Debt Covenant Violation and Cost of Borrowing: Evidence from Quarterly Bond Issues

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Abstract

The study explores the cost of covenant violations from three aspects: the incidence, timing and frequency of the violation. This is the first study that presents explicit estimates of their costs. First, I find that violating firms on average have a higher cost of borrowing than non-violators. Second, I find that firms which report a violation in the bond-issue quarter do not have a higher cost of borrowing compared to firms that do not report a violation. Additionally, firms that report a violation in the quarter preceding the bond-issue report a higher cost of borrowing. Third, I find that firms that report exactly one violation have a higher cost of borrowing than non-violating firms. I also find that firms that report more than one violation have a higher cost of borrowing than non-violating firms. In addition, I find that for each violation the cost of debt increases by 5-7 bps.

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JEL Classification: G12, G30

I.   Introduction

Recent research on debt covenants has acknowledged the adverse consequences of debt covenant violations on violating firms. DeFond and Jiambalvo (1994) and Sweeney (1994) show that firms go to great lengths to avoid technical defaults and engage in activities such as manipulation of accruals to avoid such events. Beneish and Press (1993, 1995) find that the costs of such violations can be substantial for the firms involved and that common share prices respond negatively to reports of violations. These studies reveal that a debt covenant violation is an important event and is viewed with concern by managers and shareholders. Fargher et al (2001) report an increase in firm risk that is associated with the initial debt covenant violation. I add to this research by investigating the changes in the cost of borrowing as a result of covenant violation and a subsequent increase in firm risk. This is the first study that provides explicit estimates of the cost of covenant violations and documents the importance of the incidence, timing and frequency of the violations.

Firms report debt covenant violations when they fail to meet the contractual requirements contained in public and private debt agreements. The violations are reported to the SEC and creditors at the end of each fiscal quarter. Dichev and Skinner (2002) and Nini et al (2012) find that once a violation is reported, the creditors intervene and suggest remedial changes with the expectation that the violation will be corrected in the short-term. However, the concessions demanded by the creditors are often substantial and in extreme cases may lead to accelerated repayment of the violated debt. Violations are not only viewed with concern by existing creditors but also provide two pieces of information to potential future creditors. First, they signal that the firm was not able to maintain its debt agreement and is more risky than previously believed. Second, they signal that the firm has not been able to attain its objectives and that its short-term goals are not achievable. Creditors in this case would view the firm as more risky and hence would only extend future credit at a higher cost to the borrower. Because debt covenant violations are potentially significant breaches in firms` loan agreements and increase the

likelihood of debt service default, bankruptcy and risk of the firm (Wilkins, 1997; Fargher et al, 2001), I contend that the timing and frequency of such violations would increase the cost of borrowing to the firm.

To test this conjecture, I develop a set of five hypotheses and use new bond issue data to examine the importance of the incidence, frequency and timing of debt covenant violations. Specifically, I look at three different aspects of violations. First, I look at bond issuance by violating and non-violating firms to determine whether the cost of borrowing for violators differs from that of non-violators. I hypothesize that firms that violate at least one debt covenant will have a higher cost of borrowing than firms that do not violate a debt covenant. Second, I look at the timing of the debt covenant violation with respect to the issuance of new bonds. I hypothesize that firms that report debt covenant violations in the quarter of bond issuance have a higher cost of borrowing than firms that do not violate a debt covenant. I also hypothesize that if the incidence of debt covenant violation occurred in the quarter preceding the bond issue, the cost of debt for the firm would be higher than for firms that did not report a debt covenant violation and for firms that reported a violation in the bond-issue quarter. Third, I look at the frequency of covenant violation to determine whether creditors penalize frequent violators more. I hypothesize that firms that report a violation once will have a higher cost of debt than firms that did not violate a debt covenant. I also hypothesize that firms that violate debt covenants more than once will have a higher cost of debt than firms that either did not violate a debt covenant or violated a debt covenant once[1].

The results indicate that debt covenant violations are associated with significant increases in the cost of borrowing to the firm. I used three different specifications to account for the cost of debt (Offer Yield, Net Interest Cost and Spread to Treasury) and find the results to be robust to these three specifications. The results show that violations are costly to the firm and attempts by the firm to avoid covenant violations, as, for example, through the manipulation of accruals, are reasonable. The timing of the violation also plays an important role in increasing the cost of borrowing. Firms that report a debt covenant violation in the bond-issue quarter do not have a higher cost of borrowing than firms that did not report a debt covenant violation indicating the importance of the information content of the announcement of covenant violation. The results are robust for firms that report a covenant violation in the quarter preceding the bond-issue quarter as the cost of borrowing for such firms is higher not only for firms that do not report a violation, but also for firms that report a covenant violation in the bond-issue quarter. I also find that the frequency of violation is an important determinant of the cost of debt as firms that violate exactly one debt covenant have a higher cost of debt than firms that do not violate any debt covenants. The results for repeat violators are even stronger, with repeat violators having a higher cost of borrowing than non-violators and one-time violators. Overall, the results indicate that the debt covenant violations are costly to the firm and the timing and frequency of violations play an important role in determining the cost of debt to the firm.

The remainder of the paper is structured as follows. The next section describes the sample selection process and the variables used in the analysis. Section III describes the debt covenants in public and private placements and presents summary statistics. Section IV outlines the

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[1] The severity of the violation and the number of violations in a particular quarter will also have important bearings on the cost of debt. However, the data is not available on these two aspects of covenant violations.

covenant violation indicators and the changes in firm specific characteristics before and after the violation. Section V develops the hypotheses and section VI presents the results. The final section of the report comprises the concluding remarks.

II.   Data Description and Variables

I use three data sets for the analysis that follows. First, I employ the Compustat database to collect firm-specific financial information used to define the firm-specific characteristics, which are an important part of this study. The broadest sample of Compustat observations used in this paper consists of 19,635 U.S. firms and 474,744 firm-quarter observations from the second calendar quarter of 1996 to the fourth quarter of 2005. Second, I use the debt covenant violation reporting data constructed by Sufi. The data were constructed using the SEC Edgar website that contains indices of every filing submitted to the Commission. The Commission made electronic filing mandatory for all SEC-registered firms in the second calendar quarter of 1996. The earliest data point therefore is 1996 since electronic SEC filings were required to find the covenant violation. The entire sample covers the period 1996 – 2008 and includes fiscal quarters through the fourth quarter of 2008. The sample of violation data used in this paper consists of 21,627 U.S. firms and 569,272 firm-quarter observations from the second calendar quarter of 1996 to the fourth fiscal quarter of 2008. Third, I use the public bond issue data collected by SDC Platinum. The data set consists of new bond issues by corporations and contains specific bond issue characteristics such as offer yield, loan maturity, loan amount, et cetera. The entire sample contains bond issue data from 1970 to 2005 and contains 1,587 U.S. firms and 3,895 public bond issues.

II. A. Data

To construct the sample, I start with the universe of U.S. firms in the Compustat database from 1996 to 2005. This is the broadest sample used in this study since the violation data set and the public bond issue data set impose the starting and ending year boundaries. First, the violation data are available only from the second calendar quarter of 1996, when electronic filing became mandatory for all SEC-registered firms. For a company to be reported as a violator, the SEC filing reports five terms: "waiv", "viol", "in default", "modif" and "not in compliance"[2]. Second, the bond issue dataset is available only until the third calendar quarter of 2005 (the last bond issue is made on September 09, 2005). The sample reports specific loan characteristic information in different formats, for example, for the *offer yield* the data set reports the data in six different ways: "numerical value", "floats", "market", "serial", "varies" and "Index"[3]. For the purpose of this paper only a numerical value can be used and I drop the remaining observations, which account for 12.31% of the reported *offer yield*. Next, I impose the quarter-year restrictions on the violation and bond issue dataset. Imposing the ending quarter-year

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[2] "waiv" refers to the fact that covenant violations are handled by a contractual waiver, meaning the lender voluntarily relinquishes the rights granted following the default, perhaps in exchange for concessions from the borrower. This happens in a majority of cases; "viol" refers to a specific incidence of violation; "in default" refers to the fact that the borrower is in default; "modif" refers to a modification in the contractual agreement following a violation; and "not in compliance' refers to the borrower not being in compliance with the contractual agreement of the loan issue.

[3] "numerical value" refers to a numerical percentage value; "float" refers to a bond offering a yield that fluctuates with the market interest rate; "market" refers to the market yield at the time of the issue; "serial" refers to a bond in which a portion of the outstanding bonds matures at regular intervals until all of the bonds have matured; "varies" refers to a bond offering a fluctuating yield; and "index" refers to a yield pegged to an index, generally a bond index

restriction on the violation data set leaves a sample of 10,088 U.S. firm and 226,637 firm-quarter observations. Imposing the starting quarter-year restriction on the bond issue data set yields a sample of 722 U.S. firms and 1,494 public bond issues. Subsequently, I merge the three data sets to construct the sample to be used in this study.

II. B. Variables

The three data sets provide details on the variables used in the study. The violations database provides information on the incidence of violations of debt covenants. The data set reports a violation as one if a firm is in violation of a debt covenant in a quarter and zero otherwise. For the purpose of the analysis I use five different measurements of violation. *VIOL* is a binary variable that equals one for violating firms and zero for non-violating firms. *Viol* is a binary variable that equals one if a debt covenant violation has occurred or has not been corrected in subsequent quarters, and zero if a violation has either not occurred or has been corrected. *Viol = 1* is a binary variable that equals one if a firm has reported exactly one debt covenant violation in the period from 1996 to 2005 and zero otherwise. *Viol > 1* is a binary variable that equals one if a firm has ever reported more than one covenant violation either in consecutive or intermittent quarters and zero otherwise. *Viol = n* is the total number of violations reported by the firm. The bond issue database provides information on bond specific characteristics. I use three different specifications for the Cost of Debt: Offer Yield, Net Interest Cost and Spread to Treasury. *Offer Yield* is the yield offered to investors at the time of the bond issue. *Net Interest Cost* is the overall interest expense that is associated with the bond and is based on the average coupon rate weighted to years of maturity adjusted for any associated discounts or premiums. *Spread to Treasury* is the difference in the bond yield and risk free treasury security yield with similar maturity. *Loan Size* is the proceeds in dollars from bond issuance. *Log Maturity* is the log of maturity in months of issued bonds and *S&P ratings* is the S&P rating for bonds and has been converted to a number.

The S&P ratings have a total of twenty-two categories and I assign "1" for the S&P bond rating of "D" (lowest rating) and "22" for the S&P bond rating of "AAA" (highest rating)[4]. The Compustat database provides information on firm specific characteristics. *Z-score* is the Altman z-score used to predict corporate defaults. The z-score for manufacturing firms is computed following Hillegeist et al (2004) and for non-manufacturing firms following Altman (2000). *Size* is the natural log of total quarterly assets of the firm in year 2000 dollars. *Leverage* is the ratio of book value of long term debt plus long term debt in current liabilities to the book value of total assets of the firm ($\frac{LTD}{TA}$). *Coverage* is the interest coverage ratio and is computed as the ratio of earnings before interest and taxes to the interest expense ($\frac{EBIT}{Interest}$). *Tangibility* is the ratio of property, plant and equipment to the total assets of the firm ($\frac{PPE}{TA}$). *Market-to-Book* is the ratio of market value of assets, computed as the market value of equity plus the book value of debt, to the book value of assets ($\frac{MVA}{TA}$). *Current ratio* is the ratio of current assets to current liabilities ($\frac{CA}{CL}$).

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[4] See Appendix for a detailed description of the numerical rating system

III.   Covenants in Private and Public Agreements: Background

Debt covenants are conditions in loan agreements that either guide or limit the actions of the borrower. Creditors use protective covenants in bond indentures and bank loans to protect their interests by restricting certain activities of the issuer that could endanger the creditor's position and to ensure that the borrower uses the funds for the stated purposes. If a borrower fails to comply with these conditions in any of the fiscal quarters it is termed as being in default of the agreement. If a company is in default the creditor can require immediate repayment of the bond issue or loan, although Nini et al (2012*)* report that creditors almost always waive the violation.

III. A. Covenants

In practice, debt covenants are somewhat different for public and private placement of debt. For public bond issues, the covenants can be divided into four categories: *New debt issuance restrictions* are the most frequent type of debt covenant and may require any subsequent bond issue to be subordinated to existing debt. They are designed to prevent risk shifting to existing bondholders by imposing restrictions on the issuance of new bonds with superior or equal claims on the firm's assets. Other covenants may prohibit the issuance of additional debt altogether, unless the firm maintains prescribed financial ratios. *Dividend payment restrictions* place a restriction on the level of dividends that can be paid to the shareholders. These restrictions generally require that dividends are paid only from earnings generated subsequent to the borrowing or earnings above a given amount. They are designed to limit shareholders from transferring assets to themselves through the issuance of extraordinary dividends, specifically assets that serve as collateral. Most dividend restrictions limit not only dividend payments but also share repurchases and often limit the borrower from increasing dividends from existing levels. *Merger activity restrictions* limit merger activity by allowing such activities only when certain conditions are met. These restrictions are designed to limit risk shifting to existing bondholders in cases when the acquiring firm has more debt than the target firm, or if the debt of the acquiring firm matures sooner. *Asset disposition restrictions* limit the ability of the managers to dispose of assets that provide collateral under the provisions of the indenture agreement. They are designed to limit bondholders' losses in case of default. Other common restrictions include, but are not limited to, restrictions on common stock investment, loans, extension of credit, maintenance of minimum asset levels and maintenance of the levels of certain accounting-based measures.

For private loan issues, the covenants can be divided into four categories: *Affirmative restrictions* include actions that a firm needs to take during the term of the loan contract, and include actions such as meeting GAAP accounting standards, meeting all regulatory reporting demands, remaining in compliance with the law, submitting financial information to the lender on a timely basis, et cetera. These restrictions are designed to be an early warning sign to the creditor regarding the firm's compliance with accounting principles and corporate law. *Negative covenants* are actions that a firm agrees not to take during the period of the loan contract. These include constraints on asset disposal, restrictions on merger and acquisition activity, limits on dividend payments, providing loan guarantees to other firms, and so forth. These restrictions are designed to limit the creditors' risk by diminishing the possibility of risk shifting. *Financial restrictions* include restrictions on firm leverage, interest coverage, total fixed charges, among other things. These covenants in private lending agreements often modify GAAP and, for example, may include off-balance-sheet debt in calculating leverage. They are designed to limit

the default risk of the creditors. *Compensation restrictions* are especially common for closely held companies and place a limit on officers' compensation. They are designed to prevent the manager-owner from appropriating benefits at the expense of the creditors.[5]

Financial covenants are common in both private and public debt agreements, but differ in their specification in the following respect: Financial covenants in public bond agreements are usually incurrence-based, signifying that the borrower needs to be in compliance at the time of a specific event (Roberts and Sufi, 2009). Conversely, the financial covenants in private loan agreements are maintenance-based, meaning that the borrower must be in compliance with the covenants on a regular basis, typically every fiscal quarter (Sansone and Taylor, 2007).

III. B. Violations

A debt covenant violation is deemed an event of default, giving the creditor the right to demand immediate repayment of the entire loan balance or limit access to unused portions of a line of credit. Creditors rarely do either, however, opting instead to renegotiate the terms of the agreement. Loan covenants thus have an impact on loan characteristics, and violation of these contractually imposed restrictions results in unfavourable loan terms for violating firms.

Table 1 presents evidence that this is the case. Using the new bond issuance database, I find that firms that violated debt covenants (violating firms) are different from firms that did not violate debt covenants (non-violating firms), in terms of loan-specific characteristics and firm-specific characteristics. The assumption is that non-violating firms will have favourable loan characteristics compared to violating firms and will have better financial health. Violating firms have had at least one debt covenant violation.

Panel A of Table 1 shows that bonds issued by violating firms carry a higher offer yield, a higher net interest cost, a higher spread to treasury, are smaller in denomination and have shorter maturities as compared to non-violating firms. The difference in loan characteristics between non-violating and violating firms is significant at the 1% level. This difference suggests that loan covenant violation is costly to the firm not only in terms of the cost of debt, but also in terms of the ability to raise debt capital and issue bonds with longer maturities. Consistent with this motivation, violating and non-violating firms also differ in terms of firm characteristics. Firm characteristics comprise accounting value measures (assets, tangibility, and market to book) and financial health measures (z-score, leverage, coverage ratio, current ratio, and S&P rating of new bond issues). Non-violating firms have healthier accounting ratios and are larger organizations, have larger tangible assets and higher market to book ratios compared to violating firms. Non-violating firms also have higher z-scores (that is, a lower chance of default), lower financial leverage, higher interest coverage ratios, higher current ratios and better S&P ratings compared to violating firms. The differences in the accounting value and financial health of non-violating and violating firms are significant at the 1% level.

The difference in firm characteristics signals the likelihood of a covenant violation by a firm and the difference in loan characteristics indicates that debt covenant violation is costly to the firm. Firms with debt covenant violations pay 100 to 107 basis points more than firms that do not

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[5] Three sources were used to identify debt covenants in private and public debt agreements. They are Copeland and Weston (1988), Helfert (1996) and Kester, Furhan and Piper (1997)

violate any restriction. Nini et al (2012) find similar loan characteristic results for private loans and conclude that firms with covenant violations are not only closely monitored by creditors, but also pay 39 basis points more in the event of a covenant violation that prompts the renegotiation of a loan contract.

III. C. Summary Statistics

Figure 1 reports the fraction of firms that violate at least one debt covenant in any given year from 1996 to 2005. The chart shows that between 9 percent and 17 percent of firms are in violation of a covenant in any given year with the violation incidence peaking during the 2001-2002 recession and declining thereafter. It suggests that the recession accelerated the incidence of covenant violation and that violations are cyclical in nature.

Table 2 provides summary statistics on the incidence of violations. About 38 percent of firms in the sample violated a debt covenant at some point during the sample period. Nearly 9 percent of firms are in violation of one covenant, 29 percent are in violation of more than one financial covenant and 6 percent of all firm-quarter observations report a financial covenant violation. Table 2 also suggests that firm characteristics (hence forth referred to as accounting values) influence debt covenant violation. Firms in the middle quartiles of size and tangibility are more likely to report a financial covenant violation and the incidence of violation decreases as size and tangibility increases. The incidence of debt covenant violation also decreases for firms with higher market to book ratios. Figure 2 provides a series of three panels that summarize the variation in the incidence of debt covenant violation as the data are segregated according to size, tangibility and market to book ratios. The solid line shows that the incidence of financial violation decreases with an increase in size and tangibility and is lowest for firms in the 95th percentile, though a quarter of the firms in the 95th percentile for size and one third of the firms in the 95th percentile for tangibility report at least one debt covenant violation at some point. Firms in the middle quartiles of size and tangibility have the highest incidence of covenant violation. Violations are also negatively correlated with market to book value, but more than one fifth of the firms in the 95th percentile violated a debt covenant at least once.

A possible explanation for this observed trend in the covenant violations with respect to size is that large firms have the ability to operate within the guidelines of the contractual agreement and possess the capacity to manipulate their accounts to avoid technical violations. The incidence of relatively lower covenant violations for small firms can also be explained by the fact that creditors are cautious in extending credit to small firms and only extend credit to firms that are financially sound. It could also be that small firms are wary of the fact that it is difficult for them to obtain credit and therefore operate within the restrictions set forth in the loan agreement for the sake of future credit availability.

In all, I conclude that small and large firms violate debt covenants less frequently than medium sized firms, though covenant violations are also quite common in small and large firms. The incidence of debt covenant violation displays the same trend for tangibility, with firms having too few or too many tangible assets violating covenants less frequently than firms with average levels of tangible assets. For market to book, the incidence of debt covenant violation decreases as the market to book value of the firm increases, with the incidence dropping from

approximately 50 percent to about 22 percent. Overall firms violate debt covenants frequently regardless of size, tangibility and market to book value.

IV.   Financial Covenant Violation Indicators

Creditors play an important role and have higher stakes in the event of bankruptcy or following a payment default by the borrower. Financial covenant violations act as a first indicator that the firm is going through a period of financial uncertainty. The violations of restrictions imposed on debt contracts act as a first sign that a firm may not be able to meet its debt payment obligations in the future, and certain firm characteristics can help creditors determine whether a firm will violate a debt covenant. However, a covenant violation does not mean that a firm is near default. In this section, I examine the hypotheses that (i) certain firm characteristics can help identify firms that will violate debt covenants and that (ii) creditors' actions after the violation result in improving the overall financial condition of the firm.

IV. A. Accounting Value Measures Before and After Violation

I first look at three accounting value firm characteristics: assets, tangibility and market to book. Figure 3 produces a series of three panels that summarize these measures for violators during the eight quarters leading up to, including and following a violation. Total assets and tangibility of the firm increase in the quarters leading up to the violation and decrease after the violation has occurred. Nini et al (2012) attribute this trend to investment conservatism. They argue that creditors play an important role in the event of a covenant violation, even if bankruptcy or payment default is not imminent, and this results in a decrease in investment. The trend lines for assets and tangibility in Figure 3 show that in the quarters leading up to a violation, firms grow fairly aggressively, with total assets increasing an average of over 5 percent. Growth levels off in the quarter of the violation and decreases moderately in the quarters immediately after the violation. Growth in tangibility exhibits the same pattern. The nearly 4 percent increase in tangibility in the quarters leading up to a violation and nearly 5 percent decline in tangibility following the violation suggests that violators engage in divestitures and investment conservatism after a violation. The market to book value of the firm falls leading up to a violation and for three quarters thereafter, whereupon it starts improving. Although not reported, the stock price of the firm decreases in the quarters leading up to and after the quarter of the violation, with the decrease tapering off in the seventh quarter after the violation. The nearly 18 percent decline in market to book in the quarters leading up to a violation and a near 3 percent recovery following the violation suggests that the decrease in assets in the quarter following the violation does not entirely compensate for the decrease in the stock price. Overall, the financial condition of the firm deteriorates in the quarters leading up to a violation and only improves moderately after the intervention of creditors.

IV. B. Financial Value Measures Before and After Violation

A debt covenant violation does not mean that a firm is on the verge of insolvency and Nini et al (2012) show that violating firms are usually in relatively good health. A violation would however warrant attention from creditors and, as such, should lead to an improvement in the financial health of the firm following a violation. I look at four financial value firm-specific indicators: z-score, leverage, coverage ratio and current ratio, and two bond issue specific indicators: S&P rating and number of new bond issues, to determine the change in the financial health of the firm pre- and post-violation.

Figure 4 produces a series of six panels that summarize the financial health of the violating firms. The z-scores of violating firms in the quarters surrounding the violation are relatively low, starting around the "grey zone" and falling into the "distress zone"[6] by the time of the violation. Although the decrease of 27 percent in the z-scores in the eight quarters preceding the violation is largely offset by an increase of nearly 18 percent after the violation, the z-scores nevertheless remain in the "distress zone". The financial leverage of violating firms increases aggressively in the quarters leading up to a violation with the financial leverage increasing from nearly 29 percent to nearly 36 percent. Leverage levels off in the quarters immediately following the violation and decreases moderately following the fifth quarter after violation. Following a violation, creditors intervene and prevent the firm from issuing any more debt. The panel indicating new bond issues confirms this. The total number of new bonds issued decreases considerably following a violation, with nearly 75 percent of all bond issues occurring in the eight quarters preceding the covenant violation. Only 2.5 percent of bonds are issued in the quarter of the violation and the rest are issued in the quarters following a violation.

The coverage ratio is a measure of a firm's ability to pay interest and serves as a good indicator of whether the firm will default. In the eight quarters leading up to the violation, the coverage ratio declines sharply from about 12 to 1 for violating firms. In the violation quarter the coverage ratio becomes negative, indicating the firm would not be able to meet its interest obligation from operating earnings. After the violation the coverage ratio rises sharply and becomes positive in the quarter immediately following the violation. The ratio continues on an upward trend for the quarters following the violation.

The current ratio displays the same movement as the coverage ratio in the quarters leading up to and following the violation. The current ratio declines by nearly 16 percent in the quarters preceding the violation, levels off in the violation quarter and the quarter following, and begins to increase steadily afterwards. This ratio shows that violators are not experiencing sharp liquidity shortages and that the lowest level of 1.9 in the violation quarter is still adequate for short term liquidity needs, although it may reflect high inventory levels.

The S&P ratings of new bond issues does not show any specific trend pre- and post-violation, though the trend line does indicate that the rating decreases slightly over the sixteen quarters examined. This is in line with the earlier reported findings that violating firms are not on the verge of insolvency and are in relatively good health. The S&P ratings also show that for bonds issued in the violation quarter the rating dropped from "BBB+" in the preceding quarter to "BB+" in the violation quarter. The ratings however increased subsequently to "BBB+" in the quarter following the violation.

Overall the plots of trend lines indicate that financial covenant violations are preceded by deterioration in the financial health indicators of the firm, and intervention by creditors following a violation helps improve the financial health of the violator.

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[6] z-score > 2.9 -"Safe" Zone

1.23 < z-score < 2. 9 -"Grey" Zone

z-score < 1.23 -"Distress" Zone

Table 3 provides the summary statistics for the outcome and control variables used in the analysis. All of these variables are defined in the Appendix. The first three variables represent the outcome variables and include the offer yield, net interest cost, and spread to treasury presented in percentages. They are used to test the importance of covenant violations in determining the cost of debt to the firm. The control variables for the cost of debt include Altman's z-score, size, leverage, coverage ratio, tangibility, market to book, current ratio, S&P rating, log of the maturity of the bonds, and log of the proceeds generated from the bond issue. The bond-specific characteristics are limited to the bond issue data available and hence have a small number of observations.

V.   Hypotheses

The financial condition of the firm is inversely related to the agency costs of debt, and debt covenants are more restrictive in the loan contracts of the least creditworthy borrowers. Riskier firms should have tighter covenants because such covenants provide lenders with the option to reassess the loan and take action for even a modest deterioration in performance (Demiroglu and James, 2010). The information content of a debt covenant violation is thus twofold. First, the covenant threshold conveys information to other market participants about expectations regarding the future prospects and riskiness of the borrower (Diamond, 1991 and Rajan, 1992). Second, contract design models (e.g. Gârleanu and Zwiebel, 2009) and collateral requirement models (e.g. Besanko and Thakor, 1987) imply that contract terms require borrowers to convey credibly private information regarding a firm's future prospects. In the framework of these models, information asymmetry between borrowers and lenders regarding the borrower's credit quality and risk-shifting opportunities determines the tightness of the covenant design. The information content to the lender of a violation of such debt restrictions is straightforward: The borrower has not been able to meet targets or stay on course for future projections and hence is more risky.

I employ three measures of the cost to the borrower of a new bond issue. These are offer yield, net cost of debt and spread to treasury, and are collectively referred to as the Cost of Debt (CoD)[7]. Specifically I test the following hypothesis:

H1: *Violators, on average, experience a higher Cost of Debt (CoD) compared to non-violators.* A valid concern with respect to H1 is whether it is the violation that results in a higher CoD or is it because the firm was fundamentally weak? To address this concern I look at the timing of the covenant violation with respect to the bond issue. The timing of the violation has definite implications regarding the effect of reporting of the violation on the cost of debt of the new bond issue. Mandatory reporting of quarterly firm characteristics by the SEC reduces information asymmetry between borrowers and lenders, and these characteristics act as indicators preceding the incidence of violation. As evidenced earlier firm-specific indicators deteriorate in the quarters leading up to a violation but the borrower does not know if an actual violation has occurred during the quarter as the violation would be reported to the borrower(s)/SEC at the end of the quarter. I test to see the effect of the incidence of violation in the same quarter as the bond issue and hypothesize that the cost of bond issue would not be affected since the creditors do not have the information about the covenant violation. Accordingly, I test the following hypothesis:

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[7] The cost of debt (CoD), in this study, refers specifically to the cost of borrowing when issuing new bonds.

H2: *Debt covenant violation at time t, where t is the quarter of bond issue, does not increase the cost of debt to the borrower.*

A natural implication of H2 is that if the incidence of violation were known with certainty in a quarter, the cost of debt to the borrower would be high for any bond issue in the subsequent quarter. For example, Gârleanu and Zwiebel (2009) present a model with information asymmetry, where borrowers are better informed than lenders concerning the present and future prospects of the firm. Debt covenants are designed to reduce this information asymmetry between borrowers and lenders, and the incidence and subsequent reporting of a covenant violation would make the violating firm riskier for the lender. A central result of this premise is that if the violation occurred in the quarter preceding the bond issue, the cost of debt would not only be higher for the violating firm, but also even higher than if the violation occurred in the bond issue quarter. I test the following hypothesis, which is conditional on the covenant violation-reporting requirement.

H3: *Debt covenant violation at time t-1, where t is the quarter of bond issue, increases the cost of debt to the borrower and the increase is greater than if the incidence of violation occurred at time t.*

Covenant violations provide creditors with the same rights as payment defaults and creditors can accelerate the repayment of any outstanding principal, although few creditors exercise this right (Nini et al, 2012). The consequences of renegotiating loans following a covenant violation include, among other things, an increase in the cost of debt for the borrower and an improvement in the performance of the firm due to creditors' intervention (Dichev and Skinner, 2002).

Beneish and Press (1995) report that a decline in stock prices in the days around the announcement of a covenant violation indicates that investors do not immediately impound future performance improvements into the stock price of a violator once a violation becomes public. They suggest that investors do not immediately incorporate such information into their assessment of the financial health of the firm. It follows that firms violating a restriction and correcting it in the following quarter should benefit from the creditors' discretionary right to waive the penalties of covenant violation as the violation is corrected for before the information can be incorporated into investors' analyses. However, the incidence of violation does indicate that the firm has not been able to maintain the minimum requirements outlined in the loan contract. The outcome of this proposition would be that firms violating a debt restriction once and correcting for it in the following quarter would have a moderately higher cost of debt than firms that have not violated any covenants. Accordingly, I test the following hypothesis:

H4: *Firms that violate a debt covenant once and correct for it in the following quarter have a higher cost of debt than firms that do not violate a debt covenant.*

An instinctive outcome of H4 would be that firms that either violate more than one debt covenant or do not correct for the violation in the quarter following the incidence of violation, would have a higher cost of debt than that of firms which do not violate a debt covenant or violate a debt covenant but correct it in the following quarter. The violation in this case would be reported to the creditor at the end of each quarter and would indicate that the firm had not been able to achieve the expected results consistently. If the violation-CoD effect holds, then such firms would incur a higher cost of borrowing. A central premise of this argument is that the cost of

debt for the bond issue made by firms that have had more than one reported incidence of violation would be particularly high. Accordingly, I test the following hypothesis:

H5: *Firms that violate debt covenants more than once or do not correct for a violation in the following quarter would have a higher cost of debt than firms that do not violate a debt covenant or report a violation only once.*

Violations are costly to the firms and managers attempt to correct for a violation to avoid being penalized. DeFond and Jiambalvo (1994) show that managers manipulate accruals and adopt accounting practices that help avoid covenant violations. If the violation-CoD effect holds, then the number of reported violations would affect the cost of borrowing. Accordingly, I test the following hypothesis:

H6: *The number of reported covenant violations has a direct relationship with the cost of debt.*

VI.   Methodology and Results
VI. A. Univariate test of H1
To examine whether violating firms on average carry a higher cost of debt than non-violating firms, I first examine key loan and firm-specific characteristics to see if these are significantly different between violators and non-violators. As reported earlier, Table 1 shows that violating and non-violating firms differ in both firm-specific and loan characteristics. The loan terms used to test for H1 include offer yield, net interest cost and spread to treasury, and are reported in the first three rows of Panel A of Table 1. The first column reports the findings for firms that did not violate a debt covenant. The second column provides the same information for violating firms and the last column reports the difference in the mean loan characteristics between violating and non-violating firms. The results of the univariate test of differences in mean provide strong evidence that non-violators enjoy a lower cost of debt. Comparing it for the two classifications of firms, *Offer Yield* is 100 bps lower for non-violating firms. The difference is significant at the 1% level. The results for *Net Interest Cost* are similar, with non-violators, on average, paying 105 bps less than violating firms. The difference is significant at the 1% level. *Spread to Treasury* is the third measure of CoD and the results show that non-violating firms are better off by 107 bps. Again the difference is significant at the 1% level and economically large. Thus, the violation-CoD effect documented in the univariate tests suggests that violating a debt covenant is costly for the firm and on average violating firms incur a higher cost of debt. The violation-CoD effect also provides evidence for H1.

While the univariate test provide preliminary evidence that violating a debt covenant is costly, these results do not take into account potentially significant differences in borrower and loan characteristics. Consequently, I employ multivariate tests to better document the violation-CoD effect.

VI. B. Multivariate Tests
The cost of borrowing is likely to be related to various borrower-specific features such as the probability of bankruptcy, the relative size of the firm, the financial leverage ratio and bond-specific features such as issue size and maturity. Accordingly I use a regression model of the following form:

$$CoD = \beta_0 + \beta_1 \, (VIOLATION) + \sum \beta_i \, (Borrower\_Characteristics_i)$$

$$+ \sum \beta_j \, (Bond\_Characteristics_j) + \sum \beta_k \, (Control_k)^8$$

VI. C. Multivariate Results

As suggested by the univariate results, borrowers and bond characteristics play an important role in determining the cost of debt. I discuss the results for these characteristics in this section and outline their relationship with the cost of borrowing. The results for the borrower and bond characteristics are reported in Tables 4, 5 and 6 across all specifications for debt covenant violation *(VIOL, Viol_t, Viol_{t-1}, Viol = 1, Viol >1 and Viol =n)*.

The coefficient for the z-score, although mostly negative for the three specifications of cost of debt, is not significant. This is in line with expectations in two ways. First, it is consistent with the contention that a higher z-score translates into a lower probability of bankruptcy and hence should have a negative coefficient. Secondly, it is consistent with results reported earlier indicating that violating firms are not necessarily at risk of default and therefore the coefficient for the z-score is not statistically significant. Size has a negative coefficient, significant at the 1% level, for all specifications. This is consistent with expectations as previous research (e.g. Frank and Goyal, 2009) provides evidence that the cost of borrowing is low for large firms. In this sample, size reduces the cost of borrowing by approximately 14 – 20 bps. The coefficient for leverage is not significant for any of the three specifications of the cost of borrowing. This is consistent with expectations since the insignificance of the coefficient shows that firms are not highly leveraged, in line with Binsebergen et al (2010), and that an increase in the use of debt does not change the cost of borrowing significantly. Coverage has varying results for the three specifications. The coefficient for *Offer Yield* is positive and significant. This is unexpected as coverage indicates the ability of the firm to cover its interest obligations and a higher coverage ratio should translate into a lower offer yield.

Coverage has a negative coefficient for *Net Interest Cost*. The negative coefficient is consistent with expectations; however, it is statistically insignificant. *Spread to Treasury* has a positive but insignificant coefficient. Overall, the results seem to show that the coverage ratio is not an important determinant of the cost of debt. Tangibility has a negative but mostly insignificant coefficient for all specifications of the cost of borrowing. The availability of collateralizable assets is expected to decrease the cost of debt. This decrease, though not statistically significant for most specifications, is relatively large, ranging up to 36 bps for spread to treasury (significant at the 10% level). Market-to-book has a negative coefficient for all specifications, but the coefficient is significant only for the *Offer Yield* and for two of four cases for *Spread to Treasury*. Current ratio, surprisingly, displays a positive coefficient. This measure of short term liquidity of the firm was expected to reduce the cost of debt, but the results show that this is not the case, and an increase in the current ratio increases the cost of borrowing by 6 – 16 bps. The S&P Rating of the bond issue has a significant impact on the cost of borrowing as the coefficients are negative and significant for all specifications. The magnitude of the coefficients indicate that a change in one level in the S&P rating (e.g. from BBB to BBB+) results in a decrease of 22 to 28 bps in the cost of debt. Log_Maturity displays a varying relationship for the three measures of the cost of debt. For *Offer Yield* the coefficient of Log_Maturity is in line with expectations and is positive and significant at the 1% level. For *Net Interest Cost* the coefficient of Log_Maturity is positive but mostly insignificant. The coefficients for the first two measures

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[8] See Appendix for a complete description of the variables

of cost of debt are nearly identical; however, the standard errors for *Net Interest Cost* are very large and the coefficient is not statistically significant. The coefficient of Log_Maturity for *Net Interest Cost* is positive but insignificant, and negative and insignificant for *Spread to Treasury*. Log_Loan_Amount has a positive and significant coefficient across all specifications and is in line with expectations. The coefficients are economically significant, ranging from 7 – 13 bps.

VI. D. Multivariate Test of H1

The results in Section 6.A provides evidence that violators, on average, incur a higher cost of borrowing compared to non-violators. This section examines this issue after controlling for various firm- and bond-specific characteristics.

To test H1, the regression equation outlined in Section 6.B is used and the results are reported in column (1) of Tables 4, 5 and 6. Three different measures of cost of debt *(Offer Yield, Net Interest Cost and Spread to Treasury)* are employed, and the results are reported in column (1) of the three tables outlined above to test for H1. Holding all else constant, the cost of debt for violators is higher than that of non-violators. The *Offer Yield, Net Interest Cost* and *Spread to Treasury* for a firm reporting a violation in the bond-issue quarter are higher by approximately 48 bps, 61 bps and 40 bps respectively. The coefficients are significant for all specifications at the 1% level. The multivariate tests provide evidence of the violation-CoD effect documented in the univariate tests and suggest that violating a debt covenant is costly for the firm and violating firms incur a higher cost of debt after controlling for firm- and bond-specific characteristics.

VI. E. Multivariate Test of H2

The univariate tests in Section 6.A suggest that there are significant benefits in not violating a debt covenant in terms of cost of debt. The discussion in Section 5 suggests that the overall cost of debt would be higher when the incidence of violation is not known with certainty, but a deterioration in the firm-specific indicators would indicate a higher probability of covenant violation in the quarter of the bond issue.

To test this, the regression equation outlined in Section 6.B is used. Three different measures of cost of debt *(Offer Yield, Net Interest Cost and Spread to Treasury)* are employed, and the results for H2 are reported in column (2) of Tables 4, 5 and 6. Holding all else constant, the increase in the cost of debt, as a result of a violation in the quarter of bond issue, is not significant. The *Offer Yield, Net Interest Cost* and *Spread to Treasury* for a firm reporting a violation in the bond-issue quarter are higher by approximately 34 bps, 30 bps and 44 bps respectively and are not significant. Based on the deterioration of borrower-specific characteristics in the quarters preceding the violation quarter, lenders are wary of the incidence of violation as evidenced by an increase in the cost of borrowing. However, since the actual reporting of the violation does not take place until after the end of the quarter and lenders cannot ascertain the incidence of violation with certainty in the bond-issue quarter, the coefficients for the three measures of cost of borrowing are not significant.

VI. F. Multivariate Test of H3

The discussion in Section 5 suggests that lenders would charge borrowers more if the incidence of violation was known with certainty. This hypothesis (H3) encompasses two important outcomes. First, it tests whether the incidence of violation in the quarter preceding the bond issue

increases the cost of debt. Second, it establishes that this increase in the cost of borrowing is higher than when the violation occurs in the bond issue quarter.

To test for H3, I use the regression equation outlined in Section 6.B and report the results in column (3) of Tables 4, 5 and 6. As above, I employ three different measures of the cost of debt *(Offer Yield, Net Interest Cost and Spread to Treasury)*. The results provide evidence on two important characteristics of the timing of the violation. First, they show that holding all else constant, the cost of debt, as a result of a violation in the quarter preceding the bond issue, is higher. The *Offer Yield, Net Interest Cost* and *Spread to Treasury* for a firm reporting a violation in the bond-issue quarter is higher by approximately 105 bps, 118 bps and 88 bps respectively. Second, the results provide evidence that this increase in cost of borrowing is higher than the case in which the violation occurred in the bond issue quarter. The difference is approximately 71 bps for *Offer Yield*, 88 bps for *Net Interest Cost* and 44 bps for *Spread to Treasury*. The coefficients are significant for *Offer Yield* and *Net Interest Cost* but not for *Spread to Treasury*. The increase in the cost of debt also appears to be economically important. This result combined with the results for H2 is important as it gives evidence that creditors take violations as an important signal regarding the financial health of the firm and accordingly demand a higher return from violating firm.

VI. G. Multivariate Test of H4
As discussed in Section 5, Nini et al (2012) suggest that firms that violate debt covenants incur a higher cost of borrowing following creditor intervention. They focused on debt contract renegotiation following a covenant violation in private lending arrangements. The practice of renegotiation (after violation) of a debt contract for loans provided by banks is also followed in public loans, and lenders would penalize violators by demanding a higher return for the credit extended. H4, however, postulates that firms which violate a covenant only once and correct for it in the following quarter should benefit from creditors' discretionary rights, and the increase in the cost of debt would not be excessive.

To test for H4, I use the regression equation outlined in Section 6.B and report the results in column (4) of Tables 4, 5 and 6. As above, I employ three different measures of cost of debt *(Offer Yield, Net Interest Cost and Spread to Treasury)*. Holding all else constant, the cost of debt for firms reporting a violation in one quarter is higher than firms that do not violate any debt covenant. The *Offer Yield, Net Interest Cost* and *Spread to Treasury* for violating firms are higher by approximately 39 bps, 47 bps and 13 bps respectively. The coefficients are significant for *Offer Yield* and *Net Interest Cost* at the 1 percent level, but not significant for *Spread to Treasury*. Overall, the results suggest that violating a debt covenant once is costly for the firm, although the increase is not significant across all specifications.

VI. H. Multivariate Test of H5
An important implication of H4 is that firms that violate debt covenants more than once would incur a higher cost of borrowing. H5 encompasses two important implications for violating firms. First, it tests whether violators incur a higher cost of debt. Second, it establishes that the increase in the cost of borrowing is greater for firms that are repeat offenders than firms that violated a debt covenant once.

To test for H5, the regression equation outlined in Section 6.B is used and the results are reported in column (5) of Tables 4, 5 and 6. As above, three difference measures of cost of debt *(Offer Yield, Net Interest Cost and Spread to Treasury)* are used. The results provide evidence on two important characteristics of the incidence of violation. First they show that, holding all else constant, the cost of debt is higher for firms which repeatedly violate debt covenants. The *Offer Yield, Net Interest Cost* and *Spread to Treasury* for repeat offenders are higher by approximately 48 bps, 47 bps and 39 bps respectively. Second, the results provide evidence that the increase in the cost of debt for repeat offenders is greater than that for one time offenders. The cost to repeat offenders is higher approximately by 9 bps for *Offer Yield*, 0 bps for *Net Interest Cost* and 26 bps for *Spread to Treasury*, when compared with one time offenders. The coefficients are statistically significant at the 1 percent level for the three specifications and the magnitudes of the coefficients highlight the adverse economic impact of the repeated violations on the cost of borrowing for the firm.

VI. I. Multivariate Test of H6
The number of reported violations by the firms has an adverse impact on the cost of debt as a firm with a higher number of reported violations would be considered more risky. H6 encompasses the implications of each covenant violation on the cost of debt.

To test for H6, the regression equation outlined in Section 6.B is used and the results are reported in column (6) of Tables 4, 5 and 6. As above, three different measure of cost of debt *(Offer Yield, Net Interest Cost and Spread to Treasury)* are used. The results provide evidence on the increase in the cost of debt with each violation. The *Offer Yield, Net Interest Cost* and *Spread to Treasury* for repeat offenders are higher by approximately 6 bps, 7 bps and 5 bps respectively. The coefficients are statistically significant at the 1 percent level for the three specifications and the magnitudes of the coefficients highlight the adverse economic impact of each violation on the cost of borrowing for the firm.

VII.   Conclusion
The role of covenants in debt contract design has been an area of active research in recent years. Evidence of violation of these restrictions translates into information to the creditors regarding borrowers' ability to maintain contractual agreements. I find that incidences of covenant violation are cyclical in nature with 38 percent of firms having reported a debt covenant violation in at least one quarter. Firm characteristics also play an important role in violations with firms in the middle quartiles of size, tangibility and market-to-book reporting a higher frequency of violation. I also find that the financial health of a firm deteriorates in the quarters leading up to the quarter of violation and improves thereafter. The primary goal of this study was to see if there is a cost of debt covenant violation in terms of an increased cost of debt to the borrower. I find that violating at least one debt covenant translates into a 40 – 61 bps increase in the cost of debt.

The results also provide evidence that after controlling for firm- and loan-specific characteristics, a debt covenant violation in the quarter of bond issue increases the cost of borrowing. This result continues to hold across different measures of the cost of debt with the increase ranging from 30 to 44 bps, although the incidence of violation is reported only at the end of the quarter. I also find that if the incidence of violation is known with certainty in the bond issue quarter, the cost of

borrowing is economically more important than if the incidence of violation is not known. The results show that a debt covenant violation occurring in the quarter preceding the bond issue translates into an increase in the cost of debt of 88 – 105 bps. The results also shed light on the timing and information content of the violation and show that creditors penalize violators by expensing higher borrowing costs for known violations.

The paper also employs measures to see if there is any difference in the cost of borrowing for one-time and repeat offenders. The results show that firms that reported a violation in exactly one quarter have a cost of borrowing which is 13 – 47 bps higher than firms that did not report any violation. Further tests reveal that repeating violations translates into a 39 – 48 bps increased cost of borrowing. The paper also tests for the relationship between each covenant violation and the increase in the cost of debt and finds that each violation translates into a 5 – 7 bps increased cost of borrowing. The results are robust to three different measures of the cost of debt. In sum, I find that there are significant costs to violating a debt covenant, and that violators are penalized by creditors for not upholding their contractual commitments.

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Table 1

Comparing Loan & Firm Characteristics for Debt Covenant Non-Violating and Violating Firms

Panel A presents mean loan characteristics for new bond issues by firms that did not violate a debt covenant (Non-Violating Firms) and firms that violated at least one debt covenant (Violating Firms). *Offer Yield* is the yield offered to investors at the time of bond issue; *Net Interest Cost* is the overall interest expense that is associated with the bond and is based on the average coupon rate weighted to years of maturity adjusted for any associated discounts or premiums; *Spread to Treasury* is the difference in the bond yield and risk free treasury security yield with similar maturity; *Loan Size* is the proceeds from bond issuance; *Loan Maturity* is the maturity in years of issued bonds. Panel B presents mean firm characteristics for new bond issues by firms that did not violate any debt covenant (Non-Violating Firms) and firms that violated at least one debt covenant (Violating Firms). *Z-score* is the Altman z-score used to predict corporate defaults and is computed differently for manufacturing and non-manufacturing firms. *Assets* are total assets of the firm; *Leverage* is the ratio of book value of long term debt plus long term debt in current liabilities to the book value of total assets of the firm; *Coverage* is the ratio of earnings before interest and taxes to the interest expense; *Tangibility* is the ratio of property, plant and equipment to the total assets of the firm; *Market-to-Book* is the ratio of market value of assets to the book value of assets; *Current ratio* is the ratio of current assets to current liability; *S&P ratings* is the S&P rating for bonds and has been converted to a number (see Appendix 4). ***, ** and * denote 1%, 5% and 10% levels of significance, respectively.

	Non-Violating Firms	Violating Firms	Difference
Panel A: Loan Characteristics			
Offer Yield (%)	6.99	7.99	-1 ***
Net Interest Cost (%)	7.15	8.2	-1.05 ***
Spread to Treasury (%)	1.67	2.74	-1.07 ***
Loan Size ($ millions)	253.72	220.79	32.93 ***
Loan Maturity (months)	143.4	115.3	28.1 ***
Panel B: Firm Characteristics			
z-score	2.19	1.58	0.61 ***
Assets ($ millions)	10,442	6,103	4339 ***
Leverage (%)	0.36	0.42	-0.06 ***
Coverage Ratio	12.1	7.15	4.95 ***
Tangibility	0.423	0.399	0.024 ***
Market-to-Book	1.87	1.49	0.38 ***
Current Ratio	1.58	1.68	-0.1 ***
S&P Rating	14.7	12.43	2.27 ***

*** p<0.01, ** p<0.05, * p<0.1

Table 2
Frequency of Debt Covenant Violation

This table presents the percentage of firms that report a financial covenant violation at least once at any point between 1996 and 2005. The sample includes firm-quarter observations available from the Compustat universe that can be matched with the firm-quarter observation for the violation data. Assets are total quarterly assets of the firm; Tangibility is the ratio of property, plant and equipment to the total assets of the firm; Market-to-Book is the ratio of market value of assets to the book value of assets.

	Violator Percentage
Fraction of firms reporting a covenant violation	37.97%
Fraction of firms reporting 1 covenant violation	9.40%
Fraction of firms reporting more than 1 covenant violation	28.57%
Firm-quarter observations with covenant violation	6.29%
By Assets	
25th Percentile	35.38%
Between 25th and 50th Percentile	46.75%
Between 50th and 75th Percentile	45.11%
Between 75th and 100th Percentile	36.02%
Top 10%	30.53%
Top 5%	25.42%
By Tangibility	
25th Percentile	34.47%
Between 25th and 50th Percentile	39.86%
Between 50th and 75th Percentile	41.81%
Between 75th and 100th Percentile	40.68%
Top 10%	36.98%
Top 5%	33.05%
By Market-to-Book	
25th Percentile	48.75%
Between 25th and 50th Percentile	45.05%
Between 50th and 75th Percentile	40.26%
Between 75th and 100th Percentile	32.86%
Top 10%	26.88%
Top 5%	22.70%

Table 3

Summary Statistics

This table presents loan characteristics for new bond issues by all firms before applying the restrictions of each data set. *Offer Yield* is the yield offered to investors at the time of bond issue; *Net Interest Cost* is the overall interest expense that is associated with the bond and is based on the average coupon rate weighted to years of maturity adjusted for any associated discounts or premiums; *Spread to Treasury* is the difference in the bond yield and risk free treasury security yield with similar maturity; *Loan Size* is the proceeds from bond issuance; *Loan Maturity* is the maturity in years of issued bonds; *z-score* is the Altman z-score used to predict corporate defaults and is computed differently for manufacturing and non-manufacturing firms (see Appendix 4). *Assets* are total assets of the firm; *Leverage* is the ratio of book value of long term debt plus long term loan in current liabilities to the book value of total assets of the firm; *Coverage* is the ratio of earnings before interest and taxes to the interest expense; *Tangibility* is the ratio of property, plant and equipment to the total assets of the firm; *Market-to-Book* is the ratio of market value of assets to the book value of assets; *Current ratio* is the ratio of current assets to current liabilities; *S&P rating* is the S&P rating for bonds and has been converted to a number (see Appendix 4); *Log Maturity* is the log of the maturity of the bonds; *Log Amount* is the log of the total value of the issued bonds.

Variable	Mean	Median	Standard Deviation	25th Percentile	75th Percentile	N
Offer Yield (%)	6.818	6.829	1.529	6.000	7.622	1,269
Net Interest Cost (%)	6.960	6.902	1.608	6.016	7.745	1,152
Spread to Treasury (%)	1.658	1.280	1.239	0.800	2.100	1,270
z-score	-9.323	2.044	67.076	-0.840	5.047	362,212
Size	5.021	5.111	2.691	3.277	6.825	512,908
Leverage	0.306	0.184	0.518	0.022	0.382	480,904
Coverage Ratio	7.410	4.692	105.145	1.006	11.653	306,416
Tangibility	0.260	0.160	0.265	0.042	0.415	496,767
Market-to-Book	3.315	1.414	7.657	1.057	2.456	446,445
Current Ratio	3.213	1.744	5.157	1.019	3.148	423,255
S&P Rating	15.166	15.000	3.034	14.000	17.000	1,473
Log Maturity	4.569	4.802	1.017	4.113	4.826	1,483
Log Amount	4.943	5.298	1.283	4.605	5.704	1,486

Table 4

Regression Results: Offer Yield

This table presents the regression results to test for the hypotheses (H2 – H5). Offer Yield is the yield offered to investors at the time of bond issue. VIOL is a binary variable that equals 1 for violating firms and 0 otherwise. $Viol_t$ is a binary variable that equals one if the firm reported a debt covenant violation in the quarter of bond issue and zero otherwise. $Viol_{t-1}$ is a binary variable that equals one if the firm reported a debt covenant violation in the quarter preceding the bond issue and zero otherwise. Viol = 1 is a binary variable that equals one if a firm has reported one debt covenant violation in the period from 1996 to 2005 and zero otherwise. Viol > 1 is a binary variable that equals one if a firm has reported more than one covenant violation either in consecutive or intermittent quarters and zero otherwise. Viol = n is the total number of violations reported by the firm. Z-score is the Altman z-score used to predict corporate defaults and is computed differently for manufacturing and non-manufacturing firms (see Appendix 4). Size is the natural log of the total quarterly assets of the firm in year 2000 dollars; Leverage is the ratio of book value of long term debt plus long term debt in current liabilities to the book value of total assets of the firm; Coverage is the ratio of earnings before interest and taxes to the interest expense; Tangibility is the ratio of property, plant and equipment to the total assets of the firm; Market-to-Book is the ratio of market value of assets to the book value of assets; Current ratio is the ratio of current assets to current liabilities; S&P rating is the S&P rating for bonds and has been converted to a number (see Appendix 4); Log_Maturity is the natural log of the maturity of the loan in months. Log_Loan_Amount is the natural log of the proceeds from bond issuance. All regressions include year and quarter dummies. Figures in parentheses are robust clustered standard errors.

	(1)	(2)	(3)	(4)	(5)	(6)
VIOL	0.475***					
	(0.124)					
$Viol_t$		0.339				
		(0.407)				
$Viol_{t-1}$			1.052*			
			(0.590)			
Viol =1				0.388**		
				(0.183)		
Viol > 1					0.477***	
					(0.137)	
Viol = n						0.0577***
						(0.021)
z_score	0.00302	-0.0177	-0.0278	-0.0232	-0.00986	-0.014
	(0.045)	(0.040)	(0.043)	(0.040)	(0.042)	(0.041)
$Size_{t-1}$	-0.158***	-0.196***	-0.186***	-0.187***	-0.189***	-0.186***
	(0.045)	(0.041)	(0.044)	(0.043)	(0.042)	(0.042)
$Leverage_{t-1}$	0.196	0.0832	0.162	0.0832	0.108	0.295
	(0.353)	(0.357)	(0.345)	(0.353)	(0.338)	(0.339)
$Coverage_{t-1}$	0.00191***	0.00180**	0.00184**	0.00178**	0.00182**	0.00230***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$Tangibility_{t-1}$	-0.0466	-0.0884	-0.0623	-0.152	-0.017	-0.15
	(0.232)	(0.205)	(0.209)	(0.206)	(0.190)	(0.196)
$Market\text{-}to\text{-}Book_{t-1}$	-0.0775	-0.118**	-0.125**	-0.105*	-0.106*	-0.138**
	(0.059)	(0.057)	(0.060)	(0.057)	(0.058)	(0.057)
$Current\ Ratio_{t-1}$	0.126*	0.117*	0.137**	0.132**	0.096	0.117*
	(0.068)	(0.065)	(0.065)	(0.063)	(0.064)	(0.062)
$S\&P\ Rating_{t-1}$	-0.226***	-0.224***	-0.212***	-0.220***	-0.214***	-0.219***
	(0.028)	(0.022)	(0.022)	(0.022)	(0.021)	(0.022)
Log_Maturity	0.188***	0.163***	0.159**	0.161***	0.178***	0.159***
	(0.065)	(0.062)	(0.062)	(0.059)	(0.062)	(0.060)
Log_Loan_Amount	0.125***	0.104***	0.0987***	0.105***	0.111***	0.120***
	(0.041)	(0.034)	(0.033)	(0.035)	(0.035)	(0.032)
Constant	8.494***	9.344***	9.041***	9.152***	8.910***	8.918***
Observations	678	678	649	678	678	678

R-squared	0.66	0.664	0.656	0.669	0.676	0.68

*** p<0.01, ** p<0.05, * p<0.1

Table 5

Regression Results: Net Interest Cost

This table presents the regression results to test for the hypotheses (H2 – H5). Net Interest Cost is the overall interest expense that is associated with the bond and is based on the average coupon rate weighted to years of maturity adjusted for any associated discounts or premiums. VIOL is a binary variable that equals 1 for violating firms and 0 otherwise. $Viol_t$ is a binary variable that equals one if the firm reported a debt covenant violation in the quarter of bond issue and zero otherwise. $Viol_{t-1}$ is a binary variable that equals one if the firm reported a debt covenant violation in the quarter preceding the bond issue and zero otherwise. Viol = 1 is a binary variable that equals one if a firm has reported one debt covenant violation in the period from 1996 to 2005 and zero otherwise. Viol > 1 is a binary variable that equals one if a firm has reported more than one covenant violation either in consecutive or intermittent quarters and zero otherwise. Viol = n is the total number of violations reported by the firm. Z-score is the Altman z-score used to predict corporate defaults and is computed differently for manufacturing and non-manufacturing firms (see Appendix 4). Size is the natural log of the total quarterly assets of the firm in year 2000 dollars; Leverage is the ratio of book value of long term debt plus long term debt in current liabilities to the book value of total assets of the firm; Coverage is the ratio of earnings before interest and taxes to the interest expense; Tangibility is the ratio of property, plant and equipment to the total assets of the firm; Market-to-Book is the ratio of market value of assets to the book value of assets; Current ratio is the ratio of current assets to current liabilities; S&P rating is the S&P rating for bonds and has been converted to a number (see Appendix 4); Log_Maturity is the natural log of the maturity of the loan in months. Log_Loan_Amount is the natural log of the proceeds from bond issuance. All regressions include year and quarter dummies. Figures in parentheses are robust clustered standard errors.

	(1)	(2)	(3)	(4)	(5)	(6)
VIOL	0.611***					
	-0.144					
$Viol_t$		0.294				
		(0.386)				
$Viol_{t-1}$			1.182*			
			(0.690)			
Viol =1				0.469*		
				(0.242)		
Viol > 1					0.466***	
					(0.153)	
Viol =n						0.0700***
						(0.025)
z_score	0.0206	0.0129	0.00226	0.00625	0.0222	0.0204
	(0.0493)	(0.049)	(0.050)	(0.047)	(0.048)	(0.052)
$Size_{t-1}$	-0.123**	-0.161***	-0.142***	-0.151***	-0.155***	-0.145***
	(0.0513	(0.046)	(0.050)	(0.049)	(0.048)	(0.047)
$Leverage_{t-1}$	-0.0349	-0.117	-0.0371	-0.112	-0.0887	-0.0866
	(0.393)	(0.406)	(0.388)	(0.401)	(0.386)	(0.419)
$Coverage_{t-1}$	-0.000202	-0.000246	-0.000204	-0.000216	-0.000287	-0.000151
	(0.000709	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$Tangibility_{t-1}$	-0.198	-0.182	-0.132	-0.271	-0.114	-0.162
	(0.268	(0.279)	(0.284)	(0.274)	(0.262)	(0.261)
$Market\text{-}to\text{-}Book_{t-1}$	-0.0275	-0.0416	-0.0449	-0.0254	-0.03	-0.064
	(0.0601	(0.062)	(0.064)	(0.061)	(0.062)	(0.064)
$Current\ Ratio_{t-1}$	0.121	0.136*	0.160**	0.151**	0.114	0.123
	(0.0762	(0.074)	(0.075)	(0.072)	(0.077)	(0.075)
$S\&P\ Rating_{t-1}$	-0.274***	-0.287***	-0.278***	-0.283***	-0.276***	-0.284***
	(0.0335	(0.032)	(0.033)	(0.032)	(0.033)	(0.033)
Log_Maturity	0.320*	0.282	0.283	0.281	0.305	0.312
	(0.178)	(0.202)	(0.205)	(0.188)	(0.206)	(0.194)
Log_Loan_Amount	0.109**	0.0852*	0.0717	0.0909**	0.101**	0.0865*
	(0.0502)	(0.045)	(0.044)	(0.045)	(0.047)	(0.046)
Constant	8.464***	9.498***	11.24***	9.238***	8.971***	9.153***
Observations	611	611	594	611	611	611

R-squared	0.674	0.651	0.644	0.657	0.66	0.66

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 6

Regression Results: Spread to Treasury

This table presents the regression results to test for the hypotheses (H2 – H5). Spread to Treasury is the difference in the bond yield and risk free treasury security yield with similar maturity. VIOL is a binary variable that equals 1 for violating firms and 0 otherwise. $Viol_t$ is a binary variable that equals one if the firm reported a debt covenant violation in the quarter of bond issue and zero otherwise. $Viol_{t-1}$ is a binary variable that equals one if the firm reported a debt covenant violation in the quarter preceding the bond issue and zero otherwise. Viol = 1 is a binary variable that equals one if a firm has reported one debt covenant violation in the period from 1996 to 2005 and zero otherwise. Viol > 1 is a binary variable that equals one if a firm has reported more than one covenant violation either in consecutive or intermittent quarters and zero otherwise. Viol = n is the total number of violations reported by the firm. Z-score is the Altman z-score used to predict corporate defaults and is computed differently for manufacturing and non-manufacturing firms (see Appendix 4). Size is the natural log of the total quarterly assets of the firm in year 2000 dollars; Leverage is the ratio of book value of long term debt plus long term debt in current liabilities to the book value of total assets of the firm; Coverage is the ratio of earnings before interest and taxes to the interest expense; Tangibility is the ratio of property, plant and equipment to the total assets of the firm; Market-to-Book is the ratio of market value of assets to the book value of assets; Current ratio is the ratio of current assets to current liabilities; S&P rating is the S&P rating for bonds and has been converted to a number (see Appendix 4); Log_Maturity is the natural log of the maturity of the loan in months. Log_Loan_Amount is the natural log of the proceeds from bond issuance. All regressions include year and quarter dummies. Figures in parentheses are robust clustered standard errors.

	(1)	(2)	(3)	(4)	(5)	(6)
VIOL	0.369***					
	(0.105)					
$Viol_t$		0.437				
		(0.393)				
$Viol_{t-1}$			0.882			
			(0.581)			
Viol =1				0.13		
				(0.146)		
Viol > 1					0.393***	
					(0.129)	
Viol = n						0.0485***
						(0.019)
z_score	0.00004	0.00203	-0.00561	-0.00571	0.00607	-0.00642
	(0.040)	(0.039)	(0.042)	(0.039)	(0.040)	(0.040)
$Size_{t-1}$	-0.136***	-0.153***	-0.138***	-0.154***	-0.151***	-0.156***
	(0.043)	(0.039)	(0.042)	(0.040)	(0.041)	(0.040)
$Leverage_{t-1}$	0.0999	0.0396	0.0514	0.0387	0.0602	0.0272
	(0.346)	(0.357)	(0.361)	(0.365)	(0.347)	(0.348)
$Coverage_{t-1}$	0.000397	0.000273	0.000315	0.00029	0.000321	0.000411
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$Tangibility_{t-1}$	-0.362*	-0.284	-0.263	-0.319	-0.237	-0.337*
	(0.206)	(0.202)	(0.208)	(0.204)	(0.193)	(0.194)
$Market\text{-}to\text{-}Book_{t-1}$	-0.0764	-0.0822*	-0.0900*	-0.0755	-0.0735	-0.0909*
	(0.048)	(0.047)	(0.050)	(0.047)	(0.048)	(0.048)
$Current\ Ratio_{t-1}$	0.0712	0.0773	0.0847	0.0803	0.0601	0.0697
	(0.065)	(0.062)	(0.062)	(0.062)	(0.066)	(0.063)
$S\&P\ Rating_{t-1}$	-0.224***	-0.238***	-0.232***	-0.237***	-0.230***	-0.232***
	(0.020)	(0.020)	(0.021)	(0.020)	(0.020)	(0.020)
Log_Maturity	-0.00291	-0.0172	-0.0226	-0.0178	-0.00102	-0.00253
	(0.026)	(0.031)	(0.031)	(0.031)	(0.029)	(0.027)
Log_Loan_Amount	0.0955**	0.0822***	0.0723**	0.0832***	0.0910**	0.0923**
	(0.040)	(0.030)	(0.029)	(0.030)	(0.035)	(0.039)
Constant	5.514***	6.077***	5.915***	6.088***	5.769***	5.889***
Observations	676	676	648	676	676	676
R-squared	0.596	0.586	0.589	0.586	0.597	0.592

*** p<0.01, ** p<0.05, * p<0.1

Figure 1
Covenant Violation from 1996 – 2005
This figure presents the annual fraction of firms reporting at least one covenant violation during the fiscal years 1996 to 2005.
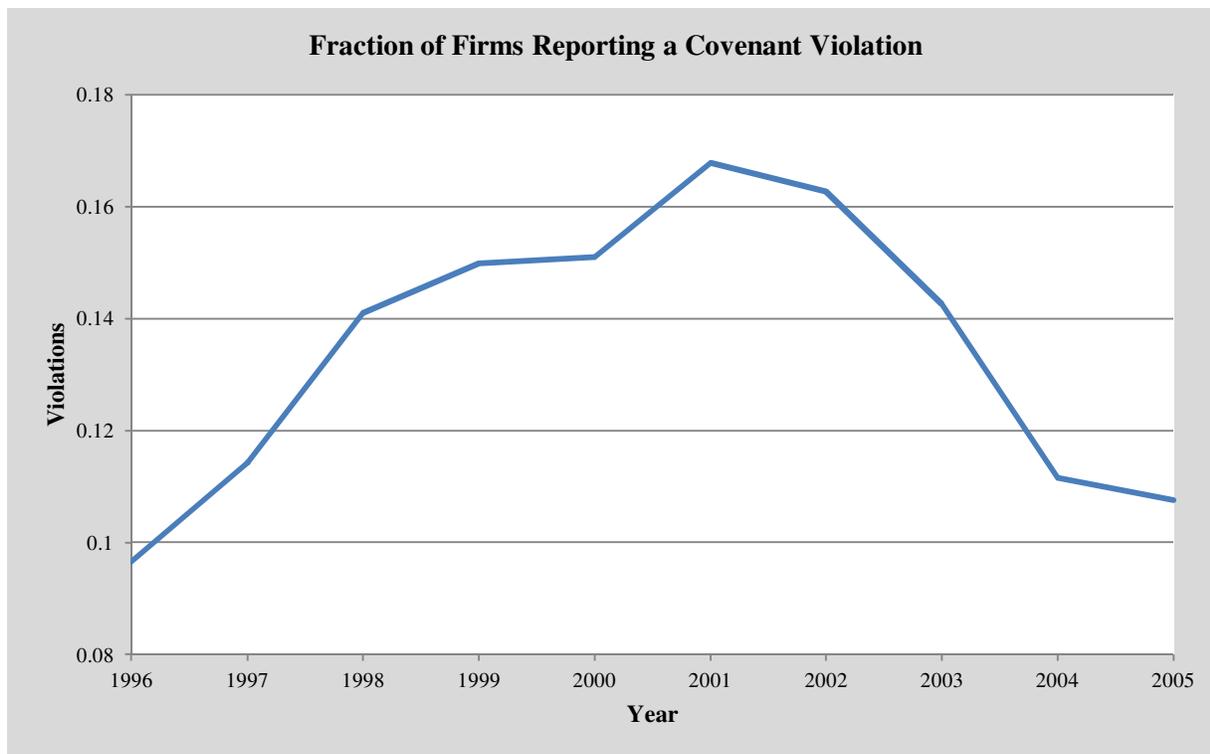

Fraction of Firms Reporting a Covenant Violation

Figure 2
Covenant Violation by Firm Characteristics
This figure presents the annual percentage of firms reporting at least one covenant violation during the fiscal years 1996 to 2005 and segregates the data based on Size, Tangibility and Market to Book.
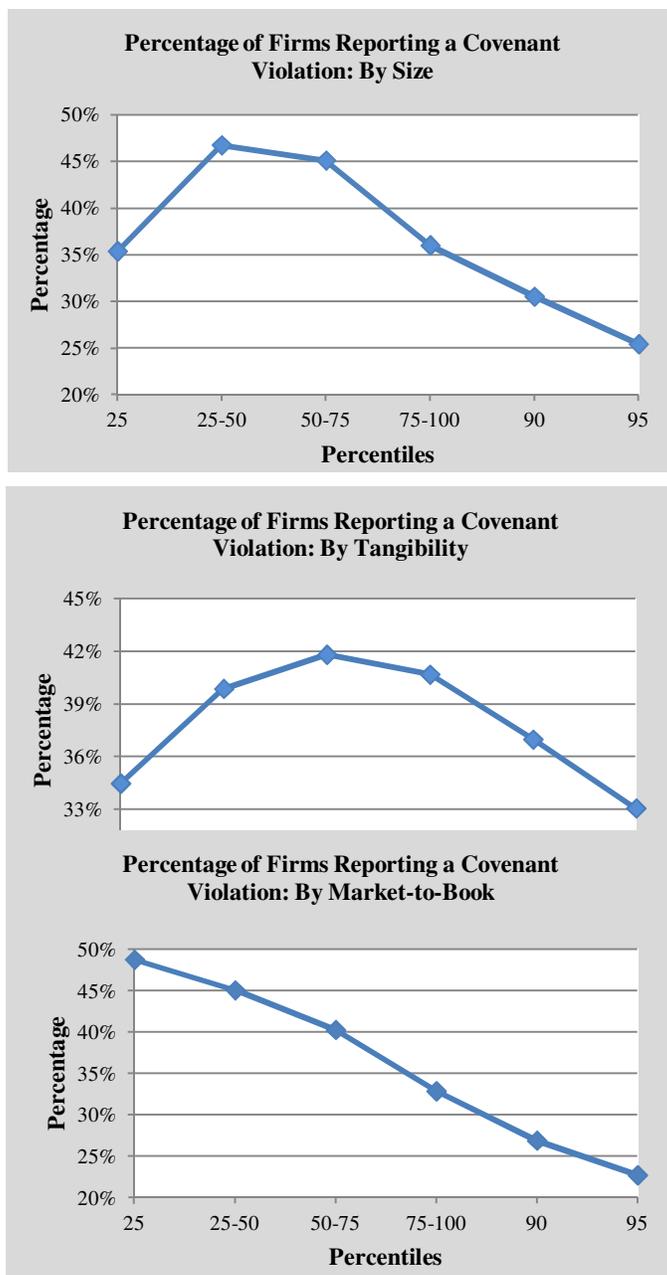
Figure 3
Firm Characteristics Preceding and Following a Violation
This figure presents the financial condition of firms reporting at least one covenant violation during the fiscal years 1996 to 2005 and looks at the progression of firm characteristics in the quarter preceding and following a financial covenant violation.
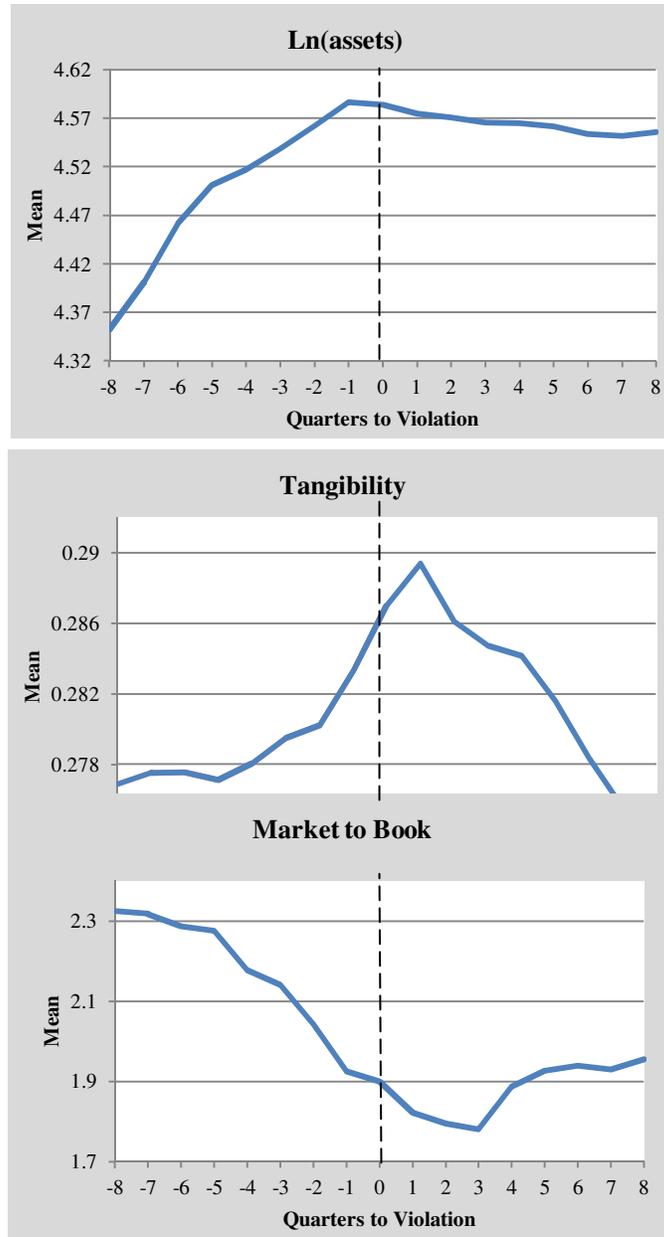
Figure 4
Financial Indicators Preceding and Following a Violation
This figure presents the financial condition of firms reporting at least one covenant violation during the fiscal years 1996 to 2005 and looks at the progression of the indicators of financial health of the firm in the quarter preceding and following a financial covenant violation.
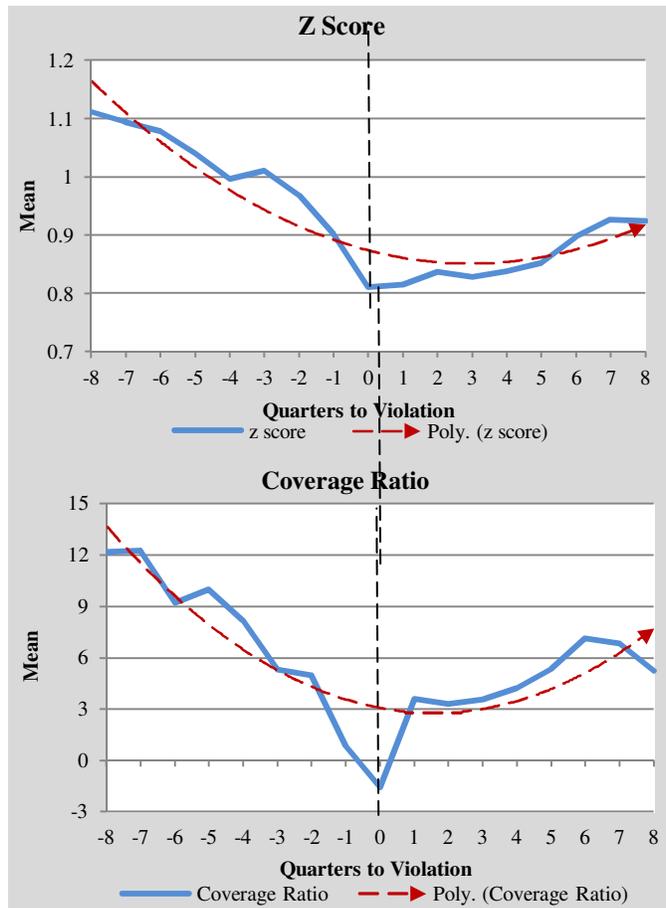
Figure 4
Continued
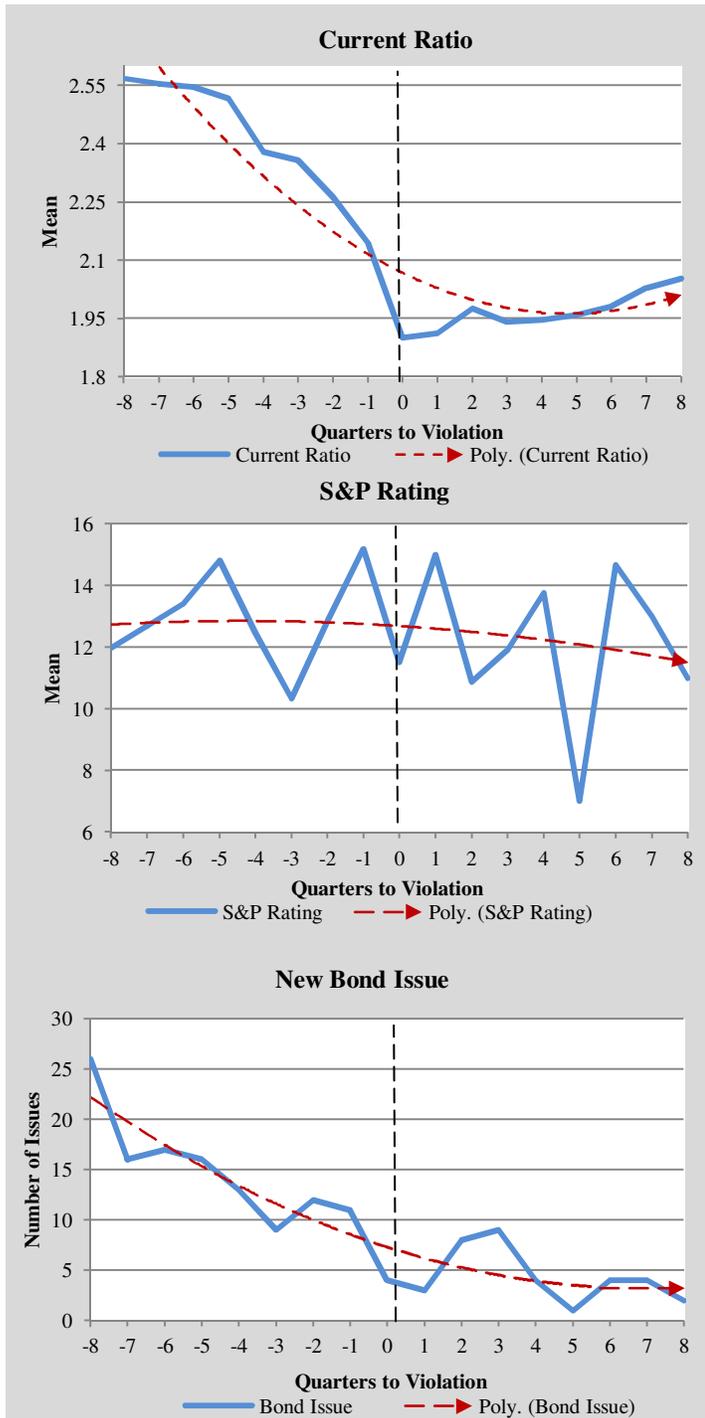
Appendix
Definition of variables

- CoD: The dependent variable is "Cost of Debt". Three different specifications are used: Offer Yield, Net Interest Cost and Spread to Treasury.
  - Offer Yield: The yield offered to investors at the time of bond issue.
  - Net Interest Cost: The overall interest expense that is associated with the bond and is based on the average coupon rate weighted to years of maturity adjusted for any associated discounts or premiums.
  - Spread to Treasury: The difference between the bond yield and a risk-free treasury security yield with similar maturity.

VIOLATION

- VIOLATION: This is a binary variable measured by: VIOL, [$Viol_t$, $Viol_{t-1}$], and [Viol =1, Viol >1].
  - $Viol_{(t)}$: Incidence of violation occurred in the bond-issue quarter
  - $Viol_{(t-1)}$: Incidence of violation occurred in the quarter preceding the bond-issue quarter
  - Viol =1: Firm reported exactly one violation
  - Viol >1: Firm reported more than one violation
  - Viol = n: total number of violations reported by the firm

BORROWER CHARACTERISTISCS

- Z-SCORE: The z-score for the issuer calculated separately for manufacturing and non-manufacturing firms.
- SIZE: The natural log of the book value of the assets of the borrower adjusted for inflation in year 2000 dollars. This controls for the cross-sectional variation in issuer size in the sample.
- LEVERAGE: Ratio of book value of long term debt plus the long term debt in current liabilities to the book value of total assets.
- COVERAGE RATIO: Calculated as ($\frac{EBITDA}{Interest\ Expenses}$).
- TANGIBILITY: Ratio of property, plant and equipment to total assets.
- MARKET-to-BOOK: Ratio of market value of the firm to the book value of the firm.
- CURRENT RATIO: Ratio of current assets to current liabilities.

BOND CHARACTERISTICS

- S&P RATING: The Standard & Poor's ratings of the new bond issue converted to a numerical value using the following scheme. S&P Rating = 22 if S&P Rating ="AAA"; S&P Rating =21 if S&P Rating ="AA+"; S&P Rating =20 if S&P Rating ="AA"; S&P Rating =19 if S&P Rating ="AA-"; S&P Rating =18 if S&P Rating ="A+"; S&P Rating =17 if S&P Rating ="A"; S&P Rating =16 if S&P Rating ="A-"; S&P Rating =15 if S&P Rating ="BBB+"; S&P Rating =14 if S&P Rating ="BBB"; S&P Rating =13 if S&P Rating ="BBB-"; S&P Rating =12 if S&P Rating ="BB+"; S&P Rating =11 if S&P Rating ="BB"; S&P Rating =10 if S&P Rating ="BB-"; S&P Rating =9 if S&P Rating ="B+"; S&P Rating =8 if S&P Rating ="B"; S&P Rating =7 if S&P Rating ="B-"; S&P Rating =6 if S&P Rating ="CCC+"; S&P Rating =5 if S&P Rating ="CCC"; S&P Rating =4 if S&P Rating ="CCC-"; S&P Rating =3 if S&P Rating ="CC"; S&P Rating =2 if S&P Rating ="C"; S&P Rating =1 if S&P Rating ="D";
- LOG MATURITY: The natural log of the maturity of the bond issue in months.
- LOG AMOUNT: The natural log of the loan issue value.

CONTROL
- Control$_k$: These are other control variables and include dummy variables for the year and quarter of the bond issue and the industry of the borrower.

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