# Corporate Bondholder Reactions to Bank Loan Covenant Violations and the Evolution of Bank Loan Covenants

Yuqian Wang[1,2], Che-Wei Chiu[1,2] & Shu-Ling Wu[3]

[1] College of Busisness, Winona State University, Winona, MN, USA

[2] Naveen Jindal School of Management, University of Texas at Dallas, Dallas, TX, USA

[3] College of Management, National Taiwan University, Taipei, Taiwan

Correspondence: Yuqian Wang, College of Busisness, Winona State Univers, Winona, MN, USA. Tel: 1-507-457-2285. E-mail: ywang@winona.edu

**Abstract**

Prior research has documented effects of bank loan covenant violations on various firm behaviors from the perspective of shareholders. Our paper extends this stream of research by examining how bank loan covenant violations affect public corporate bondholders. Using an event study approach, we find that the bond price response to a bank loan covenant violation is marginally negative in the 1990s and becomes significantly positive in the 2000s. The favorable price response in more recent years indicates that bondholders benefit from covenant violations. The differential bond price responses suggest an evolution of banks' use of loan covenants. Specifically, banks gradually take covenants as "trip wires," enabling them to step in and take necessary actions to safeguard their interests when early warning signals show up through covenant violations. Such disciplinary actions benefit not only banks but also bondholders. In addition, this paper finds that bondholder and stockholder reactions are positively correlated in the 2000s and that managerial entrenchment could decrease banks' influence after covenant violations.

**Keywords:** bank loan covenant violations, public corporate bondholders, stockholder reactions

## 1. Introduction and Hypotheses

Debt covenants play a substantial role in mitigating agency conflicts between creditors and shareholders. They protect creditors from wealth expropriation due to asset substitution and over/under-investment (Jensen & Meckling, 1976; Myers, 1977; Smith & Warner, 1979). However, the violation of bank loan covenants is not uncommon. Roberts and Sufi (2009) show that more than one quarter of public firms in the United States violated bank loan covenants between 1996 and 2005. In response to covenant violations, banks often take disciplinary actions, such as reducing the size of credit facilities, increasing interest rates, and asking for additional collateral. Unlike banks, public corporate bondholders are less likely to take disciplinary actions when bond covenants are violated because bondholders are broadly dispersed in general, and bond covenant violations typically lead to liquidation. Prior research has documented effects of bank loan covenant violations on various firm behaviors from the perspective of shareholders. Based on these findings, a natural question that arises is whether bank loan covenant violations also affect public corporate bondholders. To address this question, we use an event study approach to examine the firms' bond price reactions to bank loan covenant violations. To the best of our knowledge, this paper is the first study investigating direct effects of bank covenant violations on bondholders.

Bank loan covenant violations may adversely affect bondholders of the same firm since covenant violations could signal deterioration of the firm's financial performance and precede payment defaults. Moreover, actions taken by banks after covenant violations, such as increasing interest rates and requiring additional collateral, could diminish firms' ability to service the corporate bond (Note 1). This hypothesis suggests an adverse bond price reaction to bank loan covenant violations. It is also consistent with Esmer (2013), who documents a significant increase in firm risk in the year following covenant violations. In addition, Esmer (2013) claims that risk-shifting behaviors of managers can counter creditor interventions after violations and that agency conflicts between creditors and shareholders are heightened due to bank loan covenant violations.

On the other hand, violations of bank loan covenants occur relatively often, and they do not necessarily indicate borrowers are in severe financial distress. As argued by Dichev and Skinner (2002), private lenders may set debt covenants tightly and use them as "trip wires," which provide creditors with an option to step in and take action before something really bad happens. Nini, Smith, and Sufi (2012) show that bank loan violations are followed by a decline in acquisitions and capital expenditures, a sharp reduction in leverage and shareholder payouts, and an increase in CEO turnover due to formal or informal influence exerted by banks. They also document that both operating and stock performance of firms start to improve gradually within one or two years after violations. Balsam, Gu, and Mao (2018) find that CEOs' risk-taking incentives decrease after violations. These findings suggest that bank loan covenant violations allow banks to step in early and take disciplinary actions, which safeguard interests of creditors in the same firm. Based on this hypothesis, bond prices are expected to respond positively to bank loan covenant violations.

The two hypotheses discussed above are not mutually exclusive. Net effects of bank loan covenant violations depend on the severity of current financial performance and potential improvements by bank interventions. Taken together, it is an empirical question whether bondholders respond to covenant violations favorably or adversely.

This paper uses an event study approach to investigate if bondholders are significantly affected by covenant violations. Specifically, we compute excess corporate bond returns during event windows and test if they are statistically and economically significant. Data on bank loan covenant violations were collected by Nini, Smith and Sufi (2012) from SEC filings and is available on Dr. Sufi's website (Note 2). We use daily bond prices from the Bloomberg Corporate BGN Price database and the Lehman Brother bond index from the Datastream database to calculate excess bond returns. Compared with TRACE, which started to record bond trades in June 2002, Bloomberg provides daily bond prices back to the 1990s.

When dividing the sample period into two sub-periods, 1997-2002 and 2003-2008, we find significantly positive bond price reactions to covenant violations in more recent years (2003-2008) and marginally negative reactions in earlier years (1997-2002). Specifically, the daily excess return is 7.15 bps (basis points) in the period 2003-2008, while it is -7.91 bps in the period 1997-2002. In order to show that our results are not data sensitive, we also use monthly bond data from Mergent/Moody's bond record and daily bond data from TRACE for robustness tests and find consistent results. The empirical evidence supports the hypothesis that bondholders benefit from bank loan covenant violations in the 2000s. In other words, actions taken by a firm's bank after covenant violations benefit not only the bank but also bondholders of the same firm.

Bondholders' differential reactions in the two periods cannot be entirely attributed to changes in firm characteristics. Based on LPC DealScan database, the average number of bank loan financial covenants on U.S. public firms with bank loans rose sharply in the 1990s, and slowed down in the 2000s. The trend indicates an evolution of the use of bank loan covenants: banks gradually add more and/or tighter covenants to loans, take covenants as "trip wires," and play an active role in corporate governance after covenant violations. The evolution gradually changes bondholders' perceptions of covenant violations over time. As shown in our empirical results, bondholders have started to respond favorably to bank loan covenant violations in more recent years (2003-2008).

This paper also investigates the association between stockholder and bondholder reactions to bank loan covenant violations. We find that they are positively correlated in the period 2003-2008. One dollar increase in the bondholder wealth is associated with 56 cents increase in the stockholder wealth. The positive association indicates that both bondholders and stockholders benefit from bank interventions after covenant violations in this period.

Lastly, we examine how managerial entrenchment affects the association between stockholder and bondholder reactions. On the one hand, the influence of bank interventions after covenant violations could be attenuated by managerial entrenchment. On the other hand, firms with severe entrenchment have more room for improvement. In the subsample of covenant violations between 2000 and 2008, we find that one dollar increase in bondholder wealth is associated with one dollar increase in stockholder wealth when a firm has good corporate governance and managerial entrenchment level is low, while the association becomes insignificant when a firm has severe managerial entrenchment. This finding suggests that greater managerial entrenchment hinders banks' actions to safeguard interests of creditors.

The rest of the paper proceeds as follows. Section 2 reviews prior literature. Section 3 discusses data and methodology. Section 4 provides the empirical analysis, and Section 5 concludes this paper.

## 2. Literature Review

This paper extends the literature on the effects of debt covenant violations. Extant research focuses on effects of bank loan covenant violations on various firm behaviors but does not directly investigate whether bondholders benefit from bank interventions after covenant violations. For example, Chava and Roberts (2008) show that capital investment declines sharply following a financial covenant violation. Roberts and Sufi (2009) find that net debt issuing activity experiences a sharp and persistent decline following debt covenant violations. Nini, Smith, and Sufi (2012) provide a comprehensive analysis of the impact of bank loan covenant violations and find that violations are followed by a decrease in acquisitions, capital expenditures, leverage and shareholder payouts, and an increase in CEO turnover. Some studies, however, provide mixed evidence. Esmer (2013) claims that firm risk increases after covenant violations, while Balsam, Gu, and Mao (2018) find that CEOs' risk-taking incentives decline after covenant violations. Our paper contributes to the literature by showing that, on average, bondholders are beneficiaries, rather than victims of loan covenant violations in recent years, and our findings are consistent with Balsam, Gu, and Mao (2018).

This paper is also related to a large body of research on the unique monitoring function of banks and their relation with bondholders. Black (1975) and Fama (1985) claim that, as insiders, banks have a low-cost ongoing history of financial information that gives them a comparative cost advantage in monitoring borrowing firms than public corporate bondholders do. Diamond (1984) analyses the determinants of delegation costs and theoretically shows that a financial intermediary, such as a bank, has a net information cost advantage relative to direct lending and borrowing in public debt market. Additionally, empirical studies present abundant evidence that stock markets positively respond to loan commitments (James, 1987; Lummer & McConnell, 1989; Mikkelson & Partch, 1986). Datta, Iskandar-Datta, and Patel (1999) find that the existence of a bank relationship lowers the initial cost of public debt financing due to cross-monitoring benefits of bank debt. Our paper provides new evidence that, in addition to cross-monitoring benefits, bondholders also benefit from bank interventions after loan covenant violations.

Finally, our paper is related to several studies on the evolution of debt covenants. Contracts of public corporate bonds generally use boilerplate language (Simpson, 1973); that is, a standard provision of the bond contract could be used repetitively without much change. Whitehead (2009) claims that private debt holders may move from the traditional dependence on covenants to a reliance on liquid credit instruments. Our paper documents a sharp increase of bank loan covenants on U.S. public firms in the late 1990s, suggesting that banks gradually use more covenants to play an active disciplining role in corporate governance after covenant violations. This is consistent with the "trip wires" argument in Dichev and Skinner (2002).

## 3. Data and Methodology

### 3.1 Sample

Data on bank loan covenant violations were collected by Nini, Smith, and Sufi (2012) from SEC filings and are available on Dr. Sufi's website. New bank loan covenant violations are defined as violations by firms that did not violate any bank loan covenants in the previous four quarters. There were 4,178 new bank loan covenant violations from 3,145 unique nonfinancial public firms between 1997 and 2008. The SEC filing date, which falls on the last day of a calendar month, is considered as the official report date of a bank loan covenant violation.

Daily bond prices data are from Bloomberg. Compared with data in TRACE, the historical daily bond prices in the Bloomberg system go back to early 1990s. Bloomberg receives prices from various dealers via transactions which are recorded on the Bloomberg trading system. The daily bond price used in this paper is the last mid-price of a trading day. To be included in the sample, a firm must have a bond rating and non-zero total debt in the year of covenant violations. We cross check whether these firms have bonds outstanding based on maturity and offering date of new bond issues from the Mergent Fixed Income Securities Database (FISD) database and get the 9-digit CUSIP for each bond outstanding. Only nonconvertible U.S. public bonds are included in the sample. Bonds with prices below \$30 are excluded to rule out zero coupon bonds. When a firm has multiple bonds, the one with a longer term to maturity, larger amount outstanding, and less security is selected as the representative bond. This screening process leads to 508 observations. For each observation, we hand-collect the last available bond price before the filing date of a bank loan covenant violation, $P_0$, and the first available bond price after the violation filing date, $P_1$, from Bloomberg based on the 9-digit CUSIP number. This process leads to 193 observations. In order to mitigate the effects of illiquidity on bondholder reactions, bonds included in the final sample are required to be traded for at least one fifth of the total trading days within 2 months ($0.2 \times (20+20)$), i.e., 8 days in the violation month and subsequent month, and the event windows are required to be no more than 8 days. These requirements further reduce the sample to 140 observations with available information to compute bond price reactions.

For robustness tests, bond prices from Mergent/Moody's bond record and TRACE are also collected to calculate bond returns. However, neither Mergen/Moody nor TRACE records all trade prices of bonds during the sample period 1997 to 2008. The former stopped recording updated monthly bond prices in 2003, and the latter started to record the flat daily trade price from 2002.

Lehman Brother monthly bond index returns with accrued interests are collected from Datastream database. They are used as the benchmarks to compute excess bond returns. There are eight Moody's bond rating categories (Aaa, Aa, A, Baa, Ba, B, Caa, Ca-D) and two maturity categories (long term and intermediate term), resulting in sixteen different bond indices. Each bond is grouped into one of the sixteen categories based on its rating and maturity.

Daily stock return data are from CRSP database. Fama and French (1993) three factors (i.e., excess market returns, excess returns of small caps over big caps, and excess returns of value stocks over growth stocks) and the momentum factor are collected from Dr. Kenneth French's website at Dartmouth. Financial information of firms is from the Compustat database. Finally, G-index is collected from RiskMetrics to test managerial entrenchment effects.

*3.2 Main Variables and Methodology*

We use an event study approach to investigate bondholder reactions to bank loan covenant violations. By focusing on the excess price reactions over a short event window, this approach helps assess the impact of an event on firms' stakeholders, such as stockholders and bondholders. We first compute excess bond returns for each of the 140 observations during their respective event windows and then test if they are statistically and economically significant.

Daily excess bond returns are computed as the difference between daily average bond return (change in price plus accrued interest) and daily average index return. Specifically, the excess return is equal to

$$[(P_1 + Accrued\ interest) / P_0]^{1/N} - (1 + R_{index})^{1/M} \tag{1}$$

where $P_1$ is the first available bond price after the filing date of a bank loan covenant violation, while $P_0$ is the last available bond price before the violation filing date, $N$ is the number of trading days between $P_1$ and $P_0$, $M$ is the number of trading days of the violation month, and $R_{index}$ is the Lehman Brother monthly bond index return of the violation month. Since bonds are traded less frequently than stocks, some bonds do not have any transactions on a certain trading day. Therefore, the length of the event window, $N$, could be different for each event of covenant violations. As shown in Panel A of Table 1, the average length of the event window is 2.58 trading days for the full sample (Note 3).

Daily excess stock returns are measured based on the Carhart four-factor model. It is estimated using daily data in the previous 12 months before a bank loan covenant violation filing date.

We also use the Gompers, Ishii, and Metrick index (G-index) to measure managerial entrenchment. G-index is based on the number of anti-takeover provisions in a firm's charter. It is a negative index for good corporate governance because a takeover itself is supposed to improve corporate governance. G-index is reported every two or three years from 1990 on the RiskMetrics database.

## 4. Empirical Results

We examine bondholder reactions to bank loan covenant violations using daily bond returns from Bloomberg and conduct robustness tests using monthly bond price data from Mergent/Moody's bond record and daily bond price data from TRACE. We also examine stockholder reactions using daily excess stock returns. Finally, we investigate the association between shareholders and bondholders reactions to covenant violations and examine how managerial entrenchment affects this association.

*4.1 Excess Bond Returns*

Table 1. Excess bond returns (in basis points) to loan covenant violations based on Bloomberg

Panel A. Descriptive statistics of daily excess bond returns

| | Mean | Median | Std. Dev. | 1st Quartile | 3rd Quartile | Average length of event windows (trading days) | Obs. |
|---|---|---|---|---|---|---|---|
| Daily excess bond return | -0.54 | 2.07 | 44.75 | -14.73 | 20.98 | 2.58 | 140 |

Panel B. t-tests and the Wilcoxon signed-rank tests

| | | | | Below investment grade | | Investment grade | |
|---|---|---|---|---|---|---|---|
| | Full sample | 1997-2002 | 2003-2008 | 1997-2002 | 2003-2008 | 1997-2002 | 2003-2008 |
| Mean | -0.54 | -17.91** | 7.15* | -18.35** | 10.23** | -15.99 | -3.33 |
| | (0.89) | (0.03) | (0.08) | (0.04) | (0.02) | (0.46) | (0.75) |
| Median | 2.07 | -3.32* | 4.09** | -2.4 | 4.18** | -17.56 | 2.34 |
| | (0.40) | (0.10) | (0.03) | (0.18) | (0.01) | (0.04) | (0.99) |
| Obs. | 140 | 43 | 97 | 35 | 75 | 8 | 22 |

The above table reports daily excess bond returns (in basis points) calculated as the difference between a bond's daily average return and the Lehman Brother daily average bond index return based on Equation (1). If a firm has multiple bonds, only one representative bond with a longer term to maturity, a larger amount outstanding, and less security is included. The full sample is winsorized at top and bottom 1% to mitigate the effects of extreme outliers. Bonds included are required to be traded at least for one-fifth of the violation month and subsequent month, i.e., 8 trading days. The event window is required to be no more than 8 trading days. The significance level of the median is based on the Wilcoxon signed-rank test. P-values are reported in parentheses. ***, ** and * indicate significance at the 0.01, 0.05 and 0.10 significance level, respectively.

Covenant violation data cover twelve years from 1997 to 2008 due to data availability. Panel B of Table 1 shows that during the first half of sample years (1997-2002), the mean of daily excess bond return is -17.91 bps and is significant at 5% significance level. In contrast, during the second half of the sample years (2003-2008), the daily excess bond return is 7.15 bps and is significant at a 10% significance level.

The positive bondholder reactions in the period 2003-2008 may seem counterintuitive since bank loan violations could signal poor financial performance and precede payment defaults. However, loan covenant violations also give private lenders an option to step in and take actions to safeguard the benefits of creditors (Dichev & Skinner, 2002). Taken together, the net effect of bank loan violations on bondholders is an empirical question determined by the severity of current financial performance and improvements by bank interventions, such as an increase in CEO turnover (Nini, Smith, & Sufi, 2012) and a decrease in CEOs' risk-taking incentives (Balsam, Gu, & Mao, 2018). Evidence shown in Panel B indicates that in earlier years (1997-2002), the net effect of covenant violations is driven by adverse impacts of financial performance deterioration, while the positive effects of corporate governance improvement become dominant in the period 2003-2008 as more loan covenants are used as trip wires for banks to maintain close scrutiny. Our findings show a significant change in bondholders' views on the bank loan covenant violations over time.

Compared with prior studies, the positive excess bond return in the period 2003-2008 is also economically significant. Bessembinder, Kahle, Maxwell, and Xu (2009) use daily transaction data in TRACE and find that cumulative abnormal bidder return (CAR) is -20 bps for a three-day event window (or 7 bps per day). Billet, Mauer, and Zhang (2010) find that the excess bond return to the first appearance of option and /or restricted stock grants is -112 bps for the two-month period 0 and period +1, that is, -2.82 bps per day ($(1+0.0112)^{1/40}-1 =2.82$ bps). Maxwell and Stephens (2003) find that the abnormal bond returns to the announcement of spin-off are 29 bps for a month. In contrast, we find greater bondholder reactions over a much shorter event window (18.52 bps (= 7.15 ×2.59) over 2.58 days).

In Panel B of Table 1, the full sample is also partitioned into two sub-samples: below investment grade and investment grade according to the ratings of representative bonds. 110 out of 140 observations have a credit rating below investment grade. As shown in Panel B, bondholder excess returns are negative in the first half of the sample period (1997-2002) and positive in the second half of the sample period (2003-2008) for bonds below investment grade.

To show that our findings are not data sensitive, Table 2 presents the results of robustness tests using monthly bond data from Mergent/Moody's bond record from 1997 to 2003 and daily bond data from TRACE from 2002 to 2008.

Table 2. Excess bond returns (in basis points) to loan covenant violations based on monthly bond prices of Mergent/Moody's manual 1997-2003 and daily bond prices of TRACE 2002-2008

Panel A. Descriptive statistics

| | Mean | Median | Std. Dev. | 1st Quartile | 3rd Quartile | Obs. |
|---|---|---|---|---|---|---|
| Mergent/Moody's excess bond returns (over event month 0 and +1) 1997-2003 | -163.33 | -32.98 | 1,367.03 | -560.08 | 273.54 | 161 |
| TRACE daily excess bond returns 2002-2008 | 11.79 | 3.88 | 69.06 | -12.68 | 27.80 | 103 |

Panel B. t-tests and the Wilcoxon signed-rank tests among different sample/subsample

| | Mergent/Moody's 1997-2003 | | | TRACE 2002-2008 | | |
|---|---|---|---|---|---|---|
| | Full sample | Below investment grade | Investment grade | Full sample | Below investment grade | Investment grade |
| Mean | -163.33 | -147.06 | -219.80** | 11.79* | 17.90** | -8.34 |
| | (0.13) | (0.28) | (0.03) | (0.09) | (0.03) | (0.49) |
| Median | -32.98* | -47.42 | -14.69* | 3.88* | 3.29* | 4.69 |
| | (0.10) | (0.28) | (0.10) | (0.09) | (0.07) | (0.86) |
| Obs | 161 | 125 | 36 | 103 | 79 | 24 |

In the table above monthly excess bond returns based on monthly bond prices of Mergent/Moody's manual are computed as the difference between a bond's monthly total return (change in price plus accrued interest) and the Lehman Brother monthly bond index return from DataStream. Event month 0 is the month of violation filing date and event month +1 is the month subsequent to the violation filing date. Daily excess bond returns based on daily bond prices of TRACE 2002-2008 are computed as the difference between a bond's daily average return (change in price plus accrued interest) and the Lehman Brother daily average bond index return. The excess return is equal to $[(P_1 + Accrued\ interest)/P_0]^{1/N} - (1 + R_{index})^{1/M}$ , where $N$ is the number of TRADING days between $P_1$ and $P_0$, $M$ is the number of TRADING days of the violation month, and $R_{index}$ is the Lehman Brother monthly bond index return from DataStream. $P_1$ is the first available bond price after the violation filing date, while $P_0$ is the last available bond price before the violation filing date. The significance level of the median is based on the Wilcoxon signed-rank test. P-values are reported in parentheses. ***, ** and * indicate significance at the 0.01, 0.05 and 0.10 significance level, respectively.

Panel B of Table 2 shows marginally negative bond reactions to bank loan covenant violations from 1997 to 2003 when Mergent/Moody's data are used, and significantly positive bond reactions from 2002 to 2008 when TRACE data are used. The consistent results reported in Tables 1 and 2 show that our findings are not sensitive to sources of the bond price data.

*4.2 The Evolution of Banks' Use of Debt Covenants*

The empirical results of the previous section shows significantly positive bond market reactions in the second half of the sample period (2003-2008), while marginally negative bond market reactions in the first half of the sample period (1997-2002). These findings suggest an evolution of banks' use of debt covenants.
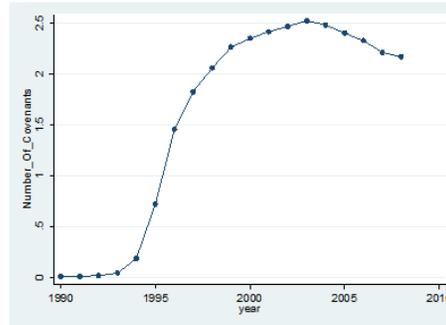


Figure 1. Average number of loan financial covenants by year

Figure 1 above presents the average number of bank loan financial covenants on U.S. nonfinancial public firms with private debt from 1990 to 2008. Dealscan Database records 15 different types of financial covenants. A firm is considered to be subject to a particular covenant if the covenant exists in any bank loans outstanding at the end of each calendar year. The sample includes 6,524 unique firms and 37,426 firm-year observations. Figure 1 shows that the average number of financial covenants of public firms rose sharply in the late 1990s and stayed above 2 in the 2000s. The increase of covenants in the late 1900s is consistent with the idea that banks use covenants as "trip wires," which allow banks to step in after covenant violations and take actions to safeguard their own interests.

Admittedly, the rising number of debt covenants may be the result of changes in firm characteristics over this period of time. In order to exclude that alternative explanation, in Table 4 we use total excess bond returns as the dependent variable and control for effects of basic firm characteristics, i.e., total assets, leverage, and market-to-book ratio, based on the accounting information at the most recent fiscal year end. Latest6yrs and Year2000s are dummy variables which are equal to 1 if the violations occur in the latest 6 years (2003-2008) and 2000s (2000-2008), respectively, and 0 otherwise. 67% of violations in our sample occur between year 2003 and 2008 and 83% of violations are in 2000s. These variables are summarized in Penal A of Table 3.

Table 3. Summary statistics of firm characteristics

|  | Mean | Median | Std. Dev. | 1st Quartile | 3rd Quartile | Obs. |
|---|---|---|---|---|---|---|
| Panel A: firm characteristics |  |  |  |  |  |  |
| Total assets (in millions) | 9 697.18 | 3 146.95 | 14 410.64 | 1 700.32 | 11 481.80 | 126 |
| Leverage | 0.33 | 0.31 | 0.18 | 0.18 | 0.50 | 126 |
| Market-to-book | 1.56 | 1.32 | 0.94 | 1.10 | 1.74 | 126 |
| Latest6yrs | 0.67 | 1 | 0.47 | 0 | 1 | 126 |
| Year2000s | 0.83 | 1 | 0.38 | 1 | 1 | 126 |
| Panel B: other measures |  |  |  |  |  |  |
| ΔEPS | -0.35 | 0.00 | 1.72 | -0.12 | 0.05 | 121 |
| CEO turnover | 0.30 | 0 | 0.46 | 0 | 1 | 119 |
| G-index | 8.97 | 9 | 2.33 | 7 | 11 | 100 |

The table above presents summary statistics of firm characteristics for the event sample. Total assets are in million dollars. Leverage is the book value of total debt divided by the market value of assets, where the market value of assets is calculated as the book value of assets minus the book value of equity plus the market value of equity. Market-to-book is the market value of assets divided by the book value of assets. Latest6yrs and Year2000s are dummy variables which are equal to 1 if the violations occur in the latest 6 years (2003-2008) and 2000s (2000-2008), respectively, and 0 otherwise. ΔEPS is calculated as the difference between earnings per share of the

fiscal year of covenant violation (excluding extraordinary items and discontinued operations and adjusted for any changes in share outstanding) minus earnings per share of the previous year, divided by equity price at the previous fiscal year-end. CEO turnover is a dummy variable, which is equal to 1 if the CEO is replaced according to the following two annual reports after bank loan covenant violations, and is 0 otherwise. G-index is the latest Gompers, Ishii, and Metrick index of the firm before bank loan covenant violations. Dollar values are CPI-adjusted to 2008 dollars, and all continuous variables are winsorized at the top and bottom 1%.

Regression results of Table 4 show that the coefficients of both Latest6yrs and Year2000s are positive and significant when firm characteristics are controlled. Specifically, the bond excess returns to bank loan covenant violations are 0.47% higher during 2003-2008 and 0.54% higher in the 2000s. The results show that the positive bondholder reactions to covenant violations cannot be fully explained by changes of firm characteristics over the sample period and provide further support for the idea of the evolution of banks' use of covenants: banks use debt covenants as "trip wires" and play an active role in corporate governance after covenant violations.

Table 4. Year effects on bondholder reactions to bank loan covenant violations

|  | Total excess bond returns | |
| --- | --- | --- |
|  | (1) | (2) |
| Latest6yrs | 0.47** | |
|  | (0.02) | |
| Year2000s | | 0.54** |
|  | | (0.02) |
| ln(Total Asset) | 0.13* | 0.11 |
|  | (0.06) | (0.13) |
| Leverage | 1.64** | 1.40** |
|  | (0.01) | (0.02) |
| Market-to-book | 0.16* | 0.11 |
|  | (0.06) | (0.25) |
| Constant | -2.18*** | -1.93*** |
|  | (0.00) | (0.01) |
|  |  |  |
| Observations | 126 | 126 |
| R-squared | 0.113 | 0.110 |

This table above reports time effects on total excess bond returns (in percentage) using OLS regression models. All dollar values are CPI-adjusted to 2008 dollars, and all continuous variables are winsorized at the top and the bottom 1%. P-values based on heteroskedasticity and autocorrelation robust standard errors are reported in parentheses. ***, ** and * indicate significance at the 0.01, 0.05 and 0.10 significance level, respectively.

*4.3 The association between stockholder and bondholder reactions to covenant violations*

This section examines the association between stockholder and bondholder reactions to bank loan covenant violations. Table 5 reports the excess stock returns of the subsequent day of violation filing date over the period 1997 to 2008. We use the Carhart four-factor model as the benchmark to calculate excess stock returns. Panel B of Table 5 shows that the stock price reaction is negative and significant in the period 2003 to 2008, while insignificant in the period 1997 to 2002.

Table 5. Excess stock returns (in percentage) to loan covenant violations based on daily stock returns from CRSP 1997-2008

Panel A. Descriptive statistics of excess stock returns of new violations

|  | Mean | Median | Std. Dev. | 1st Quartile | 3rd Quartile | Obs. |
|---|---|---|---|---|---|---|
| Excess stock returns over event day +1 | 0.04 | 0.00 | 5.74 | -2.34 | 2.14 | 3,530 |

Panel B. t-tests and the Wilcoxon signed-rank tests among different sample/subsample

|  | Full sample | 1997-2002 | 2003-2008 |
|---|---|---|---|
| Mean | 0.04 | 0.15 | -0.18* |
|  | (0.65) | (0.26) | (0.08) |
| Median | 0.00 | 0.00 | -0.12** |
|  | (0.30) | (0.83) | (0.01) |
| Obs. | 3,530 | 2,393 | 1,137 |

Panel C. Pearson correlation coefficients of excess stock returns and excess bond returns

|  |  |  |  | Excess bond return > 0 | | Excess bond return < 0 | |
|---|---|---|---|---|---|---|---|
|  | Full sample | 1997-2002 | 2003-2008 | 1997-2002 | 2003-2008 | 1997-2002 | 2003-2008 |
| Excess stock returns | 0.03 | -0.08 | 0.16 | -0.04 | 0.38*** | -0.14 | -0.04 |
|  | (0.77) | (0.60) | (0.13) | (0.87) | (0.01) | (0.54) | (0.83) |

Panel C reports the Pearson correlation coefficients between excess stock returns and excess bond returns. The excess bond return is equal to $[(P_1 + Accrued\ interest)/P_0] - (1 + R_{index})^{N/M}$, where $N$ is the number of trading days between $P_1$ and $P_0$, $M$ is the number of trading days of the violation month, and $R_{index}$ is the Lehman Brother monthly bond index return from DataStream. $P_1$ is the first available bond price after the violation filing date, while $P_0$ is the last available bond price before the violation filing date. The total stockholder reactions are the cumulative excess returns between dates of $P_0$ and $P_1$.

Panel C shows that total excess stock returns and total excess bond returns are positively related in the period 2003 to 2008, especially when bondholder reactions, as measured by excess bond returns, are positive. On the other hand, when the bondholder reactions are negative, there is no significant correlation between the stock market and bond market reactions.

While the correlation analysis is a useful diagnostic tool, it does not control for other factors. Regression models in Table 6 add firm characteristics as control variables. Following Maxwell and Rao (2003) who investigate the wealth transfer between shareholders and bondholders during spin-offs, we use excess stock dollar returns, ECAR, as the dependent variable in the regression model and excess bond dollar returns, BCAR, as the independent variable. ECAR is computed as the product of the total excess stock return based on the Carhart four-factor model and the market value of equity at the end of the month before the violation filing date. BCAR is computed as the product of the total excess bond return and the book value of long-term debt at the most recent fiscal year-end. Both excess dollar returns are scaled by the total capital of the securities and converted into percentages. BCAR×Latest6yrs captures the association between excess stock and bond dollar returns from 2003 to 2008, while BCAR× (1 – Latest6yrs) captures the association from 1997 to 2002.

Table 6. Regressions of excess stock and bond dollar returns (in percentage) on bank loan covenant violations

| Independent variable | Independent variable: total excess stock dollar returns (ECAR) | | | | | |
|---|---|---|---|---|---|---|
|  | (1) | (2) | (3) | (4) | (5) | (6) |
| BCAR | 0.25 |  |  |  |  |  |
|  | (0.11) |  |  |  |  |  |
| BCAR × Latest6yrs |  | 0.56** | 0.68** |  |  |  |
|  |  | (0.05) | (0.05) |  |  |  |
| BCAR × (1 – Latest6yrs) |  | 0.03 | 0.19 |  |  |  |
|  |  | (0.88) | (0.44) |  |  |  |
| Latest6yrs |  | 0.41 | 0.07 |  |  |  |
|  |  | (0.29) | (0.88) |  |  |  |
| BCAR × Year2000s |  |  |  | 0.42** | 0.55** |  |
|  |  |  |  | (0.03) | (0.04) |  |
| BCAR × ( 1 - Year2000s ) |  |  |  | 0.11 | 0.26 |  |
|  |  |  |  | (0.76) | (0.53) |  |
| Year2000s |  |  |  | -0.57 | -0.79 |  |
|  |  |  |  | (0.30) | (0.21) |  |
| BCAR × Governance |  |  |  |  |  | 1.00** |
|  |  |  |  |  |  | (0.02) |
| BCAR × ( 1-Governance) |  |  |  |  |  | 0.34 |
|  |  |  |  |  |  | (0.22) |
| Governance |  |  |  |  |  | -0.36 |
|  |  |  |  |  |  | (0.34) |
| ΔEPS |  |  | -0.06 |  | -0.07 | -0.04 |
|  |  |  | (0.43) |  | (0.36) | (0.53) |
| CEO turnover |  |  | 0.41 |  | 0.37 | 0.06 |
|  |  |  | (0.27) |  | (0.29) | (0.88) |
| Ln(Total assets) |  |  | -0.11 |  | -0.09 | -0.13 |
|  |  |  | (0.37) |  | (0.44) | (0.37) |
| Leverage |  |  | -2.14 |  | -2.74** | -1.54 |
|  |  |  | (0.16) |  | (0.04) | (0.21) |
| Market-to-book |  |  | -0.91* |  | -1.06** | -0.85* |
|  |  |  | (0.06) |  | (0.03) | (0.07) |
| Constant | -0.19 | -0.50 | 2.63 | 0.27 | 3.65** | 2.79* |
|  | (0.23) | (0.17) | (0.16) | (0.61) | (0.03) | (0.07) |
| Obs. | 126 | 126 | 117 | 126 | 117 | 83 |
| R-squared | 0.008 | 0.029 | 0.088 | 0.028 | 0.112 | 0.122 |

In the table above, regressions are estimated for firms violating a bank loan covenant from 1997 to 2008. Dollar values are CPI-adjusted to 2008 dollars, and all continuous variables are winsorized at the top and the bottom 1%. P-values based on heteroskedasticity and autocorrelation robust standard errors are reported in parentheses. ***, ** and * indicate significance at the 0.01, 0.05 and 0.10 significance level, respectively.

As shown in Column 2 to Column 5 of Table 6, the relation between stockholder and bondholder reactions is significantly positive in more recent years with and without control variables. Specifically, one dollar increase in bondholder wealth is associated with 68 cents increase in stockholder wealth in the year 2003-2008 (Column 3) and is associated with 55 cents increase in the 2000s (Column 5). The positive association supports our hypothesis that both bondholders and stockholders benefit from the influence exerted by banks after loan covenant violations in the 2000s. Meanwhile, the association between shareholder and bondholder reactions is insignificant in earlier years, as captured by BCAR× (1 – Latest6yrs) in Column 2 and 3, and BCAR× (1 – Year2000s) in Columns 4 and 5. These findings are consistent with the evolution of banks' use of covenants discussed in the previous section.

In Column 6, we examine how managerial entrenchment affects the association between bondholder and stockholder reactions to covenant violations. When a firm has severe managerial entrenchment issues, i.e., poor corporate governance, the influence exerted by banks after covenant violations could be compromised. As a result, the association between bondholder and stockholder reactions is likely to be weaker. Alternatively, firms with a high level of managerial entrenchment may have more room for improvement, and banks are likely to take more disciplinary actions after covenant violation. In this case, the association could be stronger.

Gompers, Ishii, and Metrick index (G-index) is used as the measure of managerial entrenchment. As discussed in the previous section, a high G-index value implies poor corporate governance. In column 6, the dummy variable, Governance, is equal to 1 if the G-index of the firm is below the median of the sample, indicating good corporate governance, and it is equal to 0 otherwise. BCAR×Governance captures the association between bondholder and stockholder reactions when the firm has sound corporate governance, while BCAR×(1 - Governance) captures the association when the firm has poor corporate governance. Column 6 includes bank loan covenant violations in the 2000s only, since this is when banks start to play an active role after firms violate loan covenants.

The regression results show that one dollar increase in bondholder wealth is associated with one dollar increase in stockholder wealth when the firm has good corporate governance, as captured by BCAR×Governance. However, the association is insignificant when the firm has poor corporate governance. These results suggest that managerial entrenchment dampens banks' ability to improve firm performance after covenant violations.

## 5. Conclusions

This paper examines how public corporate bondholders react to bank loan covenant violations. Using an event study approach, we find positive excess bond returns during the covenant violation filing dates in the sample period 2003 to 2008. In contrast, we find a marginally negative response of bondholders in the period 1997 to 2002. These findings are consistent with the hypothesis that in more recent years, banks use covenants as "trip wires"; covenant violations offer banks an option to step in and take disciplinary actions that benefit not only banks but also bondholders. The differential bondholder reactions in the two sample periods suggest an evolution of banks' use of loan covenants over time. A caveat of this paper is that bond price reactions during the event window may not capture all the effects of covenant violations since bonds are traded less frequently than stocks. Therefore, our results might be underestimated. Our paper also demonstrates that financial covenants on U.S. public firms rose sharply in 1990s and stayed above 2 in the 2000s. The trend suggests that banks gradually use more covenants and play an active disciplining role in corporate governance after covenant violations. Last, we find that stockholder reactions are positively correlated with bondholder reactions in more recent years, consistent with the idea that banks exert positive influence on corporate governance which benefits both bondholders and stockholders after covenant violations.

This paper provides new evidence on the unique monitoring and disciplining function of banks. It also offers new insight into the literature on debt covenant violations. While recent studies focus on the effects of bank loan covenant violations on various firm behaviors from the shareholders' perspective, we directly investigate effects on bondholders based on bond price reactions. Consequences of bank loan covenant violations on other bond characteristics, such as bond covenants, maturity, security, market liquidity, and so on, are left to future research.

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**Notes**

Note 1. Actions taken by banks are recorded in SEC 10-K and 10-Q filings. According to Roberts and Sufi (2009), creditors take action in 32.2% of the violations in their sample.

Note 2. We would like to thank Dr. Amir Sufi for providing access to debt covenant violation data on the webpage https://amirsufi.net/chronology.html. For more details about the data, please see the Appendix of "Creditor control rights, corporate governance, and firm value" by Nini, Smith, and Sufi (2012).

Note 3.　If the event window is very short, it cannot capture the full effects of an event. However, if the event window is very long, it may include confounding effects. The length of an event widow is a trade-off between the two.

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