Labor Unions and Debt Covenant Violations[*]

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Abstract

This study examines the effect of labor unions on firms' covenant violation decisions. We find evidence that high-unionization firms are more likely than low-unionization firms to violate debt covenants. The positive relation between labor unions and the likelihood of violating debt covenants is stronger when firms hold more cash. We also find that debt covenant violations lead to a lower probability of strike. High-unionization firms are in better financial condition prior to covenant violations than are low-unionization firms. Consistent with the existing literature, we find that the long-term abnormal stock returns after covenant violations are significantly positive. However, we also find that stock returns for high-unionization firms are much smaller than are those for low-unionization firms. We also show that high-unionization firms tend to manipulate earnings downward prior to covenant violations. Our findings suggest that firms may strategically engage in covenant violation decisions to gain bargaining flexibility and force labor unions to make concessions in subsequent negotiations.

Keywords: labor union, union election, debt covenant, covenant violation, earnings management
JEL classification: G31, G32, J51

1. Introduction

Existing research shows that labor unions introduce an important friction that can have significant effects on firm operations. Labor unions make wages sticky and layoffs costly, increasing firms' operating leverage and thus making the adjustment of firms' labor stock costlier. Labor unions often intervene in firm restructuring by, for example, blocking plant closures, which makes the adjustment of firms' physical capital stock costlier. Chen et al. (2011) provide evidence that a loss of operational flexibility due to the presence of labor unions significantly increases a firm's cost of equity.

On the other hand, firms may use a financial or operational strategy to shield resources from labor unions to maintain financial or operating flexibility. Matsa (2010) finds evidence that labor unions tend to affect a firm's debt policy as the firm strategically increases its debt in order to derive concessions during negotiations with labor unions. In a similar vein, Klasa et al. (2009) show that firms with strong labor unions try to reduce their cash holdings to shelter internal resources from union demands. Despite ample evidence concerning the effect of labor unions on various other dimensions of corporate finance, relatively little attention has been paid to the relation between labor unions and firms' covenant violation decisions. We explore this relation and, more importantly, examine whether a firm will employ covenant violations to weaken the position of its labor union, as Matsa (2010) and Klasa et al. (2009) suggest.

This study seeks to identify the effect of labor unions on a firm's debt covenant violations and examine how labor unions affect firms' debt policies and financial flexibility. We investigate how labor unions affect firms' financial policies by inquiring into two distinct effects of labor unions on financing and operating activities. First, the preference of labor unions is very similar to that of debtholders, since labor's stream of promised wages and benefits constitute a fixed

claim for a firm. The literature shows that labor unions avoid risky corporate activities. Chen et al. (2012) show that firms in unionized industries invest less in risky projects and that bond yields are negatively associated with labor unionization. Labor unions serve as internal monitors of firm activities, mitigating the conflicts between lenders and borrowers. Labor unions avoid greater firm operating and cash-flow risk; thus, firms with strong labor unions have a low probability of covenant violations. Second, and conversely, strong labor unions may induce firms to strategically violate debt covenants, since such violations enable firms to gain bargaining power against labor unions, obtain operating and financial flexibility, and shield their resources from labor unions. In other words, labor unions increase the marginal benefits of debt covenant violations. For instance, Benmelech et al. (2012) show that airline companies tend to renegotiate wages downward when in financial distress. Therefore, firms' strategic decisions depend on the tradeoff between the costs and benefits of covenant violations. Whether labor unions' influence on corporate policies implies a higher or lower probability of covenant violations remains an empirical issue.

Using industry-level union coverage data for a sample of U.S. public firms covering 2000 to 2011, we find evidence that stronger labor unions lead to higher probabilities of debt covenant violations. Similarly, evidence found using a much smaller set of firm-level union election data suggests that a firm is more likely to violate debt covenants after the firm is unionized or after its workforce wins a unionization election. Klasa et al. (2009) find that labor unions are associated with lower cash holding, as firms strategically hold less cash when negotiating with their unions. We find that, when cash holding is higher, firms with strong labor unions are more likely to violate debt covenants than are firms with weak labor unions. Thus, a firm with high cash holding could strategically violate debt covenants to strengthen its negotiating position against its

labor unions. In contrast to the results on cash holdings in Klasa et al. (2009), our results suggest that debt covenant violation is an alternative strategy for a firm facing a rent-seeking labor union.

Accounting theory predicts that firms approaching covenant violations will make income-increasing accounting choices to loosen their debt constraints (Watts and Zimmerman, 1986). Defond and Jiambalvo (1994) find that abnormal total and working capital accrual is positive in the year prior to covenant violations. Dichev and Skinner (2002) report evidence that managers take action to avoid debt covenant violations: they find an unusually small number of firm/quarters with financial measures just below covenant thresholds and an unusually large number of firm/quarters that just meet or beat covenant thresholds. We compare earnings management behavior between high- and low-unionization firms and find that firms with strong unions actually display negative earnings manipulation prior to covenant violations, while firms with weak labor unions show positive earnings manipulation. Our results suggest that management strategically manipulates earnings downward in hopes of hitting the covenant threshold and presenting a credible threat to its labor unions.

Our findings offer several contributions to the literature on labor unions and corporate finance. First, we provide direct evidence that firms may strategically violate debt covenants to gain advantages in negotiations with labor unions. Our study also supports the results of previous research, such as Matsa (2010) and Klasa et al. (2009). Benmelech et al. (2012) show that financial distress plays a role in ex post wage renegotiations and that firms can use their financial position to extract surplus from labor. Our results suggest that firms with strong labor unions may favor covenant violations as a way to gain bargaining power against unions. We add to the literature by analyzing the association between labor unions and debt covenant violations. In

particular, our study is the first to provide evidence that firms with strong unions are more likely to violate debt covenants.

Second, our evidence supports the benefits of debt covenant violations, as we find a lower probability of a strike after a violation. Covenant violations bring significant benefits to the violators because they place the violators in a favorable bargaining position with their unions.

Third, we find that firms with strong unions display negative earnings management two years prior to debt covenant violations. This finding identifies a potential mechanism whereby firms with strong unions strategically violate debt covenants. The literature documents positive earnings management on average before covenant violations (Defond and Jiambalvo, 1994), but we show that this is not always the case when the firm faces a strong union. Whether unions have a positive or negative relation to earnings quality in general remains a controversial issue in empirical studies. Leung et al. (2010) find that higher unionization levels are associated with higher levels of accounting conservatism, while Farber et al. (2010) find that lower levels of union strength are associated with higher conservatism levels. We show that unions can lead to firm policies on earnings management and covenant violations that are more complicated than previous studies have suggested.

DeAngelo and DeAngelo (1991) find that reported income is lower during union negotiations. Mora and Sabater (2008) show that firms manage earnings downward prior to labor negotiations and argue that labor negotiations create incentives to reduce accounting earnings to avoid salary demands. Bova (2013) finds that unionized firms are more likely to miss estimates than are their non-unionized counterparts and that managers seek to project a negative outlook to their unions. In a similar vein, we show that unions have significant impacts on earnings

management, as managers seek to weaken unions' negotiating positions through accounting disclosure.

Furthermore, we find that debt-covenant-violating firms with high unionization are in better financial health conditions than are those with low unionization, as measured by firm credit rating and Altman's Z-score. These results suggest that covenant violations may be a voluntary choice for highly unionized firms. While the literature on covenant violations documents significant positive long-term stock returns after debt covenant violations (Nini et al., 2012), we find that the stock returns of high-unionization firms are much smaller than are those of low-unionization firms after covenant violations. Creditor control generally enhances firm value after debt covenant violations. However, creditors have less room to improve, as high-unionization firms are healthier than low-unionization firms prior to covenant violations. Because the preference of creditors is similar to that of strong unions, the value effect of creditor monitoring is much smaller when the firm faces a strong union prior to covenant violation.

Last but not least, we find that the increase in the cost of bank loans for high-unionization firms is much lower than is that for low-unionization firms after covenant violations. The credit ratings of high-unionization firms are less likely to be downgraded after covenant violations than are those of low-unionization firms. These results suggest that covenant violations are not significantly costly for high-unionization firms and that the benefits are great. Some studies suggest that covenant violations are costly (e.g., Beatty et al., 2002; Gao et al., 2016). Other studies argue that the costs are not as high as might be expected (e.g., Chen and Wei, 1993; Gopalakrishnan and Parkash, 1995; Dichev and Skinner, 2002; Roberts and Sufi, 2009). Our study helps reconcile these two conflicting arguments by showing that the cost of covenant violations for a high-unionization firm is significantly lower than is that for a low-unionization firm and

thus that the cost of covenant violations varies across firms.

The rest of the paper is structured as follows. Section 2 describes the study's data sources and defines the main variables. Section 3 explores the relation between unionization and debt covenant violations. Section 4 reports additional tests and relates unions to earnings management prior to covenant violation. Section 5 examines the stock returns for unionized firms after covenant violations. Finally, Section 6 concludes the paper.

2. Data

2.1 Data on labor unions and covenant violations

We obtain industry-level unionization data covering 2000 to 2011 from the Union Membership and Coverage Database (www.unionstats.com) maintained by Barry Hirsch and David Macpherson. The data are compiled from the Current Population Survey based on the method used by the Bureau of Labor Statistics. Union Membership and Coverage Database provides unionization data based on CIC industry codes. We manually match CIC industry codes with four-digit SIC codes, thus the unionization data in the analysis is based on four-digit SIC industry codes. Then we match the unionization data with Compustat data by four-digit SIC codes. Additional firm fundamental data are from Compustat. Average industry unionization rates (Union) are measured as the average industry union members divided by the average industry total employment.

We obtain union election and contract data from the Bloomberg BNA Labor Plus database. We compare loan contracting between pre- and post-union election periods and investigate the effect of firm-level union elections on covenant violations. Covenant violation data are taken

from a website maintained by Michael Roberts.[2] These covenant violation data have been used in Roberts and Sufi (2009) and many other studies. We use data covering 2000 to 2011.

2.2 Variables

We construct the following two variables to measure the frequency and intensity of covenant violations based on Michael Roberts's dataset: (1) *Violation*, a dummy variable equal to one if at least one covenant violation occurs in a given year for a given firm; (2) *Violation frequency*, the frequency of covenant violations in a given year for a given firm.

Following Nini et al. (2012), we add control variables in our multivariate analysis as follows: (1) *Firm size*, measured as the natural logarithm of total assets; (2) *Profitability*, measured as return on equity (ROE) = net income/equity; (3) *Leverage*, measured as liability/total assets; (4) *Operating cash flow ratio*, measured as operating cash flow/net income; (5) *Interest expense ratio*, measured as interest expense/total assets; (6) *Current ratio*, measured as current assets/total assets; and (7) *Market-to-book*. To mitigate the impact of outliers, we winsorize all variables at the 1% and 99% levels. Table 1 reports the summary statistics. At the industry level, the mean (median) of *Union* is 9.6% (5.5%).

3. Labor union and covenant violations

3.1 Industry-level analysis

3.1.1 Baseline results

We conduct a multivariate analysis in which the probability of covenant violation (*Violation*) or violation frequency (*Violation frequency*) is the dependent variable and *Union* is the key

[2] http://finance.wharton.upenn.edu/~mrrobert/styled-9/styled-11/index.html.

independent variable. Control variables include *Firm size*, *Profitability*, *Leverage*, *Operating cash flow ratio, Interest expense ratio, Current ratio,* and *Market-to-book.*

Table 2 reports the results of the multivariate analysis. The first two columns report the results of the full-sample analysis that includes all industries. In Column 1, the coefficient of *Union* is positive and significant, showing that *Union* is positively related to covenant violations. Thus, a high-unionization firm is more likely to violate debt covenants. In Column 2, the coefficient of *Union* is positive and significant, showing that *Union* is positively related to the frequency of covenant violations. The probability of covenant violations increases 0.59% when industry unionization rate increases 1%. Thus, as expected, debt covenant violations are significantly and negatively associated with firm size, profitability, operating cash flow ratio, current ratio, and market-to-book ratio and is significantly and positively associated with leverage and interest expense ratio.

Klasa et al. (2009) investigate whether firms decrease their cash holding to gain bargaining power with labor unions in manufacturing industries. In the next two columns, we investigate the subsample with manufacturing industries (four-digit SIC codes between 3000 and 3999). The results in Columns 3 and 4 are consistent with those in the first two columns: the coefficient of *Union* is positive and significant. Note that the coefficient is much greater in the subsample of manufacturing industries than in the full sample in the first two columns. In fact, *Union* has a greater significantly positive impact on covenant violations in manufacturing industries than in our full sample with all industries. The probability of covenant violations increases 2.128% as industry unionization rate increase 1%. The results in Table 1 suggest that high-unionization firms may take strategic action to gain bargaining power against labor unions, not only in

manufacturing industries but also in other industries. This finding extends the results of Klasa et al. (2009).

3.1.2 Instrumental variable analysis

The results shown in Table 2 may be subject to an endogeneity problem. For example, unions may be strong in industries with higher risk; high-unionization firms would then be more likely to violate debt covenants. To address this endogeneity concern, we introduce an instrumental variable, *Percent of Black or African American,* in our analysis. While the ratio of Black or African Americans in an industry may be related to unionization, it is hard to argue that the ratio of Black or African Americans may be related to firms' decisions about debt covenant violations. We collect data on the percentage of Black or African Americans in each industry from the Bureau of Labor Statistics website (www.bls.gov). Since the Bureau of Labor Statistics changed its calculation method for the instrumental variable in 2002, we use data from 2003 to 2011. In the first stage of the instrumental variable (IV) analysis, we estimate Union using the following regression:

$$\text{Union} = \beta_0 + \beta_1 Percent\ of\ Black\ or\ African\ American + \beta_2' X + \varepsilon \quad (1)$$

where X is a collection of control variables. In the second stage, we run the following regression:

$$\text{CovenantViolation} = \beta_0 + \beta_1 \widehat{Union} + \beta_2' X + \varepsilon \quad (2)$$

where $\widehat{Union}$ is the estimated Union from equation (1). Panel A of Table 3 reports the results of the first-stage regression. *Percent of Black or African American* is positively and significantly associated with *Union*. Industries with a high ratio of Black or African Americans tend to have a high level of unionization. Panel B reports the results from the second-stage regression. In both Columns 1 and 2, the coefficients of *Union* are positive and significant. High unionization is

positively associated with the probability and frequency of covenant violation. The results of the IV regressions are consistent with the results shown in Table 2.

3.2 Firm-level analysis

Following Chyz et al. (2013), we examine the changes in covenant violations surrounding labor union elections using the NLRB (National Labor Relations Board) election file. This file contains information about unions (such as election closing dates, election outcomes, and petition types) that have successfully petitioned for a representation election between 1991 and 2011. The observations in the NLRB file are at the establishment level. Following Chyz et al. (2013) and Bradley et al. (2016), we create the sample through the following steps: (1) we drop observations with missing election dates, as this omission suggests that the election did not take place; (2) we drop observations for which the union election outcome is "Unresolved" and keep only those for which the union election outcome is "Labor win" or "Management win"; (3) following Bradley et al. (2016), we drop observations with a number of workers less than 100; (4) following Bradley et al. (2016), we match Compustat data with NLRB data by firm name, and drop observations with different one-digit SIC numbers; (5) following Chyz et al. (2013), we keep only those observations with one union election, as it is difficult to classify pre- and post-election periods when there are multiple elections; and (6) following Chyz et al. (2013), we keep five firm-year observations before and after the election and drop election-year observations. Table 4 describes the sample selection procedure. We obtain 1278 observations from 221 firms. We define the variables as follows: *Post* is a dummy variable equal to 1 if it is a post-election year and 0 otherwise; *Labor win* is a dummy variable equal to 1 if the union election outcome is "Labor win" and 0 otherwise.

Table 5 reports the results of the firm-level regressions of covenant violations. In the first two columns of Table 5, the coefficient of "*Post* × *Labor win*" is positive and statistically significant in both regressions of *Violation* and *Violation frequency*, indicating that the probability and frequency of covenant violation are higher after labor wins the election, consistent with the industry-level analysis. The probability of covenant violations increases 16.853% if a union wins the election. In the next two columns, we limit the sample to manufacturing firms and obtain similar results.

3.3 Effect of cash holding

Klasa et al. (2009) find that firms hold less cash when labor unions are strong (i.e., firms decrease cash holding to gain bargaining power against labor unions). Our evidence suggests that firms may violate debt covenants to gain bargaining power against labor unions. In other words, firms can choose to either reduce cash holdings or violate debt covenants to deal with a union's intervention in firm policies. Cash holding may have an impact on the relationship between unions and covenant violations. If there is a substitutive relationship between cash holding reduction and debt covenant violation, then the relation between unions and covenant violations would be weaker when the cash holding level is low. If there is a complementary relation between cash holding reduction and debt covenant violation, then the relation between unions and covenant violations would be stronger when the cash holding level is low.

Following Klasa et al. (2009), we define cash holding as the logarithm of cash and short-term investment over total assets minus cash and short-term investment (i.e., Cash holding = log[cash and short term investment /(total assets - cash and short term investment)]). Unreported results show that *Union* is negatively related to *Cash holding*, which is consistent with Klasa et

al. (2009). Table 6 reports the regression results of covenant violations on labor unions, cash holding, the interaction term of *Union* and *Cash holding*, and other control variables. In both Columns 1 and 2, the coefficients of the interaction term *Union* × *Cash holding* are positive and significant, while the coefficients of *Union* are positive and significant, and the coefficients of *Cash holding* are negative and significant. When cash holding is greater, the positive relation between unions and covenant violations is more significant. This suggests that cash holding reduction and debt covenant violation have a substitutive relationship when firms bargain with labor unions.

4. Discussion of covenant violations

4.1 Covenant violations and strikes

We conjecture that firm management strategically makes violation decisions when they negotiate with strong labor unions. For unions, striking is one way to force management into negotiations. Thus, it is natural to ask whether covenant violations reduce the probability of a strike. Following Klasa et al. (2009), we examine whether covenant violations affect future strike probability. We use strike data from the BNA Labor Plus database. Following Klasa et al. (2009), we screen the data as follows: (1) we require firms to be in manufacturing industries, and (2) the number of people participating in the strike must be above 500. We then match strike firms with non-strike firms using four-digit SIC codes. We drop observations with missing variables. Our final sample covers 57 strikes involving 40 firms from 2000 to 2011. Including 500 observations from the matching group, we obtain 557 observations in the full sample. We run multivariate regressions to examine the effect of covenant violations on striking. We select two explanatory variables: (1) *Strike*, a dummy variable equal to one if there is a strike in that year and zero

otherwise, and (2) *Strike days*, the number of days the strike lasts. The impact of *Strike* increases as the number of strike days increases. Our main explanatory variable is *Violation*, reflecting whether a firm has violated covenants in the previous year, or *Violation frequency*, reflecting the number of times a firm violated covenants in the previous year. According to data availability and following Klasa et al. (2009), we select the control variables as follows. (1) *Right-to-work* is a dummy variable equal to one if the state in which the firm is registered has right-to-work laws and zero otherwise. (2) *Change in firm size* reflects a firm's total assets in year t-1 minus its total assets in year t-2. (3) *Change in leverage* reflects a firm's debt ratio in year t-1 minus its debt ratio in year t-2. (4) We also use *Change in dividend payment* and (5) *Change in profitability*. (6) *Change in working capital ratio* reflects the working capital ratio, equal to working capital over total assets. Finally, we also use (7) *Change in sales growth* and (8) *Change in cash holding*. As changes in cash holdings affect strike probability (Klasa et al., 2009), we control for changes in cash holdings in our analysis.

Panel A of Table 7 reports the results for *Strike*. In Column 1, the coefficient of *Violation frequency* is negative and significant. Thus, a high frequency of covenant violations significantly reduces strike probability in the following year. When the frequency of covenant violations increases by one time, the firm will have 0.584 fewer strike in the next year. In Columns 2 and 4, we control for *Change in cash holding*. The coefficient of *Violation frequency* is also negative and significant. Note that the coefficient of *Cash holding* is positive and significant. This suggests that a high level of cash holding increases strike probability, which is consistent with Klasa et al. (2009). Panel B of Table 7 reports the regression results for *Strike days*. In Column 3, the coefficient of *Violation frequency* is negative and significant. Thus, a high frequency of covenant violations significantly decreases the number of strike days in the following year. If the

frequency of covenant violations increases by one time, the strike days will decrease by 83.55 days. In Column 4, we control for *Change in cash holding*. The coefficient of *Violation frequency* remains negative and significant. Note that the coefficient of *Cash holding* is not significant. This suggests that a high level of cash holding does not affect the number of strike days. In unreported regressions, we use dummy variable *Strike* as an explanatory variable; the results remain the same.

4.2 Union and firm characteristics prior to covenant violations

We classify covenant violators into two groups according to unionization rate and compare firm characteristics between high- and low-unionization firms one year before covenant violations. Table 8 reports the summary statistics. Among firms that violate covenants, high-unionization firms are larger and have higher profitability, higher leverage, higher interest expense ratio, lower current ratio, and lower market-to-book ratio. Note that, while both groups of firms have negative mean (median) profitability (ROE), high-unionization firms have higher mean (median) profitability than do low-unionization firms. More importantly, high-unionization firms have better credit ratings (lower S&P rating scores) and lower bankruptcy risk (higher Altman's Z-scores). Among firms that violate covenants, high-unionization firms are in better financial condition (are lower risk) than low-unionization firms.

4.3 Earnings management before covenant violations

The literature indicates that firms manage earnings upward before covenant violations, thereby decreasing the probability of such violations (Defond and Jiambalvo, 1994). However, the previous section's analysis finds that firms may violate covenants to weaken the position of labor

unions. The management of high-unionization firms may manipulate earnings, not upward, but downward prior to covenant violations. In this section, we examine whether earnings management behaviors differ between strong- and weak-union firms before violations.

We measure earnings management by calculating discretionary accruals (DA) based on the Jones Model (Jones, 1991). Details on the model are provided in the appendix. A positive DA indicates upward earning management, while a negative DA indicates downward earnings management. We examine earning management one and two years before covenant violations. When multiple violations occur, the subsequent violations may be affected by the previous violations. Thus, we consider only the first violation. After missing values are accounted for, we obtain 1048 firm-year observations for 605 firms (605 violations).

Figure 1 and Table 9 reports earnings management prior to covenant violations for high- and low-unionization firms, respectively. Both Figure 1 and Table 9 show that in year -2 and -1, the mean (median) of DA is positive and significant for low-unionization firms, and the mean (median) of DA is negative and significant for high-unionization firms. Table 9 shows that the difference between the mean (median) of DA in the two groups is statistically significant. High-unionization firms have DA of 0.102 (0.119) lower than low-unionization firms in the first (second) year before the covenant violation. These results suggest that low-unionization firms manage earnings upward to lower the probability of covenant violations one and two years prior, while high-unionization firms manage earnings downward to increase the probability of covenant violations.

Using the sample from years -2 and -1, we run multivariate regressions to examine the relation between unions and earnings management prior to covenant violations. Table 10 reports the results. In Column 1, we run a regression of *DA* on *Union* only, and the coefficient of *Union*

is negative and significant. When industry unionization rate increases 1%, DA would decrease 0.536%. In Column 2, we control for factors such as firm size, profitability, and leverage, and the coefficient of *Union* is negative and significant. These results suggest that firms with higher unionization tend to manage earnings downward prior to covenant violations.

Our results contribute to the literature in two ways. First, we extend the literature on the relation between earnings management and covenant violations. While existing studies find upward earnings management prior to covenant violations, our results show that this does not always occur. We show that management facing a strong union may manage earnings downward to increase the probability of covenant violations, thus weakening the position of its labor union. Second, we provide additional direct evidence concerning firms' strategic covenant violation from the earnings management perspective by showing that downward earnings management is a measure of strategic covenant violations.

4.4 Covenant violations and firm credit rating

Covenant violations are costly. To investigate these costs, we examine firm credit ratings around covenant violations. When multiple covenant violations occur, it is difficult to define the time periods before and after due to the potential for overlap and interference. Thus, we restrict our sample to firms with single covenant violations. Specifically, we compare firm credit ratings three years before violations and three years after. We drop observations in the covenant violation year. This produces 301 firm-year observations for 103 covenant violations. We obtain firm credit ratings data (S&P rating scores) from Compustat. The scores range from 1 to 7 (1 = Aaa, 2 = Aa, 3 = A, 4 = Bbb, 5 = Bb, 6 = B or worse, 7 = no rating). A higher S&P score reflects a worse credit rating. We define *Top 25% Unionization Rate* as a dummy variable equal to one if

a firm has a unionization rate in the top quartile and zero otherwise. We also include dummy variable *Post*, equal to one for observations after covenant violations and zero for observations before covenant violations. We run an ordered logit regression on firm credit ratings. The results are reported in Table 11.

In Column 1 of Table 11, the coefficient of *Post* is positive and significant, which suggests that S&P rating scores increase after covenant violations. This means that a firm has a worse rating after covenant violations. The coefficient of the interaction term, *Top 25% Unionization Rate* × *Post*, is negative and significant, which suggest that, when unionization is in top quartile, the firm's rating decreases after covenant violations. If a firm has a unionization level in the top quartile, then the firm on average would have a credit rating improvement after covenant violations, reducing rating scores by 1.064 than a firm in the bottom three quartile. Thus, high-unionization firms' ratings will not decrease as much as those of low-unionization firms. In Column 2, we control for firm characteristics such as size, profitability, and leverage. The results are similar. Overall, the results suggest that rating agencies give better ratings to high-unionization firms than to low-unionization firms after covenant violations. Rating agencies appear to identify the union's effect on covenant violations and the better financial conditions of high-unionization firms ex ante, and understand the motivation for the covenant violations of high-unionization firms, leading them to award high-unionization firms smaller rating changes. From the credit rating perspective, the cost of covenant violations is smaller for high-unionization firms.

4.5 Covenant violations and the cost of bank loans

In the previous section, we examine firm rating changes after covenant violations. We now investigate the cost of covenant violations by examining the cost of bank loans around covenant violation occurrence. We consider only firms with single covenant violations in our sample. Specifically, we compare loan spreads three years before violations and three years afterward. Loan spread is measured as the all-in drawn spread from the Dealscan database. All-in drawn spread is defined as the amount the borrower pays in basis points over LIBOR or a LIBOR equivalent for each dollar drawn down. We match loan records in the Dealscan database with our covenant violation sample. We drop observations in the covenant violation year. This results in 186 loan observations for 69 firms.

We run regressions on loan spreads. The main explanatory variables are *Post, Union High*, and the interaction term of *Post* and *Union Hig*h. We define *Union High* as a dummy variable equal to one if a firm has a unionization rate in the top 50% range and zero otherwise. We control for the following loan characteristics: (1) *Performance pricing*, a dichotomous variable equal to 1 for loans with a performance pricing clause and zero otherwise; (2) *Loan size*, the natural logarithm of facility size (in millions of dollars); (3) *Loan maturity*, the natural logarithm of facility maturity (in months); (4) *Loan type*, a dummy variable for loan types, including term loans, revolvers greater than one year, revolvers less than one year, and 364-day facility; (5) *Loan purpose*, a dummy variable for loan purposes, including mergers and takeovers, debt repayment, and corporate purposes; (6) *Credit spread*, the difference between the AAA corporate bond yield and the BAA corporate bond yield; (7) *Term spread*, the difference between the 10-year Treasury yield and the two-year Treasury yield; and (8) *Z-score*, a modified Altman (1968) Z-score = (1.2working capital+1.4retained earnings+2.2EBIT+0.999sales)/total assets. The ratio of the market value of equity to the book value of total debt is excluded because the market-to-

book ratio is controlled for in the regressions. We also control for firm characteristics, including *Firm size*, *Market-to-book*, *Leverage*, *Profitability*, *Tangibility* (which is equal to the firm's property plant and equipment divided by total assets), and *S&P rating score*. Table 12 reports the results. In both Column 1 and Column 2, the coefficient of *Post* is positive but not significant, which suggests that loan spreads increase somewhat after covenant violations. In Column 1, the interaction term of *Union High* × *Post* is negative but not significant. In Column 2, the interaction term of Union *High* × *Post* is negative and significant. This suggests that the cost of bank loans increases less for high-unionization firms than for low-unionization firms after covenant violations. On average loan spreads of high-unionization firms increase 78.23 basis points less than those of low-unionization firms. In terms of the cost of bank loans, the cost of covenant violations is smaller for high-unionization firms. It seems that lenders consider the better financial condition of high-unionization firms and lend to them at a lower rate than they give to low-unionization firms.

5. Union and stock returns after covenant violations

Covenant violations have different implications for high- and low-unionization firms. In this section, we investigate the stock returns after covenant violations.

We use the following four-factor model to estimate the expected stock returns. The window for estimation is from 300 days to 51 days before the announcement of covenant violations:

$$R_{it} = \alpha_i + \beta_{1i}R_{mt} + \beta_{2i}SMB_t + \beta_{3i}HML_t + \beta_{4i}UMD_t + \varepsilon_{it} \qquad (3)$$

where R_{it} is the return for stock on trading day t; R_{mt}, SMB_t, HML_t, and $UMD_t$are market factor, size, market to book, and momentum factor respectively. After we estimate the expected return, we can calculate the abnormal return for stock i on day t as

$$AR_{it} = R_{it} - \overline{R_{it}} \quad (4)$$

where $AR_{it}$is the abnormal return of stock i on trading day t, and $\overline{R_{it}}$is the expected return of stock i on trading day t estimated from (3). Then, we obtain the accumulated abnormal return of stock i in event window (t_1, t_2):

$$CAR_{it} = \sum_{t=t_1}^{t=t_2} AR_{it} \quad (5)$$

We consider the announcement day of the covenant violation as the event day. We calculate cumulated abnormal return (CAR) for 60- , 120- , and 240-day event windows for high-unionization firms and low-unionization firms respectively[3]. Since some of the firms violated covenants more than once in our sample period and the multiple violations could bias our estimate, we include only firms that violated covenants once in our sample period. Our final sample has 385 observations. Figure 2 shows the CARs of covenant violation for high-unionization firms and low-unionization firms. As seen in Figure 2, the abnormal return of covenant violations for high-unionization firms is close to zero in the 240-day window, while the abnormal return of covenant violations for low-unionization firms is significantly larger. We also calculate the CAR of covenant violations for the entire sample; the CAR is significantly positive. For simplicity, we omit the CAR for the entire sample in Figure 2.

Existing literature suggests that creditor control enhances firm value after debt covenant violations in the long run; thus, a positive CAR is expected. Nini et al. (2012) find a negative short term abnormal cumulative stock return but a significant and positive long-term abnormal cumulative stock return after a firm violates debt covenants. Our CAR results for the full sample are similar to that in Nini et al. (2012). Moreover, we find that the stock return of a high-

[3] Covenant violation is disclosed in quarterly reports, thus the date of covenant violation disclosed in quarterly report may differ from the date when the violation actually took place. We follow Nini et al. (2012) and calculate the long-term stock return after covenant violations based on the disclosure date of covenant violation in quarterly reports.

unionization firm after covenant violation is much smaller than is that of a low-unionization firm. As shown in the previous sections, a highly unionized firm is financially healthier than a low-unionization firm prior to covenant violation and tends to violate covenants to weaken the union's position. Thus, there is much less room for creditors to improve firm performance after covenant violations take place. Creditors have preferences similar to strong unions. Thus, the value-enhancing effect of creditors' firm monitoring is much smaller when the firm is facing a strong union prior to covenant violation.

6. Conclusion

This study finds that labor unions have a significant effect on a firm's debt covenant violations. We find evidence that a firm with a strong labor union is more likely to violate debt covenants. We also find that the positive relation between a strong labor union and the likelihood of debt covenant violation is stronger when the firm holds more cash. We further find that a firm tends to manipulate earnings downward before covenant violations when its labor union is stronger. This provides a specific mechanism by which firms can pressure labor unions. Long-term stock returns after covenant violations are smaller for firms with strong unions than for firms with weak unions. The evidence suggests that firms engage in covenant violations strategically to push labor unions to make concessions on issues such as wage reductions, pension restructuring, and layoffs. Our findings are consistent with the view that firms may use a financial strategy to weaken the position of labor unions.

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Appendix A: Measuring abnormal accruals

We construct the measure of abnormal accruals using information from cash flow statements. As argued by Hribar and Collins (2002), using balance sheet variables to measure earnings management create potential problems around "non-articulation" dates. We define total accruals (TA) as the difference between earnings before extraordinary items and discontinued operations and operating cash flows from continuing operations. We calculate total accruals as a percentage of lagged total assets:

$$TA_{i,t} = (EBXI_{i,t} - CFO_{i,t})/Assets_{i,t-1}$$

Then, we use the modified Jones (1991) model of accruals. The nondiscretionary accruals is a fitted value of a regressions of total accruals on the inverse value of lagged total assets; changes of sales scaled by lagged total assets; and gross property, plant, and equipment scaled by lagged total assets:

$$TA_{i,t} = \alpha_0 + \alpha_1 \times \left(\frac{1}{Assets_{i,t-1}}\right) + \alpha_2 \times \frac{\Delta sales_{i,t}}{Assets_{i,t-1}} + \alpha_3 \times \left(\frac{PPE_{i,t}}{Assets_{i,t-1}}\right) + \varepsilon_{i,t}$$

We estimate the parameters in the regression equation by fiscal year and Fama and French 48 industries. Discretionary accruals (DA) reflect the difference between total accruals and nondiscretionary accruals:

$$DA_{i,t} = TA_{i,t} - \widehat{TA_{\iota,t}}$$

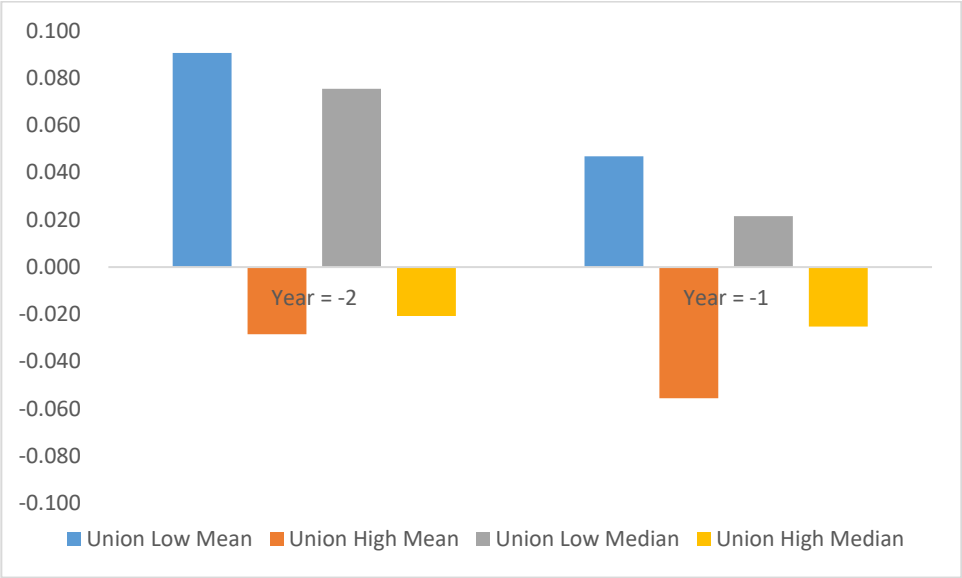

Figure 1: Earning management (DA) before covenant violation

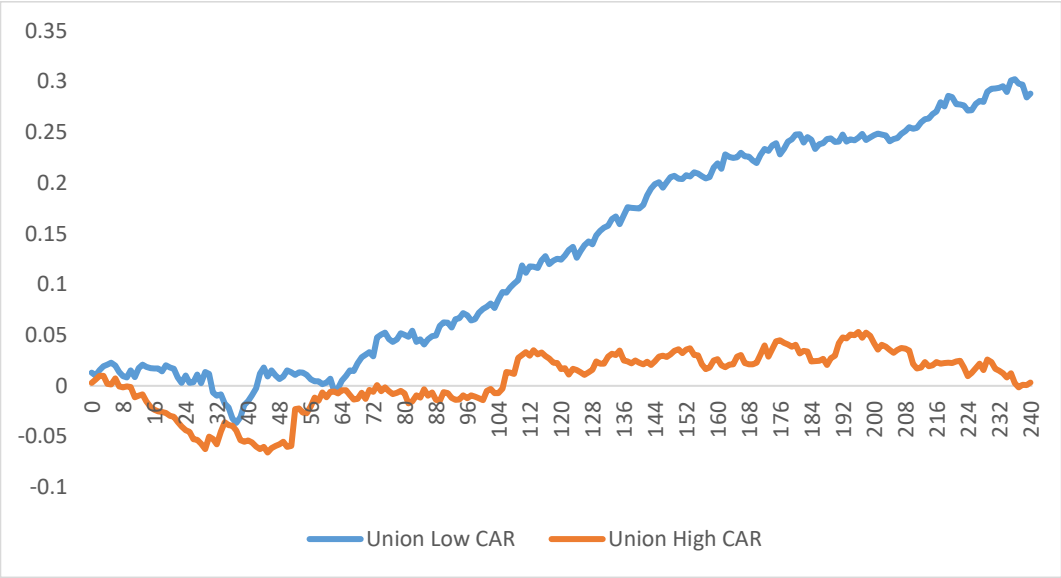

Figure 2: Unions and CARs after covenant violations

Table 1: Summary statistics

This table reports the summary statistics of industry unionization, violation, violation frequency, firm size, profitability, leverage, operating cash flow ratio, interest expense ratio, current ratio, and market-to-book.

Variable	N	Mean	STD	Min	Median	Max
Union (industry level)	37442	0.096	0.104	0	0.055	0.729
Violation	37442	0.035	0.185	0	0	1
Violation frequency	37442	0.052	0.309	0	0	5
Firm size	37442	6.108	2.174	1.239	6.078	12.436
Profitability	37442	-0.049	0.657	-4.633	0.076	2.986
Leverage	37442	0.513	0.264	0.030	0.507	1.562
Operating cash flow ratio	37442	1.344	5.093	-34.786	1.198	40.545
Interest expense ratio	37442	0.019	0.022	0	0.013	0.139
Current ratio	37442	0.467	0.255	0.031	0.455	0.994
Market-to-book	37442	2.719	4.207	-14.576	1.895	30.302

Table 2: Labor unions (industry level) and covenant violations

This table reports the regression results of covenant violation measured by violation and violation frequency. A logit regression model is applied in the violation regression, and an ordered logit regression model is applied in the violation frequency regression. Standard errors are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Full sample		**Manufacturing industry sample**	
	Violation (1)	**Violation frequency (2)**	**Violation (3)**	**Violation frequency (4)**
Union	**0.590****	**0.594****	**2.128*****	**2.088*****
	(0.299)	**(0.299)**	**(0.596)**	**(0.602)**
Firm size	-0.432***	-0.432***	-0.487***	-0.488***
	(0.014)	(0.014)	(0.026)	(0.026)
Profitability	-0.119***	-0.119***	-0.075	-0.078
	(0.025)	(0.026)	(0.052)	(0.054)
Leverage	1.115***	1.131***	1.661***	1.698***
	(0.107)	(0.107)	(0.210)	(0.212)
Operating cash flow ratio	-0.014**	-0.014**	-0.019*	-0.018*
	(0.007)	(0.006)	(0.011)	(0.011)
Interest expense ratio	3.136***	3.136***	-1.992	-1.884
	(1.156)	(1.162)	(2.265)	(2.297)
Current ratio	-0.453***	-0.439***	-0.896***	-0.873***
	(0.117)	(0.117)	(0.264)	(0.264)
Market-to-book	-0.029***	-0.029***	-0.031***	-0.031***
	(0.004)	(0.004)	(0.009)	(0.009)
Constant	-1.448***		-0.900***	
	(0.126)		(0.269)	
Pseudo R2	0.103	0.086	0.113	0.093
Wald chi2	1717.30***	1713.24***	532.34***	527.38***
N	37442	37442	10445	10445

Table 3: Instrumental variable analysis

This table reports the regression results of covenant violation measured by violation and violation frequency using the Percent of Black or African Americans as the instrumental variable for average industry unionization rates (Union). A logit regression model is applied in the violation regression, and an ordered logit regression model is applied in the violation frequency regression. Standard errors are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: first stage	
	Union
Percent of Black or African Americans	**0.302***** **(0.017)**
Firm size	0.007*** (0.000)
Profitability	-0.001 (0.001)
Leverage	0.033*** (0.003)
Operating cash flow ratio	0.000 (0.000)
Interest expense ratio	-0.197*** (0.047)
Current ratio	-0.093*** (0.003)
Market-to-book	-0.001*** (0.000)
Constant	0.048*** (0.003)
R-squared	0.146
F-value	467.83***
N	21780

Panel B: second stage		
	Violation	**Violation frequency**
	(1)	**(2)**
$\widehat{Union}$	**2.386***	**0.489*****
	(1.458)	**(0.166)**
Firm size	-0.244***	-0.023***
	(0.012)	(0.001)
Profitability	-0.073***	-0.021***
	(0.023)	(0.003)
Leverage	0.618***	0.091***
	(0.118)	(0.012)
Operating cash flow ratio	-0.002	-0.000
	(0.003)	(0.000)
Interest expense ratio	0.968	0.172
	(1.008)	(0.140)
Current ratio	0.054	0.038**
	(0.171)	(0.018)
Market-to-book	-0.012***	-0.001***
	(0.004)	(0.000)
Constant	-1.044***	0.081***
	(0.120)	(0.016)
Log likelihood (R-squared)	17318.467	0.0003
Wald chi2	670.50***	667.85***
Statistic for test of exogeneity	2.89*	3.63
N	21780	21780

Table 4: NLRB sample selection

This table reports the sample selection process for NLRB dataset.

	Observations	Firms
Full sample with non-missing election certification date	59253	46184
Election outcome is not "Unresolved"	59118	46081
Elections with more than 100 workers	9628	8005
Merged with Compustat by name and SIC	1384	686
Firms with only one election in sample period	423	423
Merged with Roberts's violation data	2714	244
Within 5 years before (after) election, exclude observation in election year	1278	221

Table 5: Union elections (firm level) and covenant violations

This table reports the regression results of covenant violation measured by violation and violation frequency based on a NLRB firm-level union election dataset. A logit regression model is applied in the violation regression, and an ordered logit regression model is applied in the violation frequency regression. Standard errors are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Panel A: Full sample		**Panel B: Manufacturing industry sample**	
	Violation (1)	**Violation frequency (2)**	**Violation (3)**	**Violation frequency (4)**
Post	-0.511	-0.501	-0.067	-0.040
	(0.501)	(0.505)	(0.799)	(0.781)
Post × Labor win	**16.853*** **	**15.732*** **	**15.969*** **	**15.946*** **
	(0.995)	**(0.661)**	**(1.027)**	**(0.857)**
Labor win	-16.035***	-14.902***	-15.251***	-15.273***
	(0.898)	(0.346)	(1.247)	(0.987)
Firm size	-0.464***	-0.466***	-0.653***	-0.658***
	(0.122)	(0.122)	(0.208)	(0.207)
Profitability	-0.045	-0.015	0.101	0.123
	(0.265)	(0.299)	(0.361)	(0.370)
Leverage	2.067	2.127	5.045*	5.229*
	(1.656)	(1.623)	(3.080)	(3.221)
Operating cash flow ratio	-0.010	-0.009	-0.016	-0.014
	(0.024)	(0.025)	(0.027)	(0.030)
Interest expense ratio	3.813	3.924	-23.395	-24.987
	(17.339)	(16.941)	(36.425)	(37.384)
Current ratio	-0.024	0.025	2.446	2.682
	(1.490)	(1.489)	(2.711)	(2.832)
Market-to-book	-0.018	-0.018	-0.056	-0.057
	(0.019)	(0.019)	(0.058)	(0.060)
Constant	-1.976		-3.573	
	(1.267)		(2.325)	
Pseudo R2	0.125	0.112	0.185	0.166
Wald chi2	455.98***	4161.74***	422.23***	865.83***
N	1278	1278	514	514

Table 6: Labor unions, cash holding and covenant violations

This table reports the regression results on how cash holding affects the relation between labor unions and covenant violations. A logit regression model is applied in the violation regression, and an ordered logit regression model is applied in the violation frequency regression. Standard errors are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Violation (1)	**Violation frequency (2)**
Union	1.103**	1.105**
	(0.496)	(0.503)
Union × Cash holding	**0.317*** **	**0.318*** **
	(0.114)	**(0.116)**
Cash holding	-0.314***	-0.316***
	(0.014)	(0.014)
Firm size	-0.440***	-0.441***
	(0.015)	(0.015)
Profitability	-0.181***	-0.181***
	(0.028)	(0.029)
Leverage	0.886***	0.905***
	(0.123)	(0.123)
Operating cash flow ratio	-0.012**	-0.012**
	(0.006)	(0.006)
Interest expense ratio	3.138**	3.171***
	(1.277)	(1.281)
Current ratio	0.602***	.627***
	(0.130)	(0.131)
Market-to-book	-0.025***	-0.025***
	(0.005)	(0.005)
Constant	-2.623***	
	(0.143)	
Pseudo R2	0.136	0.114
LR chi2	1836.68***	1837.60***
N	37395	37395

Table 7: Covenant violations and strikes

This table reports the regression results on how covenant violations in previous year affect the probability of strikes and the number of days that the strike lasts for a firm. A logit regression model is applied in the strike regression, and an OLS regression model is applied in the strike days regression. Standard errors are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Panel A: Strike		**Panel B: Strike days**	
	(1)	**(2)**	**(3)**	**(4)**
Violation frequency	**-0.584***	**-0.528***	**-83.548***	**-73.839***
	(0.345)	**(0.314)**	**(50.274)**	**(41.498)**
Right-to-work laws dummy	-0.865**	-0.979**	-86.357	-82.024
	(0.424)	(0.464)	(58.657)	(53.574)
Change in firm size	0.000	0.000	-0.012	-0.015
	(0.000)	(0.000)	(0.011)	(0.015)
Change in leverage	1.509	1.656*	-197.406	-143.916
	(0.923)	(0.953)	(331.216)	(296.416)
Change in dividend payment	-0.064	-0.046	-9.510**	-9.596**
	(0.066)	(0.068)	(3.905)	(3.724)
Change in profitability	-0.008	-0.008	-28.460*	-28.800
	(0.010)	(0.013)	(16.305)	(17.346)
Change in working capital ratio	1.635	1.241	552.872	473.043
	(1.009)	(1.006)	(470.479)	(414.506)
Change in sales growth	-0.003	-0.004	90.912	91.687
	(0.007)	(0.007)	(98.882)	(100.203)
Change in cash holding		0.001***		0.031
		(0.000)		(0.038)
Constant	-2.063***	-2.130***	77.657**	73.376***
	(0.163)	(0.165)	(30.025)	(26.643)
Pseudo R2 (R-squared)	0.044	0.064	0.149	0.162
Wald chi2 (F-value)	15.86**	17.89**	14.70***	17.26***
N	557	557	57	57

Table 8: Firm characteristics one year before covenant violations

This table compares characteristics one year before covenant violations for low-unionization firms and high-unionization firms. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Variable	Low-Unionization Firms (1)			High-Unionization Firms (2)			Difference (3)=(2)-(1)	
	N	Mean	Median	N	Mean	Median	Mean	Median
Firm size	722	4.289	4.216	722	4.772	4.647	0.482***	0.431***
Profitability	722	-0.254	-0.082	722	-0.222	-0.028	0.032	0.054***
Leverage	722	0.553	0.527	722	0.629	0.606	0.075***	0.079***
Operating cash flow ratio	722	0.649	0.282	722	0.966	0.316	0.317	0.034*
Interest expense ratio	722	0.026	0.017	722	0.031	0.026	0.005***	0.009***
Current ratio	722	0.525	0.548	722	0.476	0.469	-0.050***	-0.079***
Market-to-book	722	1.977	1.381	722	1.533	1.067	-0.445**	-0.314***
S&P rating score	47	5.681	6	99	5.394	5	-0.287**	-1***
Altman's Z-score	722	0.074	1.027	722	0.884	1.244	0.810***	0.217***

Table 9: Earnings management (DA) before covenant violations (univariate analysis)

This table compares earnings management (DA) two years before covenant violations for low-unionization firms and high-unionization firms. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Year before violation	**Low-Unionization Firms (1)**			**High-Unionization Firms (2)**			**Difference (3)=(2)-(1)**	
	N	Mean	Median	N	Mean	Median	Mean	Median
-2	257	0.091***	0.075***	254	-0.028*	-0.021*	**-0.119*****	**-0.096*****
-1	277	0.047**	0.022*	260	-0.056***	-0.025***	**-0.102*****	**-0.047*****

Table 10: Earnings management before covenant violations (multivariate analysis)

This table reports the OLS regression results of how labor unions affect firms' earnings management before covenant violations. Standard errors are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	DA	
	(1)	(2)
Union	**-0.536*** (0.107)**	**-0.343*** (0.101)**
Firm size		-0.035*** (0.008)
Profitability		0.197*** (0.034)
Leverage		-0.046 (0.084)
Operating cash flow ratio		0.003*** (0.001)
Interest expense ratio		-1.640** (0.836)
Current ratio		-0.001 (0.048)
Market-to-book		-0.000 (0.005)
Constant	0.060*** (0.015)	0.305*** (0.054)
Adj R-Sq	0.018	0.213
F-Value	25.15***	17.93***
N	1048	1048

Table 11: Covenant violations and credit ratings

This table reports the ordered logit regression results on how labor unions affect the change in firms' credit ratings measured by S&P rating score after covenant violations. Standard errors are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	S&P rating score	
	(1)	**(2)**
Top 25% Unionization Rate	0.131	0.317
	(0.374)	(0.458)
Top 25% Unionization Rate × Post	**-1.064****	**-1.386****
	(0.488)	**(0.588)**
Post	1.199***	1.532***
	(0.304)	(0.359)
Firm size		-0.439***
		(0.129)
Profitability		-0.469
		(0.366)
Leverage		0.454
		(1.277)
Operating cash flow ratio		-0.025
		(0.031)
Interest expense ratio		65.181***
		(17.355)
Current ratio		1.261
		(0.812)
Market-to-book		-0.113**
		(0.055)
Pseudo R2	0.039	0.256
Wald chi2	20.69***	90.21***
N	301	301

Table 12: Covenant violations and loan spreads

This table reports the OLS regression results on how labor unions affect the change in firms' cost of loans measured by all-in drawn spread after covenant violations. Standard errors are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	All-in drawn spread	
	(1)	(2)
Union High	53.176	6.836
	(45.933)	(34.361)
Union High × Post	-50.259	**-78.230***
	(60.849)	**(42.914)**
Post	38.700	6.254
	(46.275)	(33.975)
Firm characteristics		
Firm size		18.535
		(14.167)
Market-to-book		-2.541
		(2.571)
Leverage		154.521**
		(63.018)
Profitability		-2.306
		(16.288)
Tangibility		43.791
		(53.569)
Z-score		3.654
		(10.579)
S&P rating score		60.377***
		(20.272)
Loan characteristics		
Loan maturity		-72.718***
		(27.362)
Loan size		-36.065***
		(12.500)
Performance pricing		-73.943***
		(23.913)
Macroeconomic factors		
Credit spread		150.507***
		(41.365)
Term spread		24.064*
		(14.511)
Control for		
Loan type		yes
Loan purpose		yes
Constant	269.419***	578.201**
	(36.357)	(261.406)
Adj_R^2	-0.008	0.570
F-value	0.47	10.85***
N	186	186