Organized Labor and the Cost of Debt: Evidence from Union Votes*

Murillo Campello
Cornell University & NBER
campello@cornell.edu

Janet Gao
Cornell University
rg449@cornell.edu

Jiaping Qiu
McMaster University
qiu@mcmaster.ca

Yue Zhang
McMaster University
zhangy57@mcmaster.ca

Abstract

Unionization assigns extraordinary rights to workers in bankruptcy court. The shift to workers' bargaining power can be detrimental to senior unsecured creditors in default states. We gather data on union election results from 1977 through 2010 and employ a regression discontinuity design to identify the effect of worker unionization on bondholders' wealth. Closely-won union elections lead to significant losses in bond values, but do not lead to poorer firm performance or higher default risk. We show that unionization is associated with longer proceedings in bankruptcy court, more bankruptcy emergences and refilings, and higher bankruptcy fees and expenses, all of which aggravate bondholders' losses. The value effects of unionization are weakened in states where unions' powers are undermined by the passage of right-to-work laws.

Key words: Unionization, Bond Values, Regression Discontinuity Design, Bankruptcy Costs.

JEL classification: G32, G33, J50.

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Abstract

Unionization assigns extraordinary rights to workers in bankruptcy court. The shift to workers' bargaining power can be detrimental to senior unsecured creditors in default states. We gather data on union election results from 1977 through 2010 and employ a regression discontinuity design to identify the effect of worker unionization on bondholders' wealth. Closely-won union elections lead to significant losses in bond values, but do not lead to poorer firm performance or higher default risk. We show that unionization is associated with longer proceedings in bankruptcy court, more bankruptcy emergences and refilings, and higher bankruptcy fees and expenses, all of which aggravate bondholders' losses. The value effects of unionization are weakened in states where unions' powers are undermined by the passage of right-to-work laws.

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The purpose of Chapter 11 is to prevent a debtor from going into liquidation with an attendant loss of jobs and possible misuse of economic resources.

— *Supreme Court, N.L.R.B. v. Bildisco & Bildisco (1984)*

1 Introduction

Despite their declining prominence, labor unions still shape human capital participation in corporate activity. Of the largest 100 industrial firms in the U.S. today, 33 have a unionized labor force, with most of their unions formed in the last 20 years. Unions are meant to enhance workers' bargaining power in negotiating contracts governing benefits such as wages, health care, and pension funding. Arguably, however, these pecuniary benefits are less important than concerns such as job security and career development. Those future, non-contractual interests are most endangered when firms go bankrupt. Indeed, the Bankruptcy Code protects only workers' accumulated wages and benefits for work already performed, leaving other interests up for negotiation.[1] To protect their members, unions become active parties in legal proceedings under Chapter 11. Not surprisingly, their overriding goal in those proceedings has been that of securing job preservation (see Haggard (1983) and Stone (1988)).

Unions can protect workers' interests in bankruptcy proceedings in several ways. As recognized creditors, unions may be eligible to obtain positions in creditors' committees.[2] Section 1102(a) of the Bankruptcy Code charges the United States Trustee with the duty of organizing a committee including the largest unsecured creditors. The committee has powers to: (1) investigate the debtor for fraud or incompetence, (2) participate in the formulation of reorganization plans, (3) request the replacement of managers, and (4) ask the court to dismiss the case or convert it into Chapter 7 liquidation. Debtors are legally obliged to disclose all information requested by the creditors' committee and pay (from estate assets) for all of the committee's expenses.[3] Workers in non-unionized firms, in contrast, do not gain positions in creditors' committees. Instead, they are treated individually by the courts, benefitting only

[1]The Chapter 11 Bankruptcy Code (U.S. Code § 507 (a)(4)) only gives automatic "superior priority" for wages and benefits earned in the 180 days before bankruptcy.

[2]Unions' claims against debtors include (1) withheld union dues, (2) unpaid contributions to union pension and welfare plans, (3) unpaid wages and accrued benefits to union workers, and (4) claims for damages following from debtor's rejection of collective bargaining agreements (see Haggard and Pulliam (1987)). Firms in financial distress often run debts on all such accounts.

[3]Dawson (2014) reports that a union was a member in the court-appointed unsecured creditors' committee in over one third of the bankruptcy cases in which the debtor was unionized. We report similar figures below.

from standard statutory priorities.[4]

Unions resort to several additional tactics to empower workers in bankruptcy. Chiefly, they organize strikes, boycotts, and public denouncements; they even overtly exert political pressure. As firms face financial difficulties, managers are more likely to work with unions to avoid disruptions that invite greater creditor control or liquidation (see Atanassov and Kim (2009)). When convenient, unions use their leverage in court so that bankruptcy proceedings allow for disruption of absolute priority rules (APR).[5] Unions can also make bankruptcies last longer than necessary, using the courts to force parties into repeated, costly negotiations over workers' demands. In securing continued employment for their workers, unions can also facilitate inefficient reorganizations in lieu of (efficient) liquidation. This is an important issue since firms that emerge from reorganization often re-enter bankruptcy, as unions resist asset sales and worker layoffs. Even in cases where firm ownership is transferred, the successor is legally bound to negotiate and bargain with the predecessor's union. In all, while unions are sometimes forced to make concessions in court, unionization gives rise to significant legal obstacles that have to be dealt with in resolving bankruptcy.

This paper examines the effect of unionization on unsecured corporate creditors by studying the price reactions of publicly-traded bonds to labor union elections. It does so using detailed, establishment-level election data from the National Labor Relations Board (NLRB). The majority of the union elections conducted in the U.S. are through secret ballot voting, often with little advance notice to management. Once a union wins over 50% of the votes, the union attains legal recognition and its members can exercise collective bargaining over compensation, benefits, and disputes with management and investors. These rights are governed and protected by the National Labor Relations Act (NLRA) and a successful union election can discretely strengthen the bargaining power of workers in a firm.

We combine the NLRB data with information on publicly-traded bonds from TRACE, Mergent FISD, and the University of Houston Database. Publicly-traded bond prices represent a unique value metric with which we gauge the effects of unionization on the expected costs of corporate default. Unlike other creditors (e.g., banks and syndicated lenders), it is very difficult for investors of diffusely-held bonds to renegotiate their claims with borrowers. Bond investors, instead, dispose of their securities in the market in response to innovations to

[4] For example, employee benefit and wages priority privileges are currently capped at only $10,000 per worker.

[5] In the Chrysler bankruptcy, United Auto Workers (UAW) was instrumental in having the reorganized entity ("new Chrysler") assume $4.5 billion of employee benefits from "old Chrysler." The company distributed 55% of its equity to satisfy $10 billion of unsecured obligations to labor unions. Most other creditors, by comparison, recovered less than 30 cents per dollar from asset sales, despite having more senior claims (Adler (2010)).

the value of their claims. Given the concave structure of bond payoffs (capped at issue face values in non-bankruptcy states), bond price movements reflect investors' expected losses from bankruptcy states. Innovations that increase expected bankruptcy costs lead to declines in the secondary market price of unsecured corporate bonds.

Naturally, both the occurrence and the results of union elections are related to firm-specific conditions, rendering it challenging to identify the causal impact of unionization on bond prices. To wit, the average union-win firm might differ from the average union-loss counterpart in several dimensions (both observable and unobservable). To establish causality in our tests, we resort to a regression discontinuity design (RDD) that utilizes local variations in the vote share of elections that lead to discrete changes in union legal status. In short, our tests contrast bond price reactions to closely-won union elections with bond price reactions to closely-lost elections. Close winners gain representation status while close losers do not, yet average firm characteristics and workers' support for unions are ex-ante similar across the two groups of firms. Critically, given the nature of secret ballot elections, it is unlikely for individuals or firms to precisely anticipate or manipulate the outcome of union elections. Under these regularity conditions (which we verify in the data), differences in bond price reactions to close election outcomes can be plausibly attributed to the causal effect of unionization.

Our results show that unionization negatively affects the wealth of senior, unsecured corporate creditors. It does so in an economically significant manner. A simple event study shows that closely-won union elections are associated with a negative 60 (180)-basis-point average cumulative abnormal return (CAR) over the 3-month (12-month) window following election events, while closely-lost elections are associated with a statistically insignificant negative 10 (60)-basis-point CAR over the same window. Results from RDD analyses show even bigger effects. Closely-won union elections lead to a 200 (500) basis points greater decline in bond CARs than closely-lost elections during the 3-month (12-month) post-election window.[6]

We also investigate the mechanisms through which unionization reduces bond values. From a pricing perspective, the decline in bond values could be associated with increases in (1) default probabilities, or (2) in-court bankruptcy costs (or both). We first examine whether unionization increases default risk by tracking firms' performance following unionization. Comparing the performance of close union winners and losers, we find no evidence that close winners perform worse or become more likely to go bankrupt than close losers for several years after

[6]The horizons we consider follow prior literature on the effects of unionization (see DiNardo and Lee (2004) and Lee and Mas (2012)) and event studies on bond returns (e.g., Warga and Welch (1993), Eberhart and Siddique (2002), Ellul et al. (2011), and Klein and Zur (2011)).

the vote. At the same time, bond CARs of close union winners show noticeable declines even when their remaining time to maturity is relatively short (less than 5 years). Our results imply that the negative impact of unionization on bond prices is unlikely to be caused by increases in default probability.

We next examine the effects of unionization on in-court bankruptcy costs. We use information from the UCLA-LoPucki bankruptcy database to compute court cost measures including the duration of bankruptcy proceedings, the fees paid to financial and legal professionals, and creditors' committee expenses. We find that bankrupt firms with labor unions experience more prolonged bankruptcy proceedings and are also more likely to go through inefficient reorganizations, as evidenced by a higher likelihood of emergence from bankruptcy and refiling for bankruptcy thereafter. Unionized firms are also more likely to reorganize under debtor-in-possession (DIP) financing.[7] We also find that firms with labor unions incur significantly higher expenses and fees in bankruptcy court, including the fees paid to attorneys and creditors' committees. Notably, these costs increase with the number of seats assigned to unions in unsecured creditors' committees. Taken together, the results are consistent with the notion that unionization significantly increases firms' bankruptcy costs, with those costs being imposed onto other financial stakeholders of the firm.

We exploit firm heterogeneity to verify that unionization affects bond values through bankruptcy costs. We do so comparing subsamples of financially-distressed and financially-healthy firms. We expect the bond prices of distressed firms to have more negative reactions to unionization, as these firms are closer to realizing the increased bankruptcy costs associated with unionization. We consider several measures of financial distress in our analysis, including Altman's Z-score, Ohlson's O-score, Merton's distance to default, as well as Moody's credit ratings. These distress measures are similarly distributed across firms where union elections are closely won and lost. Yet, consistently across all measures, RDD results show that unionization has a much greater impact on the bond values of distressed firms.

Finally, we examine the argument that the value impact of unions can be ascribed to increases in the bargaining power of the workers they represent. To do so, we experiment with settings where unions experience varying degrees of power in collective bargaining negotiations. Specifically, we use the adoption of right-to-work (RTW) laws across different jurisdictions (states) in the U.S. RTW laws, which allow non-union members to enjoy the benefits of unions' bargaining without having to pay union dues or join the union. These laws weaken

[7] These financing arrangements often assign pre-existing senior creditors to more junior claimant categories; yet they allow firms to continue operating and workers to keep their employment.

unions' power, as they constrain unions' financial resources and reduce their organizing activity, ultimately impairing their effectiveness (see Ellwood and Fine (1987) and Holmes (1998)). We partition our sample according to whether or not union elections are held in states with RTW laws and find that the effect of unionization on bond values is far stronger in states without those laws. Indeed, for RTW-law states, unionization has negligible effects on bond values.

The effect of organized labor on corporate decisions and value is a multifaceted, understudied issue. Lee and Mas (2012) show that the equity prices of unionized firms decline slowly over time, but the authors do not find discernible differences at the 50% vote share cutoff. Their analysis does not identify the economic mechanism through which the union support rate affects stock prices. Notably, their results cannot be explained by fundamental changes in business survival rates, employment, productivity, or wages, since none of these variables are affected by unionization (see DiNardo and Lee (2004) and evidence reported below).

The impact of unionization on creditors is also a complex issue. Studies such as Faleye et al. (2006), Chen et al. (2012), and Bradley et al. (2013) argue that bondholders and workers share a common interest in reducing firm risk in good states, since both parties hold fixed claims on firm values in those states. Accordingly, Faleye et al. show that firms with strong labor representation invest less in long-term assets, taking fewer risks. Chen et al. report regressions showing that bonds issued by firms in more unionized industries are more highly valued by investors because those firms implement less risky investments and are less likely to be target of acquisitions. Bradley et al. argue that unions stifle risky innovation by firms, measured by declines in patents and citation counts following unionization. These papers do not study conflicts between workers and creditors when dividing assets and sharing wealth in bankruptcy court. We contribute to the literature by characterizing this dynamic, showing that unionized firms incur higher costs during bankruptcy, reducing the value inherent in other creditors' claims.

More broadly, our paper adds to a growing line of research on how human capital and organized labor influence firm financing. Berk et al. (2010) and Agrawal and Matsa (2013) argue that managers choose lower leverage to reduce workers' exposure to unemployment risk. Simintzi et al. (2015) argue that labor power increases firms' operating leverage, crowding out financial leverage. Matsa (2010) argues that firms use leverage to raise their bargaining power against unions (see also Graham et al. (2014)) and Lin et al. (2015)). Our paper contributes to this debate by showing that unions are ultimately costly to holders of unsecured debt claims, a result that further helps explain the negative association between debt ratios and unions. In all, the analysis furthers our understanding of the impact of worker organization on corporate investors, an important facet of firm–labor relations.

The rest of the paper is organized as follows. Section 2 describes the data. Section 3 presents our baseline results. Section 4 provides evidence regarding the channels through which unionization affects bond value. Section 5 provides a welfare analysis of worker unionization. Section 6 concludes.

2 Data Description and Sample Selection

We piece together a number of databases to study the effect of unionization on bond values and bankruptcy costs. This section describes our data collection process, sampling, and variable construction methods.

2.1 Union Election Data

The NLRB provides detailed data on the results of elections to certify a representative union for a collective bargaining unit for the 1977–2010 period.[8] We gather information related to the time and location of each union election in the United States, the number of participating and eligible voters, the number of votes "for" and "against" unionization, and the company in which the election took place. Starting from the universe of elections recorded in the NLRB database, we follow prior literature in considering the set of elections with more than 50 voters. We then follow the algorithm used in Lee and Mas (2012) for matching company names in the NLRB to their identifier in the Center for Research in Security Prices (CRSP) database. We inspect every match manually and exclude incorrect matches. Our base union election sample includes 5,714 elections.

2.2 Bond Data

We collect information on publicly-traded corporate bonds from multiple data sources. Bond information for the 1977–1997 period is taken from the University of Houston Fixed Income Database (formerly Lehman Brothers Database). The University of Houston Database provides month-end bid prices for each bond issue, as well as issue-level characteristics such as accrued interest, yield to maturity, and credit ratings (see, e.g., Warga (1998) and Collin-Dufresne et al. (2001)). For information after 1997, we use transaction-level data from the

[8]The 1977–1999 period data are used in Holmes (2006) and are available from Thomas Holmes's website (`http://www.econ.umn.edu/~holmes/data/geo_spill/index.html`). The 2000–2010 data are posted by the NLRB (`http://www.data.gov/`).

Mergent Fixed Income Securities Database (FISD) covering the 1997–2004 period and from Trade Reporting and Compliance Engine (TRACE) for the 2005–2011 period. Both providers offer comprehensive coverage of the bond market. We eliminate all canceled, corrected, and commission trades, following standard procedure in the literature (Bessembinder et al. (2006, 2009)). We also follow existing studies in limiting our sample to U.S. dollar-denominated, fixed-coupon corporate debt issues that are senior, not puttable, and unsecured. Senior, unsecured bonds account for around 95% of all corporate bonds issued.[9]

2.3 Bond Returns

We compute cumulative abnormal returns (CARs) of corporate bonds over several time windows to gauge creditors' reactions to union elections. We use monthly frequencies in calculating bond returns since NLRB election dates are often only reported with monthly precision. Using monthly data also helps alleviate concerns about the impact of market illiquidity on bond prices, as many bonds are infrequently traded. Following Bessembinder et al. (2009), we compute trade size-weighted bond prices for each trading day and use the price on the last trading day of the month as the month-end price. We then calculate the observed return (OR) for bond b in month t as:

$$OR_{b,t} = \frac{((P_{b,t} - P_{b,t-1}) + AI_{b,t})}{P_{b,t-1}}, \tag{1}$$

where P_t is the bond price at the end of month t, AI_t is the accrued interest of that month, and P_{t-1} is the bond price at the end of month $t-1$.

We calculate abnormal bond returns in three steps. First, we find a benchmark portfolio for each bond based on its risk. Specifically, we classify all senior, unsecured bonds into three-by-three portfolios according to their credit ratings and time-to-maturity.[10] We then calculate the value-weighted average return for each portfolio using the returns of every bond in that portfolio. For a given bond b, we find a portfolio with the closest credit rating and time-to-maturity as its benchmark portfolio.

Next, we calculate the abnormal return of bond b using its benchmark portfolio return as the bond's expected return (ER). The abnormal return (AR) for bond b is thus defined as the

[9] Unsecured means the bond not being backed by assets, not based on secured lease obligation, nor a private placement exempt from registration under SEC Rule 144a.

[10] Bessembinder et al. (2009) show that default risk (proxied by credit ratings) and time-to-maturity are the two primary risk factors driving bond returns. Bonds are classified into 9 benchmark portfolios according to whether their credit rating is high grade (Aaa+—Aa3), medium grade (A1—Baa3), or speculative grade (Ba1 and below), and whether the remaining time to maturity is less than 10 years, between 10 and 20 years, or above 20 years.

difference between the observed bond return (OR) and expected return:

$$AR_{b,t} = OR_{b,t} - ER_{b,t}. \tag{2}$$

The firm-level abnormal bond return is computed using the weighted average abnormal returns of all bonds issued by the firm, weighting each bond with its market value.[11] Formally, the abnormal bond return AR for firm k at time t is calculated as follows:

$$AR_{k,t} = \sum_{b=1}^{J} w_{b,t} AR_{b,t}, \tag{3}$$

where J is the number of bonds outstanding for firm k; w is the market value weight of bond b scaled by the total bond market value of firm k. Finally, we compute the cumulative abnormal return (CAR) following union election i for firm k from month $T_{i,1}$ to month $T_{i,2}$ as:

$$CAR(k, T_{i,1}, T_{i,2}) = \sum_{t=T_{i,1}}^{T_{i,2}} AR_{k,t}. \tag{4}$$

To be included in the sample, firms are required to have available monthly bond prices from one month prior to the union election to twelve months after the election. This allows us to examine time horizons similar to previous work on the effects of unionization (DiNardo and Lee (2004) and Lee and Mas (2012)) and event studies for bond returns (Warga and Welch (1993), Eberhart and Siddique (2002), and Ellul et al. (2011)). We winsorize bond CARs at the 1^{st} and 99^{th} percentiles to mitigate the influence of outliers. After matching bond CARs to the union election data, we are able to study a total of 721 election events.

2.4 Other Covariates

We extract firm fundamental information from Compustat and equity data from CRSP. We construct several measures of firm risk, including Altman's Z-score (*Z-score*), Ohlson's O-score (*O-score*), and Merton's distance to default (*Distance-Default)*. We construct additional measures that describe firm characteristics: return on assets (*ROA*), asset size (*Size*), book-to-market ratio (*B/M*), liability-to-asset ratio (*Liability Ratio*), cash-to-asset ratio (*Cash*), and property, plant, and equipment-to-asset ratio (*Tangibility*). Detailed definitions of these variables are in Appendix A. We winsorize covariates at the 1^{st} and 99^{th} percentiles.

[11] We also use individual bonds (as opposed to firm-portfolio bonds) CARs to estimate price reactions to union elections. We obtain statistically and economically similar results to those reported below.

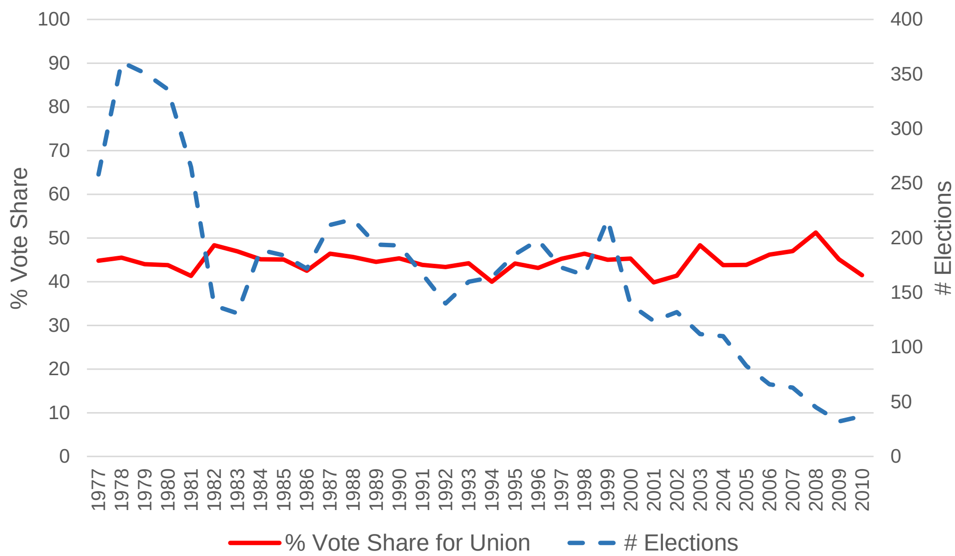


Figure 1. Occurrence and results of union elections
This figure describes the time series variation in the occurrence and results of union elections in our sample period. The solid line represents the median percentage votes in support of union (% Vote Share for Union) in the elections held in a given year; the dashed line represents the total number of elections (# Elections) held.

2.5 Summary Statistics and Univariate Analysis

2.5.1 Union Elections

There is a well-documented decline in the unionization movement in the U.S. (see, e.g., Vedder and Gallaway (2002) and DiNardo and Lee (2004)). Our data sample spans 33 years and Figure 1 shows that it captures the secular trend in establishment-level union elections. In the 2000s, in particular, the number of elections declined sharply. Having a rich times series variation as our forcing variable is important for both statistical and economic inferences.[12]

The patterns present in our sample seem consistent with claims that union activity has declined due to factors such as changes in the political climate and public policy, managerial opposition to unions, development of labor-saving technologies, and increased competition from international trade (DiNardo and Lee (2004)). Despite the decline in union elections, key statistics of election results remain constant over time. For example, the average vote share in support of union is close to 45% over the last three decades. Although not displayed, the percentage of successful union elections has also remained constant over time, hovering around 25%.

Table 1 reports summary statistics for firm and bond characteristics. These statistics are based on election-year data. Overall, our sample firms are large and profitable, with an average book value of total assets of about $20 billion and an average return on assets of 9%. Those

[12]By comparison, a recent study by Chen et al. (2012) only has industry-level data (consolidated at the 3-digit SIC) over the 1984–1998 period, when the decline in the unionization movement is not particularly pronounced. Those authors recognize that their proxy measures firm-level unionization with noise.

firms are also financially healthy and liquid, with an average Z-score of 3.6 and cash ratio of 4.3%. Firms in our sample typically have multiple bonds outstanding (average of 4) with above-investment grade credit ratings according to Moody's.

TABLE 1 ABOUT HERE

2.5.2 Bond Returns

An election event is defined as the month in which a union election vote takes place.[13] Observing the process through which unionization unfolds, we examine bond returns accumulated from the month prior to the vote to every 3 months up to one year following the event; i.e., $CAR(-1,3)$, $CAR(-1,6)$, $CAR(-1,9)$, and $CAR(-1,12)$.[14] Column (1) of Table 2 shows the abnormal bond returns following all union elections in our sample. On average, union-election bond CARs have a relatively small magnitude, ranging from –20 basis points during the 3-month post-election window to –100 basis points during the 12-month post-election window. Column (2) shows abnormal bond returns following all union winning elections, while column (3) shows the average bond CAR following all union losing elections. Notably, changes in bond values are not significantly different across those two groups.

TABLE 2 ABOUT HERE

As we focus on comparisons between closely-won and closely-lost union elections, differences between bond CARs widen, becoming both economically and statistically significant. To illustrate this, we define as "close union losers" those elections in which the vote share for unionization is between 35% and 50% (inclusive), and as "close union winners" those in which the vote share for unionization is between 50% (exclusive) and 65%. Columns (4) and (5) of Table 2 show that the average $CAR(-1,3)$ ($CAR(-1,12)$) of close union winners is –60 (–180) basis points, while the average $CAR(-1,3)$ ($CAR(-1,12)$) of close union losers is only –10 (–60) basis points. To put these numbers in perspective, papers looking at corporate events that directly affect bondholders, such as LBOs (Warga and Welch (1993)) or fire sales driven by downgrades (Ellul et al. (2011)), find CARs of the order of 700 to 870 basis points over periods ranging from 4 to 5 months.

[13]We use the union election date instead of the case closure date by the NLRB as the former date is more widely available for all election events and it is rare that the NLRB later overrules union election outcomes. Regardless of this choice, the NLRB closing date is around 10 days after the election in most cases and using NLRB closing date does not affect our results.

[14]Results are similar if we start the event window from the election month; i.e., $CAR(0,3),...,CAR(0,12)$.

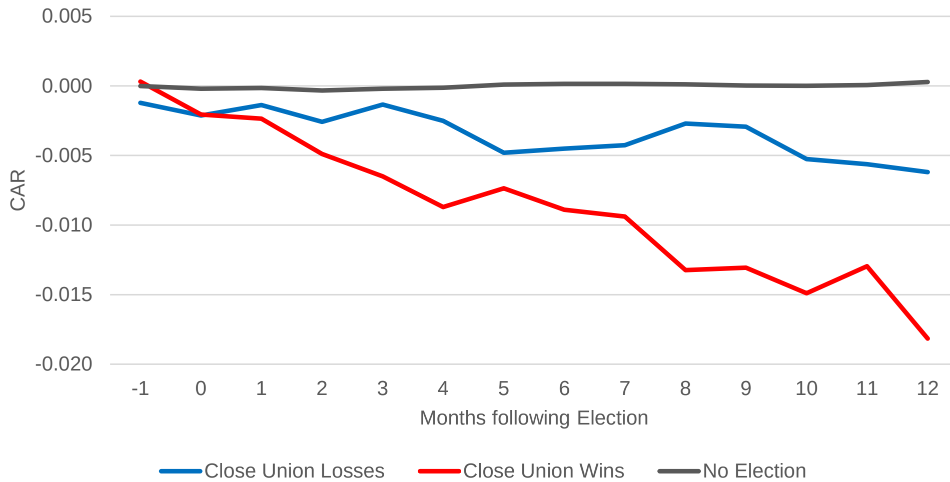


Figure 2. Bond CARs following union elections
This figure shows the evolution of bond CARs of close union winners, close union losers, and firms with no union elections. The red line represents the bond CARs of close union winners, the dashed blue line represents the bond CARs of close union losers, and the grey line represents the bond CARs of firms with no union elections. The number of months following the elections is shown on the horizontal axis.

Figure 2 shows how bond values evolve over the 12 months following union elections. Bond CARs of close union winners decrease much more than those of close union losers. The difference starts to emerge from the first month following the election and continues to increase over the post-election period examined. The patterns depicted are consistent with the results in Table 2, suggesting that the bondholders' value of close union winners gradually declines over the course of a year. Although coarse, these univariate comparisons already point to the negative relation between unionization and unsecured creditors' wealth that we identify below.

3 The Impact of Unionization on Bond Prices

3.1 Test Strategy

There can be several ways for a union to gain legal representation for workers in business establishment. The most common path is through the following process. Union proponents must first file a petition supported by at least 30 percent of workers in the bargaining unit to obtain permission from the NLRB to conduct an election. The NLRB checks the petition's vote support and investigates employers's claims regarding the legitimacy of the petition. The NLRB then schedules the election. The time lag between an initial petition and the vote is usually around seven weeks. Once the election is conducted, a union is formed if over 50 percent of eligible workers vote in favor. Within seven days following the election, parties can file objections to the NLRB regarding election procedures. If the Board rules the election as invalid, it will carry out a rerun (this happens only rarely). If valid, the union is certified to represent the bargaining unit, and the employer is obligated to negotiate with the union in good faith.

We examine the impact of unionization on corporate bonds using a regression discontinuity design (RDD). The RDD approach gauges effects from a "treatment" by identifying a cutoff above or below which a treatment is assigned. The underlying assumption is that for subjects in the vicinity of the cutoff, the treatment assignment is plausibly random ("local randomization"). In our setting, union representation status (the treatment) is determined by whether the vote share for union exceeds 50%. Due to the secret-ballot election mechanism required by law, there is a substantial level of ex-ante uncertainty about election outcomes. For close elections, it is unlikely for voters and other agents to exactly anticipate the election result. The nature of the secret ballot mechanism also makes it difficult for agents to manipulate the vote share around the cutoff. As such, close winners and close losers in union elections are likely to be ex-ante similar. By calculating the differential bond return reactions from close union winners and close losers, one should be able to infer the causal effect of workers' union status on bondholders' wealth.

3.2 Methodology

A simple RDD implementation consists of estimating two separate regressions on each side of the relevant assignment cutoff. One can use those two regression intercepts to compute the change in the outcome variable of interest at the cutoff. Formally, one estimates a polynomial regression model of order p on each side (*left* and *right*) of the cutoff c as follows:

$$Y = \alpha_l + (X - c) \times \beta_{l,1} + (X - c)^2 \times \beta_{l,2} + ... + (X - c)^p \times \beta_{l,p} + \epsilon, \ where \ X \leq c, \tag{5}$$

and

$$Y = \alpha_r + (X - c) \times \beta_{r,1} + (X - c)^2 \times \beta_{r,2} + ... + (X - c)^p \times \beta_{r,p} + \epsilon, \ where \ X > c. \tag{6}$$

In our setting, c is 50% (the cutoff for a union win). Y is bond CAR, X is the union vote share in the election, and ϵ is an error term. Combining the two equations above, we can estimate the following pooled regression:

$$Y = \alpha_l + D \times \tau + \sum_{n=1}^{p} (X - 0.5)^n \times \beta_{l,n} + \sum_{n=1}^{p} (X - 0.5)^n \times D \times (\beta_{r,n} - \beta_{l,n}) + \epsilon, \tag{7}$$

where D is an indicator for union victory that equals 1 if the vote share surpasses 50% and the union wins, and equals 0 if the union loses. The term τ equals $\alpha_r - \alpha_l$, capturing the jump in Y as the vote share just passes 50%. In other words, τ provides an estimate of the causal effect of unionization on corporate bonds' CARs.

Because the polynomial regression approach uses all available data in the estimation, it can achieve greater precision. The tradeoff, however, is that it imposes a particular functional form onto the relation between bond values and vote shares over a wide range of data, including data far away from the cutoff. Critically, strong functional form assumptions admit biases. Thus, we also consider a local linear regression approach, which is a non-parametric estimation using data within a small window h around the assignment cutoff. This approach reduces the potential for biases arising from global functional form assumptions at the cost of reducing statistical power due to the limit imposed on the sample size. Balancing the issues of bias and precision, we use both methods for estimation so as to ensure the reliability of our inferences.

Our local linear regressions can be represented similarly to the polynomial regressions discussed above, where one conveniently estimates the following model:

$$Y = \alpha_l + D \times \tau + (X - 0.5) \times \beta_l + D \times (X - 0.5) \times (\beta_r - \beta_l) + \epsilon, \tag{8}$$

where $0.5 - h \leq X \leq 0.5 + h$, and τ captures the causal effect of unionization on bond CARs.[15] In our local linear regression tests, we estimate models using both rectangular and triangular kernels. Each kernel method has advantages. Imbens and Lemieux (2008) and Lee and Lemieux (2010) recommend using rectangular kernels because they achieve higher efficiency. Fan and Gijbels (1996) and Cheng et al. (1997) show that triangular kernel is boundary-optimal, which is a desirable feature for sharp RDD applications.

3.3 Validity

We examine two necessary conditions to test the validity of our RDD approach: (1) continuity of the distribution of the forcing variable (union vote share) around the assignment cutoff and (2) continuity of other covariates around the cutoff. These two conditions help verify whether union voting serves as a locally randomized assignment.

We first examine whether the distribution of vote share is continuous around the 50% mark. If workers or firms could systematically manipulate vote shares around the 50% cutoff,

[15] The local linear regression is estimated by solving the following kernel-weighted least square problem on each side of the cutoff: $min_{\alpha,\beta} \sum_i (Y_i - \alpha - \beta(X_i - c))^2 K(\frac{X_i - c}{h})$, where K is a kernel and h is the bandwidth.

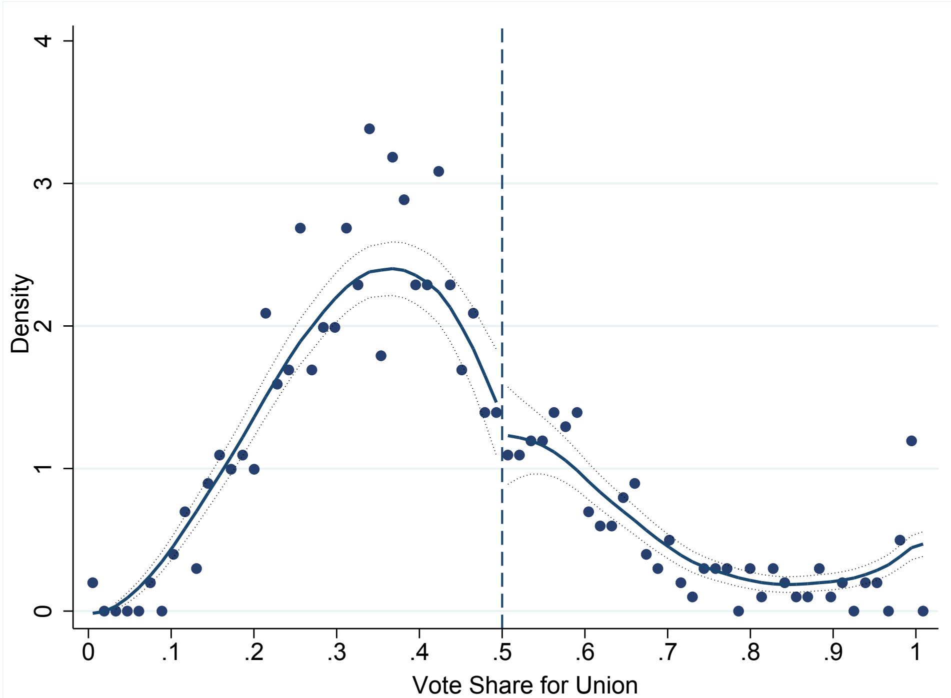


Figure 3. Density distribution of the vote share for union
This figure shows the density distribution of vote shares for union following McCrary (2008). The horizontal axis represents the percentage of votes in favor of unionization and the vertical axis represents the associated distribution density. The dots correspond to the observed density. The solid lines show the local linear density estimate of vote share for union (90% confidence intervals are displayed).

we should expect to see markedly different vote shares densities just above or just below that point. One could also be concerned that workers only call for a vote when they anticipate a union win (even if marginal). In that case, we could see an upward jump in the union vote share distribution density after the 50% mark. To formally test the continuity of vote distribution, we follow the methodology proposed by McCrary (2008). It consists of a local linear regression combined with a Wald test to detect jumps in the marginal density of the forcing variable around the treatment assignment cutoff.[16] If there is a jump in the density of vote shares at the 50% threshold, the treatment is likely to be unsuitable for RDD estimation.

Figure 3 plots the distribution of vote share for union. The dots represent the average observed distribution density for each bin for union vote share. The solid line represents the fitted distribution density function from local linear regressions (90% confidence intervals are also

[16]Formally, McCrary (2008) shows that the log difference between the density on the left and right sides of the cutoff $ln\hat{f}^r - ln\hat{f}^l$ follows an asymptotic normal distribution. The density $\hat{f}(p)$ at each point p is estimated as ϕ_1, where $\{\phi_1, \phi_2\}$ minimize the average distance to the observed density through a kernal smoothing function: $L(\phi_1, \phi_2, p) = \sum_{j=1}^{J}\{Y_j - \phi_1 - \phi_2(X_j - p)\}^2 K((X_j - p)/h)\{1(X_j > c)1(p \geq c) + 1(X_j < c)1(p < c)\}$, where $K(\cdot)$ is a triangle kernel function; X_j is the midpoint of bin j; and Y_j is the observed density of bin j.

shown). The graph displays continuity in the vote share distribution around the 50% cutoff, with a large overlap between the confidence intervals of density function on both sides of the cutoff. Consistent with the visual evidence, the Wald test shows that the distribution density of vote shares on two sides of the cutoff has a log difference of –0.09, with a standard error of 0.26. This estimate implies that in our sample of 721 elections, we can expect 15 closely-lost elections with vote share between 48.4% and 50%, and 14 close wins with vote share between 50% and 51.6%.[17] This difference is economically small and statistically insignificant.

We next examine whether predetermined firm-level covariates are continuous around the 50% vote share cutoff. If there is an abrupt change in observable covariates around the cutoff, we cannot safely attribute the difference in bond values around the cutoff to unionization, as it might result from the changes in those covariates. Importantly, discontinuity of firm characteristics around the 50% cutoff may indicate that firms on the left side of the cutoff are systematically different from those on the right side of the cutoff, and should not be used as controls.

We test the assumption of continuity in firm-level covariates using local linear regressions under the RDD framework around the 50% vote share cutoff. We focus on firm characteristics that are relevant to bond valuation, including firm fundamental information given by *ROA*, *Size*, *B/M*, *Liability Ratio*, *Cash*, and measures of credit risk such as *Z-score*, *O-score*, and *Distance-Default*. Table 3 shows the estimation results for these firm-level covariates using rectangular kernel and Imbens and Kalyanaraman's (2012) optimal bandwidths.[18]

Table 3 About Here

The estimates in Table 3 do not point to any measurable changes in covariate values around the union election cutoff. We do not find evidence that close winners and close losers in union elections are different in relevant observable characteristics.

3.4 Graphical Analysis

We first use graphical analysis to identify the relation between vote shares for union and bond value changes following union elections. We divide the vote share into bins, calculating the conditional mean of the bond CAR corresponding to each bin. We then fit bond CARs on

[17] The bin size is 1.6%. Within the interval of (48.4%, 51.6%] around the cutoff, there is a probability of 2.1% (= 15/721) that an election is a close loss, and a probability of 1.9% that it is a close win. The –0.09 estimate represents the change in these probabilities $2.1\% \times (1 - 0.09) = 1.9\%$.

[18] The results are robust to using triangular kernel or varying bandwidths. We obtain similar results using the polynomial regression approach. Those results are omitted for brevity but are readily available from the authors.

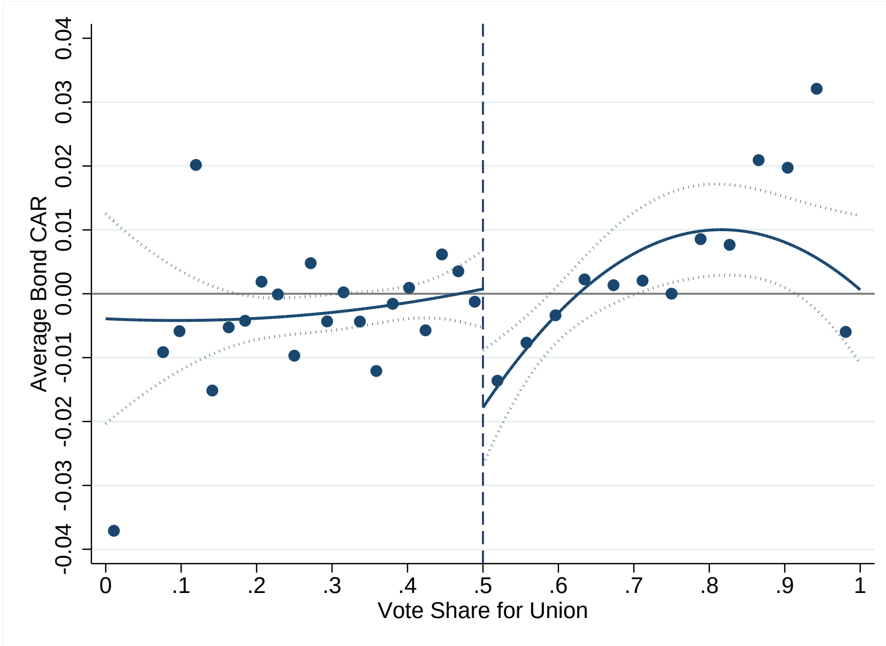


Figure 4. Bond CARs following election
This figure shows the bond CARs over 3 months following elections against the vote share for union. The horizontal axis represents the vote share for union, and the vertical axis represents the bond CAR. The dots are CAR conditional means for each bin for union vote share. The solid lines represent the fitted quadratic polynomial function, estimated separately for union loss and union victory cases (below and above 50% vote share). The dotted lines represent the 90% confidence intervals of the polynomial estimation.

each side of the cutoff as separate quadratic functions of vote shares. We plot the average bond CAR against the midpoint of each bin. Figure 4 graphs the relation between bond $CAR(-1, 3)$ and vote share for union. The solid lines depict bond CARs as fitted functions of vote shares; the dotted lines show 90% confidence intervals for those functions.

Figure 4 shows a distinct drop in bond CARs from the left side to the right side of the 50% cutoff, with non-overlapping confidence intervals. Bond CARs for close union winners decline over 180 basis points during the 3-month window following the election, while close losers CARs are nearly 0 during the same event window.

3.5 Estimation Results

We consider multiple event windows to gauge the dynamics of the change in bond values. Starting from one month prior to the election time, we examine the effect of unionization on the bond returns accumulated through 3, 6, 9, and 12 months following the election. The gains from looking as far as a one-year horizon are two-fold. First, the effect of unionization on corporate securities can be hard to assess in the short run (Lee and Mas (2012)). Second, the lack of liquidity in bond markets is shown to prevent prices from reflecting information in the short run (Bao et al. (2011)).

3.5.1 Polynomial Regressions

Table 4 shows the results from polynomial regressions. For every return window, we report results in stages. We first regress bond CARs on a union victory dummy (*Union Victory*), which equals one if the union wins the election, and zero otherwise. We then add to the specification the vote share for the union (*Vote Share for Union*), thus controlling for a linear relation between bond values and the level of support for union. Finally, we allow for nonlinear functional relations by adding higher order terms of vote share. Specifically, we add up to 4^{th}-order terms of vote share as well as the interaction between union victory dummy with these higher-order terms, allowing for different polynomial relations for victory and losing elections.[19]

Column (1) reports regression results for bond $CAR(-1,3)$ on a dummy variable indicating whether the union wins the representation election. The coefficient on the union victory dummy is insignificantly different from zero, indicating that the average abnormal bond returns that follow union victories are not different from the returns following union losses. Column (2) reports results accounting for a linear effect of vote shares on bond returns. The coefficient on the union victory dummy gains in magnitude and significance. Column (3) reports results when we allow for nonlinear relations between bond returns and vote shares. The union victory dummy attracts an economically and statistically significant coefficient. The estimate indicates that, following union elections, the bond prices of near-winner firms decrease 250 basis points *more* than the bond prices of near-losers.

<u>TABLE 4 ABOUT HERE</u>

Columns (4) through (12) repeat the analyses in columns (1) through (3), examining the bond abnormal returns accumulated over longer event windows. Columns (6) and (9) show that unionization is associated with a 250 (480)-basis-points decline in bond prices over the 6 (9) months following a union's victory. Column (12) shows that, over the 12-month post-election window, the bond prices for near-win elections drop 600 basis points more than the bond prices associated with near-loss elections.

Importantly, the union-led declines in bond values that we identify are statistically and economically significant. The estimates imply that our sample bond investors lose, on average, $7

[19]Our inferences are insensitive to the choices of the order of the polynomial function.

million over merely 90 days following union elections. The magnitude of those losses increases with the increase of the event window, reaching \$17 million one year after the election.[20]

3.5.2 Local Linear Regressions

We employ local linear regressions to complement and verify the results returned from polynomial models. We use both rectangular and triangular kernels for estimation. We also consider several data bandwidths in our tests. In particular, we follow Imbens and Kalyanaraman (2012) and use the optimal bandwidth that minimizes the estimation errors over the entire data range. For robustness, we also report results based on 75% and 125% of their optimal bandwidth.[21]

Table 5 shows the results from local linear estimations using several different combinations of data bandwidths and kernel methods. Panel A (Panel B) shows the results from rectangular (triangular) kernel estimations. The test yields statistically and economically similar results across all specifications. The estimates suggest that unionization leads to significant declines in bond values over all event windows. Bondholders of close union winners suffer, on average, a 210-basis-points larger decline in bond values over the 3 months following elections than the bondholders of close losers. The effect is magnified as we increase the event window. Over the 12-month post-election window, bondholders of close union winners observe their bonds drop by 470–500 basis points more than bondholders of close losers. The magnitudes of these estimates are economically similar to those from polynomial regressions models.

<u>TABLE 5 ABOUT HERE</u>

The results from Tables 4 and 5 show that union victories in workers' representation elections lead to considerable bond price declines. The value impact we measure is statistically significant and economically meaningful, with effects persisting for several months after the union vote. Unionization bears detrimental, lasting effects to unsecured creditors' wealth.

[20] Given our sample firms have, on average, \$288 million in bond outstanding, one can estimate that close winners incur a \$288 $\times$ 0.025 = \$7 million greater loss in bond value during the 3-month window following union elections. Similarly, they are expected to observe a \$17 million greater loss during the 12-month window (= \$288 $\times$ 0.06).

[21] The choice of bandwidth involves the standard tradeoff between precision and bias. A wider bandwidth improves precision by using more observations, but may admit biases as the function form may change over a larger interval. Using a narrower bandwidth yields less bias, but reduces estimation precision.

4 Mechanisms

While we have shown that unionization affects bond values, we have not shown whether this effect comes from the changes in bankruptcy likelihood or bankruptcy costs (or both). To gauge the effect of unionization on bankruptcy likelihood, we track the evolution of firm performance and financial health for several years after union elections, comparing close winners and close losers over time. To gauge the effect of unionization on bankruptcy costs, we gather information on bankruptcy proceedings and examine whether unionized firms experience longer, costlier bankruptcies.

4.1 Unionization and Bankruptcy Likelihood

For every firm in which an election takes place, we compute performance measures such as return on assets, book to market ratio, firm size, stock return volatility, liability ratio, cash, tangibility, Z-score, O-score, and distance to default. For benchmarking, we subtract industry medians from each of these variables (3-digit SIC categorization). We then track the evolution of these industry-adjusted measures for up to 5 years following the election year. Finally, we use local linear regressions to test whether the changes in performance measures are different for close union election winners than for close losers.

Table 6 reports RDD estimates associated with close union victories on each of the industry-adjusted metrics we consider. Panel A (Panel B) shows the results from rectangular (triangular) kernel estimations from 1- to 5-year windows following union elections. The coefficient for union victory is rarely significant, indicating that close union winners and losers experience similar post-election performance. If anything, close union winners show slightly better performance and lower liability ratios than close union losers following elections.

TABLE 6 ABOUT HERE

The lack of performance deterioration for the union winning firms within 5 years following the election could indicate that the effect of unionization may only materialize in the longer term (more than 5 years). If this is the case, bonds that mature within 5 years following the election should not be affected by unionization. We investigate this possibility by examining whether bonds with less than 5 years to maturity at the election year experience any difference in returns across close winners and close losers. Table 7 repeats the RDD analyses of Table 5 for the subsample of bonds with less than 5 year to maturity; a total of 760 bonds associated

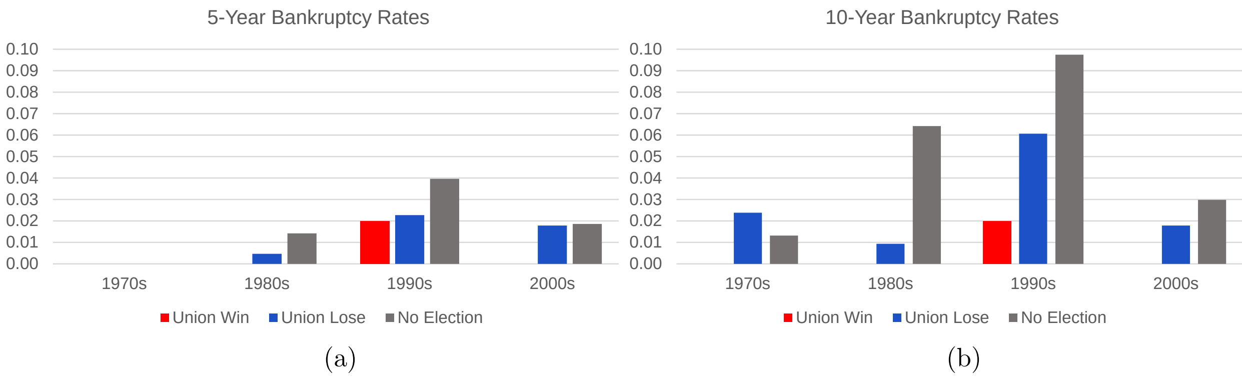


Figure 5. Bankruptcy rates following elections
This figure shows the actual bankruptcy rates for union election winners, losers, and matched firms with no union elections. The red columns represent the subsequent bankruptcy rates following elections for union winners, the blue columns represent the bankruptcy rates for firms without elections. Panel (a) shows firms' bankruptcy rates within 5 years following their elections. Panel (b) shows firms' bankruptcy rates within 10 years following their elections.

with 416 election events. Even for this sample we find that close union winners experience steeper declines in bond prices. In other words, shorter-term bond values decline in the aftermath of unionization even though there is no evidence that unionization will affect the odds the firm will go bankrupt in the short term. The value estimates are statistically significant, yet sensibly smaller in magnitude compared to those from the full sample analyses.

<u>Table 7 About Here</u>

The results from Table 7 rule out the argument that unionization only affects corporate bond prices in the long term (more than 5 years after the union election). At the same time, the results from Table 6 suggest that unionization has no measurable influence over a firm's probability of default. To verify this claim in the data, we look at *de facto* 5-year and 10-year bankruptcy rates of sample following union elections. Figure 5 compares these bankruptcy rates for union election winners and losers. The red columns represent the post-election bankruptcy rates for union winners and the blue columns represent the post-election bankruptcy rates for union losers. For benchmarking, the grey columns represent the bankruptcy rates for firms that operate in the same industries as the losing firms, who have bonds outstanding, yet have not hosted an election during the election year of losing firms. We compare the bankruptcy likelihood of firms who hold union elections during each decade. Panel A (Panel B) compares the bankruptcy rates for these firms during a 5-year (10-year) post-election period.

The patterns in Figure 5 suggest that union winners do not experience higher bankruptcy rates than union losers or firms that have not hosted an election. If anything, bankruptcy rates are lower for union-win firms. A natural inference from these results is that the decline in bond value following elections is likely caused by the costs associated with bankruptcy, conditional on that event. We study this mechanism in turn.

4.2 Unionization and Bankruptcy Costs

We gather information on Chapter 11 bankruptcy cases from the UCLA-LoPucki Bankruptcy Research Database. This database contains detailed records of petitions filed in U.S. Bankruptcy Courts since 1979. We examine in-court costs incurred during bankruptcy from several margins.

4.2.1 Bankruptcy Duration, Refinancing, Emergence, and Refiling

First, we examine whether unionization is associated with more prolonged, convoluted bankruptcy proceedings. LoPucki and Doherty (2011) show that the duration of bankruptcy cases is one of the most important determinants of legal fees and expenses. To study whether unions prolong the bankruptcy process, we compute the log of the number of days between the Chapter 11 filing date and the legal ending date of the case (*Duration*).[22] We regress *Duration* on a unionization dummy (*Union*) that equals one if the company has unionized workers prior to bankruptcy and zero otherwise. We further control for other variables that may be related to bankruptcy processing time, such as firm size, liability ratios, cash, and asset tangibility, as well as the performance before bankruptcy. Due to the limited sample size and the uneven time lag between election and bankruptcy across firms, we adopt a simple regression approach with year-fixed effects. Column (1) of Table 8 shows the results. *Union* attracts a significant and positive coefficient, suggesting that unionized firms tend to experience a bankruptcy process that is 21% (around 109 days) longer than other firms with similar characteristics.

TABLE 8 ABOUT HERE

Next, we examine whether unionization is associated with a higher likelihood of the firm obtaining debtor-in-possession (DIP) financing during the bankruptcy process. DIP financing refers to the loans extended to firms under Chapter 11 protection. These loans generally have priority over all other debt issued by a company prior to bankruptcy, side-stepping absolute priority rules (see Dahiya et al. (2003) and Chatterjee et al. (2004)). Labor unions are likely

[22] The end of a Chapter 11 case can be the confirmation of a reorganization plan by the judge, the conversion to Chapter 7 liquidation, or dismissal by the court, whichever is applicable.

to be in favor of DIP financing as it enables firms to continue operating during bankruptcy, and even emerge from bankruptcy. DIP-financed firms often face very high debt levels when they emerge, and pre-existing bondholders are wary of DIP financing since, in the emerged entity, DIP financiers receive a higher seniority.[23]

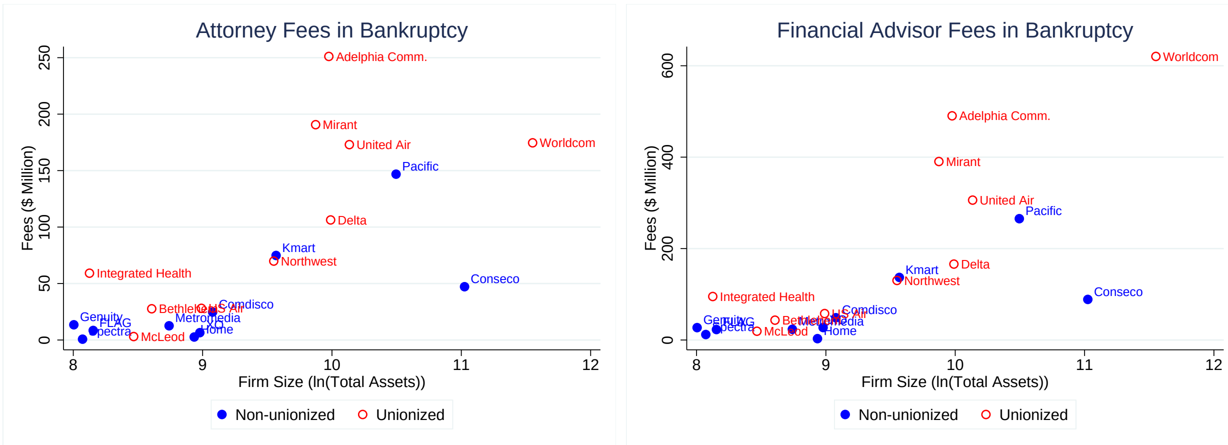
To examine the relation between unionization and DIP financing, we define an indicator variable *DIP* that equals one if the firm receives DIP financing in bankruptcy and zero otherwise. We employ logistic regressions and regress *DIP* on *Union*, controlling for firm characteristics and year-fixed effects. Column (2) of Table 8 reports the results from this test. The estimated marginal effect suggests that, compared to their non-unionized counterparts, unionized firms are 19% more likely to obtain DIP financing during bankruptcy. This result is both statistically and economically significant, indicating that unionized firms are more likely to participate in refinancing maneuvers that reduce bondholders' priority claim over firms' assets in bankruptcy court.

Finally, we examine whether unionization is associated with a higher likelihood of the firm emerging from bankruptcy and refiling for bankruptcy again after emergence. If unionization leads to inefficient reorganization processes, we may observe more occurrences of firms emerging from Chapter 11, yet falling back into bankruptcy afterwards. To test this conjecture, we construct an indicator for a firm emerging from Chapter 11 bankruptcy (*Emergence*) and an indicator for the firm refiling for bankruptcy after emergence (*Refiling*). We repeat the analysis for DIP financing, regressing the indicators *Emergence* and *Refiling* on the unionization dummy *Union* in a logistic model. Columns (3) and (4) of Table 8 report the results. The marginal effects indicate that unionized firms are 14% more likely to emerge from Chapter 11 than non-unionized firms. After emergence, however, unionized firms are 6% more likely to refile for bankruptcy.

4.2.2 Bankruptcy Fees and Expenses

The LoPucki database provides extensive information on court fees and expenses related to 102 of the largest bankruptcy cases of in the U.S. between 1998 and 2007. To provide an intuitive cost comparison between unionized and non-unionized bankruptcies, we rank firms by total assets and identify the 10 largest unionized and the 10 largest non-unionized firms in our sample. We then plot the fees and expenses these 20 firms paid to attorneys and financial advisors during bankruptcy. Figure 6 displays the relevant expenses, with the red hollow dots

[23]During Brookstone's bankruptcy process, bondholders vehemently argued that DIP financing undercut the value of their bonds. See "Brookstone in Deal with Vendors as Bondholders Clash," *Wall Street Journal.*



(a) (b)

Figure 6. Fees and expenses in bankruptcy for unionized and non-unionized firms
This figure shows the fees and expenses paid in bankruptcy by the 10 largest unionized firms (Integrated Health Services, McLeodUSA, Bethlehem Steel Corp., US Airways, Northwest Airlines, Mirant Corp., Adelphia Communications, Delta Air Lines, United Airlines, Worldcom) and 10 largest non-unionized firms (Genuity, SpectraSite Holdings, FLAG Telecom Holdings, Metromedia Fiber Network, Home Holdings, XO Communications, Comdisco, Kmart, Pacific Gas & Electric, Conseco) in our sample. The red hollow dots indicate firms that are unionized, while the blue solid dots indicate firms that are not. Panel (a) shows the fees and expenses paid to attorneys during bankruptcy. Panel (b) shows the fees and expenses paid to financial advisors during bankruptcy. Firms' size before bankruptcy (measured by $ln(Total\ Assets)$) is shown on the horizontal axis.

indicating unionized firms and the blue solid dots indicating non-unionized firms. The figure makes it clear that unionized firms pay much higher fees to (both) attorneys and financial advisors during bankruptcy relative to non-unionized firms of comparable sizes.

Formally, we test how unions affect the costs incurred during bankruptcy across the following dimensions: (1) total fees and expenses paid in court, (2) fees paid to attorneys, (3) the number of professional firms hired during the bankruptcy process, and (4) fees paid to creditors committees' attorneys. We do so by regressing the log amount of these court costs on a dummy variable that indicates whether firms' workers have union representation prior to bankruptcy (*Union*). Our regression models also control for firm characteristics, such as return on assets, size, liability, cash, and asset tangibility, also including year-fixed effects.

The results from Table 9 point to a consistent pattern across all dimensions of in-court bankruptcy costs. Unionized firms pay, on average, $18 million (57%) more overall expenses and $10 million (61%) more to attorneys than non-unionized firms. They also hire 4 (25%) more professionals during the bankruptcy process. Finally, unionized firms are likely to pay $1.4 million (53%) more to the attorneys of creditors' committee. Simply put, bankruptcy is

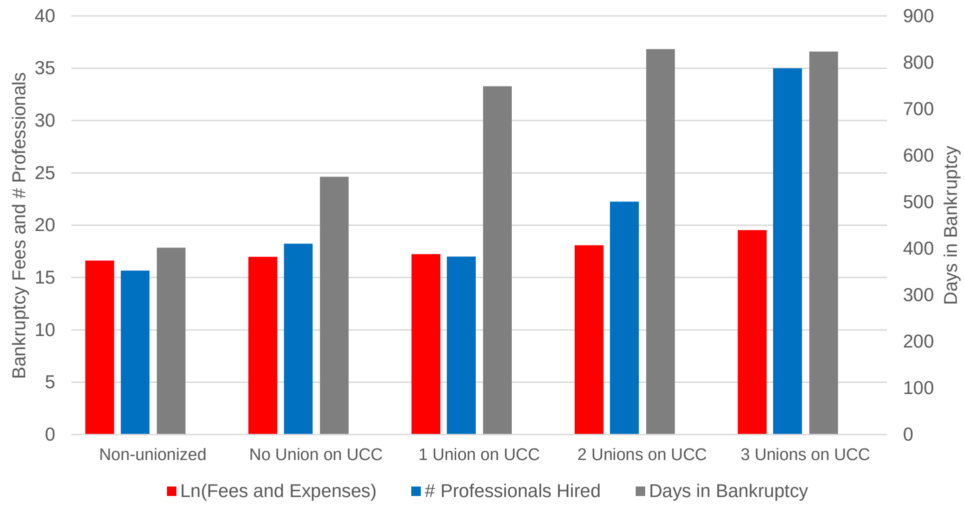


Figure 7. Bankruptcy costs and unions' participation in creditors' committee
This figure shows the relation between bankruptcy costs associated and unions' involvement in the unsecured creditors' committee (UCC). The grey column shows the log of total fees and expenses spent in bankruptcy, the blue column shows the number of professional firms hired during bankruptcy, and the red column shows the number of days the bankruptcy procedure takes. The left vertical axis shows the log amount of bankruptcy fees and the number of professionals hired during bankruptcy, and the right vertical axis shows the number of days in bankruptcy.

far more costly for unionized firms than for comparable non-unionized firms.

TABLE 9 ABOUT HERE

4.2.3 The Presence of Unions in Unsecured Creditors' Committees

The results in Tables 8 and 9 show that unions can significantly increase the costs firms incur in bankruptcy court. Anecdotal evidence suggests that one way unions can do so is by using the power they gain when they are assigned seats in unsecured creditors' committee (UCCs). To investigate this claim, we collect data on UCCs. We resort to bankruptcydata.com, a database that contains a wide range of financial details concerning bankruptcy proceedings. Focusing on our sample of unionized firms in bankruptcy, we find matches for 228 cases. A total of 146 cases have available UCC information, with 49 showing unions sitting on their UCC. We combine this information with our measures of bankruptcy costs and analyze the relation between unions' seat assignments in UCCs and bankruptcy proceedings.

Figure 7 illustrates these relations. Bearing in mind the small sample size, the figure reveals a striking pattern. When a union is assigned a seat in the UCC by the judge, the firm spends more money with court fees and expenses, hire more professional firms, and go through more prolonged bankruptcy proceedings. More interestingly, these costs are accentuated as more

UCC seats are assigned to unions. Firms with only one union on UCC experience, on average, 748 days in bankruptcy and hire 17 professional firms. With three unions on the committee, however, a firm is expected to spend 823 days in bankruptcy and hire 35 professionals.

Taken altogether, the analyses of this section show that unionization does not lead to deterioration in firm performance or an increase in default risk. Notably, however, unionization is associated with prolonged bankruptcy processes, repeated bankruptcy filings, and significantly higher costs incurred in bankruptcy court, all of which have adverse impact on unsecured creditors' claims. Our results suggest that unionization is likely to affect bond value by increasing bankruptcy costs, rather by increasing the likelihood of bankruptcy.

4.3 Heterogeneity

4.3.1 Firm Characteristics

We exploit cross-sectional variation in firm characteristics to verify the argument that unionization affects bondholders through bankruptcy costs. Bond values reflect the product of default likelihood and bankruptcy costs. If unionization reduces bond values by increasing bankruptcy costs, this impact should be stronger when firms are more likely to go bankrupt in the first place. In other words, as the threat of bankruptcy looms, bondholders should become increasingly concerned about the cost impact of unionization.

To examine this conjecture, we partition our sample into financially-distressed and financially-healthy firms, conducting RDD analyses on bond CARs for each subsample. We expect the marginal impact of unionization on bond values to be stronger for distressed firms than for healthy firms. We use several measures of financial distress to conduct this comparison. First, we partition the sample according to Altman's Z-score, identifying a subsample of distressed (healthy) firms whose Z-scores are below 1.8 (above 3). Using Ohlson's O-score, we assign firms with O-scores above (below) 0.5 to the distressed (healthy) subsample. Based on Merton's distance to default, we assign firms in the bottom (top) quintile of our *Distance-Default* proxy to the distressed (healthy) subsample. Finally, we partition the sample firms according to credit ratings provided by Moody's and classify as distressed (healthy) those firms with speculative grade (investment grade) credit ratings.

Table 10 reports union near-wins RDD estimates for financially-distressed and financially-healthy firms. Across virtually all measures of distress, unionization has a large, highly-significant impact on the bonds of distressed firms, but only a small, insignificant impact on the bonds of healthy firms. Results in Panel A show that close union winners with low

Z-scores lose 780 basis points over the course of 3 months following the union election. In contrast, close winners with high Z-scores only lose 90 basis points, which is insignificantly different from zero. Similarly, close winners with speculative ratings suffer a drop of 620 (1,520) basis points in bond values over 3 (12) months following the election, while close winners with investment ratings observe only a 110 (180)-basis-point drop.

TABLE 10 ABOUT HERE

The estimates in Table 10 generate economically sensible magnitude for union-induced bankruptcy costs. The results support the argument that the effect of unionization largely stems from increased bankruptcy costs, and suggest that unionization has a far stronger effect on bondholders' wealth when the firm is facing a high risk of default.

4.3.2 Union Characteristics

An important argument underlying our story is that unionization increases the collective bargaining power of workers, ultimately affecting bondholders. To examine this claim, we explore regional variation in the power of the union movement. In particular, we take advantage of state-level right-to-work (RTW) laws that alter unions' bargaining position. RTW laws allow employees who are not union members to enjoy the benefits of unions without paying dues. Research shows that RTW laws reduce unions' resources, limiting their powers (see, e.g., Ellwood and Fine (1987), Holmes (1998), and Matsa (2010)).[24] We conjecture that in RTW-law states unionization is likely to increase labor's bargaining power to a lesser extent than in states without RTW laws. We exploit this wrinkle to test if unionization has differential effects on bond prices according to whether the state in which the firm is incorporated has passed a RTW law.

We partition our sample of union elections into two subsamples. One consists of 266 elections taking place in states that have passed RTW laws when a union vote takes place. The other consists of 455 elections in states that have not passed those laws. Despite the size difference, the two subsamples have similar rates of union victory and similar vote share distributions (insignificantly different according to Kolmogorov-Smirnov distribution tests). We also find that the continuity conditions necessary to conduct our RDD tests hold across both RTW and non-RTW law states.

Table 11 shows the RDD results. In states that have not passed RTW laws, unionization

[24]Eren and Ozbeklik (2011) report that union membership declined by nearly 15% after Oklahoma adopted RTW laws.

has a large and significant impact on bond values. Relative to near losers, bond prices of near winners drop 220 (670) basis points over the 3 (12)-month window following union elections. In states with RTW laws, in contrast, the impact of unionization on bond values is small and insignificantly different from zero.

Table 11 About Here

The estimates in Table 11 imply that the impact of unionization on corporate bond values arises from the increased collective-bargaining power. To wit, the negative impact of unionization on unsecured creditors' wealth in bankruptcy is weakened in states where the legislature has passed laws that undermine the power of unions.

5 Welfare Implications

We have shown that worker unionization brings losses to unsecured creditors. We have also shown that some of those losses are associated with costs arising from court proceedings involved with the bankruptcy process. It is important that we put those two values (total bond losses and court costs) into perspective, fleshing out magnitudes and assessing the consequences they bring to workers and creditors. Notably, the bankruptcy process allows — even if only temporarily — for workers to continue receiving wages and enjoying benefits. This can be seen as a wealth transfer amongst corporate stakeholders. This welfare effect stands in contrast to transfers from firm insiders to outside parties, such as attorneys, financial advisors, and other professionals involved in court litigation. While it is difficult to compare these two types of wealth effects, our setting and results allow for a back-of-the-envelope calculation that helps tease out some of the magnitudes involved.

We start by calculating the total value loss to bondholders that is caused by unionization. Given that the effect of unionization deepens according to firms' distress levels (see Section 4.3.1), we partition our sample into two distress subsamples (based on firms' Z-scores) and calculate bondholder losses separately for each subsample. For example, among financially-distressed firms (whose Z-score ≤ 1.8), a close union winner experiences a 1,500-basis-point decline in bond values over the 12-month period following the union election (cf. Table 10). Given that the average distressed firm in our sample has $1,373 million in bonds outstanding, this estimate translates to an average of $206 million total value loss for bondholders. Analogously, we estimate that, in the 12-month period following union elections, bondholders of financially-healthy firms (Z-score > 3) experience a \$20 million drop in their value of their claims.

Next, we estimate bondholders' losses that arise from the increases in court costs attributable to unionization. Estimates of direct bankruptcy costs range from as low as 2.8% (Weiss (1990)) to 6% (Altman (1984)) of firms' total asset values. Given that firms are large in our sample, we choose a conservative estimate of 2.8% following Weiss (1990). The estimations in Table 9 suggest that unionization is associated with 57.5% higher bankruptcy costs. Accordingly, we take that unionization is associated with a higher bankruptcy cost that is equivalent to 1.6% of a firm's total asset value (= 57.5% × 2.8%). The average distressed firm in our sample has a total asset value of \$34.3 billion, thus we estimate that bankruptcy is likely to cost \$548 million more if the firm is unionized (= 1.6% × \$34.3 billion). Finally, we estimate default probabilities according to firms' credit ratings, and we employ two measures of default probabilities. We first use the risk-neutral default probability estimated by Almeida and Philippon (2007), who account for investors' risk preference and suggest a default probability that is higher than historical occurrences.[25] We also use the historical default probability estimated by Moody's (cf. Canter et al. (2007)). Given that our sample of distressed firms have an average credit rating of Ba1, they have a risk-neutral default probability of 39% and a historical default probability of 10%.

Only half of the firms that file for bankruptcy will go into Chapter 11 (Graham et al. (2014)), we thus estimate an expected explicit bankruptcy costs to be \$107 million (548 × 39% × 50%)) according to risk-neutral probability, which is a significant fraction of the \$206 million total bondholder losses as a result of worker unionization. However, not accounting for investors' risk preferences, we estimate that the expected bankruptcy costs to be only \$28 million, a much less substantial amount. Similar calculation implies that, for financially-healthy firms, unionization is associated with a \$10 million (risk-neutral probability) or a \$0.35 million (historical probability) increase in expected bankruptcy costs.

Figure 8 depicts the results of our calculations, with the blue bars indicating bondholders' total value losses from unionization, the red bars indicating the increases in bankruptcy costs due to unionization according to risk-neutral estimation, and the grey bars indicating the

[25] Risk-neutral measures take into account investors' disutility when defaults happen in low consumption states. It correctly prices an Arrow-Debreu security that pays off \$1 in difference states of the world. As corporations are more likely to default in bad economic times, defaultable bond prices will be more heavily discounted compared to their actual historical default rates (Almeida and Philippon (2007)). In other words, risk-neutral default probabilities are higher than historical probabilities so that the securities are correctly priced.

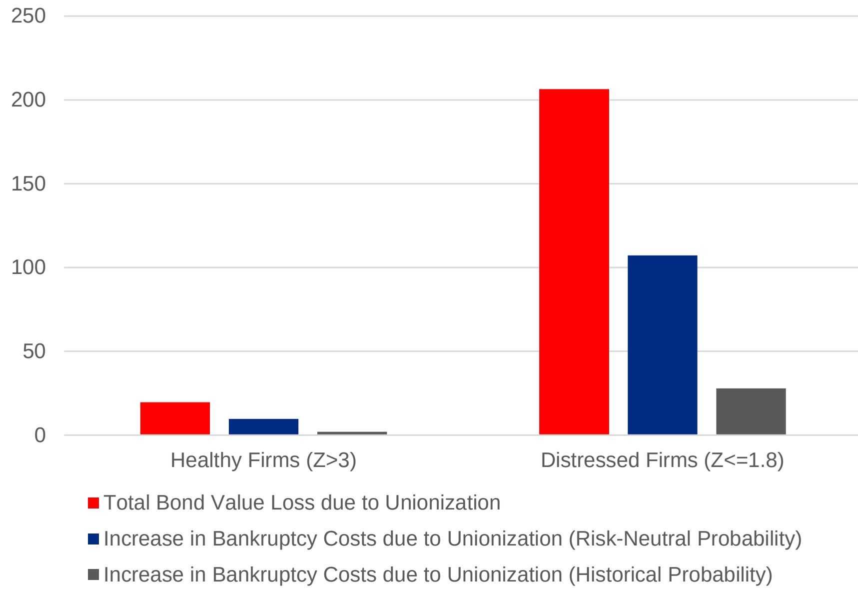


Figure 8. Decomposition of value losses to bondholders
This figure analyzes the average value loss to bondholders for firms in different distress categories (in $ millions). The blue columns represent the estimated total value loss to bondholders due to unionization in the 12 months following union elections. The red columns represent the increases in expected bankruptcy costs that are related to unionization, calculated using risk-neutral probabilities of default. The grey columns represent increases in expected bankruptcy costs calculated with historical default probabilities.

increases in bankruptcy costs according to historical default probabilities. Our estimation suggests that both the total bond value losses and the increases in bankruptcy costs from unionization are aggravated by firms' financial distress. Notably, around half of bondholders' value loss arises from the increase in the expected bankruptcy costs. The estimates presented suggest that a large proportion of the value loss observed by the bondholders of distressed firms is not transferred to workers in bankruptcy, but instead dissipated through the court process.

6 Concluding Remarks

Using a comprehensive sample of union elections spanning four decades, we study the effects of unionization on bond values using a regression discontinuity design. We find that union victories lead to significant declines in bond prices. A baseline estimation suggests that the bond values of close union winners drop by 250 basis points more than the bond values of close losers over 3 months following the election. This relative decline in bond values persists and increases over time. Over the 12-month post-election window, the bond values of close union winners observe 600 basis points steeper losses compared to close union losers. As we investigate channels through which unionized labor affects bond values, we find that unionization leads to significant increases in bankruptcy costs, yet negligible changes in bankruptcy odds. Indeed, unionization itself does not cause firm performance to deteriorate.

In all, our paper sheds new light on how the bargaining power of labor unions can affect financial stakeholders of the firm, unsecured creditors in particular. We show that unions can make bankruptcy more costly, prolonged, and convoluted by the way unionized workers' rights are assigned under Chapter 11 proceedings. Our study shows that the rights of unions in court are recognized by creditors, who in turn price it into firms' funding costs. The analysis provides insights for researchers and policymakers in understanding how firm–labor relations shape corporate access to credit.

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Appendix A Variable Definitions

Vote Share for Union: The ratio of number of employees in the unit voting for the union to number of employees in the unit eligible to vote. Data source: NLRB

Union Victory: A dummy variable that equals one if the union gains more than half of the votes and obtain the legal representation status and equals zero otherwise. Data source: NLRB

ROA: EBIT/total assets. Data source: Compustat

Size: ln(Total assets). Data source: Compustat

B/M: The ratio of book value of equity to market value of equity. Data source: Compustat and CRSP

Liability Ratio: Total liability/total assets. Data source: Compustat

Cash: The ratio of cash and short-term investments to total assets. Data source: Compustat

Tangibility: The ratio of property, plant, and equipment to total assets. Data source: Compustat

Z-score: 3.3×EBIT/total assets + 1.0×sales/total assets + 1.4×retained earnings/total assets + 1.2×working capital/total assets. Data source: Compustat

O-score: − 1.32 − 0.407×size + 6.03×liability ratio − 1.43×working capital/total assets+ 0.0757×current liabilities/current assets − 1.72X − 2.37×net income/total assets − 1.83×funds from operations/total liabilities + 0.285Y − 0.521×(net income(t) − net income($t-1$))/(|net income(t)| + |net income($t-1$)|), where X is an indicator for total liabilities being larger than total assets, and Y is an indicator for net losses in the past two years. Data source: Compustat

Distance-Default: Distance to default measure as in Bharath and Shumway (2008). *Distance-Default*=$\frac{ln(V/F)+(\mu-0.5\sigma_V^2)T}{\sigma_V\sqrt{T}}$. Data source: Compustata and CRSP

Duration: The log of the number of days from the day on which the bankruptcy case was filed to the day on which the judge signed the order confirming a plan of reorganization or to the day on which the Chapter 11 case was converted to Chapter 7 or dismissed, whichever is applicable. Data source: UCLA-LoPucki Bankruptcy Research Database

Fees and Expenses: The log amount of fees and expenses awarded by the court to bankruptcy case. Data source: UCLA-LoPucki Bankruptcy Research Database

Fees and Expenses to Attorneys: The log amount of fees and expenses awarded to attorneys of the bankruptcy case by the court. Data source: UCLA-LoPucki Bankruptcy Research Database

# of Professional Firms: The log number of professional firms filing fee applications in the bankruptcy case. Data source:UCLA-LoPucki Bankruptcy Research Database

Fees and Expenses to Creditor Committee's Attorney: The log amount of fees and expenses awarded to the Creditor Committee's lead attorney. Data source: UCLA-LoPucki Bankruptcy Research Database

Table 1
Summary statistics
This table provides summary statistics of the variables of interests in our sample, including election information, firm characteristics, and bond statistics. *Election Year* is the year in which the election was held. *ROA*, *Size*, *Liability Ratio*, *Cash*, *Tangibility*, *B/M*, *Z-score*, *O-score*, and *Distance-Default* are based on the information collected during the year of the election. *# Bonds per Firm*, *Bond Maturity* and *Bond Rating* are based on the information during the month of the election. *# Bonds per Firm* is the average number of bonds outstanding for a firm. *Bond Maturity* measures the time to maturity for a bond. *Bond Rating* is the Moody's credit rating on the bonds. When a firm has multiple bonds, we use a simple average to measure a firm's *Bond Maturity* and *Bond Rating*. The sample period is from 1977 to 2010.

	N	Mean	Std. Dev.	Median	5 Pct.	95 Pct.
Election Year	721	1990.03	9.45	1989	1978	2007
# Valid Votes	721	232.877	633.132	118	55	756
Vote Share for Union	721	0.414	0.187	0.384	0.165	0.800
ROA	698	0.090	0.045	0.085	0.025	0.166
Size	703	8.829	1.207	8.862	6.761	10.609
B/M	673	0.770	0.497	0.670	0.193	1.669
Liability Ratio	703	0.662	0.179	0.633	0.457	0.871
Cash	703	0.043	0.043	0.028	0.003	0.132
Tangibility	703	0.407	0.221	0.382	0.230	0.596
Z-score	604	3.586	2.434	3.126	1.371	6.999
O-score	703	–0.921	1.453	–0.988	–2.826	1.205
Distance-Default	673	7.014	3.964	6.568	2.035	14.572
# Bonds per Firm	721	4.08	3.59	3	1	46
Bond Maturity (years remaining)	721	13.21	7.07	12.615	0.71	34.66
Bond Rating (Aaa+=1, Aaa=2,...,C=22)	721	8.21	3.77	8	2	19.67

Table 2
Bond CARs following union elections, event study
This table reports average bond CARs following union elections. $CAR\,(T_1, T_2)$ denotes the cumulative abnormal return from month T_1 to month T_2 relative to the union election month. Column (1) summarizes the average bond CAR for all elections in our sample. Column (2) shows average bond CARs following union victory elections, where unions receive more than 50% of the votes. Column (3) shows average bond CARs following union loss elections; i.e., unions receive 50% or less of the vote. Column (4) shows average CARs following close wins; the vote share for union is between 50% (exclusive) and 65%. Column (5) shows average bond CARs following close losses; the vote share for union is between 35% and 50% (inclusive).

	(1) All Elections	(2) Union Victory	(3) Union Defeat	(4) Close Win	(5) Close Loss
CAR (-1, 3)	–0.002**	–0.002	–0.002*	–0.006**	–0.001
	(0.001)	(0.002)	(0.001)	(0.003)	(0.002)
CAR (-1, 6)	–0.004***	–0.004	–0.004***	–0.009**	–0.005**
	(0.001)	(0.003)	(0.001)	(0.004)	(0.002)
CAR (-1, 9)	–0.006***	–0.009**	–0.005***	–0.013**	–0.003
	(0.002)	(0.004)	(0.002)	(0.005)	(0.003)
CAR (-1, 12)	–0.010***	–0.013***	–0.009***	–0.018***	–0.006**
	(0.002)	(0.004)	(0.002)	(0.007)	(0.003)
Observations	721	180	541	107	245

Table 3
Continuity of firm characteristics
This table reports the results from local linear regressions for firm characteristics in the election year. *Union Victory* is a dummy variable that equals one if a union receives more than 50% of votes and equals zero otherwise. Only the coefficients of *Union Victory* are reported. We use rectangular kernel and the optimal bandwidth defined in Imbens and Kalyanaraman (2012).

	Union Victory Coefficient	Std. Err.	*Z*-statistics	*P*-value
ROA	–0.003	0.012	–0.250	0.801
Size	–0.022	0.363	–0.061	0.952
B/M	–0.157	0.151	–1.039	0.299
Liability Ratio	0.034	0.042	0.809	0.411
Cash	0.006	0.010	0.637	0.524
Tangibility	–0.013	0.038	–0.33	0.740
Z-score	–0.187	0.178	–1.051	0.294
O-score	0.052	0.285	0.182	0.855
Distance-Default	–0.983	0.991	–0.992	0.321

Table 4

Polynomial regression results for bond CARs

This table reports the results from polynomial regression analyses for bond CARs following union elections. *Union Victory* is a dummy variable which equals 1 if the union wins the election and equals 0 if not. *Vote Share for Union* is the percentage share of votes in support of union in the election.

	CAR (–1, 3)			*CAR* (–1, 6)			*CAR* (–1, 9)			*CAR* (–1, 12)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Union Victory	–0.000	–0.007	–0.025**	0.000	–0.003	–0.025*	–0.003	–0.012**	–0.048***	–0.003	–0.016**	–0.060***
	(0.003)	(0.004)	(0.011)	(0.003)	(0.005)	(0.013)	(0.004)	(0.006)	(0.016)	(0.004)	(0.007)	(0.018)
Vote Share for Union		0.018*	0.073		0.011	–0.025		0.027**	0.055		0.038**	0.165
		(0.009)	(0.165)		(0.011)	(0.197)		(0.013)	(0.236)		(0.015)	(0.266)
(Vote Share for Union)^2			–0.024			–0.076			0.334			1.430
			(1.467)			(1.749)			(2.099)			(2.367)
(Vote Share for Union)^3			–2.084			–0.581			0.443			4.437
			(4.856)			(5.791)			(6.950)			(7.837)
(Vote Share for Union)^4			–4.257			–1.345			–0.703			3.822
			(5.294)			(6.313)			(7.576)			(8.543)
Union Victory× *Vote Share for Union*			0.344			0.661*			0.949**			1.032*
			(0.327)			(0.389)			(0.467)			(0.527)
Union Victory× *(Vote Share for Union)*^{2}			–2.995			–4.018			–6.665			–8.965*
			(2.851)			(3.400)			(4.081)			(4.601)
Union Victory× *(Vote Share for Union)*^{3}			11.645			10.757			14.063			12.917
			(9.069)			(10.814)			(12.978)			(14.634)
Union Victory× *(Vote Share for Union)*^{4}			–5.832			–7.085			–10.101			–16.855
			(9.345)			(11.144)			(13.374)			(15.080)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	721	721	721	721	721	721	721	721	721	721	721	721
R-squared	0.129	0.134	0.152	0.161	0.163	0.176	0.167	0.172	0.188	0.153	0.161	0.178

*** p-value<0.01, ** p-value<0.05, * p-value<0.10

Table 5

Local linear regression results for bond CARs

This table reports the results from local linear regression analysis for bond CARs following the NLRB election month. $CAR\,(T_1, T_2)$ denotes the cumulative abnormal return from month T_1 to month T_2 relative to the union election month. We report the coefficient on *Union Victory* for each dependent variable and specification. Panels A presents results based on estimations with rectangular kernels, and panel B presents results based on estimations with triangular kernels.

Panel A: Coefficients of Union Victory (Rectangular Kernel)

	CAR (–1, 3)	*CAR* (–1, 6)	*CAR* (–1, 9)	*CAR* (–1, 12)
Optimal bandwidth	–0.021***	–0.022*	–0.040**	–0.047**
	(0.008)	(0.012)	(0.018)	(0.021)
Observations	370	324	263	295
75% Optimal bandwidth	–0.021**	–0.023*	–0.050**	–0.061**
	(0.009)	(0.013)	(0.022)	(0.025)
Observations	275	239	197	227
125% Optimal bandwidth	–0.018***	–0.021**	–0.036**	–0.043**
	(0.007)	(0.009)	(0.016)	(0.018)
Observations	460	402	335	270

Panel B: Coefficients of Union Victory (Triangular Kernel)

	CAR (–1, 3)	*CAR* (–1, 6)	*CAR* (–1, 9)	*CAR* (–1, 12)
Optimal bandwidth	–0.020***	–0.021*	–0.041**	–0.050**
	(0.008)	(0.011)	(0.018)	(0.022)
Observations	467	405	340	379
75% Optimal bandwidth	–0.022**	–0.02	–0.043**	–0.055**
	(0.009)	(0.013)	(0.021)	(0.026)
Observations	350	298	254	279
125% Optimal bandwidth	–0.018***	–0.020**	–0.038**	–0.044**
	(0.007)	(0.01)	(0.016)	(0.018)
Observations	549	492	429	468

Table 6

Performance changes 5 years following election

This table provides the results on the changes of industry-adjusted performance from local linear regressions. The dependent variables are the changes of firm characteristics related to performance or risk. Only the coefficients of *Union Victory* (standard errors) are reported. We use the optimal bandwidth defined in Imbens and Kalyanaraman (2012) for estimation.

Panel A: Coefficients of Union Victory (Rectangular)

Year	*ROA*	*Size*	*B/M*	*Liability Ratio*	*Cash*	*Tangibility*	*Z-score*	*O-score*	*Distance-Default*
1	–0.003	0.033	–0.062	–0.012	0.001	–0.005	0.000	0.048	1.243
	(0.009)	(0.148)	(0.080)	(0.016)	(0.252)	(0.010)	(0.097)	(0.150)	(0.751)
2	–0.008	–0.053	0.031	–0.025*	–0.001	0.009	–0.185	–0.114	–0.849
	(0.007)	(0.071)	(0.077)	(0.014)	(0.009)	(0.014)	(0.406)	(0.222)	(0.855)
3	0.017**	–0.081	–0.068	0.001	0.001	0.018	–0.081	–0.223	0.474
	(0.007)	(0.090)	(0.076)	(0.021)	(0.008)	(0.022)	(0.495)	(0.245)	(0.914)
4	0.016**	0.020	–0.044	–0.015	0.013	0.016	0.692	–0.221	1.293
	(0.007)	(0.136)	(0.120)	(0.022)	(0.012)	(0.018)	(0.899)	(0.312)	(0.909)
5	0.008	0.076	0.041	0.014	–0.021*	0.019	–0.576	–0.442	0.426
	(0.012)	(0.140)	(0.113)	(0.025)	(0.011)	(0.026)	(0.675)	(0.328)	(0.992)

Panel B: Coefficients of Union Victory (Triangular)

Year	*ROA*	*Size*	*B/M*	*Liability Ratio*	*Cash*	*Tangibility*	*Z-score*	*O-score*	*Distance-Default*
1	–0.006	0.119	–0.059	–0.005	0.002	–0.007	0.132	0.005	1.079
	(0.010)	(0.163)	(0.082)	(0.016)	(0.008)	(0.009)	(0.258)	(0.143)	(0.686)
2	–0.007	–0.053	0.010	–0.033**	0.001	0.008	–0.051	–0.103	–0.416
	(0.007)	(0.069)	(0.073)	(0.014)	(0.009)	(0.014)	(0.377)	(0.217)	(0.820)
3	0.011	–0.053	–0.062	0.003	–0.003	0.022	0.061	–0.321	0.573
	(0.007)	(0.085)	(0.075)	(0.021)	(0.007)	(0.023)	(0.437)	(0.232)	(0.807)
4	0.014*	–0.009	–0.069	–0.018	0.017	0.020	0.435	–0.372	1.029
	(0.007)	(0.131)	(0.119)	(0.020)	(0.012)	(0.019)	(0.597)	(0.281)	(0.796)
5	0.007	0.045	0.032	0.014	–0.019*	0.013	–0.105	–0.463	0.290
	(0.012)	(0.132)	(0.113)	(0.025)	(0.010)	(0.028)	(0.548)	(0.298)	(0.928)

Table 7
Bond CARs for issues maturing within 5 years
This table reports the test results from local linear regressions on the impact of unionizations on bonds matured within 5 years after the election year. Only the coefficients of *Union Victory* (standard errors) are reported. The dependent variable is bond CAR.

Panel A: Coefficients of Union Victory (Rectangular Kernel)

	CAR (–1, 3)	*CAR* (–1, 6)	*CAR* (–1, 9)	*CAR* (–1, 12)
Optimal bandwidth	–0.012*	–0.037***	–0.041***	–0.026*
	(0.007)	(0.013)	(0.015)	(0.015)
Observations	296	191	185	249
75% Optimal bandwidth	–0.017**	–0.039**	–0.048***	–0.038**
	(0.008)	(0.016)	(0.019)	(0.019)
Observations	236	139	132	183
125% Optimal bandwidth	–0.011*	–0.034***	–0.034***	–0.029**
	(0.006)	(0.012)	(0.013)	(0.014)
Observations	344	237	224	288

Panel B: Coefficients of Union Victory (Triangular Kernel)

	CAR (–1, 3)	*CAR* (–1, 6)	*CAR* (–1, 9)	*CAR* (–1, 12)
Optimal bandwidth	–0.014*	–0.036***	–0.042***	–0.033**
	(0.007)	(0.013)	(0.015)	(0.016)
Observations	351	239	228	302
75% Optimal bandwidth	–0.016**	–0.038**	–0.048***	–0.039**
	(0.008)	(0.015)	(0.018)	(0.019)
Observations	283	185	172	237
125% Optimal bandwidth	–0.012*	–0.034***	–0.037***	–0.028*
	(0.006)	(0.012)	(0.013)	(0.015)
Observations	392	287	275	338

Table 8
The impact of unionization on bankruptcy process
This table provides the regression analysis of unionization's impact on bankruptcy's process. *Duration* is defined as the log of the number of days from the bankruptcy filing date to the conclusion of Chapter 11 bankruptcy case. *DIP* is a dummy variable that equals one if a firm obtains Debtor-in-Possession financing during bankruptcy and zero otherwise. *Emergence* is a dummy variable that equals one if the company emerged from bankruptcy and zero otherwise. *Refiling* is a dummy variable that equals one if the emerging company refiled bankruptcy and zero otherwise. *Union* is a dummy variable that equals one if the bankruptcy firm had unionized workers before bankruptcy. Columns (1) presents results from an OLS regression while the rest columns present results from logistic regressions. For each variable, the coefficient (heteroscedasticity-robust standard error) is reported.

	(1)	(2)	(3)	(4)
Dep. Var.	*Duration*	*DIP*	*Emergence*	*Refiling*
Union	0.210**	1.098***	0.753***	0.602**
	(0.096)	(0.373)	(0.241)	(0.301)
ROA	–0.295	0.004	1.050	1.826*
	(0.289)	(1.116)	(0.821)	(1.091)
Size	0.092**	–0.159	0.019	–0.200
	(0.036)	(0.133)	(0.094)	(0.133)
Liability Ratio	–0.335***	–0.286	1.246***	0.757**
	(0.119)	(0.315)	(0.324)	(0.340)
Cash	–0.347	–5.678**	–1.867	–2.566
	(0.535)	(2.486)	(1.195)	(1.892)
Tangibility	–0.234	0.571	0.855*	–0.515
	(0.178)	(0.653)	(0.459)	(0.563)
Year FE	Yes	Yes	Yes	Yes
Observations	512	228	492	487
R-squared	0.175	0.156	0.144	0.182

*** p-value<0.01, ** p-value<0.05, * p-value<0.10

Table 9
The impact of unionization on bankruptcy costs
This table provides results for the difference in fees and expenses during bankruptcy between unionized and non-unionized firms. We compare the following fees and expenses incurred during bankruptcy: (1) the log amount of total fees and expenses awarded by the court to bankruptcy case (*Fees and Expenses*), (2) the log amount of fees and expenses awarded to attorneys of the bankruptcy case by the court (*Fees and Expenses for Attorneys*), (3) the number of professional firms filing fee applications in the bankruptcy case (*# of Professional Firms*) and (4) the log amount of fees and expenses awarded to the creditors' committee's lead attorney (*Fees and Expenses for Creditor Committee's Attorneys*).

	(1) *Fees and Expenses*	(2) *Fees and Expenses for Attorneys*	(3) *# of Professional Firms*	(4) *Fees and Expenses for Creditor Committee's Attorneys*
Union	0.566**	0.614**	0.246*	0.533*
	(0.244)	(0.271)	(0.141)	(0.317)
ROA	–0.966***	–1.066***	–0.722***	–1.269***
	(0.248)	(0.304)	(0.160)	(0.372)
Size	0.722***	0.762***	0.259***	0.718***
	(0.084)	(0.090)	(0.047)	(0.090)
Liability Ratio	–0.477	–0.350	–0.419*	–0.865*
	(0.364)	(0.415)	(0.212)	(0.443)
Cash	1.409	1.875	1.287*	1.975
	(1.199)	(1.379)	(0.723)	(1.679)
Tangibility	–1.098*	–1.669**	–0.584*	–0.963
	(0.591)	(0.706)	(0.320)	(0.758)
Year FE	Yes	Yes	Yes	Yes
Observations	68	68	68	61
R-squared	0.808	0.751	0.612	0.674

*** p-value<0.01, ** p-value<0.05, * p-value<0.10

Table 10
Firm heterogeneity
This table provides RDD results from local linear regressions on the impact of unionization on bond returns for firms with different default risks. Only the coefficients of *Union Victory* are reported. We examine subsamples of firms according to their Z-score (above 3 or below 1.8), Distance-Default (top and bottom quintile), and O-score (below or above 0.5) in the election year, and their credit ratings (investment or speculative grade) in the election month. The dependent variable is bond CAR. We use the optimal bandwidth defined in Imbens and Kalyanaraman (2012) for estimation.

Panel A: Coefficients of Union Victory (Rectangular Kernel)

	Distressed				Healthy			
	Z-score	*O-score*	*Distance-Default*	*Rating*	*Z-score*	*O-score*	*Distance-Default*	*Rating*
CAR (–1, 3)	–0.078***	–0.035	–0.020	–0.062***	–0.009	–0.013	–0.015*	–0.011*
CAR (–1, 6)	–0.094*	–0.139***	–0.012	–0.082**	–0.035*	–0.003	0.007	–0.004
CAR (–1, 9)	–0.130*	–0.204***	–0.059*	–0.121**	–0.031	–0.010	0.002	–0.010
CAR (–1, 12)	–0.150***	–0.239**	–0.075*	–0.152**	–0.035	–0.015	–0.014	–0.018*

Panel B: Coefficients of Union Victory (Triangular Kernel)

	Distressed				Healthy			
	Z-score	*O-score*	*Distance-Default*	*Rating*	*Z-score*	*O-score*	*Distance-Default*	*Rating*
CAR (–1, 3)	–0.075***	–0.048**	–0.020	–0.058**	–0.011	–0.011	–0.008	–0.009
CAR (–1, 6)	–0.088*	–0.135***	–0.008	–0.075**	–0.029	–0.003	0.006	–0.002
CAR (–1, 9)	–0.119*	–0.201***	–0.051	–0.118**	–0.039	–0.011	–0.001	–0.013
CAR (–1, 12)	–0.141***	–0.236**	–0.073*	–0.148**	–0.043	–0.016	–0.016	–0.017

Table 11
The role of Right-to-Work (RTW) laws
This table provides results from local linear regressions for subsamples depending on whether the union election takes place in states with or without RTW laws. We examine the impact of unionization on bond returns for each subsample and report the coefficients of *Union Victory* for all event horizons and both subsamples. The dependent variable is bond CAR. We use optimal bandwidth defined in Imbens and Kalyanaraman (2012) for estimation.

Panel A: Coefficients of Union Victory (Rectangular Kernel)

	RTW (not passed)		RTW (passed)	
	Unionization Coef.	Std. Err.	Unionization Coef.	Std. Err.
CAR (–1, 3)	–0.022**	(0.009)	–0.025	(0.015)
CAR (–1, 6)	–0.030**	(0.015)	–0.005	(0.021)
CAR (–1, 9)	–0.054**	(0.022)	–0.017	(0.022)
CAR (–1, 12)	–0.067**	(0.028)	–0.018	(0.023)

Panel B: Coefficients of Union Victory (Triangular Kernel)

	RTW (not passed)		RTW (passed)	
	Unionization Coef.	Std. Err.	Unionization Coef.	Std. Err.
CAR (–1, 3)	–0.021**	(0.009)	–0.019	(0.015)
CAR (–1, 6)	–0.029**	(0.015)	–0.005	(0.023)
CAR (–1, 9)	–0.055**	(0.023)	–0.013	(0.021)
CAR (–1, 12)	–0.068**	(0.029)	–0.014	(0.023)