Bankruptcy and the Cost of Organized Labor: Evidence from Union Elections

Murillo Campello
Cornell University and NBER

Janet Gao
Indiana University

Jiaping Qiu
McMaster University

Yue Zhang
Université Catholique de Louvain

Unionized workers are entitled to special treatment in bankruptcy court that can be detrimental to other corporate stakeholders, with unsecured creditors standing to lose the most. Using data on union elections, we employ a regression discontinuity design to identify the effect of worker unionization on bondholders in bankruptcy states. Closely won union elections lead to significant bond value losses, especially when firms approach bankruptcy, have underfunded pension plans, and operate in non-RTW law states. Unionization is associated with longer, more convoluted, and costlier bankruptcy court proceedings. Unions depress bondholders' recovery values as they are assigned seats on creditors' committees. (*JEL* J51, G33, G32)

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Despite their declining prominence, labor unions still shape workers' participation in corporate activity. Today, over eight million private-sector workers in the United States are represented by unions, and of the largest 100 industrial firms, 33 have a unionized work force. Unions are known to use collective bargaining power to protect workers' interests, such as wages,

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health care, and job security (Freeman 1980; Lewis 1986), but less is known about the role they play in bankruptcy. At a time when workers' investment in firm-specific human capital is most threatened, the U.S. Bankruptcy Code only safeguards wages and benefits for work already performed.[1] To protect their members' long-term interests, unions must become active parties in bankruptcy states (Haggard 1983).

Unions are able to protect their members' interests in several ways in bankruptcy, and this paper shows that worker unionization bears significant wealth consequences for other stakeholders of the firm. As recognized creditors, for example, unionized workers may be eligible to seats on unsecured creditors' committees under Chapter 11.[2] Those committees are favored by the courts and have broad powers to (1) formulate reorganization plans, (2) request the replacement of managers, (3) block asset sales, and (4) move to convert the case into Chapter 7. Nonunionized workers with separate, small claims are not eligible to seats on creditors' committees.[3]

Beyond receiving debtor-like recognition under Chapter 11, unions resort to other tactics that empower workers in bankruptcy. They organize strikes, boycotts, and public denouncements with the goal of forcing managers to acquiesce to their demands, so as to avoid disruptions that invite creditor control (Atanassov and Kim 2009). When convenient, unions use their leverage in court so that bankruptcy proceedings allow for a disruption of absolute priority rules (APR), whereby unsecured creditors' claims lose seniority (Adler 2010). Unions can also make bankruptcies last longer, using the courts to force parties into repeated, costly negotiations over workers' demands. In securing continued employment for their members, unions often favor inefficient reorganizations in lieu of liquidation (Korobin 1996). This is a key concern since firms that emerge from reorganization often reenter bankruptcy, as unions resist asset sales and worker layoffs.

We study the impact of worker unionization on corporate creditors by looking at the price reactions of publicly traded bonds to union elections. Bond prices represent a unique value metric with which to gauge the impact of unionization onto financial stakeholders of the firm. Unlike other creditors (e.g., banks and syndicated lenders), it is difficult for investors of diffusely held bonds to renegotiate with borrowers. Bond investors, instead, dispose of their securities in the market in response to innovations to the expected value of their claims. Given the concave structure of bond payoffs (capped at the issue face values in nonbankruptcy states), bond prices are sensitive to

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

2 Recognized union claims include (1) withheld union dues, (2) unpaid contributions to pension plans, (3) unpaid wages and benefits, and (4) damages from the rejection of collective bargaining agreements. Firms in Chapter 11 often accumulate debts on all those accounts.

3 Employee benefits and wage priority privileges are capped at $12,850 per worker.

expected losses in bankruptcy states. In particular, as their claims are senior, yet mostly unsecured, bondholders' expected wealth declines sharply in the face of high bankruptcy costs.[4] Deviations from an orderly bankruptcy process will increase expected bankruptcy costs and lead to declines in the secondary market price of corporate bonds.

Union elections are conducted through secret ballot voting. Once a union wins over 50% of the workers' votes, it attains legal recognition. Union rights are protected by the National Labor Relations Act and a successful election significantly increases the bargaining power of workers. Naturally, both the occurrence and the results of union elections are influenced by a number of factors. As such, the average union-win firm might differ from its average union-loss counterpart on several dimensions (both observable and unobservable). To identify our tests, we resort to a regression discontinuity design (RDD) that exploits local variation in the vote share of elections that can lead to discrete shifts in union legal status. In short, our tests contrast bond price reactions to closely won union elections with bond price reactions to closely lost union elections. Workers in close-win elections gain legal representation status while those in close-loss elections do not; yet firm characteristics and workers' support for unions are ex ante similar across the two groups. Given the nature of the voting process, it is unlikely for individuals or firms to precisely anticipate or manipulate the outcome of close union elections. Under these regularity conditions (which we verify in the data), relative differences in bond price reactions to close union election results can be plausibly attributed to the effect of unionization.

Using records from the National Labor Relations Bureau (NLRB), we conduct our analysis on a sample of 721 bond issuers witnessing worker unionization attempts between 1977 and 2010. In short, our tests show that worker unionization negatively affects the wealth of senior, unsecured creditors. Results from RDD estimations imply that closely won union elections lead to a negative 210 (470)-basis-point average cumulative abnormal return (CAR) over a 3-month (12-month) time window.[5] Closely lost elections, in contrast, are associated with economically insignificant bond CARs. Our bond price results are remarkable since an earlier study by Lee and Mas (2012) using a similar RDD approach found no impact of unions on equity prices around unionization. The critical contrast between the two studies is that equity stakes *do not* share the senior creditor status that is shared by bondholders and unionized workers in bankruptcy court.

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[4] The Bankruptcy Code treats holders of senior, unsecured claims as the "most impaired" claimants against corporate assets in default. This stands in contrast to secured creditors, who are often treated as "unimpaired." Consistent with this legal doctrine, a Moody's (2007) report shows that the median recovery rate of bank loans in bankruptcy is 100%, whereas that of senior, unsecured bonds is only 30%.

[5] The time horizons considered follow the prior literature on the effects of unionization (e.g., DiNardo and Lee 2004; Lee and Mas 2012) and event studies on bond returns (e.g., Ellul, Jotikasthira, and Lundblad 2011).

From a pricing perspective, the decline in bond values that we report could arise from increases in default risk or in bankruptcy costs. We next look for evidence of those effects in our data. DiNardo and Lee (2004) find no relevant impact of worker unionization on firms' profitability or survival rates, implying negligible changes in firms' default risk following unionization. Consistent with those authors' results, we find no evidence that close union winners perform worse, become more likely to enter distress, or are more likely to file for bankruptcy than close union losers for several years after the vote.

We then set out to investigate the effects of unionization on bankruptcy costs. This is a difficult task and our analysis is limited by the fact that we focus on explicit bankruptcy costs. The examination necessitates data from actual bankruptcy events and we first expand our data set to include information from the UCLA-LoPucki bankruptcy database. In this investigation, we use non-local-linear regressions to compare the duration, costs, and outcomes of court proceedings across bankrupt firms with unionized workers and those without. We find that unionized firms experience more prolonged court proceedings and are also more likely to go through inefficient reorganizations, as evidenced by a higher likelihood of emerging from bankruptcy and refiling for bankruptcy shortly thereafter. Unionized firms are also more likely to reorganize under debtor-in-possession (DIP) financing.[6] In addition, firms with labor unions incur significantly higher expenses and fees paid in bankruptcy court. The results we report are consistent with the notion that unionization is associated with higher in-court bankruptcy costs. Admittedly, these tests could allow for a noncausal interpretation.

We thus set out to more granularly identify the welfare costs of labor unions in bankruptcy court by exploiting statutory variation in the number of seats assigned to unions on unsecured creditors' committees (UCCs). Section 1102(a) of the Bankruptcy Code charges the U.S. Trustee with the duty of organizing a committee composed of the largest unsecured creditors of the bankrupt firm (including both unionized workers and bondholders). Following this guideline, the Trustee shall assign union representatives to seats on UCCs if they represent labor claims whose amount ranks among the largest liabilities of the firm. It is difficult to ascertain the claims of various corporate creditors, and as a result, there is considerable variation regarding the number of UCC seats eventually assigned to unions, seats that come at the expense of other unsecured creditors. We use this source of variation to gauge the marginal effect of unions' empowerment in bankruptcy court onto bondholders' wealth in bankruptcy. We collect information on the composition of UCCs of firms filing for bankruptcy between 1988 and 2010 and combine it with Moody's data on in-court loss given default (LGD) rates. Our tests show that bondholders' losses

[6] These financing arrangements force preexisting senior creditors into more junior claimant categories; yet importantly, they allow firms to continue operating and workers to keep their employment.

monotonically increase with the assignment of seats to unions on unsecured creditors' committees. Notably, the LGD rates of secured creditors on the same firms are found to be insensitive to the number of UCC seats assigned to unions.

We also exploit firm and union heterogeneity in our RDD framework to help characterize how unionization affects bond values through expected bankruptcy costs. First, we compare subsamples of financially distressed and financially healthy firms, expecting bond price reactions to news of unionization to be particularly pronounced for firms in distress. We consider several measures of financial distress, including Altman's Z-score, Ohlson's O-score, Merton's distance to default, as well as Moody's credit ratings. Consistently across all measures, RDD results show that unionization has a much greater impact on the bonds of distressed firms. We also look at the funding status of firms' pension plans. Unionized workers' pensions are entitled to the same (high) priority assigned to their wages in bankruptcy. As such, underfunded plans will aggravate bondholders' expected bankruptcy costs. We partition our sample based on firms' pension funding status and find the effect of unionization to be significantly stronger for firms with underfunded plans. Finally, we examine the argument that the value impact of unions is related to their bargaining powers. The adoption of right-to-work (RTW) laws by some state legislatures allows nonunion workers to enjoy the benefits of collective bargaining without paying union dues. These laws constrain unions' financial resources, diminishing their powers (Holmes 1998). Partitioning our sample according to whether a union election is held in a state with RTW laws, we find that the negative impact of unionization on bond values is much weaker in states with RTW laws in place (where unions are weaker).

There is a growing literature on the interplay between human capital and corporate financing. Papers in this literature often focus on the effect of labor force bargaining power (e.g., union coverage) on firms' leverage ratios. Studies such as those by Bronars and Deere (1991) and Matsa (2010) document a positive relation between labor power and leverage.[7] The underlying theme of this stream of work is that firms increase their leverage as a way to enhance shareholders' bargaining power over the labor force (see also Benmelech, Bergman, and Enriquez 2012). Other studies propose a different argument: firms may reduce leverage to preserve workers' human capital. Berk, Stanton, and Zechner (2010) propose a theory in which firms' leverage is influenced by the higher wages workers demand in exchange for exposure to job loss in default states. Along this view, Simintzi, Vig, and Volpin (2015) show that firms in countries with higher union coverage have lower leverage (see also Ellul and Pagano 2017).

[7] Matsa (2010) uses firm-level unionization rates to show that union coverage is positively related to leverage.

Our results speak to the literature on conflicts between labor and suppliers of financial capital to the firm, creditors in particular. As unionization empowers workers by preserving their human capital in default states, "displaced creditors" (unsecured bondholders) observe a change in the value of their claims. Our paper on union voting and bond price dynamics differs from existing studies in important ways, nonetheless. While most previous studies build on contrasts between unionized and nonunionized firms (regardless of a vote occurring or its outcome), our contrasts focus on firms in which workers attempted to unionize (see also Schmalz 2015). By the nature of its test design, our study may not rule in or rule out existing views on the relation between labor and leverage ratios, as the bankruptcy dynamics that we consider do not apply to the entire schedule of debt contracts in firms' balance sheets. We can only speak to the pricing of bonds, the claims held by creditors that are displaced by unions under the U.S. Bankruptcy Code.

Our work is related to Chen, Kacperczyk, and Ortiz-Molina (2012), who find a negative relation between industry-level unionization rates and bond yields. The authors propose that such a relation arises from lower agency conflicts in more unionized industries. While the results reported by Chen et al. are informative, the empirical strategy we use is unique in disentangling the effects of firm and union heterogeneity that confound the relations of interest. Our analysis is further differentiated by the focus we place on labor–creditor conflicts that arise in bankruptcy.[8] Because of our emphasis on bankruptcy, our paper is naturally related to Blaylock, Edwards, and Stanfield (2015), who document a significantly negative creditor reaction towards government's support of labor in Chrysler's bankruptcy. Our work, however, does not contemplate governmental interventions and related policy actions.

Finally, we stress that our tests yield estimates of local average treatment effects (LATE). Accordingly, we caution readers about limits in the generalization of our inferences. First, our RDD methodology focuses on contrasts between closely won and closely lost elections, a narrow band. Second, our estimates refer to firms with access to bond markets that witness union elections after 1976. Our results, therefore, do not directly speak to union elections won by large margins, to votes conducted in small firms, or to firms that do not observe votes for unionization in their plants after the 1970s. With these limitations in mind, our findings are important in assessing the impact of labor force unionization on the bondholders of large, public firms over the last four decades.

8 Recent work by Qiu and Shen (2017) considers conflicts between secured creditors (banks) and labor in bankruptcy. The authors argue that banks raise loan interest rates after workers unionize in light of higher expected bankruptcy costs. Their results seem consistent with ours, yet are somewhat puzzling, since the vast majority of bank loans are secured, giving those creditors higher priority over labor claims in bankruptcy court. Relatedly, Falato and Liang (2016) look at relations between banks and firms following unionization in resolving loan covenant violations.

1. Data Description and Sample Selection

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

1.1 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.[9] We use 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 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 contains 5,714 elections.

There is a well-documented decline in the unionization movement in the United States (see Western and Rosenfeld 2011). Our sample spans 33 years and Figure 1 shows that it captures a declining trend in establishment-level union elections. Despite the decline in the number of union elections, key statistics of election results remain constant over time. For example, as shown in Figure 1, the average vote share in support of unions is close to 45% over the entire horizon of our sample. The percentage of successful union elections (not displayed) has also remained constant over time, at around 25%.

1.2 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). For information after 1997, we use transaction-level data from the Mergent Fixed Income Securities Database (FISD) covering the 1997–2004 period and from Trade Reporting and Compliance Engine (TRACE) for the 2005–2010 period. We eliminate all canceled, corrected, and commission trades, following standard procedure in the literature (Bessembinder, Maxwell, and Venkataraman 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.[10]

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9 The 1977–1999 period data are used by Holmes (2006) and are available from Thomas Holmes's Web site (http://www.econ.umn.edu/~holmes/data/geo_spill/index.html). The 2000–2010 data are posted by the NLRB (http://www.data.gov/). We download electronic records of union elections provided by these sources, as our bond sample starts from the late 1970s.

10 Unsecured means that the bond is not backed by assets, not based on secured lease obligation, and is not a private placement exempt from registration under SEC Rule 144a.

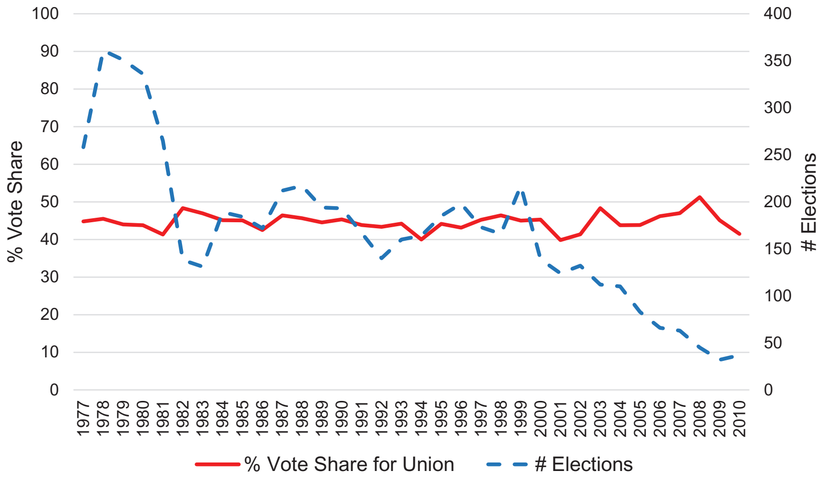

Figure 1
Occurrence and results of union elections
This figure plots the occurrence and results of union elections over our sample period. The solid line represents the average percentage votes in support of a union (% vote share for union) in the elections in a given year. The dashed line represents the total number of elections (# elections) held.

1.3 Bond return computation

We compute cumulative abnormal returns (CARs) of corporate bonds over several time windows to gauge creditors' reactions to union elections.[11] We use monthly frequencies in calculating bond returns since NLRB election dates are sometimes 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 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.[12] We then calculate the value-weighted average return

[11] In the Internet Appendix, we repeat our tests using bond yield changes instead of bond returns.

[12] Bonds are classified into 9 benchmark portfolios according to whether their credit rating is high grade (Aaa+ to Aa3), medium grade (A1 to 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 more than 20 years.

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 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. 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 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:

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

An election event is defined as the month in which a union election vote takes place. We examine bond returns accumulated from the month prior to the vote to every three months up to one year following the vote; that is, $CAR(-1,3)$, $CAR(-1,6)$, $CAR(-1,9)$, and $CAR(-1,12)$. To be included in the sample, firms must have available monthly bond prices from one month prior to the union election to 12 months after the election. This allows us to examine horizons similar to previous work on the effects of unionization (DiNardo and Lee 2004; Lee and Mas 2012) and event studies on bond returns (Warga and Welch 1993; Ellul, Jotikasthira, and Lundblad 2011). Matching bond CARs to union vote data, we are able to study 721 election events in total. We highlight that our sampling essentially gathers information on how unionization affects unsecured bondholders of large, public firms. This goal differentiates our study from the literature that examines broad implications of unions on the performance or policies of small or private firms.

1.4 Other covariates

We extract firm 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-to-default)*. We compute additional measures of firm characteristics: return on

Table 1
Summary statistics

A. Summary statistics for our sample firms

	N	Mean	SD	Median	5th pct.	95th pct.
Election year	721	1990.030	9.447	1989	1978	2007
# valid votes	721	232.877	633.143	118	55	756
Union vote share	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	0.726	0.871	0.670	0.193	1.669
Liability ratio	703	0.662	0.179	0.633	0.457	0.871
Cash	703	0.043	0.045	0.028	0.003	0.132
Tangibility	703	0.407	0.221	0.383	0.068	0.759
Z-score	577	3.586	2.434	3.126	1.371	6.999
O-score	703	−0.921	1.453	−0.988	−2.826	1.205
Distance-to-default	671	7.005	3.965	6.529	2.035	14.572
# bonds per firm	721	4.082	3.585	3	1	46
Bond maturity (years remaining)	721	13.211	7.066	12.615	3.686	26.712
Bond rating (Aaa+=1, Aaa=2,..., C=22)	721	8.214	3.773	8	2	15
B. Summary for all public firms with union elections						
ROA	4,238	0.093	0.105	0.093	−0.008	0.213
Size	4,302	7.003	2.183	7.314	3.136	10.213
B/M	4,079	0.629	1.965	0.668	0.118	1.874
Liability ratio	4,295	0.614	0.241	0.596	0.298	0.941
Cash	4,292	0.063	0.083	0.035	0.003	0.215
Tangibility	4,296	0.39	0.203	0.363	0.096	0.745
Z-score	3,759	9.129	63.474	3.599	0.997	18.696
O-score	4,207	−0.631	2.109	−0.789	−3.28	2.438
Distance-to-default	3,878	6.677	4.601	5.89	0.881	15.761

Panel A reports the summary statistics of the variables of interest of our sample firms, including election information, firm characteristics, and bond statistics. Panel B reports the summary statistics for all public firms with union election records. Both samples span from 1977 to 2010. *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-to-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*.

assets (*ROA*), asset size (*Size*), book-to-market ratio (*B/M*), liabilities-to-asset ratio (*Liability ratio*), cash-to-asset ratio (*Cash*), and property, plant, and equipment-to-asset ratio (*Tangibility*). We winsorize variables at the 1st and 99th percentiles. All variable definitions are shown in Appendix A.

1.5 Summary statistics

Table 1 reports summary statistics of our variables of interest. Panel A reports statistics for all firms in our sample. These statistics are based on election-year data. Perhaps unsurprisingly, our sample firms are large and have high liability-to-asset ratios. Those firms are also financially healthy and liquid, with an average *Z-score* of 3.6 and tangibility ratio of 41%. Firms in our sample typically have multiple bonds outstanding (average of 4), mostly with investment-grade credit ratings according to Moody's.

Panel B reports the statistics for all public firms with union election records from 1977 to 2010. These statistics help us compare our paper to other studies that examine the impact of unionization, thus framing our findings. Compared with previous research, our study samples on large public firms that have access to the bond market. Firms in our sample are larger, on average, than other firms that host union elections. The union elections in our sample also have more votes casted than the average election hosted by both public and private firms (DiNardo and Lee 2004).[13] These data patterns place boundaries on the ability to generalize our findings.

2. The Impact of Unionization on Bond Prices

2.1 Test strategy

We follow DiNardo and Lee (2004) in assessing the impact of workers' union status on bondholders' wealth in bankruptcy states using a regression discontinuity design (RDD) approach (see also Lee and Mas 2012). The RDD approach gauges effects from a "treatment" by identifying a cut-off above or below which a treatment is assigned. The underlying assumption is that for subjects in the vicinity of the cut-off, the treatment assignment is plausibly random. In this setting, union representation status (the treatment) is determined by whether the union vote share exceeds 50%. As a result of the secret-ballot election mechanism imposed by law, there is a substantial level of ex ante uncertainty about election outcomes. For close elections, it is unlikely that voters and other agents 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 cut-off. 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 losers, one may infer the impact of workers' union status on bondholders' wealth.

2.2 Methodology

The RDD implementation consists of a regression of the outcome variable on an indicator for union victory, while controlling for a polynomial function of order p:

$$Y_i = \alpha + D_i \times \tau + \sum_{n=1}^{p} (X_i - 0.5)^n \times \beta_n + \epsilon_i, \tag{5}$$

where i indicates a union election, X is the union vote share in the election, and D is an indicator for union victory that equals 1 if the vote share surpasses 50% and zero otherwise. Y represents bond CAR. ϵ is an error term. Note that we subtract 0.5 from vote share X, so that the above expression is centered around the vote share cut-off 50%. As such, the term τ captures the jump in Y

[13] Compared with the most recent research examining the effect of unionization on the cash holdings of publicly traded firms (Schmalz 2015), our sample firms carry higher debt levels and lower cash holdings.

as the vote share just passes 50%. In other words, τ provides an estimate of the effect of unionization on corporate bonds' CARs.

The polynomial regression approach may achieve greater precision by utilizing all available data in the estimation. However, it could admit biases by imposing a particular functional form onto the relation between bond values and vote shares over a wide range of data. Accordingly, we also consider a local linear regression approach, an estimation over data within a small window h around the assignment cut-off. 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.

Our local linear regressions can be represented in manner a similar to that used in the polynomial regressions discussed above, where one conveniently estimates the following model:

$$Y_i = \alpha + D_i \times \tau + (X_i - 0.5) \times \beta_l + D_i \times (X_i - 0.5) \times (\beta_r - \beta_l) + \epsilon_i, \qquad (6)$$

where $0.5 - h \leq X_i \leq 0.5 + h$, and τ captures the effect of unionization on bond CARs.[14] We estimate models using rectangular and triangular kernels.

Two conditions are necessary for the validity of the RDD approach: (1) continuity of the distribution of the forcing variable (union vote share) around the assignment cut-off and (2) continuity of other covariates around the same cut-off. We examine the first condition, leaving the second to the Internet Appendix.

If workers or firms could systematically manipulate vote shares around the 50% cut-off, we should expect to see markedly different vote share densities just above or just below that point. Alternatively, one could 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 test the continuity of the 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 cut-off. Figure 2 plots the distribution of the union vote share under the McCrary method. The dots represent the observed distribution density for each bin for union vote share. The solid lines represent the fitted distribution density functions from local linear regressions on either side of the cut-off (with 90% confidence intervals).

Figure 2 points to continuity in vote share around the 50% cut-off. Consistent with the visual evidence, the Wald test shows that the distribution density of vote shares on each side of the cut-off has a log difference of –0.09, with a standard error of 0.26. This difference is small and statistically insignificant.

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

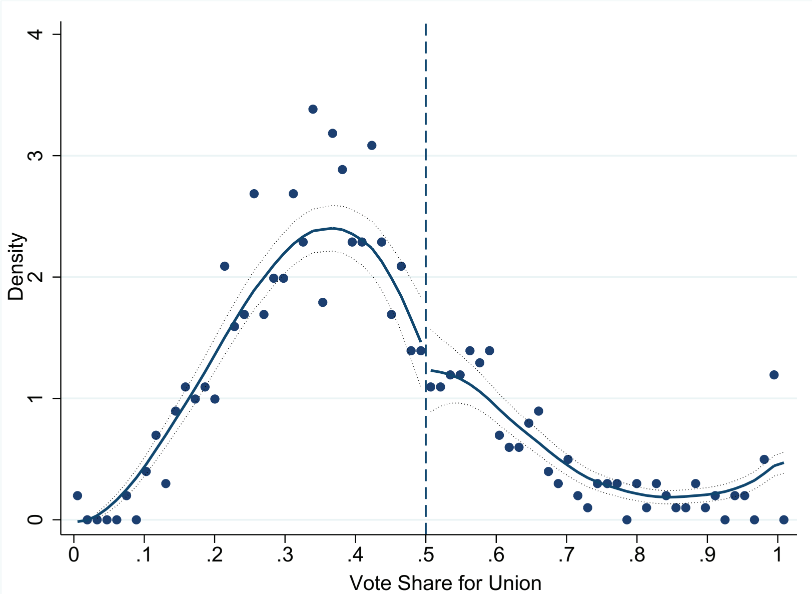

Figure 2
Density distribution of the union vote share
This figure shows the density distribution of the union vote shares following McCrary (2008). The horizontal axis represents the percentage of votes in favor of unionization, and the vertical axis the associated distribution density. The dots correspond to the observed density. The solid lines show the local linear density estimate of the union vote share (90% confidence intervals are displayed).

2.3 Graphical analysis of the outcome

We first use graphical analysis to describe the relation between vote shares for union and bond CAR changes following union elections. We divide the vote share into 20 equal-sized bins, calculating the conditional mean of the bond CAR corresponding to each bin. We then fit CARs as sixth-order polynomial functions of vote shares. Figure 3 graphs the relation between $CAR(-1,3)$ and the vote share. Solid lines fit bond CARs as polynomial functions of vote shares. Dotted lines show 5th and 95th percentile confidence intervals for those functions.

Figure 3 shows a distinct drop in bond CARs from the left side to the right side of the 50% cut-off, with nonoverlapping 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 slightly increased during the same event window.

2.4 Estimation results

2.4.1 Polynomial regressions. Panel A of Table 2 shows the results from global polynomial regressions. For every return window, we report results in stages. We first regress bond CARs on a union victory dummy (*Union victory*),

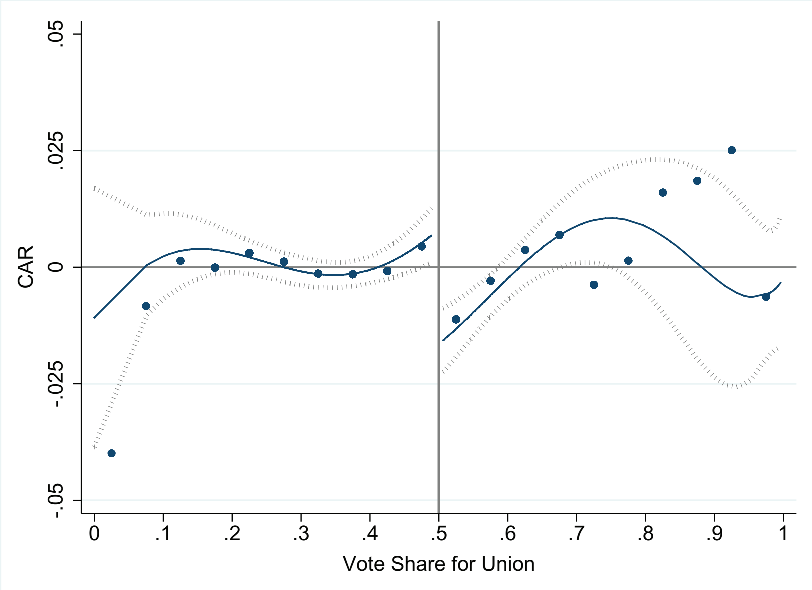

Figure 3
Bond CARs following an election
This figure shows the bond CARs over 3 months following an election against the union vote share. The horizontal axis represents the union vote share, and the vertical axis the bond CAR. The dots are CAR conditional means for each of the 20 equally sized bins of union vote share. The solid lines represent the fitted sixth-order polynomial function estimated from our RDD analyses. The dotted lines represent the 5th and 95th percentile confidence intervals of the polynomial estimation, calculated based on clustered standard errors.

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 CARs and the level of support for unionization. Finally, we allow for nonlinear relations by adding higher order terms of vote share. Specifically, we include sixth-order terms of vote share. In all regressions, we control for year and firm fixed effects to account for time-specific economic conditions and firm-specific characteristics that can affect both election outcomes and bond returns.

Column (1) reports regression results for bond *CAR*(–1, 3) on a dummy variable indicating whether the union wins the 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. Results from Column (2) account for a linear effect (only) 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, bond CARs of near-winner firms drop by 230 basis points *more* than the bond CARs of near-losers.

Columns (4) through (12) repeat the analyses in Columns (1) through (3), considering the bond abnormal returns accumulated over longer event windows. Columns (6) and (9) show that unionization is associated with a 180 (390)-basis-point decline in bond CARs over the 6 (9) months following a union's victory. Column (12) shows that, over the 12-month post-election window, the bond CARs associated with near-win elections drop 420 basis points more than those associated with near-loss elections.

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 million over 90 days following union elections. The magnitude of those losses increases with the increase of the event window, reaching \$12 million one year after the election.[15]

To test the robustness of our inferences under different functional form choices, we vary the orders of polynomials up to the 12th order in our RDD analysis. Panel B of Table 2 reports the results. Across all functional forms, we observe a negative effect of union victory on bond CARs.

2.4.2 Local linear regressions. We use local linear regressions to 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. 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.

Table 3 shows the results from local linear estimations using several different combinations of data bandwidths and kernel methods. Panel A (B) shows the results from rectangular (triangular) kernel estimations. The test yields statistically and economically similar results across all specifications. Bondholders of close union winners suffer, on average, a 210-basis-point larger decline in bond CARs 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 bond CARs drop by 470–500 basis points more than the bonds of close losers. The magnitudes of these estimates are similar to those from polynomial regressions.

Our base analyses show that union elections won by close margins lead to a substantial decline in bondholders' wealth. However, one should exercise caution in generalizing our inferences to all unionization events. As suggested

[15] Our average sample firm has \$288 million in bonds outstanding. One can thus estimate that close winners expect to incur a $\$288 \times 0.023 = \$6.6$ million greater loss in bond value during the 3-month window following union elections (or \$12 million greater loss during a 12-month window).

Table 2
Polynomial regression results for bond CARs

A. Baseline polynomial tests

	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	–0.002	–0.006	–0.023***	–0.002	–0.004	–0.018*	–0.006	–0.017**	–0.039***	–0.003	–0.017*	–0.042***
	(0.003)	(0.005)	(0.008)	(0.003)	(0.006)	(0.010)	(0.005)	(0.008)	(0.013)	(0.005)	(0.009)	(0.015)
Union vote share		0.012	0.117***		0.006	0.101*		0.034**	0.198***		0.041**	0.229***
		(0.012)	(0.042)		(0.015)	(0.052)		(0.016)	(0.066)		(0.020)	(0.077)
Sixth-order polynomials	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	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	0.478	0.493	0.493	0.478	0.489	0.489	0.501	0.519	0.522	0.506	0.525	0.527

B. Robustness tests with higher-order polynomials

Orders of polynomials	*CAR*(–1, 3)	*CAR*(–1, 6)	*CAR*(–1, 9)	*CAR*(–1, 12)
6	–0.023***	–0.018*	–0.039***	–0.042***
	(0.008)	(0.010)	(0.013)	(0.015)
8	–0.026***	–0.025**	–0.049***	–0.055***
	(0.009)	(0.011)	(0.016)	(0.019)
10	–0.028***	–0.024*	–0.042**	–0.045**
	(0.009)	(0.012)	(0.016)	(0.021)
12	–0.020*	–0.017	–0.040**	–0.056**
	(0.011)	(0.014)	(0.018)	(0.023)

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

This table reports the results from polynomial regression analyses for bond CARs following union elections. $CAR(T_1, T_2)$ denotes the cumulative abnormal return from month T_1 tomonth T_2 relative to the union election month. Panel A reports the baseline results. Panel B reports the regression results when we consider increasingly higher order polynomials. Only the coefficients for *Union victory* are reported in panel B. All regressions control for year- and firm fixed effects with clustered standard errors.

Table 3
Local linear regression results for bond CARs

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**
	(0.007)	(0.012)	(0.017)	(0.021)
Observations	366	321	264	296
75% optimal bandwidth	−0.021**	−0.023	−0.050**	−0.061**
	(0.009)	(0.014)	(0.021)	(0.025)
Observations	277	239	196	225
125% optimal bandwidth	−0.018***	−0.021**	−0.036**	−0.043**
	(0.006)	(0.009)	(0.015)	(0.017)
Observations	460	402	335	370
B. Coefficients of union victory (triangular kernel)				
Optimal bandwidth	−0.020***	−0.021*	−0.041**	−0.050**
	(0.007)	(0.012)	(0.018)	(0.021)
Observations	468	405	340	379
75% optimal bandwidth	−0.022**	−0.020	−0.043**	−0.055**
	(0.009)	(0.014)	(0.021)	(0.025)
Observations	352	298	254	279
125% optimal bandwidth	−0.018***	−0.020*	−0.038***	−0.044**
	(0.006)	(0.010)	(0.015)	(0.018)
Observations	554	491	429	468

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

This table reports the results from the 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. Panel A presents results based on estimations with rectangular kernels, and panel B presents results based on estimations with triangular kernels. We use the optimal bandwidth defined in Imbens and Kalyanaraman (2012) for estimation. Standard errors are clustered by firm.

in Table 2, bondholders respond weakly, on average, to news about a union victory. One potential reason is that elections where unions win by large margins may be accompanied by worker-led changes to corporate policies or agency conflicts (see Chen, Kacperczyk, and Ortiz-Molina 2012; Schmalz 2015).

3. Bankruptcy Likelihood and Bankruptcy Costs

Our results show that unionization affects bond values, an outcome that may arise from an increase in the likelihood of bankruptcy or higher bankruptcy costs. We set out to investigate these two channels. To gauge the effect of unionization on bankruptcy likelihood, we use our bond-union-matched data set and track the evolution of firm performance and financial health for several years after union elections take place, comparing close winners and close losers over time. To gauge the effect of unionization on bankruptcy costs, we gather additional data on bankruptcy proceedings from several sources and examine whether unionized firms experience longer, costlier bankruptcies. We also examine the effects of union actions and powers in bankruptcy on bondholders' recovery value. Across these sets of investigations, we employ a variety of empirical approaches to accommodate the characteristics of the data sets we use.

3.1 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, liability ratio, cash holdings, tangibility, Z-score, O-score, and distance to default. For benchmarking, we subtract industry medians from these variables. We then track the evolution in these industry-adjusted measures for the five years following the election year, comparing the difference of these measures to their original level in the year prior to the election. Finally, we use local linear regressions similar to Equation (6) to test whether changes in those performance measures differ across close union election winners and losers. To ensure that the power of our results is not limited by the bond-union-matched sample, we repeat the test in a larger sample that includes all firms with a union election, regardless of the availability of detailed bond trading data; that is, we use a super set of our base sample.

Table 4 reports RDD estimates from close union victories on each of the industry-adjusted metrics we consider. Panel A displays the results from our main sample, which admits firms with both union election data and sufficient information on bond returns. Panel B shows results from a broader sample that includes all publicly traded firms with union elections. In both panels, the coefficient for union victory is rarely significant, indicating that close union winners and losers experience similar post-election outcomes.

The lack of performance deterioration for the close union-winning firms within five years following the election could indicate that the effect of unionization may only materialize in the longer term (more than five years). If this is the case, bonds that mature within five years following the election should not be affected by unionization. We investigate this possibility by examining whether bonds with less than five years to maturity at the election year experience any difference in returns across close winners and close losers. Table 5 repeats the RDD analyses of Table 3 for the subsample of bonds with less than five years to maturity. Even for this subsample, close union winners experience declines in bond CARs. In other words, shorter-term bond values drop 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.

The results from Table 5 seem to rule out the argument that unionization only affects bond prices in the long term (more than five years after the union election). At the same time, the results from Table 4 suggest that unionization has no measurable influence over a firm's probability of default in the foreseeable future. From the declining prices of soon-to-mature bonds (within five years of union election), one likely inference is that the decline in bond value following elections is caused by higher bankruptcy costs, conditional on that event. We consider this argument in turn.

Table 4
Performance changes 5 years following an election

A. Union-bond sample, N = 721 observations

Year	*ROA*	*Size*	*B/M*	*Liability ratio*	*Cash*	*Tangibility*	*Z-score*	*O-score*	*Distance-to-default*
1	0.002	0.119	−0.114	−0.006	0.018*	−0.027*	1.425**	−0.126	0.968
	(0.008)	(0.282)	(0.072)	(0.033)	(0.011)	(0.016)	(0.653)	(0.262)	(0.944)
2	−0.001	0.150	−0.250	−0.014	0.006	−0.011	1.398	−0.149	0.541
	(0.011)	(0.499)	(0.174)	(0.025)	(0.011)	(0.013)	(0.878)	(0.233)	(0.767)
3	0.022*	0.825*	−0.052	−0.041	0.021	0.017	0.155	−0.731**	1.562
	(0.011)	(0.465)	(0.180)	(0.039)	(0.014)	(0.026)	(0.930)	(0.347)	(1.340)
4	0.041***	0.715	−0.568	−0.021	0.030**	0.003	−1.290	−0.877*	1.301
	(0.016)	(0.467)	(0.548)	(0.042)	(0.013)	(0.020)	(2.373)	(0.461)	(0.813)
5	0.034*	0.391	−0.576	−0.027	0.019	0.008	0.783	−0.768	2.009
	(0.018)	(0.501)	(0.410)	(0.050)	(0.014)	(0.025)	(0.800)	(0.483)	(1.367)
B. All union sample, N = 4,058 observations									
1	−0.002	−0.004	0.054	0.000	0.011*	−0.001	0.044	0.041	0.152
	(0.005)	(0.080)	(0.211)	(0.011)	(0.006)	(0.010)	(2.037)	(0.105)	(0.285)
2	0.004	0.007	0.122	−0.017	0.006	−0.013	2.078	−0.152	0.145
	(0.007)	(0.061)	(0.208)	(0.018)	(0.007)	(0.012)	(2.384)	(0.160)	(0.332)
3	0.004	−0.049	−0.275	−0.021	0.020**	−0.005	9.509	−0.040	−0.060
	(0.008)	(0.073)	(0.314)	(0.020)	(0.009)	(0.014)	(6.141)	(0.197)	(0.343)
4	−0.001	−0.022	−0.241	−0.008	0.013	−0.003	5.569	0.207	0.009
	(0.009)	(0.105)	(0.239)	(0.021)	(0.009)	(0.012)	(3.692)	(0.230)	(0.360)
5	0.003	−0.056	−0.283*	0.005	0.012	−0.017	4.154	−0.053	0.656
	(0.012)	(0.094)	(0.166)	(0.025)	(0.008)	(0.013)	(4.474)	(0.244)	(0.522)

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

This table provides the results of the changes in industry-adjusted performance using local linear regressions. The dependent variables are the changes in firm characteristics related to performance or risk, relative to the year prior to the election. Panel A reports the results of performance changes for firms with union election and bond return information. Panel B reports the results for all firms that have union elections. Only the coefficients of *Union victory* (standard errors) are reported. We use the optimal bandwidth defined in Imbens and Kalyanaraman (2012) and the rectangle kernel for estimation.

3.2 Unionization and bankruptcy costs

We conduct a host of analyses to gauge the effect of unionization on the bankruptcy costs borne by bondholders. To do so, we focus on information regarding costs documented in actual Chapter 11 case proceedings. We begin by examining whether unionization leads to steeper loss rates for bondholders. We then utilize detailed evidence of bankruptcy expenses to examine whether unionized firms experience longer, more complicated, or costlier bankruptcy proceedings. In the last set of analyses, we explore discrete variation in unions' statutory powers under the U.S. Bankruptcy Code, estimating bondholders' losses in relation to unions' court-assigned committee powers.

3.2.1 Bondholders' loss given default. The significant drop in bond prices that we document seem not to be explained by an increase in the likelihood of bankruptcy brought about by worker unionization. As bond prices are highly sensitive to loss rates that bondholders effectively suffer in default states (Duffie and Singleton 1999), we set out to verify whether bondholders' losses in bankruptcy could justify the negative bond CARs that we observe following unionization. We do so via an RDD test where we regress bondholders' losses

Table 5
Bond CARs for issues maturing within 5 years

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)	(0.014)	(0.016)	(0.015)
Observations	293	193	191	266
75% optimal bandwidth	−0.017**	−0.039**	−0.048***	−0.038**
	(0.007)	(0.016)	(0.019)	(0.020)
Observations	234	139	135	198
125% optimal bandwidth	−0.011*	−0.034***	−0.034***	−0.029*
	(0.007)	(0.012)	(0.013)	(0.015)
Observations	341	237	230	308
B. Coefficients of union victory (triangular kernel)				
Optimal Bandwidth	−0.014*	−0.036***	−0.042***	−0.033**
	(0.007)	(0.014)	(0.016)	(0.017)
Observations	348	239	234	313
75% optimal bandwidth	−0.016**	−0.038**	−0.048***	−0.039**
	(0.008)	(0.016)	(0.018)	(0.019)
Observations	280	187	177	254
125% optimal bandwidth	−0.012*	−0.034***	−0.037***	−0.028*
	(0.007)	(0.013)	(0.013)	(0.015)
Observations	389	285	279	361

*** p-value < 0.01, ** p-value < 0.05, * p-value < 0.10
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 CARs. We use the optimal bandwidth defined in Imbens and Kalyanaraman (2012) for estimation. All standard errors are clustered by firm.

in bankruptcy on the outcomes of union votes that occurred prior to the host firms' bankruptcy filings. This test strategy is pointed in that it only considers firms that did file for bankruptcy. We focus on elections that happened up to three years prior to bankruptcy.

To gauge bondholders' loss rates in court, we use Moody's loss given default (LGD) rates for creditors in Chapter 11 bankruptcies. Moody's LGD measures the percentage value of borrowers' claims that is lost in formal default. In our setting, it represents the portion of bond par values that cannot be recovered from bankruptcy proceedings. Moody's describes its three methods of calculating LGDs as: "1) settlement method, whereby the value of the settlement instruments is taken at or close to default, 2) liquidity method, whereby the value of the settlement instruments is taken at the time of a liquidity event, and 3) trading price method, whereby the value of the settlement instruments is based on the trading prices of the defaulted instruments at or post-emergence." Moody's recommends using the valuation method that is most representative of the actual recovery case. We follow that recommendation in our calculations.

Matching the LGD data for bonds to the election records of the corresponding bankrupt firms, we obtain a sample of 309 bond-election observations from 1990 to 2009. The matching yields a super set of our base data in that it does not require detailed bond trading information over numerous months around a union vote. The RDD model estimation resembles the local linear regression of Equation (6), but features LGD as the dependent variable. It shows that worker unionization that takes place within a three-year horizon prior to bankruptcy leads to a 32% increase in the loss rates of bondholders in bankruptcy court (t-statistic of 2.21). To interpret the economic magnitude of this estimate, we use risk-neutral default probabilities estimated by Almeida and Philippon (2007), who account for investors' risk preferences.[16] Given that our sample firms have an average credit rating of A3, they have a risk-neutral default probability of 12%. Our RDD test of LGD rates thus implies that, following unionization, bondholders should expect an in-court loss rate of 3.8% (=12% × 32%). This result is interesting in showing that our LGD estimate is in line with the baseline results that unionization leads to a 2% to 4.7% decline in bond value. Put differently, the bond price reactions that we observe upon news of worker unionization map into the expected value losses bond claims observe in bankruptcy states.

3.2.2 Bankruptcy court procedures and Expenses. It is important that we characterize how unions help shape the bankruptcy process, and in this section, we examine in-court bankruptcy procedures and expenses. This examination necessitates data from actual bankruptcy events. Accordingly, we expand our analysis to include information on Chapter 11 bankruptcy proceedings from the UCLA-LoPucki Bankruptcy Research Database. The LoPucki database contains records of petitions filed in bankruptcy courts, allowing us to contrast the judicial court processes experienced by unionized and nonunionized firms. We use two data sets from the LoPucki library. The first contains information about the duration and outcomes of 546 Chapter 11 cases spanning the period of 1980 through 2010. The second contains in-depth information about fees and expenses paid in court for a sample of 102 events filed by large companies from 1995 to 2006. Both data sets report whether the workers of a bankrupt firm were unionized before bankruptcy.

We examine court costs incurred during bankruptcy from several margins. First, we investigate 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 fees and expenses incurred during litigation in the United States. 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*). We regress bankruptcy duration on *Union*, an indicator for whether a firm has unionized workers when filing for bankruptcy, controlling for firms' prebankruptcy characteristics, such as profitability (*ROA*), size, liability ratio, cash ratio, and asset tangibility, as well as bankruptcy year fixed effects. Column

16 Risk-neutral measures account for investors' disutility when defaults happen in low consumption states. Firms are more likely to default in bad economic times, so defaultable bond prices will be more heavily discounted compared with their actual historical default rates (Almeida and Philippon 2007).

Table 6
The impact of unionization on the bankruptcy procedures and bankruptcy expenses

Dep. var.	(1) *Duration*	(2) *DIP*	(3) *Emergence*	(4) *Refiling*	(5) *Total fees*	(6) *Professionals*
Union	0.210**	1.098***	0.753***	0.602**	0.566**	0.246*
	(0.096)	(0.373)	(0.241)	(0.301)	(0.244)	(0.141)
ROA	−0.295	0.004	1.050	1.826*	−0.966***	−0.722***
	(0.289)	(1.116)	(0.821)	(1.091)	(0.248)	(0.160)
Size	0.092**	−0.159	0.019	−0.200	0.722***	0.259***
	(0.036)	(0.133)	(0.094)	(0.133)	(0.084)	(0.047)
Liability ratio	−0.335***	−0.286	1.246***	0.757**	−0.477	−0.419*
	(0.119)	(0.315)	(0.324)	(0.340)	(0.364)	(0.212)
Cash	−0.347	−5.678**	−1.867	−2.566	1.409	1.287*
	(0.535)	(2.486)	(1.195)	(1.892)	(1.199)	(0.723)
Tangibility	−0.234	0.571	0.855*	−0.515	−1.098*	−0.584**
	(0.178)	(0.653)	(0.459)	(0.563)	(0.591)	(0.320)
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	512	228	492	487	68	68
R-squared	0.175	0.156	0.144	0.182	0.808	0.612

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

This table analyzes the impact of unionization on bankruptcy procedures and expenses. *Duration* is defined as the log of the number of days from the bankruptcy filing date to the conclusion of a 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 for bankruptcy and zero otherwise. *Total fees* is the log amount of total fees and expenses incurred in the bankruptcy court. *Professionals* is defined as the log number of legal and financial professionals hired during the restructuring process. *Union* is a dummy variable that equals one if the bankrupt firm had unionized workers before bankruptcy. Columns (1), (5), and (6) present results from OLS regressions. Columns (2) through (4) present results from logistic regressions. Robust standard errors are reported in parentheses.

(1) of Table 6 shows the results. Bankruptcy proceedings for unionized firms are around 21% (or 110 days) longer than for nonunionized firms filing for bankruptcy in the same year.

Next, we examine whether unionization is associated with a higher likelihood of the firm obtaining debtor-in-possession (DIP) financing during the bankruptcy process. Labor unions are likely to be in favor of DIP financing, as these loans support firms' continued operations during bankruptcy. Notably, under the Bankruptcy Code, DIP financing is assigned superior priority above all existing creditors, including bondholders (see Dahiya et al. 2003; Chatterjee, Dhillon, and Ramirez 2004). To examine the relation between unionization and DIP financing, we define *DIP* as an indicator variable for whether a firm receives DIP financing in bankruptcy. We then use a logistic estimator to regress *DIP* on *Union*, with the same set of controls as in the analysis for *Duration*. Column (2) of Table 6 reports the results from this test. The estimated marginal effect suggests that, compared to nonunionized counterparts, unionized firms are 19% more likely to obtain DIP financing in bankruptcy. This result is statistically and economically significant, indicating that firms with unionized labor are more likely to pursue refinancing maneuvers that reduce bondholders' claims over corporate assets in bankruptcy court.

We also examine whether unionization is associated with a higher likelihood of the firm emerging from bankruptcy and refiling for bankruptcy again. A total of 390 firms in our sample emerge from bankruptcy, 73 of which refile afterwards. If unionization leads to inefficient reorganization processes, one may observe more occurrences of unionized firms emerging from Chapter 11, yet falling back into bankruptcy later. 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 6 report the results. The marginal effects indicate that unionized firms are 14% more likely to emerge from Chapter 11 than nonunionized firms. After emergence, however, unionized firms are 6% more likely to refile for bankruptcy.

Finally, we examine whether unionized firms incur higher legal expenses in bankruptcy court. We measure explicit court expenses in two ways. First, we calculate the log amount of total fees and expenses paid in court (*Total fees*). We then calculate the log number of professional firms hired during the bankruptcy process (*Professionals*). Columns (5) and (6) compare the in-court expenses paid by unionized and nonunionized firms by regressing both measures of expenses on *Union*. Unionized firms pay, on average, $16 million (57%) higher in-court expenses than nonunionized firms, and hire 4 (25%) more professionals during the bankruptcy process.

In all, the evidence gathered from Chapter 11 cases suggests that unionized firms experience longer, more convoluted, and costlier bankruptcies than nonunionized firms.

3.2.3 Unions' presence on unsecured creditors' committees. In this section, we design a test that exploits variation in unions' statutory power in bankruptcy proceedings, providing a more granular assessment of the cost of unionization to bondholders' wealth in bankruptcy states.

Under the U.S. bankruptcy framework, unionized workers are eligible to seats on the unsecured creditors' committee (UCC). The Bankruptcy Code §1102(b) specifies that an unsecured creditors' committee should consist of "entities that hold the seven largest claims against the debtor." Following this guideline, the U.S. Trustee will assign union representatives to seats on unsecured creditors' committee when they represent labor claims whose amount ranks amongst the highest liabilities of the firm. Naturally, it is ex ante difficult to ascertain and calculate the claims of various corporate creditors, and as a result there is both uncertainty and considerable degree of variation regarding the number of seats eventually assigned to unions on these powerful committees (seats that come at the expense of other creditors). We use this variation as a way to test the impact of unions' powers in bankruptcy court on bondholders' losses during the reorganization process. To conduct this analysis, we collect data on the composition of UCCs in a wide range of bankruptcy cases from Bankruptcydata.com. This database contains detailed documentation on bankruptcy proceedings and court decisions. Combining these data with Moody's loss given default (LGD) rates, we obtain a sample of 635 credit facilities that were disposed of by bankruptcy courts between 1988 and 2010. Unions obtain between zero and three UCC seats in our data set.

Panel A of Table 7 reports univariate analyses of LGD rates for creditors in cases in which unions obtain: zero seats (row (a)), at least one seat (row (b)), and at least two seats (row (c)) on UCCs. Column (1) shows the average LGD for creditors in each subsample. Column (2) presents the number of credit facilities involved in the bankruptcy cases of each UCC subsample. Column (3) calculates the differential value losses between subsamples. The statistics point to a significant increase in bond value losses as unions are assigned UCC seats in bankruptcy. When unions receive at least one seat in the UCC, other creditors lose 49% of their face value, a 7-percentage-point increase relative to the cases which unions do not participate in the committee. When unions receive more than one seat, the losses increase to 55% of the bonds' face value; a 13-percentage-point increase. These differences are economically meaningful and statistically significant.

Panel B of Table 7 reports regression analyses of creditor losses on the presence of unions on UCCs. We now control for a variety of firm characteristics before their bankruptcy filings. We also control for year fixed effects, clustering standard errors by firm. In this set of analyses, we contrast the effects of union UCC representation on unsecured bonds and secured bank loans. We do this as a way to gauge the differential costs that labor unions impose on different types of creditors in court. Specifically, unionized workers' claims are classified as unsecured liabilities of the firm, competing directly with the claims from unsecured bondholders. In contrast, unions have very limited powers to expropriate wealth from secured creditors in bankruptcy court. Testing the effects of union powers upon secured loans thus serves as a "falsification-type" test. With this in mind, we split our sample of creditor claims, presenting results for unsecured bonds in columns (1) and (3), and for secured loans in Columns (2) and (4).

Results in Column (1) of panel B show that when unions are assigned seats on an unsecured creditors' committee, unsecured bondholders (only) observe an additional 15% lower recovery value from the bankruptcy proceeding. We can use a back-of-the-envelope calculation to put this estimate into perspective: recall the average bond in our sample is rated A3, with a corresponding default rate of 12% under risk-neutral probability. Having a union on the UCC is thus associated with a 1.8% increase in expected bankruptcy costs ($=12\% \times 15\%$). This is comparable with the results from our baseline local linear estimation suggesting that bond values decline by 2.1% following unionization (see Table 3). Results in Column (3) further reveal that, with every UCC seat assigned to unions, bondholders observe an additional 7.8% in-court loss in recovery value. In stark contrast, secured bank creditors do not observe

Table 7
Unions on unsecured creditors' committees and creditor losses

A. Univariate analyses

#UCC seats assigned to unions		(1) Average LGD	(2) # observations	(3) Differences		
(a)	No seats	0.421	475			
(b)	At least one seat	0.488	160	(b) – (a)	0.067**	(0.031)
(c)	At least two seats	0.553	48	(c) – (a)	0.132**	(0.049)

B. Regression analyses

Dep. var.: LGD Sample	(1) Unsecured bonds	(2) Secured loans	(3) Unsecured bonds	(4) Secured loans
Dummy(Unions on UCC)	0.150**	0.062		
	(0.067)	(0.076)		
# seats assigned to unions			0.078**	−0.018
			(0.034)	(0.072)
ROA	1.079***	1.008**	1.039***	0.855**
	(0.364)	(0.406)	(0.401)	(0.423)
Size	0.004	0.098***	−0.003	0.102***
	(0.032)	(0.023)	(0.032)	(0.024)
Liability ratio	0.624***	0.088	0.636***	0.098
	(0.118)	(0.078)	(0.120)	(0.078)
Cash	−0.244	0.851	−0.486	0.743
	(0.622)	(0.547)	(0.746)	(0.536)
Tangibility	0.096	−0.412***	0.081	−0.409***
	(0.187)	(0.124)	(0.188)	(0.131)
Year FEs	Yes	Yes	Yes	Yes
Observations	137	92	137	92
R-squared	0.718	0.636	0.710	0.633

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

This table shows the relation between creditors' loss given default (LGD) and unions' positions on unsecured creditors' committees of Chapter 11 bankruptcies. Panel A shows univariate tests for creditors' losses. Column (1) shows the average LGD for creditors in each subsample; Column (2) shows the number of credit facilities involved in the bankruptcy cases of each subsample; and Column (3) calculates the differential value losses between subsamples. Panel B shows regression analyses of creditors' LGD on unions' seats on the unsecured creditors' committee (UCC). Columns (1) and (3) present the results for unsecured bonds. Columns (2) and (4) present the results for secured bank loans. All regressions include year fixed effects. Standard errors are clustered by firm.

additional losses when unions are assigned seats in bankruptcy court, as shown in Columns (2) and (4).

It is important to stress that unions' role in UCCs only partially captures their bargaining power in bankruptcy. Unions use various other tactics, including petitioning for workers' job security, negotiating with management for pecuniary benefits, and protesting by organizing strikes. These alternative tactics may engender steeper value implications for bondholders, not necessarily captured by our tests.

Taken together, the analyses in this section suggest that unionization may not lead to deterioration in firm performance or an increase in default risk. However, unionization appears to be associated with costly, prolonged bankruptcy procedures, repeated filings, and significantly reduced recovery values under Chapter 11. The effects we document suggest that unions' actions in bankruptcy erode the value of unsecured creditors' claims.

3.3 Heterogeneous effects

3.3.1 Firm financial distress. We exploit variations along firm financial distress metrics 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. As the threat of bankruptcy looms, bondholders should become increasingly concerned about the in-court cost induced by unionization.

With these dynamics in mind, we partition our sample into financially distressed and financially healthy firms, conducting our RDD analyses of bond CARs on 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 perform 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-to-default* proxy to the distressed (healthy) subsample. Finally, we partition the sample according to Moody's credit ratings and classify as distressed (healthy) those firms with speculative (investment) grade ratings.

Table 8 reports RDD estimates for each subsample. 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 the bonds of close union winners with low Z-scores lose 780 basis points over 3 months following union elections. Bonds of close winners with high Z-scores, in contrast, only lose 80 basis points, an effect that is statistically insignificant. Likewise, close winners with speculative ratings suffer a 620 (1,520)-basis-point bond value decline over 3 (12) months following unionization, while close winners with investment ratings observe only a 110 (180)-basis-point decline.

3.3.2 Pension funding status. We also look at the funding status of firms' pension plans to identify variation in bondholders' expected costs in bankruptcy. The pension benefits of unionized workers are protected by ERISA and interests in underfunded plans are entitled to the firm's estate in bankruptcy.[17] In bankruptcy court, pension obligations are treated with the same priority as wages and salaries (Soble, Eggersten, and Bernstein 1982). In some cases, pension liabilities are granted "administrative expense" priority, a higher

[17] Under ERISA, the PBGC may obtain liens against the assets of the debtor for (1) the amount of unfunded benefit liabilities to plan participants and beneficiaries from the date of plan termination and (2) any delinquent minimum funding contributions (29 U.S. Code § 1362(b)(1)–(3)).

Table 8
Firm heterogeneity

A. Coefficients of union victory (rectangular kernel)

	Distressed				Healthy			
	Z-score	*O-score*	*Distance-to-default*	*Rating*	*Z-score*	*O-score*	*Distance-to-default*	*Rating*
CAR (–1, 3)	−0.078***	−0.035*	−0.020	−0.062***	−0.008	−0.013*	−0.033*	−0.011*
CAR (–1, 6)	−0.094*	−0.139***	−0.008	−0.082**	−0.010	−0.003	0.011	−0.004
CAR (–1, 9)	−0.130*	−0.204***	−0.059*	−0.121***	−0.023	−0.010	−0.029	−0.010
CAR (–1, 12)	−0.150***	−0.239**	−0.075*	−0.152**	−0.028	−0.015*	−0.017	−0.018*

B. Coefficients of union victory (triangular kernel)

	Z-score	*O-score*	*Distance-to-default*	*Rating*	*Z-score*	*O-score*	*Distance-to-default*	*Rating*
CAR (–1, 3)	−0.075***	−0.048**	−0.012	−0.058**	−0.011	−0.011	−0.037**	−0.009
CAR (–1, 6)	−0.088*	−0.135***	−0.011	−0.075**	−0.013	−0.003	0.002	−0.002
CAR (–1, 9)	−0.119*	−0.201***	−0.051	−0.118**	−0.023	−0.011	−0.031	−0.013
CAR (–1, 12)	−0.141***	−0.236**	−0.073*	−0.148**	−0.026	−0.016	−0.011	−0.017

*** p-value < 0.01, ** p-value < 0.05, * p-value < 0.10
This table provides RDD results from local linear regressions on the impact of unionization on bond values for firms with different levels of default risks. Only the coefficients of *Union victory* are reported. We examine healthy and distressed firms based on their *Z-score* (above 3 or below 1.8), *Distance-to-default* (top and bottom quintile), and *O-score* (below or above 0.5) in the election year as well as their credit ratings (investment or speculative grade) in the election month. The dependent variable is bond CARs. We use the optimal bandwidth defined in Imbens and Kalyanaraman (2012) for estimation. All standard errors are clustered by firm.

priority category than unsecured claims.[18] As the pension plans in unionized firms are often specified under collective bargaining agreement, firms can only propose to terminate pension liabilities if the proposal is approved by the union (U.S. Code § 1113). As such, underfunded pension plans present an added obstacle for bondholders from recovering their claims in bankruptcy.

We partition our sample based on the funding status of firms' defined benefit pension plans and conduct our RDD tests across underfunded and well-funded plans. Following Rauh (2006), we define pension funding status as the difference between pension assets and liabilities, classifying a firm as having an underfunded pension when liabilities exceed assets. We expect unionization to have a more detrimental effect on bondholders' wealth in firms with underfunded pension plans (208 election events).

Table 9 reports our test results. Unionization has a significantly negative effect on the value of bonds of firms with underfunded pension plans, but a negligible effect on bonds of firms with well-funded plans. Close union winners with underfunded pensions experience 400 basis points more decline in bond values than close losers over the 3-month window following the election. The bond CAR difference across close union winners and losers with well-funded pensions is, in contrast, only 70 basis points.

3.3.3 Union representative power. Our story suggests that unionization increases the bargaining power of workers, ultimately affecting bondholders.

18 The PBGC has claimed that pension liabilities attributed to services rendered post-petition dates, or within 180 days prior to bankruptcy, should be considered "administrative expenses." This relief has been granted in some court cases, including in the bankruptcy of Marcal Paper Mill, Inc., in 2006.

Table 9
The role of pension funding status

A. Coefficients of union victory (rectangular kernel)

	Underfunded pension		Well-funded pension	
	Unionization coeff.	SE	Unionization coeff.	SE
CAR (–1, 3)	−0.040***	(0.012)	−0.014	(0.010)
CAR (–1, 6)	−0.053***	(0.017)	0.001	(0.008)
CAR (–1, 9)	−0.055**	(0.022)	−0.005	(0.009)
CAR (–1, 12)	−0.075**	(0.030)	−0.008	(0.015)
B. Coefficients of union victory (triangular kernel)				
CAR (–1, 3)	−0.040***	(0.012)	−0.007	(0.009)
CAR (–1, 6)	−0.054***	(0.017)	0.002	(0.008)
CAR (–1, 9)	−0.057***	(0.021)	−0.006	(0.008)
CAR (–1, 12)	−0.077**	(0.031)	−0.012	(0.015)

*** p-value < 0.01, ** p-value < 0.05, * p-value < 0.10
This table provides results from local linear regressions for subsamples based on whether a firm has underfunded or well-funded pension plans. 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 CARs. We use the optimal bandwidth defined in Imbens and Kalyanaraman (2012) for estimation. Standard errors are clustered by firm.

We exploit regional variation in the power of the union movement to further this conclusion. 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. This induces a "free-rider" problem, one that labor advocates claim would weaken unions' bargaining position both in and out of bankruptcy.[19] Research also shows that RTW laws reduce unions' resources, limiting their powers and ability to litigate (see, e.g., Ellwood and Fine 1987; Holmes 1998; Matsa 2010). We use this wrinkle to test if unionization has differential effects on bond prices according to whether the state in which the union election takes place has passed an RTW law.

Table 10 shows the results of our tests. In states with no RTW laws (455 election events), unionization has a large and significant impact on bond CARs. Relative to near losers, bond CARs 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. In all, the impact of unionization on unsecured creditors' wealth seems to be weakened in states where the legislature has passed laws that undermine the power of unions.

4. Robustness

We examine the robustness of our RDD findings to potential concerns regarding sample composition. First, we restrict our sample to industrial firms.

[19] Ross Eisenbrey, Vice President of Economic Policy Institute, has argued that RTW laws make unions financially strapped and lead to "chasing after people to get their dues instead of researching, meeting with the employer, or organizing other units, doing all the things that the union would need to do to build strength" (Covert 2015).

Table 10
The role of right-to-work laws

A. Coefficients of union victory (rectangular kernel)

	RTW (not passed)		RTW (passed)	
	Unionization coeff.	SE	Unionization coeff.	SE
CAR (–1, 3)	−0.022**	(0.009)	−0.025*	(0.013)
CAR (–1, 6)	−0.030*	(0.015)	−0.005	(0.020)
CAR (–1, 9)	−0.054**	(0.022)	−0.017	(0.018)
CAR (–1, 12)	−0.067**	(0.028)	−0.018	(0.022)
B. Coefficients of union victory (triangular kernel)				
CAR (–1, 3)	−0.021**	(0.009)	−0.019	(0.012)
CAR (–1, 6)	−0.029*	(0.015)	−0.005	(0.021)
CAR (–1, 9)	−0.055**	(0.022)	−0.013	(0.018)
CAR (–1, 12)	−0.068**	(0.029)	−0.014	(0.022)

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

This table provides results from local linear regressions for subsamples based 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 CARs. We use the optimal bandwidth defined in Imbens and Kalyanaraman (2012) for estimation. Standard errors are clustered by firm. RTW, right-to-work.

Specifically, we study a subsample of firms in manufacturing, transportation, communications, and electric and gas services (1-digit SICs 2, 3, or 4). These sectors can be seen as more comparable, and where unions have a more meaningful presence. We further perform tests for individual bond CARs, where for each firm we use the largest bond, instead of using firm-level bond portfolios. We also examine whether our results are robust to concerns about political influence playing a role at the NLRB. Frandsen (2014) suggests that when the Republican party holds majority at the NLRB, union election rulings and appeals are more likely to favor employers, which may introduce nonrandomness in the treatment of unionization. In light of this, we verify our results in a subsample of elections certified by a board not controlled by Republicans, when political manipulation is less likely to be observed. As shown in the Internet Appendix, our results persist across all of these additional tests.

5. A Discussion of Economic Effects

We end our analysis with an assessment of the economic magnitudes implied in bondholders' reactions to news of worker unionization. We have shown that worker unionization leads to increased costs from in-court bankruptcy proceedings for unsecured creditors. It is important to put those costs (total bond losses and court costs) into perspective. Notably, the bankruptcy process allows — even if only temporarily — for workers to continue receiving wages and enjoying benefits. Continuation of employment can be seen as a wealth transfer amongst corporate insiders. This 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 measure all of these wealth effects, our setting allows us to perform a back-of-the-envelope calculation regarding a “partial” equilibrium based on our localized estimations.

We start by calculating the total value loss to bondholders induced by unionization. From our estimates, a close union winner experiences a 470-basis-point decline in bond CARs over the 12-month post-election period following the union election (see Table 3). Given that the average firm in our sample has \$1,087 million in bonds outstanding, this estimate translates to an average of \$51 million total value loss for bondholders.

Next, we estimate bondholders’ losses that arise directly 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. We choose the conservative figure of 2.8%. The estimates in Column (5) of Table 6 suggest that unionization is associated with 57% higher bankruptcy costs. Accordingly, we take that unionization is associated with a higher bankruptcy cost equivalent to 1.6% of a firm’s total asset value (= 57% × 2.8%). The average firm in our sample has a total asset value of \$21.5 billion; thus, we estimate that bankruptcy is likely to cost \$343 million more for unionized firms (= 1.6% × \$21.5 billion).

The last element we need to consider is the probability that firms default. We estimate default probabilities according to firms’ credit ratings, and we employ two measures of default. We first use historical default probabilities from Moody’s (Moody’s 2007), which are simple statistics of past observed default events. We also use risk-neutral default probabilities, which account for investors’ risk preferences and are higher than historical occurrences. Our sample firms have an average credit rating of A3. These firms have a historical default probability of 1.6% and a risk-neutral default probability of 12%.

With these default probability statistics, we estimate an expected explicit bankruptcy cost of around \$5.5 million for our sample firms under the historical default probability (= 1.6% × \$343 million), a negligible portion of the \$51 million total bondholder loss. Under the risk-neutral default probability, however, we expect bankruptcy costs to be \$41 million (= 12% × \$343 million), which accounts for a large proportion of total losses.

The estimates above point to two possible channels through which bondholders’ wealth is dissipated in bankruptcy. Modern asset pricing theory suggests that risk-neutrality underlies the calculation of bond prices (Duffie and Singleton 1999; Elton et al. 2001). If bond investors price their claims using risk-neutral probabilities, then our results imply that over 80% of observed losses to bond values stem from expected court costs (wealth that is in great part transferred to professionals involved in the litigation process). If one relies on historical default probabilities, on the other hand, then a plausible conclusion is that only a small percentage of bondholder losses are due to in-court expenses, and the rest of the losses are likely to be captured by unionized workers, potentially due to improved job security and preserved wages and benefits (Abowd 1989).

6. Concluding Remarks

Using a sample of union elections spanning four decades, we find that union election victories are associated with increased bankruptcy costs, which lead to declines in bond values. As we investigate channels through which unionized labor affects bond values, we find that unionization is associated with increases in bankruptcy costs, yet no apparent changes in the probability of bankruptcy. The impact of unionization on bond values is stronger for financially distressed firms, for firms with underfunded pension plans, and in jurisdictions where unions are deemed to be better funded (non-RTW states).

Overall, our paper sheds new light into how organized labor interacts with financial stakeholders of the firm, unsecured creditors in particular. We show that unions can make bankruptcy more costly, prolonged, and convoluted through the way unionized workers' rights are assigned under Chapter 11 proceedings. Our study shows that these dynamics are recognized by creditors, who in turn price it into firms' funding costs. The analysis we put forth may provide new insights for researchers and policymakers in better understanding how firm–labor relations shape corporate access to credit.

Appendix A Variable Definitions

Vote share for union: the ratio of the number of employees in the unit voting for the union to the 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 zero otherwise. Data source: NLRB

ROA: earnings before interest and tax (EBIT)/total assets. Data source: Compustat

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

B/M: the ratio of the book value of equity to the 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: yhe ratio of property, plant, and equipment to total assets. Data source: Compustat

Z-score: 3.3 $\times$ EBIT/total assets + 1.0 $\times$ sales/total assets + 1.4 $\times$ retained earnings/total assets + 1.2 $\times$ working capital/total assets + 0.6 $\times$ market value of equity/total debt. 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 – 1.72 X – 2.37 × net income/total assets – 1.83 × funds from operations/total liabilities + 0.285 Y – 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-to-default: A measure of distance to default, as in Bharath and Shumway (2008). *Distance-to-default*=$\frac{ln(V/F)+(\mu-0.5\sigma_V^2)T}{\sigma_V\sqrt{T}}$. Data source: Compustat 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

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

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

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