N is cumulative standard normal distribution, E is market value of equity, F is face value of debt, calculated as short-term debt+0.5*long-term debt , $r_{i,t-1}$ is the annual stock return of firm i in year t-1, $\sigma_V = \frac{E}{E+F}\sigma_E + \frac{F}{E+F}(0.05+0.25\sigma_E)$ and σ_E is the standard deviation of monthly stock return in past year.	Compustat and CRSP
	Covenant variables (complete definitions of all covenants are provided in Appendix A)	
Default Indicating Covenants	Sum of covenants associated with an increase in the probability of bankruptcy	FISD
Other Covenants	Sum of covenants that are not associated with an increase in the probability of bankruptcy.	FISD
Payment Index	Sum of dividend payment and other payment dummies (see Appendix A)	FISD
Asset Index	Sum of transaction, investment, asset sales and asset transfer dummies (see Appendix A)	FISD
Borrowing Index	Sum of funded debt, subordinated debt, senior debt, secured debt, indebtedness, leaseback, liens, and guarantee dummies (see Appendix A)	FISD
Stock Index	Sum of common stock, preferred stock, and other stock dummies (see Appendix A)	FISD
Default Index	Sum of cross acceleration and cross default dummies (see Appendix A)	FISD
Antitakeover Index	Sum of poison put and antitakeover M&A dummies (see Appendix A)	FISD
Profit Index	Sum of earnings and net worth dummies (see Appendix A)	FISD
Rating Decline Index	Index based on the rating decline trigger put dummy (see Appendix A)	FISD

This table provides variables definitions for issue characteristics, firm characteristics, and covenants variables. Covenant details are provided in Appendix A.

Table 2
Summary statistics

Panel A: Covenants (n=13,973)

	Mean	Median	Standard Deviation	Minimum	Maximum
Covenant Index	4.076	4	3.791	0	18
Default Indicating Covenants	0.194	0	0.463	0	3
Other Covenants	3.882	4	3.475	0	15
			Covenant/FISD dummies		
Dividend Payment	0.147	0	0.355	0	1
Restricted Payment	0.152	0	0.359	0	1
Funded Debt	0.016	0	0.126	0	1
Subordinated Debt	0.028	0	0.166	0	1
Senior Debt	0.005	0	0.072	0	1
Negative Pledge	0.495	0	0.500	0	1
Indebtedness	0.189	0	0.392	0	1
Leaseback	0.369	0	0.483	0	1
Liens	0.048	0	0.214	0	1
Guarantee	0.074	0	0.262	0	1
Asset Sale	0.626	1	0.484	0	1
Asset Transfer	0.004	0	0.060	0	1
Transaction	0.152	0	0.359	0	1
Investment	0.015	0	0.122	0	1
Stock Issuance	0.052	0	0.223	0	1
Preferred Stock	0.075	0	0.263	0	1
Stock Transfer	0.026	0	0.158	0	1
Cross Acceleration	0.401	0	0.498	0	1
Cross Default	0.060	0	0.238	0	1
Consolidation Merger	0.627	1	0.484	0	1
Change of Control	0.298	0	0.457	0	1
Earnings	0.130	0	0.336	0	1
Net Worth	0.018	0	0.133	0	1
Rating Decline Put	0.009	0	0.094	0	1

This panel provides descriptive statistics for the covenant variables used in the analyses. The data set is comprised of 13973 firm-year observations on 2072 firms over the period 1984 to 2014. Covenant details are provided in Appendix A.

Panel B: Firm and Deal Characteristics

	Mean	Median	Standard Deviation	Minimum	Maximum	Count
Yield Spread (basis points)	222.274	157.500	174.104	13.000	772.000	7194
CDS Spread (basis points)	125.095	64.512	181.053	0.318	1153.216	4802
CDS Dummy	0.596	1.000	0.491	0.000	1.000	7418
CDS Depth	7.050	6.750	3.681	2.000	24.000	4802
Bankrupt	0.102	0.000	0.302	0.000	1.000	13973
Issue Size (in logs)	12.083	12.429	1.712	0.000	16.524	13973
Relative Size	0.936	0.139	7.932	0.000	130.000	13973
Maturity	8.051	8.199	0.801	3.584	10.506	13973
Secured	0.055	0.000	0.228	0.000	1.000	13973
Callable	0.741	1.000	0.438	0.000	1.000	13973
Putable	0.021	0.000	0.143	0.000	1.000	13973
Yankee	0.003	0.000	0.055	0.000	1.000	13973
Rule 144A	0.177	0.000	0.382	0.000	1.000	13973
TA Constraint	0.291	0.000	0.457	0.000	1.250	13973
Antitakeover Index	1.802	1.000	1.502	0.000	5.000	13973
Firm Size (in logs)	8.884	8.843	1.987	0.998	13.989	13973
Leverage (%)	38.125	34.723	20.105	0.000	97.742	13973
Profitability (%)	2.128	1.993	2.012	-7.985	8.514	13973
Tangibility (%)	37.439	34.836	27.278	0.000	91.385	13973
Interest Coverage	9.540	5.169	15.945	-10.569	117.945	13973
R&D	0.215	0.000	0.693	0.000	5.564	13973
Capital Expenditures (%)	4.473	2.466	5.666	0.000	30.082	13973
Tobin's Q	1.214	0.978	0.755	0.129	5.916	13973
Stock Volatility (%)	2.261	1.987	1.201	0.682	7.460	13973
Quality Spread	0.978	0.910	0.381	0.500	3.500	13692
Big Auditor	0.977	1.000	0.150	0.000	1.000	9347
EDF	0.026	0.000	0.146	0.000	1.000	9347
Z-Score	1.298	1.015	1.474	-24.515	18.245	9347
In-House Counsel	0.165	0.000	0.371	0.000	1.000	11060
Debt Specialization	0.703	0.703	0.209	0.237	1.000	5365
Forecast Dispersion	0.112	0.047	0.217	0.000	2.231	4016
Analyst Following	6.194	5.000	4.957	2.000	40.000	4016
Recovery Rate at Default	38.349	30.000	28.467	0.010	122.630	642
Ultimate Recovery Rate	42.460	37.180	35.515	0.000	169.780	690

This panel provides descriptive statistics for firm and deal variables used in the analyses. The full data set is comprised of 13973 firm-year observations on 2072 firms over the period 1984 to 2014. Variable definitions are provided in Table 1.

Panel C: Firm and Deal Characteristics for Issues with and without Default Indicating Covenants

	Issues without Default Indicating Covenants			Issues with Default Indicating Covenants			
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Diff.
Yield Spread	182.578	125.000	175.985	228.101	215.000	223.402	-45.522***
CDS Spread	108.928	60.313	160.966	360.179	298.437	271.714	-251.251***
CDS Dummy	0.648	1.000	0.477	0.286	0.000	0.452	0.362***
CDS Depth	7.204	7.000	3.688	4.813	4.000	2.727	2.391***
Issue Size (in logs)	12.037	12.429	1.839	12.312	12.324	0.808	-0.275***
Relative Size	0.872	0.108	8.060	1.253	0.377	7.255	-0.381**
Maturity	8.053	8.203	0.868	8.034	8.156	0.289	0.013*
Secured	0.048	0.000	0.214	0.088	0.000	0.284	-0.040***
Callable	0.703	1.000	0.457	0.920	1.000	0.257	-0.226***
Putable	0.024	0.000	0.152	0.006	0.000	0.074	0.018***
Yankee	0.003	0.000	0.055	0.003	0.000	0.051	0.001
Rule 144A	0.208	0.000	0.406	0.022	0.000	0.148	0.186***
Firm Size	9.214	9.083	1.921	7.240	7.262	1.339	1.974***
Leverage	36.840	33.146	17.381	47.588	45.512	20.963	-11.362***
Profitability	2.240	2.037	1.935	1.571	1.705	2.275	0.669***
Tangibility	36.840	34.000	27.287	40.423	38.203	27.044	-3.584***
Interest Coverage	10.457	5.575	16.725	4.969	3.049	10.109	5.488***
R&D	0.233	0.000	0.711	0.127	0.000	0.589	0.106***
Capital Exp.	4.241	2.415	5.278	5.629	2.750	7.189	-1.388***
Tobin's Q	1.216	0.970	0.765	1.202	1.025	0.707	0.015
S&P Rating	13.683	14.000	3.649	8.809	9.000	2.052	4.874***
Debt Specialization	0.717	0.723	0.205	0.633	0.574	0.213	0.083***
Forecast Dispersion	0.111	0.046	0.217	0.142	0.070	0.215	-0.031**
Analyst Following	6.227	5.000	4.989	5.684	4.000	4.400	0.543*
Stock Volatility	2.131	1.841	1.129	2.904	2.566	1.337	-0.773***

This panel provides descriptive statistics for some of the firm and deal variables used in the analyses separated out for the full sample, for bonds without Default Indicating covenants, and for bonds with Default Indicating covenants. The notations ***, **, and * denote differences at the 1%, 5%, and 10% levels, respectively. Statistical differences are calculated using t-tests assuming unequal variances for continuous variables, and with chi-square tests for the discrete variables. Variable definitions are provided in Table 1.

Panel D: Industry Distribution

SIC Code	Title of Industries	Obs.	%
0	Agriculture, forestry, and fishing	42	0.3
1	Mining and Construction	1,252	8.96
2	Manufacturing (Food-Petroleum)	2,472	17.69
3	Manufacturing (Plastics/Electronics)	2,056	14.71
4	Transportation and Communication	3,503	25.07
5	Wholesale Trade and Retail Trade	1,341	9.6
6	Finance, Insurance, and Real Estate	1,907	13.65
7	Services (Hotels-Recreation)	996	7.13
8	Services (Health-Private Household)	365	2.61
9	Public Administration	39	0.28
Total		13973	100

This panel provides the number and percentage of bond issues for each industry group in the sample using one digit SIC codes.

Table 3
Covenants and bankruptcy

Panel A: All individual covenants

	Survival Analysis All Individual Covenants	Probit Analysis All Individual Covenants
	(1)	(2)
Dividend Payment Covenant	1.201	0.020
	(0.71)	(0.14)
Restricted Payment Covenant	0.817	-0.201
	(-0.62)	(-0.93)
Funded Debt Covenant	0.541	-0.419*
	(-1.19)	(-1.70)
Subordinated Debt Covenant	0.927	-0.123
	(-0.46)	(-1.14)
Senior Debt Covenant	0.806	-0.165
	(-0.78)	(-0.87)
Negative Pledge Covenant	0.921	0.004
	(-0.35)	(0.03)
Indebtedness Covenant	1.136	0.079
	(0.53)	(0.55)
Leaseback Covenant	0.960	-0.024
	(0.31)	(-0.21)
Liens Covenant	0.784	-0.175
	(-1.06)	(-1.20)
Guarantee Covenant	1.009	0.036
	(0.06)	(0.39)
Asset Sale Covenant	0.621	-0.238
	(-0.91)	(-0.92)
Asset Transfer Covenant	0.360*	-0.687**
	(-1.77)	(-2.06)
Transaction Covenant	1.584	0.415*
	(1.56)	(1.93)
Investment Covenant	1.469**	0.316**
	(1.96)	(2.08)
Stock Issuance Covenant	1.034	0.026
	(0.22)	(0.25)
Preferred Stock Covenant	1.117	0.078
	(0.66)	(0.74)
Stock Transfer Covenant	1.251	0.178
	(1.23)	(1.29)
Cross Acceleration Covenant	0.930	-0.008
	(-0.41)	(-0.07)
Cross Default Covenant	1.061	0.033
	(0.19)	(0.19)
Consolidation Merger Covenant	0.646	-0.473*
	(-0.93)	(-1.85)
Change of Control Covenant	0.841	-0.100
	(-0.91)	(-0.94)
Earnings Covenant	0.693	-0.046
	(-1.04)	(-0.28)

Net Worth Covenant	2.005**	0.281*
	(2.45)	(1.67)
Rating Decline Put Covenant	1.593*	0.385*
	(1.69)	(1.82)
Issue size	0.932	-0.005
	(-0.75)	(-0.12)
Relative size	1.009	0.005*
	(1.64)	(1.76)
Log(Maturity)	0.754	0.585***
	(-1.53)	(4.65)
Secured	1.009	0.046
	(0.06)	(0.38)
Callable	0.932	-0.008
	(-0.45)	(-0.10)
Putable	0.673	-0.356**
	(-1.61)	(-2.43)
Yankee	2.914	0.761
	(1.18)	(1.18)
Rule 144a	0.642*	-0.364***
	(-1.89)	(-3.17)
Antitakeover Index	0.825**	-0.126***
	(-2.54)	(-2.73)
TA Constraint	.033	0.090
	(0.56)	(0.61)
Firm Size	1.053	-0.008
	(0.75)	(-0.20)
Leverage	1.018***	0.012***
	(4.90)	(5.25)
ROA	0.900***	-0.066***
	(-4.23)	(-3.94)
Tangibility	1.001	0.000
	(0.14)	(0.17)
Interest Coverage	1.002	0.002
	(0.39)	(0.68)
R&D	0.967	-0.058
	(-0.31)	(-1.12)
Capital Expenditures	1.015*	0.014**
	(1.83)	(2.45)
Tobin's Q	0.798**	-0.160***
	(-2.29)	(-2.87)
Std. Dev. Stock Returns	1.175***	0.111***
	(3.97)	(4.36)
Stock Return Dev. Missing	2.043***	0.606***
	(4.53)	(4.86)
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Rating Fixed Effects	Yes	Yes
Observations	13973	12005

Panel B: Overall covenant index, default indicating covenants, and other covenants

	Cox Survival Analysis Overall Covenant Index	Cox Survival Analysis Sub-Indices	Probit Analysis Sub-Indices	Cox Survival Analysis with EDF and Z-Score	Probit Analysis with EDF and Z-Score
	(1)	(2)	(3)	(4)	(5)
Covenant Index	0.965*				
	(-1.69)				
Default Indicating Covenants		1.653***	0.393***	1.475***	0.242***
		(3.80)	(3.92)	(3.16)	(2.68)
Other Covenants		0.905***	-0.083***	0.961	-0.042**
		(-3.12)	(-3.95)	(-1.42)	(-2.25)
Z-Score				0.892**	-0.062*
				(-2.34)	(-1.86)
Expected Default Frequency				1.530*	0.289**
				(1.95)	(1.99)
Issue size	0.906	0.911	-0.019	1.138**	0.151***
	(-0.85)	(-0.85)	(-0.38)	(2.19)	(2.75)
Relative size	1.010*	1.009*	0.006*	1.008	0.005
	(1.87)	(1.73)	(1.75)	(1.10)	(1.32)
Log(Maturity)	0.708*	0.729*	0.550***	0.801	0.601***
	(-1.88)	(-1.73)	(4.73)	(-1.09)	(6.60)
Secured	1.060	1.025	0.063	0.901	0.018
	(0.34)	(0.14)	(0.54)	(-0.54)	(0.14)
Callable	0.982	0.980	0.024	0.969	0.015
	(-0.11)	(-0.12)	(0.26)	(-0.18)	(0.15)
Putable	0.530**	0.598**	-0.437***	0.752	-0.451**
	(-2.22)	(-2.12)	(-2.89)	(-0.89)	(-2.32)
Yankee	2.617	3.046	0.663	6.861***	1.231**
	(1.22)	(1.35)	(1.08)	(3.20)	(2.05)
Rule 144a	0.827	0.797	-0.254**	1.101	-0.084
	(-0.92)	(-1.12)	(-2.04)	(0.40)	(-0.67)
Antitakeover Index	0.835**	0.831**	-0.118***	0.876	-0.097*
	(-2.41)	(-2.47)	(-2.61)	(-1.61)	(-1.81)
TA Constraint	1.081	1.075	0.075	1.000	0.059
	(0.36)	(0.33)	(0.52)	(0.00)	(0.35)
Firm Size	1.042	1.041	-0.012	0.916	-0.091**

	(0.58)	(0.57)	(-0.30)	(-1.29)	(-2.00)
Leverage	1.019***	1.018***	0.012***	1.010**	0.007**
	(5.13)	(4.93)	(5.18)	(2.35)	(2.50)
Profitability	0.893***	0.897***	-0.070***	0.920***	-0.063***
	(-4.33)	(-4.24)	(-4.06)	(-3.34)	(-3.76)
Tangibility	1.000	1.001	0.001	1.000	0.001
	(0.03)	(0.14)	(0.27)	(0.02)	(0.31)
Interest Coverage	1.002	1.001	0.002	0.996	-0.001
	(0.30)	(0.24)	(0.63)	(-0.60)	(-0.24)
R&D	0.951	0.957	-0.065	1.038	-0.026
	(-0.44)	(-0.39)	(-1.18)	(0.35)	(-0.45)
Capital Expenditures	1.021**	1.019**	0.016**	1.016*	0.017***
	(2.47)	(2.30)	(2.80)	(1.91)	(3.08)
Tobin's Q	0.797**	0.812**	-0.134***	0.853	-0.134**
	(-2.28)	(-2.06)	(-2.78)	(-1.58)	(-2.08)
Std. Dev. Stock Returns	1.173***	1.176***	0.109***	1.118**	0.093***
	(4.08)	(4.17)	(4.40)	(2.48)	(2.81)
Stock Return Dev. Missing	2.132***	2.087***	0.602***	0.956	-0.143
	(4.71)	(4.61)	(4.82)	(-0.09)	(-0.44)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Rating Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	13973	13973	12005	10474	8222

Panel C: Matched sample and firm fixed effects

	Cox Survival Analysis Matched Sample	Weibull Survival Analysis With Firm Fixed Effects
	(1)	(2)
Default Indicating Covenants	1.459**	1.550**
	(2.34)	(2.17)
Other Covenants	0.933**	0.934**
	(-2.07)	(-2.00)
Firm and Issue Characteristics	No	Yes
Firm Fixed Effects	No	Yes
Industry Fixed Effects	No	No
Year Fixed Effects	No	Yes
Rating Fixed Effects	No	Yes
Observations	1540	2391

This table provides estimated coefficients from a Cox survival analyses and a probit analyses in Panels A and B, and from a Cox survival analysis, and a Weibull Proportional Hazard model in Panel C. The dependent variable is whether or not a bankruptcy occurred and the unit of measurement is at the bond issue level. The sample is from bond issuance until the bond matures or the last date of the sample (December 31, 2014). The independent variables include the bond's individual covenants in Panel A. The independent variables in Panels B and C include the sum of covenants (the Covenant Index), or the Default Indicating and Other covenant sub-indices. All survival regression coefficients are reported in exponentiated form, whereby a coefficient of 1.0 implies no effect. Note that t-statistics refer to the raw estimate, thus an exponentiated coefficient less than 1.0 has a negative t-statistic. The Default Indicating covenant variable is the sum of all covenants that are associated with an increase in the probability of default and have significant t-statistics in either regression in Panel A. The Other covenant variable is the sum of all other covenants. Firm characteristics are measured in the quarter prior to the bond issue. Variable definitions are provided in Table 1. In Panel A, Models 1 and 2 control for each type of covenant. In Panel B, Model 1 is the base case including the sum of all covenants, Model 2 includes the Default Indicating and Other covenant variables using a survival model, and Model 3 is similar but uses a Probit specification. Models 4 and 5 of Panel B are similar to Models 2 and 3 but include Z-score and expected default frequency. In Panel C, Model 1 is a matched sample between issues that do or do not include Default Indicating Covenants. Model 2 of Panel C uses the Weibull distribution and includes firm-level fixed effects. Standard errors are adjusted for clustering at the firm level. The notations ***, **, and * denote significance at the 5% level.

Table 4
Incidence of default indicating covenants by year

Year	Count	Transaction	Investment	Net Worth	Rating Decline Put
1980	105	0.000	0.000	0.000	0.000
1981	160	0.000	0.000	0.000	0.000
1982	241	0.000	0.000	0.000	0.000
1983	250	0.000	0.000	0.000	0.000
1984	287	0.000	0.000	0.000	0.000
1985	478	0.027	0.006	0.067	0.000
1986	756	0.009	0.008	0.037	0.005
1987	650	0.009	0.009	0.052	0.006
1988	467	0.038	0.006	0.062	0.004
1989	505	0.030	0.006	0.030	0.016
1990	541	0.026	0.006	0.004	0.031
1991	590	0.053	0.025	0.010	0.019
1992	970	0.104	0.046	0.019	0.021
1993	1256	0.143	0.043	0.017	0.025
1994	555	0.162	0.047	0.025	0.023
1995	741	0.154	0.039	0.022	0.023
1996	802	0.192	0.032	0.015	0.017
1997	1093	0.220	0.033	0.020	0.016
1998	1496	0.207	0.020	0.017	0.003
1999	1053	0.216	0.013	0.009	0.009
2000	724	0.138	0.011	0.011	0.006
2001	943	0.138	0.016	0.014	0.013
2002	890	0.157	0.010	0.003	0.008
2003	1215	0.134	0.009	0.007	0.002
2004	1039	0.185	0.004	0.020	0.000
2005	891	0.155	0.010	0.027	0.000
2006	920	0.095	0.003	0.011	0.000
2007	1260	0.071	0.000	0.010	0.000
2008	906	0.039	0.001	0.002	0.000
2009	936	0.076	0.025	0.002	0.000
2010	910	0.133	0.023	0.007	0.000
2011	863	0.149	0.000	0.032	0.000
2012	1089	0.095	0.006	0.039	0.000
2013	1190	0.086	0.001	0.028	0.000
2014	689	0.080	0.006	0.026	0.000

This table lists the fraction of bond issues with a particular default indicating covenant in each year.

Table 5
Recovery values

	Recovery Rate at Default (OLS)	Ultimate Recovery Rate (Tobit)
	(1)	(2)
Default Indicating Covenants	13.105***	6.996**
	(4.42)	(2.40)
Other Covenants	-2.248***	-1.883***
	(-3.35)	(-2.63)
Issue size	-2.503	-4.254
	(-1.25)	(-1.57)
Relative Size	0.022	0.591
	(0.16)	(1.57)
Log(Maturity)	-5.622	-1.976
	(-1.61)	(-0.44)
Secured	15.590*	21.125***
	(1.95)	(3.40)
Callable	-7.581*	-13.313***
	(-1.96)	(-3.06)
Putable	-2.782	-19.252***
	(-0.47)	(-2.67)
Yankee	-13.563	0.000
	(-0.74)	(0.00)
Rule 144a	-1.565	-10.290*
	(-0.30)	(-1.78)
Antitakeover Index	-4.829	-5.248
	(-0.87)	(-0.67)
TA Constraint	-0.549	-3.196
	(-0.30)	(-1.19)
Firm Size	-1.489	4.896**
	(-0.87)	(2.33)
Leverage	0.076	-0.156
	(0.65)	(-1.16)
Profitability	-0.280	1.759**
	(-0.39)	(1.99)
Tangibility	-0.072	0.180
	(-0.69)	(1.46)
Interest Coverage	-0.116	-0.905**
	(-1.06)	(-2.16)
R&D	-1.699	6.902***
	(-0.83)	(2.74)
Capital Expenditures	-0.032	0.590**
	(-0.11)	(2.28)
Tobin's Q	-4.467**	1.640
	(-2.20)	(0.68)
Std. Dev. Stock Returns	0.608	1.917
	(0.39)	(1.43)

Stock Return Dev. Missing	-0.223	2.041
	(-0.06)	(0.42)
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Rating Fixed Effects	Yes	Yes
Adjusted R^2/Pseudo R^2	0.415	0.072
Observations	585	631

This table provides regression on the relation between covenants and recovery values. Column 1 is an OLS regression on the price a month after default, column 2 is a tobit regression on the ultimate recovery value (33 observations equal to 0). In both cases, we can reject the hypothesis that the coefficient on the Other covenant equals the coefficient on the Default Indicating covenant at the 1% level. Standard errors are robust with clustering by firm. The notations ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 6
Bond structure and covenant use

	Big Auditor		In-House Counsel		Debt Specialization	
	Default Indicating Covenants	Other Covenants	Default Indicating Covenants	Other Covenants	Default Indicating Covenants	Other Covenants
	(1)	(2)	(3)	(4)	(5)	(6)
Big Auditor	-0.248***	-0.070				
	(-3.11)	(-1.46)				
In-House Counsel			-0.810***	0.062		
			(-3.54)	(1.60)		
Debt Specialization					-0.590***	-0.067
					(-4.05)	(-1.34)
Issue size	0.160***	0.180***	0.197***	0.143***	0.286***	0.043**
	(3.61)	(5.26)	(2.59)	(4.69)	(5.09)	(2.40)
Relative size	-0.001	-0.003***	0.001	-0.004***	0.000	0.001
	(-0.44)	(-3.39)	(0.18)	(-2.88)	(0.10)	(0.91)
Log (Maturity)	-0.135**	-0.003	-0.070	0.012	-0.188**	-0.026**
	(-2.28)	(-0.25)	(-1.11)	(0.89)	(-2.35)	(-2.17)
Secured	-0.057	-0.179***	-0.167*	-0.280***	-0.064	-0.259***
	(-1.07)	(-3.82)	(-1.93)	(-4.43)	(-0.76)	(-3.80)
Callable	0.173	0.166***	-0.050	0.078*	1.133***	0.265***
	(1.41)	(7.80)	(-0.41)	(1.87)	(3.39)	(4.92)
Putable	-1.441***	-0.262***	-0.961**	-0.156***	-2.465***	-0.581***
	(-4.44)	(-5.20)	(-2.03)	(-2.67)	(-3.47)	(-7.91)
Yankee	-0.469	0.003	0.637**	-0.022	-0.221	-0.045
	(-1.19)	(0.07)	(2.34)	(-0.26)	(-0.31)	(-0.88)
Rule 144a	-3.285***	-2.767***	-3.509***	-2.724***	-4.254***	-3.195***
	(-19.96)	(-20.25)	(-13.54)	(-15.04)	(-10.89)	(-19.17)
TA Constraint	-0.072	-0.010	-0.294***	-0.041	-0.337***	-0.080*
	(-0.90)	(-0.32)	(-2.63)	(-1.34)	(-3.11)	(-1.75)
Antitakeover Index	0.030	0.000	0.072**	0.008	0.076**	0.014
	(1.37)	(0.00)	(2.16)	(0.92)	(2.31)	(1.06)
Firm Size	-0.194***	-0.132***	-0.246***	-0.115***	-0.282***	-0.057***

	(-7.10)	(-7.79)	(-5.74)	(-8.09)	(-6.34)	(-3.93)
Leverage	0.004***	0.000	0.006***	-0.001	0.001	0.000
	(3.01)	(-0.29)	(3.58)	(-1.26)	(0.51)	(0.36)
Profitability	-0.007	0.000	0.008	0.008*	0.010	0.011**
	(-0.80)	(0.11)	(0.58)	(1.95)	(0.75)	(2.19)
Tangibility	-0.002	-0.001**	-0.004*	0.000	-0.002	0.000
	(-1.51)	(-2.08)	(-1.70)	(-0.81)	(-0.94)	(-0.66)
Interest Coverage	0.000	0.001*	-0.005	0.000	0.003	0.001
	(0.02)	(1.68)	(-1.25)	(0.33)	(0.62)	(1.36)
Capital Expenditures	-0.060	-0.007	0.056	0.003	-0.150**	-0.008
	(-1.30)	(-0.65)	(0.79)	(0.29)	(-2.06)	(-0.54)
R&D	0.008**	0.000	0.016***	0.002	0.007	0.000
	(2.25)	(-0.29)	(3.08)	(-0.89)	(1.36)	(0.27)
Tobin's Q	-0.121***	-0.019	-0.278***	-0.011	-0.162**	-0.002
	(-3.74)	(-1.57)	(-4.89)	(-0.85)	(-2.44)	(-0.08)
Std. Dev. Stock Returns	-0.028	0.014**	0.000	0.025***	-0.035	0.003
	(-1.62)	(2.04)	(-0.02)	(3.04)	(-1.48)	(0.34)
Stock Return Dev. Missing	0.003	0.032	0.086	0.018	-0.082	0.062
	(0.04)	(0.78)	(0.70)	(0.42)	(-0.60)	(1.00)
p-value♣	0.012		0.001		0.000	
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Rating Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12392	12392	11060	11060	5365	5365

This table provides Poisson regressions on the number of Default Indicating and Other Covenants included in a bond issue. Firm characteristics are from the quarter prior to issuance. The primary independent variables of interest are whether or not the firm uses a Big-4 auditor (Models 1 and 2), whether the firm uses in-House Counsel (Models 3 and 4) and Debt Specialization as in Colla, Ippolito, and Li (2013) (Models 5 and 6). All regressions include dummy variables for issuance year and rating. Regressions with In-House counsel include controls for underwriter, underwriter's lawyer, and other issuers' lawyers. Standard errors are calculated with clustering by firm. The notations ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

♣ p-value for test that Auditor/Counsel/Specialization have similar effects on the Other and Default Indicating covenants.

Table 7
Covenant indices and the cost of debt

Panel A: Covenants and yield spreads

		Default Indicating and Other Covenants			
	Overall Covenant Index	Primary Specification	Debt Specialization	Financial Analysts	Firm Fixed Effects
	(1)	(2)	(3)	(4)	(5)
Covenant Index	0.012***				
	(4.64)				
Default Indicating Covenants		0.084***	0.082***	0.065***	0.079***
		(5.24)	(3.01)	(3.06)	(4.20)
Other Covenants		0.005	0.001	0.000	-0.000
		(1.41)	(0.12)	(0.10)	(-0.03)
Big Auditor	-0.039	-0.036	-0.006	0.013	0.150
	(-1.15)	(-1.07)	(-0.15)	(0.35)	(1.35)
Debt Specialization			-0.072*		
			(-1.72)		
Forecast Dispersion				0.058*	
				(1.90)	
Analyst Following				-0.003**	
				(-2.19)	
Issue size	0.063***	0.063***	0.085***	0.073***	0.061***
	(6.68)	(6.78)	(5.17)	(5.82)	(6.15)
Relative size	0.002*	0.002*	0.003***	0.000	0.000
	(1.77)	(1.73)	(2.84)	(-0.17)	(0.19)
Log(Maturity)	0.167***	0.168***	0.155***	0.185***	0.188***
	(18.90)	(18.91)	(11.34)	(18.31)	(23.85)
Secured	0.13[illegible]***	-0.139***	-0.208***	-0.097*	-0.121***
	(-3.40)	(-3.51)	(-5.56)	(-1.71)	(-2.79)
Callable	0.106***	0.107***	0.047	0.068***	0.066***
	(6.89)	(6.98)	(1.22)	(2.69)	(4.20)
Putable	-0.411***	-0.412***	0.065	-0.376***	-0.431***
	(-12.85)	(-12.86)	(0.69)	(-5.61)	(-13.48)
Yankee	0.186*	0.187*	0.138	0.142***	-0.446
	(1.75)	(1.78)	(1.41)	(2.88)	(-1.41)
Rule 144a	0.174***	0.160***	0.123***	0.094***	0.094***
	(7.23)	(6.51)	(3.12)	(2.82)	(3.35)
Antitakeover Index	0.000	-0.001	0.002	-0.013*	-0.031
	(-0.06)	(-0.15)	(0.15)	(-1.91)	(-0.79)
TA Constraint	-0.003	-0.002	-0.019	0.055**	-0.212***
	(-0.10)	(-0.06)	(-0.49)	(2.45)	(-7.82)
Firm Size	-0.079***	-0.079***	-0.090***	-0.084***	-0.037**
	(-10.67)	(-10.67)	(-8.52)	(-9.13)	(-2.57)
Leverage	0.002***	0.002***	0.001*	0.001*	0.002***
	(4.30)	(4.15)	(1.70)	(1.81)	(2.80)
Profitability	-0.017***	-0.017***	-0.013**	-0.010**	-0.016***

	(-5.26)	(-5.23)	(-2.57)	(-2.47)	(-4.09)
Tangibility	0.000	0.000	-0.001	0.000	-0.001
	(-0.91)	(-0.95)	(-0.75)	(0.77)	(-1.45)
Interest coverage	0.000	0.000	-0.001**	-0.001**	0.000
	(-1.05)	(-1.09)	(-2.00)	(-2.03)	(-0.57)
R&D	-0.003	-0.003	0.005	0.011	-0.013
	(-0.36)	(-0.34)	(0.29)	(0.85)	(-1.19)
Capital expenditures	-0.004***	-0.004***	-0.004**	-0.005***	-0.004***
	(-2.90)	(-3.00)	(-2.03)	(-3.21)	(-3.48)
Tobin's Q	-0.072***	-0.071***	-0.073***	-0.069***	-0.049***
	(-9.07)	(-9.06)	(-4.55)	(-6.65)	(-3.64)
Std. Dev. Stock Returns	0.089***	0.089***	0.098***	0.092***	0.086***
	(13.61)	(13.69)	(10.59)	(11.44)	(10.85)
Stock Return Dev. Missing	0.071***	0.071***	0.097**	0.031	-0.003
	(2.70)	(2.72)	(2.37)	(0.85)	(-0.10)
Quality Spread	0.447***	0.448***	0.416***	0.459***	0.462***
	(28.27)	(28.31)	(23.20)	(24.99)	(28.86)
Rating Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes
p-value♣		0.006	0.008	0.007	0.000
R-Squared	0.861	0.861	0.838	0.855	0.806
Observations	7336	7336	3409	4016	7336

This panel provides regression results on the relation between covenant use the cost of debt. The dependent variable is the log of the yield spread over treasury bonds at issuance. All regressions are OLS with standard errors clustered by issuing firm. Model 1 includes the overall covenant index, Model 2 includes the Default Indicating and Other covenant indices (as defined from Table 3). Model 3 is the same as Model 2 but also includes the Debt Specialization as a control variable. Model 4 is the same as Model 2 but also includes the dispersion of analyst forecasts and the number of analyst forecasts. Model 5 is similar to Model 2 but includes firm-level fixed effects. All regressions include issuance year dummies, 2-digit SIC industry dummies (except for the firm fixed effect regression), and rating dummy variables. The notations ***, **, and * denotes significance at the 1%, 5%, and 10% levels, respectively.

♣ p-value for test that coefficient on Default Indicating Covenants = coefficient on Other Covenants

Panel B: Instrumental variable analysis of covenant indices and yield spreads

	First Stage		Second Stage
	Default Indicating Covenants	Other Covenants	IV Using Law Firms
	(1)	(2)	(3)
Default Indicating Covenants			0.612**
			(2.430)
Other Covenants			-0.057**
			(-2.150)
Agent Law Firm – Other Covenants	-0.004	0.216***	
	(-0.620)	(4.560)	
Agent Law Firm – Def. Ind. Covenants	0.121**	-0.425	
	(2.130)	(-1.360)	
Issuer Law Firm – Other Covenants	0.003	0.178**	
	(0.360)	(3.760)	
Issuer Law Firm – Def. Ind. Covenants	0.201***	-0.047	
	(2.750)	(-0.120)	
Big Auditor	-0.011	0.152	-0.046
	(-0.130)	(0.510)	(-0.930)
Issue size	0.030***	0.280***	0.062***
	(3.490)	(4.450)	(4.430)
Relative size	-0.001**	-0.014***	0.000
	(-2.240)	(-2.960)	(0.020)
Log(Maturity)	-0.005	-0.026	0.175***
	(-1.030)	(-0.760)	(18.130)
Secured	-0.013	-1.055***	-0.241***
	(-0.640)	(-4.340)	(-4.210)
Callable	-0.014	0.136	0.107***
	(-0.860)	(1.390)	(5.590)
Putable	0.008	-0.195	-0.426***
	(0.280)	(-1.070)	(-11.630)
Yankee	0.112***	0.037	0.277***
	(2.910)	(0.150)	(5.730)
Rule 144a	-0.378***	-5.882***	-0.012
	(-13.020)	(-38.180)	(-0.080)
Antitakeover Index	0.010*	-0.023	-0.009
	(1.890)	(-0.550)	(-0.910)
TA Constraint	-0.019	-0.057	0.006
	(-1.040)	(-0.370)	(0.190)
Firm Size	-0.029***	-0.285***	-0.077***
	(-4.610)	(-6.040)	(-6.310)
Leverage	0.001	0.002	0.002**
	(1.500)	(0.510)	(2.530)
Profitability	0.001	0.036*	-0.015***
	(0.440)	(1.910)	(-3.520)
Tangibility	-0.001*	-0.010***	-0.001
	(-1.860)	(-3.320)	(-1.230)
Interest coverage	0.000	0.002	0.000
	(0.680)	(0.740)	(-0.810)
R&D	-0.001	-0.012	-0.003
	(-0.150)	(-0.280)	(-0.330)

Capital expenditures	0.003*	0.009	-0.005***
	(1.710)	(1.130)	(-3.020)
Tobin's Q	-0.017**	0.004	-0.066***
	(-2.280)	(0.060)	(-6.610)
Std. Dev. Stock Returns	0.011	0.137***	0.100***
	(1.400)	(3.350)	(11.140)
Stock Return Dev. Missing	0.007	0.127	0.053
	(0.210)	(0.720)	(1.630)
Quality Spread	-0.018	0.057	0.451***
	(-1.320)	(0.530)	(25.130)
Rating Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes
Issuer Dummies	Yes	Yes	Yes
F-test of Excluded Instruments	5.04	3.97	
Hansen's J statistic p-val			0.738
Test of Endogeneity p-val			0.016
Test that Def. Ind = Other p-value♣			0.011
R-Squared	0.861	0.861	0.840
Observations	6347	6347	6347

The panel provides regression results on the relation between the covenant index and the cost of debt using instrumental analysis. The dependent variable is the log of the yield spread over treasury bonds at issuance. All regressions are OLS with standard errors clustered by issuing firm. Model 1 and 2 provides first stage regression results using the frequency of Default Indicating and Other covenants by firms that used the same agent's law firm and issuer law firm as instruments. Model 3 is the second stage of the instrumental variable regression. All regressions include issuance year dummies, 2-digit SIC industry dummies, and rating dummy variables. The notations ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

♣ p-value for test that coefficient on Default Indicating Covenants = coefficient on Other Covenants

Table 8
Covenant indices and the credit default swaps

	5-Year CDS Spread			CDS Existence and Depth	
	Overall Covenant Index	Primary Specification	Financial Analysts	Probit on if CDS Exist	Regression on log (CDS depth)
	(1)	(2)	(3)	(4)	(5)
Covenant Index	0.013**				
	(2.31)				
Default Indicating Covenants		0.113**	0.136***	-0.372***	-0.179***
		(2.33)	(2.77)	(-3.03)	(-3.79)
Other Covenants		0.006	0.004	0.037**	-0.002
		(0.78)	(0.51)	(2.11)	(-0.33)
Forecast Dispersion			0.085*		
			(1.74)		
Analyst Following			-0.006**		
			(-2.26)		
Big Auditor	-0.019	-0.012	0.015	0.418	-0.168
	(-0.18)	(-0.11)	(0.22)	(1.26)	(-0.88)
Issue size	-0.030***	-0.029***	0.022***	-0.003	0.013*
	(-3.07)	(-2.99)	(-3.57)	(-0.08)	(1.81)
Relative size	0.001	0.001	0.001	0.002	0.000
	(0.65)	(0.53)	(0.39)	(0.50)	(-0.19)
Log(Maturity)	-0.058***	-0.058***	-0.017*	0.045	0.002
	(-3.39)	(-3.43)	(-1.71)	(1.15)	(0.26)
Secured	-0.028	-0.039	0.007	-0.474**	-0.278***
	(-0.40)	(-0.54)	(0.07)	(-2.50)	(-4.20)
Callable	0.075***	0.078***	0.076***	-0.097	-0.022
	(3.34)	(3.43)	(3.04)	(-0.97)	(-0.83)
Putable	0.203*	0.208*	0.174	0.014	-0.074
	(1.77)	(1.82)	(1.62)	(0.06)	(-0.95)
Yankee	0.335	0.341	0.351*	-0.620*	0.052
	(1.30)	(1.35)	(1.79)	(-1.95)	(0.26)
Rule 144a	0.180***	0.167***	0.170***	-0.089	-0.033
	(4.08)	(3.69)	(3.22)	(-0.84)	(-0.80)
Antitakeover Index	-0.022*	-0.022*	-0.036**	0.001	-0.018
	(-1.82)	(-1.82)	(-2.57)	(0.02)	(-1.28)
TA Constraint	0.046	0.046	0.090*	0.060	0.031
	(1.13)	(1.11)	(1.93)	(0.45)	(0.67)
Firm Size	0.059***	0.059***	0.047***	0.567***	0.208***
	(3.48)	(3.50)	(2.61)	(10.20)	(11.41)
Leverage	0.005***	0.005***	0.004***	0.013***	0.002
	(4.13)	(3.95)	(3.30)	(4.17)	(1.49)
Profitability	-0.014	-0.013	-0.028***	0.016	0.021**
	(-1.58)	(-1.53)	(-3.10)	(0.70)	(2.09)
Tangibility	0.000	0.000	0.001	0.008**	0.000
	(0.39)	(0.37)	(1.21)	(2.46)	(0.08)
Interest coverage	0.000	0.000	0.001	-0.003	-0.003*

	(0.52)	(0.50)	(0.82)	(-1.17)	(-1.93)
R&D	0.025	0.024	0.022	0.019	0.046**
	(1.24)	(1.16)	(0.97)	(0.26)	(2.01)
Capital expenditures	-0.007**	-0.007**	-0.008***	-0.016*	-0.001
	(-2.49)	(-2.44)	(-2.63)	(-1.92)	(-0.39)
Tobin's Q	-0.154***	-0.153***	-0.119***	-0.107	-0.042
	(-5.95)	(-5.90)	(-3.99)	(-1.26)	(-1.48)
Std. Dev. Stock Returns	0.212***	0.212***	0.157***	0.064*	0.020
	(7.84)	(7.82)	(7.82)	(1.80)	(1.30)
Stock Return Dev. Missing	0.296***	0.298***	0.133*	0.300	0.026
	(3.12)	(3.14)	(1.67)	(1.53)	(0.39)
Quality Spread	0.195***	0.197***	0.267***	0.160*	0.023
	(4.97)	(5.06)	(6.40)	(1.65)	(0.74)
Rating Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes
p-value♣		0.044	0.015	0.003	0.001
R-Squared/Pseudo R-squared	0.959	0.958	0.968	0.387	0.520
Observations	4802	4802	3647	7418	4802

This panel provides regression results on the relation between covenant use and the spread on CDS contracts, as well as between covenant use and the existence and depth of CDS trading. In Models 1-3 the dependent variable is the log of the 5-year CDS contract spread. Model 4 is a probit regression where the dependent variable whether any CDS contracts exist. Model 5 is an OLS regression where the dependent variable is the log of the depth for 5-year CDS contracts. All regressions include issuance year dummies, 2-digit SIC industry dummies, and rating dummy variables. The notations ***, **, and * denotes significance at the 1%, 5%, and 10% levels, respectively.

♣ p-value for test that coefficient on Default Indicating Covenants = coefficient on Other Covenants

Appendix A
Covenant definitions

Covenant Sub-Index	Covenant Dummy Variables	FISD Covenants Dummy Variables	Definition of covenants
Payment Index	Dividend Payment	Dividends Related Payments, OR	Flag indicating that payments made to shareholders or other entities may be limited to a certain percentage of net income or some other ratio
		Subsidiary Dividends Related Payments	Limits the subsidiaries' payment of dividends to a certain percentage of net income or some other ratio. For captive finance subsidiaries, this provision limits the amount of dividends which can be paid to the parent. This provision protects the debtholder against a parent from draining assets from its subsidiaries.
	Other Payment	Restricted Payments	Restricts issuer's freedom to make payment (other than dividend related payments) to shareholders and others
Asset Index	Transaction	Transaction Affiliates	Issuer is restricted in certain business dealings with its subsidiaries
	Investment	Investments, OR	Restricts issuer's investment policy to prevent risky investments
		Subsidiary Investments Unrestricted	Restricts subsidiaries' investment
	Asset Sales	Asset Sale Clause, OR	Covenant requiring the issuer to use net proceeds from the sale of certain assets to redeem the bonds at par of at a premium. This covenant does not limit the issuers right to sell assets
		Sale Assets	Restriction on the ability of an issuer to sell assets or restrictions on the issuer's use of the proceeds from the sale of assets. Such restrictions may require the issuer to apply some or all of the sales proceeds to the repurchase of debt through a tender offer or call.
	Asset Transfer	Subsidiary sale assets unrestricted	issuer must use proceeds from sale of subsidiaries' assets (either certain asset sales or all asset sales over some threshold) to reduce debt.
Borrowing Index	Funded Debt	Subsidiary Funded Debt	Restricts issuer's subsidiaries from issuing additional funded debt (debt with an initial maturity of longer than one year)
		Funded Debt	Restricts issuer from issuing additional funded debt. Funded debt is an debt with an initial maturity of one year or longer
	Subordinated Debt	Subordinated Debt Issuance	Restricts issuance of junior or subordinated debt
	Senior debt	Senior Debt Issuance	Restricts issuer to the amount of senior debt is may issuer in the future
	Secured debt	Negative Pledge Covenant	The issuer cannot issue secured debt unless it secures the current issue on a pari passu (equal amount) basis
	Indebtetness	Indebtedness, OR	Restricts user from incurring additional debt with limits on absolute dollar amount of debt outstanding or percentage total capital
		Subsidiary Indebtedness, OR	Restricts the total indebtedness of the subsidiaries
		Leverage Test, OR	Restricts total-indebtedness of the issuer
		Subsidiary Leverage Test	Limits subsidiaries' leverage

	Leaseback	Sales Leaseback, OR	Restricts issuer to the type or amount of property used in a sale leaseback transaction and may restrict its use of the proceeds of the sale. A sale leaseback transaction is a method of raising capital in which an organization sells some specific assets to an entity that simultaneously leases the asset back to the organization for a fixed term and agreed upon rate.
		Subsidiary Sales Leaseback	Restricts subsidiaries from selling then leasing back assets that provide security for the debtholder. This provision usually requires that assets or cash equal to the property sold and leased back be applied to the retirement of the debt in question or used to acquire another property to increase the debtholders' security
	Liens	Liens, OR	In the case of default, the bondholders have the legal right to sell mortgaged property to satisfy their unpaid obligations
		Subsidiary Liens	Restricts subsidiaries from acquiring liens on their property
	Guarantee	Subsidiary Guarantee	Subsidiary is restricted from issuing guarantees for the payment of interest and/or principal of certain debt obligations
Stock Index	Common stock	Stock Issuance, OR	Restricts issuer from issuing additional common stocks
		Subsidiary Stock Issuance	Restricts issuer from issuing additional common stock in restricted subsidiaries. Restricted subsidiaries are those which are considered to be consolidated for financial test purposes.
	Preferred stock	Subsidiary Preferred Stock Issuance	Restricts subsidiaries' ability to issue preferred stock
	Other stock	Stock transfer sale	Restricts the issuer from transferring, selling, or disposing of its own common or the common stock of a subsidiary
Default Index	Cross Acceleration	Cross Acceleration	A bondholder protective covenant that allows the holder to accelerate their debt, if any other debt of the organization has be accelerated due to an event of default
	Cross Default	Cross Default	A bondholder protective covenant that will activate an event of default in their issue, if an event of default has occurred under any other debt of the company
Antitakeover Index	Poison Put	Change Control Put Provisions	Upon a change of control in the issuer, bondholders have the option of selling the issue back to the issuer (poison put). Other conditions may limit the bondholder's ability to exercise the put option. Poison puts are often used when a company fears an unwanted takeover by ensuring that a successful hostile takeover bid will trigger an event that substantially reduce the value of the company
	Antitakeover M&A	Consolidation Merger	Indicates that a consolidation or merger of the issuer with another entity is restricted
Profit Index	Earnings	Fixed charge coverage, OR	Issuer is required to have a ratio of earnings available for fixed charges, of at least a minimum specified level.
		Subsidiary fixed charge coverage, OR	Subsidiaries are required to maintain a minimum ratio of net income to fixed charges
		Net earnings test issuance	To issue additional debt the issuer must have achieved or maintained certain profitability levels. This test is a variations of the (more common) fixed coverage tests
	Net Worth	Maintenance net worth, OR	Issuer must maintain a minimum specified net worth
		Declining net worth	If issuer's net worth (as defined) falls below minimum level, certain bond provisions are

			triggered
Rating Decline Index	Rating Decline	Rating Decline Trigger Put	A decline in the credit rating of the issuer (or issue) triggers a bond holder put provision

Appendix B
Examples of Default Indicating covenants

Below are examples of covenants that are associated with an increase in the probability of bankruptcy.

1. Stock Issuance Restriction

Example A: B&G Foods Issuance from 1/11/10:

https://www.sec.gov/Archives/edgar/data/1049296/000104746910000081/a2196019z424b5.htm

Incurrence of Indebtedness and Issuance of Preferred Stock

B&G Foods will not, and will not permit any of its Restricted Subsidiaries to, directly or indirectly, create, incur, issue, assume, guarantee or otherwise become directly or indirectly liable, contingently or otherwise, with respect to (collectively, "*incur*") any Indebtedness (including Acquired Debt), and B&G Foods will not issue any Disqualified Stock and will not permit any of its Restricted Subsidiaries to issue any shares of preferred stock; *provided, however*, that B&G Foods may incur Indebtedness (including Acquired Debt) or issue Disqualified Stock, and the Guarantors may incur Indebtedness (including Acquired Debt) or issue preferred stock, if the Fixed Charge Coverage Ratio for B&G Foods' most recently ended four full fiscal quarters for which internal financial statements are available immediately preceding the date on which such additional Indebtedness is incurred or such Disqualified Stock or such preferred stock is issued, as the case may be, would have been at least 2.0 to 1.0, determined on a pro forma basis (including a pro forma application of the net proceeds therefrom), as if the additional Indebtedness had been incurred or the Disqualified Stock or the preferred stock had been issued, as the case may be, at the beginning of such four-quarter period.

Example B: Wachovia Corp. Issuance from 2/03/04,

https://www.sec.gov/Archives/edgar/data/36995/000119312504015159/d424b5.htm:

Restriction on Sale or Issuance of Voting Stock of Major Subsidiary Banks

The indentures each contain Wachovia's covenant that it will not, and will not permit any subsidiary to, sell, assign, transfer, grant a security interest in, or otherwise dispose of, any shares of voting stock, or any securities convertible into shares of voting stock, of any "Major Subsidiary Bank" (as defined below) or any subsidiary owning, directly or indirectly, any shares of voting stock of any Major Subsidiary Bank and that it will not permit any Major Subsidiary Bank or any subsidiary owning, directly or indirectly, any shares of voting stock of a Major Subsidiary Bank to issue any shares of its voting stock or any securities convertible into shares of its voting stock, except for sales, assignments, transfers or other dispositions which

- are for the purpose of qualifying a person to serve as a director
- are for fair market value, as determined by Wachovia's board, and, after giving effect to such dispositions and to any potential dilution, Wachovia will own not less than 80% of the shares of voting stock of such Major Subsidiary Bank or any such subsidiary owning any shares of voting stock of such Major Subsidiary Bank
- are made
    - in compliance with court or regulatory authority order or
    - in compliance with a condition imposed by any such court or authority permitting Wachovia's acquisition of any other bank or entity or
    - in compliance with an undertaking made to such authority in connection with such an acquisition; provided, in the case of the two preceding bullet-points, the assets of the bank or entity being acquired and its consolidated subsidiaries equal or exceed 75% of the assets of such Major Subsidiary Bank or such subsidiary owning, directly or indirectly, any shares of voting stock of a Major Subsidiary Bank and its respective consolidated subsidiaries on the date of acquisition or
    - to Wachovia or any wholly-owned subsidiary.

Example C: Used in Hanesbrands Inc., exchange offer 6.375% Senior Notes due 2020 filing from January 7, 2011 (cusip: 410345AG7; CIK: 642666). The following sentences are extracted from the prospectus available at:

https://www.sec.gov/Archives/edgar/data/846626/000095012311001154/g25447b3e424b3.htm

Limitation on the Issuance and Sale of Capital Stock of Restricted Subsidiaries

The Company will not sell, and will not permit any Restricted Subsidiary, directly or indirectly, to issue or sell, any shares of Capital Stock of a Restricted Subsidiary (including options, warrants or other rights to purchase shares of such Capital Stock) except:

(1) to the Company or a Wholly Owned Restricted Subsidiary;
(2) issuances of director's qualifying shares or sales to foreign nationals or other persons of shares of Capital Stock of foreign Restricted Subsidiaries, in each case, to the extent required by applicable law;
(3) if, immediately after giving effect to such issuance or sale, such Restricted Subsidiary would no longer constitute a Restricted Subsidiary and any Investment in such Person remaining after giving effect to such issuance or sale would have been permitted to be made under the "Limitation on Restricted Payments" covenant if made on the date of such issuance or sale; or
(4) sales of Capital Stock (other than Disqualified Stock) (including options, warrants or other rights to purchase shares of such Capital Stock) of a Restricted Subsidiary; *provided* that the Company or such Restricted Subsidiary either (a) applies the Net Cash Proceeds of any such sale in accordance with the "Limitation on Asset Sales" covenant or (b) to the extent such sale is of preferred stock, such sale is permitted under the "Limitation on Indebtedness" covenant.

2. Preferred Stock Restrictions

Used in Acadia Healthcare Company, Inc (Nasdaq:ACHC) Senior Note issued on August 20 2014 (Cusip: 00404AAG4; FISD_Issue_id: 617757). The following sentences are extracted from indenture dated as of July 1, 2014 in 8-K(Ex-4.1). https://www.sec.gov/Archives/edgar/data/1520697/000119312514258367/d7510 84dex41.htm

Section 4.09. Incurrence of Indebtedness and Issuance of Preferred Stock.

(a) The Company will not, and will not permit any of its Restricted Subsidiaries to, directly or indirectly, create, incur, issue, assume, guarantee or otherwise become directly or indirectly liable, contingently or otherwise, with respect to (collectively, "incur") any Indebtedness (including Acquired Debt), and the Company will not issue any Disqualified Stock and will not permit any of its Restricted Subsidiaries to issue any shares of Preferred Stock; provided, however, that the Company may incur Indebtedness (including Acquired Debt) or issue Disqualified Stock, and any Guarantor may incur Indebtedness (including Acquired Debt) or issue Preferred Stock, if the Fixed Charge Coverage Ratio for the Company's most recently ended four full fiscal quarters for which internal financial statements are available immediately preceding the date on which such additional Indebtedness is incurred or such Disqualified Stock or such Preferred Stock is issued, as the case may be, would have been at least 2.0 to 1.0, determined on a pro forma basis (including a pro forma application of the net proceeds therefrom), as if the additional Indebtedness had been incurred or the Disqualified Stock or the Preferred Stock had been issued, as the case may be, at the beginning of such four-quarter period.

3. Limitation on Stock Sale, Transfer, and Disposition

Used in The Navigators Group, Inc. issues of April 11, 2006, see:

https://www.sec.gov/Archives/edgar/data/793547/000104746906004993/a2169360z424b5.htm

Restrictions on Certain Dispositions

The supplemental indenture also provides that we will not, and will not permit any of our subsidiaries to, issue, sell, assign, transfer or otherwise dispose of, directly or indirectly, any of the common stock of our significant subsidiaries (except to us or to one or more of our other subsidiaries or for the purpose of qualifying directors), unless

- the issuance, sale, assignment, transfer or other disposition is required to comply with the order of a court or regulatory authority of competent jurisdiction, other than an order issued at our request or at the request of one of our subsidiaries; or

- the entire common stock that we or our subsidiaries own is disposed of in a single transaction or in a series of related transactions for consideration consisting of cash or other property that is at least equal to the fair value of such common stock; or
- after giving effect to the issuance, sale, assignment, transfer or other disposition, we and our subsidiaries would own directly or indirectly at least 80% of the issued and outstanding common stock of such significant subsidiary and such issuance, sale, assignment, transfer or other disposition is made for consideration consisting of cash or other property which is at least equal to the fair value of such common stock.

The term "fair value," when used with respect to common stock, means the fair value thereof as determined in good faith by our board of directors.

4. Transaction with affiliates

Used in Acadia Healthcare Company, Inc (Nasdaq:ACHC) Senior Note issued on August 20 2014 (Cusip: 00404AAG4; FISD_Issue_id: 617757). The following sentences are extracted from indenture dated as of July 1, 2014 in 8-K(Ex-4.1). https://www.sec.gov/Archives/edgar/data/1520697/000119312514258267/d7510 84dex41.htm

Section 4.11. Transactions with Affiliates.

(a) The Company will not, and will not permit any of its Restricted Subsidiaries to, make any payment to or sell, lease, transfer or otherwise dispose of any of its properties or assets to, or purchase any property or assets from, or enter into or make or amend any transaction, contract, agreement, understanding, loan, advance or guarantee with, or for the benefit of, any Affiliate of the Company (each, an "Affiliate Transaction") involving aggregate payments or consideration in excess of $1.0 million, unless:

(1) the Affiliate Transaction is on terms that are not materially less favorable to the Company, taken as a whole, or the relevant Restricted Subsidiary than those that would have been obtained in a comparable transaction by the Company or such Restricted Subsidiary with an unrelated Person;
(2) with respect to any Affiliate Transaction or series of related Affiliate Transactions involving aggregate consideration in excess of $10.0 million, the Company delivers to the Trustee a resolution of the Board of Directors of the Company set forth in an Officers' Certificate certifying that such Affiliate Transaction complies with clause (1) of this Section 4.11(a); and
(3) with respect to any Affiliate Transaction or series of related Affiliate Transactions involving aggregate consideration in excess of $30.0 million, the Company delivers to the Trustee an opinion as to the fairness to the Company or such Restricted Subsidiary of such Affiliate Transaction from an Independent Financial Advisor.

5. Investment

Example A: Used in Navistar International Corporate (NYSE:NAV) Senior Unsecured Note issued on October 22 2009 (Cusip: 63934EAM0; FISD_Issue_id: 506790). The following sentences are extracted from indenture dated as of October 28, 2009 in 8-K(Ex-4.1).

https://www.sec.gov/Archives/edgar/data/808450/000119312509216261/dex41.htm

Section 3.11. [Reserved].

(a) The Company will not, and will not cause or permit any of its Restricted Subsidiaries to directly or indirectly:

(iii) make any Investment (other than a Permitted Investment);

"Permitted Investments" means:

(1) Investments in Cash Equivalents;

(2) guarantees of Indebtedness otherwise permitted under Section 3.10 (other than clause (y) thereof);

(3) any Investment by the Company or any Restricted Subsidiary in or relating to a Securitization Subsidiary that, in the good faith determination of the Company, are necessary or advisable to effect any Qualified Securitization Transaction or any repurchase obligation in connection therewith;

(4) deposits, including interest-bearing deposits, maintained in the ordinary course of business in banks;

(5) any acquisition of the Capital Stock of any Person and any Investment in another Person if as a result of such Investment such other Person is merged with or consolidated into, or transfers or conveys all or substantially all of its assets to, the Company or a Restricted Subsidiary of the Company; *provided*, that after giving effect to any such acquisition or Investment such Person shall become a Restricted Subsidiary of the Company or another Restricted Subsidiary of the Company;

(6) trade receivables and prepaid expenses, in each case arising in the ordinary course of business; *provided*, that such receivables and prepaid expenses would be recorded as assets of such Person in accordance with GAAP;

(7) endorsements for collection or deposit in the ordinary course of business by such Person of bank drafts and similar negotiable instruments of such other Person received as payment for ordinary course of business trade receivables;

(8) any swap, hedging or other derivative obligation with an unaffiliated Person otherwise permitted by this Indenture (including, without limitation, any Currency Agreement, Commodity Agreement and any Interest Rate Protection Agreement otherwise permitted by this Indenture);

(9) Investments received as consideration for an Asset Disposition in compliance with Section 3.13 herein;

(10) Investments acquired in exchange for the issuance of Capital Stock (other than Disqualified Capital Stock) of the Company or acquired with the Net Cash Proceeds received by the Company after the Issue Date from the issuance and sale of Capital Stock (other than Disqualified Capital Stock) of the Company; provided that such Net Cash Proceeds are used to make such Investment within 60 days of the receipt thereof and the amount of all such Net Cash Proceeds will be excluded from clause (3)(B) of Section 3.12(a);

(11) loans and advances to employees made in the ordinary course of business in an aggregate amount not to exceed $10.0 million at any one time outstanding;

(12) Investments outstanding on the Issue Date;

(13) Investments in the Company or a Restricted Subsidiary;

(14) Investments in securities of trade creditors, suppliers or customers received pursuant to any plan of reorganization, restructuring, workout or similar arrangement of such trade creditor, supplier or customer or upon the compromise of any debt created in the ordinary course of business owing to the Company or a Subsidiary, whether through litigation, arbitration or otherwise;

(15) Investments in any Person after the Issue Date having an aggregate fair market value (measured on the date each Investment was made without giving effect to subsequent changes in value), when taken together with all other Investments made pursuant to this clause (15) that are at that time outstanding (after giving effect to any net cash proceeds received from any sale, transfer or other disposition) not to exceed $75.0 million;

(16) Investments in Navistar Financial Corporation, having an aggregate fair market value (measured on the date each Investment was made without giving effect to subsequent changes in value), when taken together with all other Investments made pursuant to this clause (16) that are at that time outstanding not to exceed $100.0 million;

(17) Investments made pursuant to the Support Agreement or Master Intercompany Agreements;

(18) extensions of loans, trade credit and advances to, and guarantees in favor of customers and suppliers and lease, utility and similar deposits to the extent made in the ordinary course of business; and

(19) Investments consisting of the licensing or contribution of intellectual property pursuant to joint marketing arrangement with other Persons.

Example B: Used in Tenet Healthcare Corp (NYSE:THC) Senior Subordinated Notes issued on January 27, 1997(Cusip: 88033GAG5; FISD_Issue_id: 49121). The following sentences are extracted from indenture dated as of January 15, 1997 in 10-K(Ex-4(M)).

https://www.sec.gov/Archives/edgar/data/70318/0000912057-97-029143.txt

SECTION 3.14. LINE OF BUSINESS.

The Company shall not, and shall not permit any of its Subsidiaries to, engage in any material extent in any business other than the ownership, operation and management of Hospitals and Related Businesses.

6. Net worth

Used in Toll Brothers Inc (NYSE:TOL) Senior subordinated Notes issued on January 19, 2001 (Cusip: 889478AC7; FISD_Issue_id: 115562). The following sentences are extracted from indenture dated as of January 19, 2001 in 8-K(Ex-4).

https://www.sec.gov/Archives/edgar/data/794170/000095011601000084/0000950116-01-000084-0003.txt

Section 4.06. Maintenance of Consolidated Net Worth.

If the Consolidated Net Worth of the Guarantor and its Subsidiaries at the end of any two consecutive fiscal quarters is less than $55,000,000, then the Guarantor shall cause the Company to offer to repurchase (the "Offer") on the last day of the fiscal quarter next following such second fiscal quarter, or, if such second fiscal quarter ends on the last day of the Guarantor's fiscal year, 120 days following the last day of such second fiscal quarter (the "Purchase Date") $7,500,000 aggregate principal amount of Securities (or such lesser amount as may be outstanding at the time, such amount being referred to as the "Offer Amount") at a purchase price equal to their principal amount plus accrued and unpaid interest to the Purchase Date. The Company may credit against its obligation to offer to repurchase Securities on a Purchase Date the principal amount of (i) Securities acquired by the Company and surrendered for cancellation otherwise than pursuant to an Offer and (ii) Securities redeemed or called for redemption, in each case at least 60 days before the Purchase Date. In no event shall the failure to meet the minimum Consolidated Net Worth stated above at the end of any fiscal quarter be counted toward the making of more than one Offer.

7. Rating decline put trigger

Used in Tenet Healthcare Corp (NYSE:THC) Senior Subordinated Notes issued on January 27, 1997(Cusip: 88033GAG5; FISD_Issue_id: 49121). The following sentences are extracted from indenture dated as of August 27, 1997 in 10-K(Ex-4(M)). https://www.sec.gov/Archives/edgar/data/70318/0000912057-97-029143.txt

Upon the occurrence of a Change of Control Triggering Event, each Holder of Securities shall have the right to require the Company to repurchase all or any part (equal to $1,000 or an integral multiple thereof) of such Holder's Securities pursuant to the offer described below (the "CHANGE OF CONTROL OFFER") at an offer price in cash equal to 101% of the aggregate principal amount thereof plus accrued and unpaid interest, if any, thereon to the date of purchase (the "CHANGE OF CONTROL PAYMENT") on a date that is not more than 90 days after the occurrence of such Change of Control Triggering Event (the "CHANGE OF CONTROL PAYMENT DATE").

"CHANGE OF CONTROL TRIGGERING EVENT" means the occurrence of both a Change of Control and a Rating Decline "RATING DECLINE" means the occurrence on or within 90 days after the date of the first public notice of the occurrence of a Change of Control or of the intention by the Company to effect a Change of Control (which period shall be extended so long as the rating of the Securities is under publicly announced consideration for possible downgrade by any of the Rating Agencies) of: (a) in the event the Securities are rated by either Moody's or S&P on the Rating Date as Investment Grade, a decrease in the rating of the Securities by both Rating Agencies to a rating that is below Investment Grade, or (b) in the event the Securities are rated below Investment Grade by both Rating Agencies on the Rating Date, a decrease in the rating of the Securities by either Rating Agency by one or more gradations (including gradations within Rating Categories as well as between Rating Categories).

Highlights

- Four of the 24 covenants typically included in public bond issues are associated with higher bankruptcy risk.
- These Default Indicating covenants can be partly explained by faulty contract design, greater recovery in bankruptcy, or within-creditor conflicts.
- Firms that that use In-House counsel, that use Big 4 Auditors, and that have more concentrated debt holdings are less likely to include these Default Indicating covenants.
- Default Indicating covenants are associated with higher bond and CDS spreads, while other covenants have a negative or zero association with spreads.