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Debt Structure as a Strategic Bargaining Tool

Finance Working Paper N° 487/2016
October 2017

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ECGI Working Paper Series in Finance

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I thank Murray Frank, Andrew Winton, and Tracy Yue Wang for their invaluable support. For helpful comments and discussions, I thank Efraim Benmelech, Jonathan Cohn, Vicente Cuñat, Xin Dai, Mark Egan, Brigham R. Frandsen, Daniel Greene, Thomas J. Holmes, Yi Huang, Inessa Liskovich, William Mann, Gregor Matvos, Elena Simintzi, Aaron Sojourner, Richard Thakor, Hongda Zhong, and seminar participants at the University of Minnesota, Louisiana State University, Lehigh University, Northeastern University, Southern Methodist University, Nanyang Technological University, National University of Singapore, Temple University, as well as conference participants of the 2017 Western Finance Association Annual Meeting, the 2017 SFS Cavalcade, the 2017 Midwest Finance Association Annual Meeting, the Washington University 13th Annual Corporate Finance PhD Poster Session, and the 2016 CSEF-EIEF-SITE Conference on Finance and Labor. I also thank Thomas J. Holmes and Michael R. Roberts for making their data publicly available.

Abstract

In this paper, I examine the strategic role of debt structure in improving the bargaining position of a firm's management relative to its non-financial stakeholders. Debt structure is essential for strategic bargaining because it affects the ease of renegotiating debt contracts and thus the credibility of bankruptcy threats. Using a regression discontinuity design, I show that debt structure is adjusted toward debt that is more difficult to renegotiate in response to an increase in employees' negotiation power. Further analyses confirm that the debt structure adjustments are more likely driven by the strategic concerns of management, rather than by other explanations.

Keywords: Labor Union, Bankruptcy Cost, Debt Structure, Regression Discontinuity Design

JEL Classifications: G30, G32, G33, J31, J51

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Introduction

Does a firm's management use debt policies to influence its bargaining position relative to employees? Although it has been theorized that increasing the debt level could strengthen management's bargaining power (Baldwin, 1983; Bronars and Deere, 1991; Perotti and Spier, 1993; Hennessy and Livdan, 2009), the empirical evidence is mixed despite the theoretical appeal. Matsa (2010) finds that the level of debt is positively correlated with firm-level union power; however, Lee and Mas (2012) and Schmalz (2015) find that the causal effect of union certification on the leverage ratio is zero on average. In this paper, I find strong causal evidence supporting the strategic bargaining view of corporate debt when taking debt heterogeneity into consideration.

The basic theoretical mechanism is that debt represents a firm's commitment to make payments to creditors and hence reduces the surplus over which labor can negotiate with management without forcing firms into bankruptcy. From this point of view, what is critical is the commitment level of the debt and the credibility of the bankruptcy threats, which depend on the ease of renegotiating debt contracts. The credibility of bankruptcy threats is higher for public debt relative to bank debt because renegotiating public debt is more difficult as a result of the Trust Indenture Act of 1939. Bank debt, however, can be renegotiated more easily (Gilson, John, and Lang, 1990) and is indeed frequently renegotiated before maturity (Roberts and Sufi, 2009). Within bank debt, the likelihood of renegotiation also varies. It decreases with syndication size because contract renegotiation becomes more difficult with more creditors. Thus, a proper test of the theory on the strategic use of debt in managerial bargaining should take into consideration the structure of the firm's debt, not just the level of debt.

In this study, I examine the ex ante adjustment of debt structure as a strategic response to an increase in employees' bargaining power. To capture a firm's debt structure, I employ a hand-collected data set from the balance sheets of firms for the 1991 and 2012 sample period to compute the public debt-to-assets ratio, the bank debt-to-assets ratio, and the

fraction of each type of debt in the firm's total amount of debt. I also use new issuance data from the Securities Data Company (SDC) Platinum and the Loan Pricing Corporation (LPC) DealScan to measure the issuance behavior of each type of debt and the syndication structure of bank debt. To capture incremental changes in the bargaining power of labor, I use the information on labor union elections collected by the National Labor Relations Board (NLRB) and employ a regression discontinuity (RD) design to draw causal inferences.

My main findings are as follows. First, the RD results show that debt structure is adjusted toward public debt and away from bank debt as a response to an increase in employees' bargaining power. In particular, compared with firms in which unions barely lose elections (the control group), firms in which unions barely win elections (the treatment group) on average experience a 5.7-percentage-points increase in the ratio of public debt to total assets and a 5.6-percentage-points decrease in the ratio of bank debt to total assets in the three years after elections. Debt structure adjustments after union certification are larger when elected unions are more powerful, when unions are expected to bear larger bankruptcy costs, or when a firm's employees have fewer outside options. I also find consistent evidence using new debt issuance data.

Second, I find that union certification has an impact on the syndication structure of newly issued bank loans. Specifically, passing a labor union election on average leads to a 34.7% increase in the number of creditors (or 2.7 more creditors) and a 50.2% decrease in the Herfindahl-Hirschman Index (HHI) for the creditor ownership in a bank loan tranche in the three years after the election. Such effect is not driven by the effect of union certification on the issuance size of bank debt. The results suggest that firms having little access to corporate bond markets could strategically increase the creditor dispersion of bank debt to advance the management's bargaining positions. Such evidence complements the previous findings on the choice between public and bank debt.

I perform tests to rule out two alternative explanations for the results. The first is that debt structure adjustments after union certification could only be responses to changes

in other firm characteristics and are not related to the management's strategic behavior. To mitigate this concern, I examine how firm characteristics that are important for debt structure choice respond to union certification and find that passing a labor union election on average has little effect on the changes in these firm characteristics.

The second alternative explanation for the findings is that firms could be more constrained from loan markets after union certification because of the potential conflicts between unions and banks: therefore, they may have to resort to the bond market for financing. To address this concern, I exploit the cross-sectional variation in the interest alignment between labor and management before union elections. Using the fraction of defined contribution (DC) pension assets invested in a firm's stock to measure the interest alignment, I find that debt structure adjustments are smaller (larger) after union certification when the interests between labor and management are more (less) aligned before elections. This cross-sectional evidence is inconsistent with the alternative explanation since the conflicts between unions and banks would be exaggerated and union certification would have a larger effect when the interests of labor and management are more aligned; however, it is more consistent with the strategic bargaining view because the need for strategic bargaining is reduced when management and labor have more common interests.

This paper contributes to two strands of literature. First, this paper adds to the literature on the strategic role of debt policies in the bargaining relations with labor.[1] This paper provides new evidence on how management responds to an increase in the bargaining power of non-financial stakeholders. Bronars and Deere (1991) and Matsa (2010) provide the first evidence on how management employs corporate leverage to advance bargaining position. Bronars and Deere (1991) document that the corporate leverage ratio is positively correlated with industry-level union coverage rates, and Matsa (2010) shows that the corporate leverage

[1]This paper is also related to Klasa, Maxwell, and Ortiz-Molina (2009), who show that firms strategically hold less cash when facing stronger unions. The paper is also related to the literature on the interactions between product markets and capital structure (Brander and Lewis, 1986; Chevalier, 1995a,b; Kovernock and Phillips, 1995; Mackay and Phillips, 2005). This paper shows that corporate debt policies also respond to strategic incentives from labor markets.

ratio is positively correlated with firm-level union power and varies with the adoptions and repeals of state laws that govern unions' bargaining power. However, the empirical evidence is mixed. Chen, Kacperczyk, and Ortiz-Molina (2011) do not find a positive relation between the corporate leverage ratio and union coverage rates at the industry level. Using data on NLRB labor union elections, Lee and Mas (2012) and Schmalz (2015) show that, on average, union certification has little impact on the corporate leverage ratio.

In theoretical models, debt is usually assumed to be non-renegotiable and the payments to creditors are fully-committed (Hennessy and Livdan, 2009). If employees are perceived to bear real costs in bankruptcy, then corporate debt is an effective bargaining tool to deter wage demands (Baldwin, 1983). As a result, this theoretical result holds for debt with a high commitment level. The role of debt structure is largely ignored in the empirical literature on the strategic role of debt policies. This paper contributes to the literature by showing the importance of debt heterogeneity, because debt structure (even after controlling for the level of total debt) affects the commitment level of corporate debt, which in turn impacts the credibility of bankruptcy threats.

The conclusions can be generalized to contract negotiations with other non-financial stakeholders, as long as the bankruptcy procedures impose larger costs on them than private workouts (e.g., lessors). Therefore, the results have broader implications beyond the labor union context.

This paper also fits within the strand of literature on the debt structure of firms and its determinants. Rauh and Sufi (2010) and Colla, Ippolito, and Li (2013) document large variations in firms' debt structures in both the cross-section and the time series. Researchers have also examined the determinants of debt structure including information monopoly (Rajan, 1992; Houston and James, 1996), credit rating (Diamond, 1991; Denis and Mihov, 2003), corporate governance (Lin, Ma, Malatesta, and Xuan, 2013), and collateral value (Park, 2000; Lin, 2016). This paper contributes to this strand of literature by showing that management's strategic bargaining motivation is also an important determinant of a firm's financing struc-

ture.

1 Hypothesis Development

A firm's debt structure is essential for strategic bargaining between management and employees for two reasons. First, a firm's debt structure affects the ease of out-of-court debt contract renegotiation and thus the credibility of a bankruptcy threat to employees. One key insight from the literature is that creditor dispersion increases debt contract renegotiation costs (Bolton and Scharfstein, 1996; Diamond, 2004; Zhong, 2014). As a result, the likelihood of out-of-court debt contract renegotiation varies across debt types. For public debt, a bankruptcy threat is more credible because it has a larger creditor dispersion and arranging successful renegotiations between issuers and holders is more difficult due to the Trust Indenture Act of 1939, which requires the bondholders' unanimity to change the interest, principal, or maturity of public debt. On the contrary, bank debt can be renegotiated more easily because of a smaller creditor dispersion, as shown in Gilson, John, and Lang (1990), and bank loans are indeed frequently renegotiated before maturities (Roberts and Sufi, 2009). Furthermore, within bank debt, the renegotiation likelihood also varies. It decreases with the syndication size of a bank loan because contract renegotiation becomes more difficult when there are more creditors.[2]

Second, labor unions bear larger costs under court-supervised bankruptcy than under private resolution of financial distress. Section 1113 of the Bankruptcy Code allows firms to modify or reject a collective bargaining agreement (CBA) to reduce labor costs during a Chapter 11 reorganization process. Although the enactment of Section 1113 in 1984 does not allow employers to unilaterally reject a CBA without violating the National Labor Relations Act (NLRA), it has not favored labor unions in practice. In particular, Dawson (2010) studies

[2]In Table A.1, I provide supporting evidence that an increase in creditor dispersion, measured by the number of creditors in a loan facility, is associated with a longer debt contract renegotiation. Therefore, the results suggest that debt renegotiations become more difficult when creditor dispersion increases. The data on bank loan contract renegotiations are from Roberts (2014) and are available at `http://finance.wharton.upenn.edu/~mrrobert/styled-9/styled-15/index.html`.

the bankruptcy filings of all large U.S. public corporations between 2001 and 2007 and finds that debtors can reject CBAs in every filed 1113 motion. Recently, some union executives also expressed the opinion that "workers' rights in all kinds of bankruptcy cases have been eroded," which suggests that unions' bargaining power during bankruptcy is indeed weak.[3]

The modification or rejection of CBAs outside of bankruptcy, however, is more costly for employers due to the NLRA. Once employers and employee representatives enter a CBA, it cannot be modified during the effective period, or otherwise the firms would commit unfair labor practices (Dawson, 2015).[4]

Overall, labor unions in the United States bear larger costs under court-supervised bankruptcy due to their reduced bargaining power. This argument is also supported by firms' actions in reality. For example, in 2006, a U.S. bankruptcy court allowed Delta Air Lines to terminate pilots' pension plans, which led to a more than $2 billion loss of pension benefits for pilots covered by the Air Line Pilots Association (Benmelech, Bergman, and Enriquez, 2012). Moreover, in 2012, the management of AMR Corporation used Section 1113 of the Bankruptcy Code against American Eagle Labor Unions to obtain cost reduction concessions.[5]

Therefore, given the cost borne by non-financial stakeholders in Chapter 11, the bargaining position of a firm's management can be improved if the firm's debt is structured to include more debt that is more difficult to renegotiate, such as public debt or bank debt with larger syndication sizes. The main hypothesis is summarized as follows:

Hypothesis: *A firm's management adjusts debt structure toward debt that is more difficult to renegotiate (with a larger creditor dispersion) when the employees' bargaining*

[3]Vincent Ryan, "Labor Unions Urge Chapter 11 Reform," CFO.com, March 28, 2013, `http://ww2.cfo.com/bankruptcy/2013/03/labor-unions-urge-chapter-11-reform/`.

[4]National Labor Relations Act, 29 U.S.C. § 158(a)(1), (a)(5) (2006).

[5]The same situation applies to other non-financial stakeholders such as lessors. Section 365 of the Bankruptcy Code states: "The trustee, subject to the court approval, may assume or reject any executory contract or unexpired lease of the debtor." Under this Bankruptcy Code, any rejected contract constitutes a pre-petition general unsecured claim that only pays cents on a dollar. Therefore, lessors' unexpired contracts with debtors are usually subject to rejections during bankruptcy and, as a result, lessors bear a larger cost in Chapter 11 reorganizations, compared to under out-of-court private workouts.

power increases.

I test the hypothesis using data on labor union elections. I use the ratio of public debt to assets as one measure for creditor dispersion in capital structure. I also use the syndication size and creditor ownership concentration of newly issued bank debt as alternative measures. In particular, I examine whether management adjusts debt structure to decrease the ease of renegotiating debt contracts, such as increasing leverage through public debt or issuing bank debt with more creditors or less concentrated creditor ownership, when there is an increase in the bargaining power of employees.

2 Data and Sample Selection

2.1 Debt Structure Data

2.1.1 Balance Sheet Data

The debt structure data used in this paper come from firms' 10-K filings and span from 1991 to 2012. Because of SEC reporting regulations S-X and S-K, detailed information on firms' long-term debt issues and revolving credit facilities is available. I hand-collect the debt structure information from the section "Notes to Financial Statement" in the 10-Ks. Based on this information, I define public debt as the sum of the outstanding amount of commercial paper and bonds and notes for each fiscal year (Lin, Ma, Malatesta, and Xuan, 2013). Bank debt is defined as the sum of the outstanding amount of revolvers, term loans, and other bank loans for each fiscal year.[6]

I construct three debt structure measures. I define the "Public Debt to Assets Ratio (book or market)" as the outstanding amount of public debt on the balance sheet at the

[6]Bonds and notes include the following debt types: public bonds, private placements, revenue bonds, medium term notes, shelf registration bonds, mortgage and equipment debt, and convertible debt. Moreover, excluding commercial paper from the public debt definition generates similar results. Due to data limitations, the public debt used in this paper actually includes both publicly and privately placed debt. I cannot differentiate public bond/Rule 144-A private placements and non-Rule 144-A private placements based on the information from 10-Ks. Therefore, this is a noisy classification, but the measurement errors should bias against our results.

fiscal year-end scaled by total assets (book or market value). I define "Bank Debt to Assets Ratio (book or market)" in a similar fashion. I also define the "% Public (Bank) Debt" as the outstanding amount of public debt (bank debt) on the balance sheet at the fiscal year-end scaled by total debt.

2.1.2 New Issuance Data

In order to examine the impact of employees' bargaining power on debt issuance behavior, I obtain new issuance data between 1992 and 2013 from the SDC Platinum for corporate bonds and the LPC DealScan database for bank loans.[7,8] One advantage of new issuance data is it has more detailed information on the types of corporate bonds. Following Gomes and Phillips (2012), I aggregate public bond and Rule 144-A private placements into the public debt category. I then assign each new issuance to one of three categories: (1) public debt, (2) non-Rule 144A private placements, and (3) bank debt. Furthermore, I consider the syndication size and creditor ownership concentration of newly issued bank loans as alternative dimensions of debt structure. I define syndication size as the number of creditors for each bank loan tranche or loan deal. For creditor ownership concentration, I follow Sufi (2007) and define it as the sum of the square of each creditor's ownership in each loan tranche.

Panel A of Table 1 presents the summary statistics for the debt structure measures based on balance sheet and new issuance data. The balance sheet data are available from one fiscal year before to three fiscal years after each labor union election; the new issuance data are selected to be in the three years following each labor union election. In this sample, public debt and bank debt on average account for 68.0% and 22.9% of a firm's total debt,

[7]Another commonly used data set for new public bond issuance is Mergent FISD. In this paper, I use SDC platinum because it coverage is larger than that of Mergent FISD. It would be beneficial if I could merge SDC and FISD data to obtain more complete coverage for new debt issues of U.S. firms using the identical identifier between SDC and FISD, the international securities identification number (ISIN). Most ISINs are missing in SDC, and therefore merging these two databases becomes difficult.

[8]Murfin (2012) finds that the actual contract date is 3 months (1 month prior to receiving the mandate and 2 months for the syndication/documentation process) before the start date reported in DealScan. Therefore, I adjust the loan facility start date to be 90 days prior to the date reported in DealScan.

respectively. These statistics are similar to those reported in Table 1 of Rauh and Sufi (2010).[9]

The summary statistics for debt issuance show that 50.2% of firms issue public debt in the three years following union elections. The average ratio of public debt issuance size to total assets is 10.3 percentage points and public debt accounts for around 39% of total new issuance after union elections . The statistics for private placements and bank debt are also available in Table 1. In the sample, the average number of creditors is around eight in a bank loan tranche or a bank loan deal and the mean HHI for creditor ownership concentration is 25.9%.

2.2 NLRB Labor Union Election Data

The labor union election data come from two sources. The data from January 1992 to September 1999 are obtained from Thomas Holmes' website.[10] The data from October 1999 to December 2009 are obtained from the NLRB official website.[11] This combined data set contains employers' names, the city and state of an election, 3-digit SIC (January 1992-September 1999), NAICS (October 1999-December 2009), the close date of an election, number of eligible voters, petition type, and total votes for and against unions in an election. There are three types of petitions: representation petitions in which employees seek to be represented by unions or unions seek to be certified, decertification petitions in which employees seek to remove existing unions, and employer-filed petitions in which employers seek to remove unions. I focus on the first type, which ensures that the employees in the bargaining unit are not unionized.[12] Following Lee and Mas (2012), I keep elections in

[9] According to the statistics in Table 1 of Rauh and Sufi (2010), the fraction of all types of bonds in total debt is 68.73% and bank debt accounts for 26.29% of total debt in their sample.

[10] Thomas J. Holmes, homepage for data used in "Geographic Spillover of Unionism," January 2006, `http://www.econ.umn.edu/~holmes/data/geo_spill/`. As described on the website, the data from 1977 to 1992 are from Henry Farber and Bruce Fallick; the data from 1993 to 1994 are from National Archives; and the data from 1995 to 1999 are from NLRB.

[11] National Labor Relations Board, `http://www.nlrb.gov/opengov/nlrb-data-data.gov`.

[12] After merging with debt structure data, the sample sizes for decertification and employer-filed petitions are too small to conduct a formal analysis.

which the number of eligible voters is greater than or equal to 100 in the sample. Following DiNardo and Lee (2004), I standardize the vote shares to the support for elections in which the minimum vote cast is 100.[13] Specifically, I assign the vote share of 50.5% to all vote shares between 50% and 51% and assign the vote share of 49.5% to all vote shares between 49% and 50%, and so forth.[14]

I merge labor union election data with debt structure data by firm names. The final sample spans from 1992 to 2009 and includes 851 elections involving 427 unique firms.[15] Panel B of Table 1 reports the summary statistics for labor union election data. The average vote share is 42.3%, which is below the 50% share with which a union wins an election by a simple majority rule. On average, unions win 28.1% of all elections in the sample, consistent with the statistics of the vote share. Panel C presents the distribution of the number of elections and the passage rate of elections by industry (one-digit SIC code). As expected, elections in manufacturing industries account for more than 67% of all elections in the sample. The year distribution of the number of elections is presented in Figure 1 and shows that the elections concentrate in the years between 1994 and 2006.

3 Empirical Strategy

3.1 Identification Strategy

In order to test the hypothesis, I use data on labor union elections and employ an RD design to estimate how debt structure is adjusted when employees' bargaining power increases. The exogenous variation in employees' bargaining power that I exploit comes from the rule that determines the outcome of a labor union election. By law, a union wins an election by a

[13] I do this is to restore the symmetry between small and large elections; otherwise, I mechanically put more weight on large elections when I focus on close elections. The results are robust without such manipulation.

[14] I also use the tally-based margin of union victory as an alternative specification for the running variable. It is defined as the difference between the number of votes for unions and the number of votes needed for union victory. Throughout the paper, I report results using the vote share for unions as the running variable. The main results using the tally-based running variable are in Table A.4.

[15] The details for data assembly are in Appendix A.4.

simple majority rule (i.e., strictly larger than 50% of total valid votes that are in favor of unionization). A union is certified as the collective bargaining agent in an establishment as the result of a secret ballot election won by the union. Consequently, employees' bargaining power in an establishment increases discontinuously once vote shares for unions pass 50% (DiNardo and Lee, 2004).

3.2 Validity Tests

The key identification assumption for an RD design is that the conditional distribution of potential outcomes as a function of vote share is continuous around the winning threshold (local continuity assumption). Under this assumption, the treatment of union certification is "as good as random" for close elections, and therefore any observed post-election difference in the debt structure distribution between firms in which unions barely win elections and firms in which unions barely lose elections is due to the treatment effect of union certification. Even though the assumption is not directly testable, Lee (2008) shows that the assumption would be likely to be satisfied if vote shares are not *perfectly* manipulated by voters around the 50% cutoff. Therefore, the tests of the discontinuities in the distribution of vote shares and predetermined firm characteristics before elections can provide evidence for or against the assumption. Any detected discontinuity would cast doubt on the validity of RD estimations.

3.2.1 Vote Share Density

I use the procedures developed in McCrary (2008) and Frandsen (2017) to test the discontinuities in the vote share distribution. The results of the vote share density test in McCrary (2008) are presented in Figure 2. The x-axis is the vote share for unions, and the solid line is the fitted density with a 95% confidence interval around it. The discontinuity estimate is -0.028, and the corresponding standard error is 0.173. Therefore, I cannot reject the hypothesis that there is no perfect manipulation of vote shares around the cutoff at the conventional 5% level. Frandsen (2017) suggests that McCrary's test is not suitable for discrete running

variables, thus I follow Frandsen (2017) and perform a second test for the discontinuity in vote share density since the binned vote shares are discrete. Applying this method, I still cannot reject the null hypothesis that there is no perfect manipulation around the winning threshold (p-value 0.770). Overall, the results of McCrary's and Frandsen's tests together suggest that the vote share is unlikely to be perfectly manipulated in the sample.

3.2.2 Continuities in Predetermined Firm Characteristics

In order to further show that the identification assumption for RD is likely to be satisfied, I also examine the continuities in the level of predetermined firm characteristics. If the vote shares are not perfectly manipulated by voters, then there should be little difference in both observable and unobservable predetermined firm characteristics between firms in which unions are barely certified (treatment group firms) and those in which unions are barely not certified (control group firms) within the narrow band of the 50% cutoff (Lee, 2008). Even though such a statement for unobservable firm characteristics is not testable, the balance in observable covariates between treatment and control groups is testable. I define the predetermined firm characteristics as those that are one fiscal year before the election close years.

I examine several important predetermined firm characteristics including debt structure measures, firm size, book and market leverage, market-to-book ratio, tangibility, ROA, modified Z-score, and cash holding. For each predetermined firm characteristic, I estimate the effect of union certification using a RD design with a rectangular kernel and the optimal bandwidth developed in Imbens and Kalyanaraman (2012).

Table 2 presents the results and shows that all estimations are small and statistically insignificant. Therefore, the results suggest that within the vicinity of the 50% cutoff, predetermined observable firm characteristics are comparable between treatment and control firms. Overall, the results in Figure 2 and Table 2 together imply that the identification assumption is unlikely to be violated in the sample. Further discussions on the identification

assumptions are in Appendix A.1.

3.3 Estimation Method

To estimate the causal effect of union certification on debt structure adjustment, I use local linear regressions.[16] Specifically, I estimate the following specification with a weighting scheme ω_i within a chosen bandwidth h:

$$Y_i - Y_{i,-1} = \alpha + \beta_1 WIN_i + \beta_2 WIN_i \times (R_i - 0.5) + \beta_3 (R_i - 0.5) + \epsilon_i \quad (1)$$

with weights $\omega_i = K(\frac{R_i - 0.5}{h})$, where K(•) is a kernel function. K(•) could be either a rectangular (OLS estimation) or triangular kernel (WLS estimation). WIN_i denotes the winning status dummy for election i, while R_i denotes vote shares for the union in election i. Y_i is the three-year average of each debt structure measure after election i. $Y_{i,-1}$ represents each debt structure measure one fiscal year before election i. Estimated β_1 represents the treatment effect of union certification. In all regressions, I treat the elections within the same firm in different years independently and cluster standard errors at the firm level to account for correlations within the same firm. I use the optimal bandwidth choice in Imbens and Kalyanaraman (2012) (IK-optimal) in main results. In the robustness section, I also use alternative choices of bandwidths and specifications to ensure the robustness of the results.

[16] An RD design can be implemented in two ways: by global polynomial regressions and by local polynomial regressions. See Lee and Lemieux (2010) for a comprehensive discussion of these two estimation methods. For a global polynomial regression, all available data are used and polynomials in vote shares are controlled to achieve the identification. In a local polynomial regression, the causal effect is estimated by choosing appropriate kernel functions and bandwidths and controlling linear or quadratic terms in vote shares. Following the suggestions in Gelman and Imbens (2014), I use local linear regressions instead of global polynomial regressions throughout. Gelman and Imbens (2014) argue that there are three drawbacks to global polynomial regressions. The first issue is that the implicit weights on observations far away from cutoffs are noisy. The second issue is that the estimated treatment effect is sensitive to the choice of polynomial order. The third issue is that the confidence interval obtained from global polynomial regressions is too narrow. My results are also robust if I use the polynomial regressions and the results are in Table A.3.

4 Empirical Results

In this section, I present the effects of union certification on the adjustments of debt structure. In subsections 4.1-4.4, I present the effects of union certification on the choice between public and bank debt. I use data from the balance sheets of firms in 4.1-4.3 and use the new issuance data in 4.4. In subsection 4.5, I examine the effects of union certification on the syndication structure of newly issued bank loans.

4.1 Balance Sheet Data Evidence

In this subsection, I use balance sheet data and present RD evidence showing that it is debt structure, not the debt level, that is adjusted strategically as a response to new legal recognition of unions. I initially confirm the results in the literature that management does not strategically adjust the corporate leverage ratio as a response to an increase in employees' bargaining power. I first present the graphical analysis and then report the regression-based results.

In Figure 3, I plot the empirical expected value of the corporate leverage ratio adjustment condition on vote shares and check whether there is any significant discontinuity around the 50% cutoff. In each plot, the x-axis represents the vote share for unions, and I use the optimal bandwidths employed in the estimations in the plots. Each dot represents the average corporate leverage ratio adjustment in a 2% bin, and the dots are fitted using a linear line on each side of the 50% cutoff, with the shaded area being the 95% confidence interval. The upper and lower plots represent the adjustment of book and market leverage ratios, respectively. In both plots, I do not observe significant discontinuities around the 50% cutoff, suggesting that union certification has little effect on the corporate leverage ratio adjustments.

I also estimate the treatment effect of union certification on corporate leverage ratio adjustments using local linear estimations with different choices of bandwidths and rectangular

kernels. The estimations in Table 3 are economically small and statistically insignificant and confirm the data shown in Figure 3. These results are consistent with the findings in Lee and Mas (2012) and Schmalz (2015).

Next, I present results showing that management actively adjusts debt structure, instead of debt level, as a response to union certification. In Figure 4, I plot the empirical expected value of the debt structure adjustment condition on vote shares using the optimal bandwidths in the estimations and check whether there is any significant discontinuity around the 50% cutoff. In each plot, a dot represents the average debt structure adjustment in a 2% bin, with the shaded area being the 95% confidence interval. The plots on the left- and right-hand sides represent the adjustments of debt structure measures for public and bank debt, respectively. In all plots, there are significant discontinuities around the 50% cutoff, which is a sign of causal effects of union certification on debt structure adjustments.

Table 4 presents the RD estimations and I use the IK-optimal bandwidths in all regressions. For each type of debt, I present results using three different measures of debt structure as the dependent variables in regressions. The results show that firms in which unions barely win elections significantly increase leverage through public debt and decrease leverage through bank debt, compared with a set of otherwise similar firms in which unions barely lose elections. Specifically, based on the results in Panel A, passing a labor union election leads to a 5.7-percentage-points increase in the ratio of public debt to total assets and a 5.6-percentage-points decrease in the ratio of bank debt to total assets. These results are statistically significant and economically large given that the sample mean of book leverage through public and bank debt is 21.5 percentage points and 7.1 percentage points, respectively.

The results in the discontinuity samples in Table 4 are not driven by a small number of firms. For example, there are 217 firms involved in the close-election samples for columns (1) and (4), respectively. Overall, the results suggest that management adjusts debt structure to decrease the ease of renegotiating debt contracts when employees' bargaining power increases.

4.2 Cross-Sectional Analyses

In this subsection, I exploit the cross-sectional variations in the bargaining power of unions (subsections 4.2.1 and 4.2.2), the bankruptcy costs expected to be borne by unions (subsection 4.2.3), and employees' outside options (subsection 4.2.4) to further strengthen the identification of the effects of union certification on a firm's debt structure adjustments.

4.2.1 Right-to-Work Law Analysis

A right-to-work (RTW) law is legislation that prohibits union shops. In states with RTW laws, employees in workplaces with CBAs are not required to pay union dues even though they can receive the benefits of collective bargaining. Such a law therefore can create free-rider problems for unions, which makes joining them less economically attractive to workers. The combination of reduced financial support and workers' unwillingness to join unions diminishes unions' ability to organize strikes (Ellwood and Glenn, 1987). This effect has important implications for unions' bargaining power, since the ability to organize strikes grants unions much bargaining power. Since management bargains with union representatives in each plant, I split the sample into RTW and non-RTW elections based on election states.[17]

I examine whether the effects of union certification are stronger (weaker) for elections held in states without (with) RTW laws and the results are reported in Panels A and B of Table 5. The estimations show that debt structure adjustments are large and significant for elections held in non-RTW states (Panel A), but are much smaller and insignificant for elections held in RTW states (Panel B). Specifically, based on the results in column (1) in each panel, passing a labor union election leads to a 6.7-percentage-points increase in the ratio of public debt to total assets for elections held in non-RTW states, and only a 0.3-percentage-points increase for elections held in RTW states.

[17]The states that have passed RTW laws as of 2009 are: Alabama, Arizona, Arkansas, Florida, Georgia, Idaho, Iowa, Kansas, Louisiana, Mississippi, Nebraska, Nevada, North Carolina, North Dakota, Oklahoma (after 2001), South Carolina, South Dakota, Tennessee, Texas (after 1993), Utah, Virginia, and Wyoming. Indiana and Michigan passed the "right-to-work" legislation in 2012 and 2013, respectively. Wisconsin adopted RTW laws in 2015 and Kentucky and Missouri adopted RTW laws in 2017.

4.2.2 Union Election Size Analysis

Alternatively, I use election size as another proxy for union power. A union has greater bargaining power if it represents a larger fraction of employees in a firm. I measure election size as the ratio of the number of eligible voters in an election to the firm's total employment. I define large (small) elections as those that rank in the top (bottom) half in the sample distribution of election size. On average, the number of eligible voters in an election accounts for 7.68% and 0.45% of a firm's total employment for large and for small elections, respectively. Therefore, there are meaningful variations in the election size across large and small elections.

I examine whether the effects of union certification on debt structure adjustment are stronger (weaker) for larger (smaller) elections. Panels C and D of Table 5 present the results. The estimations show that the effects of union certification on debt structure adjustment are large and significant for large elections, and are small and insignificant for small elections. The results in column (1) in each panel suggest that passing a labor union election leads to a 6.3-percentage-points increase in the ratio of public debt to total assets when elections are large, and only a 2.6-percentage-points increase when elections are small.

4.2.3 Unions' Bankruptcy Costs Analysis

I also investigate whether the results in Table 4 vary with the costs expected to be borne by labor unions during bankruptcy procedures. If the debt structure adjustment is strategic, then the effect should be concentrated in firms in which bankruptcies are expected to be costly for unions, since debt structure can only be an effective bargaining tool in these firms. To capture a union's bankruptcy costs, I use the predetermined underfunding status of a firm's DB pension plans. The use of this measure as a proxy for the costs borne by a union during a Chapter 11 reorganization can be justified by the evidence in Benmelech, Bergman, and Enriquez (2012), who demonstrate that the threat of bankruptcy is more acute for labor if the deficits of DB pension plans are larger. DB pension plan data come from Compustat

Pension Annual Database. The deficit of a firm's DB pension plans is defined as the difference between the projected benefit obligations and the fair value of pension plan assets.

The effects of union certification on debt structure adjustments conditional on the pre-determined underfunding status of DB pension plans are reported in Table 6. The results in column (1), Panel A show that passing a labor union election leads to a 12.1-percentage-points increase in the ratio of public debt to total assets when unions are expected to bear larger costs in bankruptcy procedures; however, the estimation is -1.6 percentage points for firms in which DB pension plans are not underfunded, as shown column (1) of Panel B.

4.2.4 Employees' Outside Options Analysis

In this subsection, I examine the effects of union certification on debt structure adjustments conditional on the outside options of employees. If employees have more outside options, then the credibility of bankruptcy threats to employees would become weaker, which would lead to union certification having a reduced effect on debt structure adjustments. I use the number of local competitors, the number of competitors in the two-digit SIC industry within a 50-mile radius around a firm's headquarters, as a proxy for the outside options of employees. In particular, employees are defined to have more (fewer) outside options if the number of local competitors is above (below) the sample median.

The effects of union certification on debt structure adjustments conditional on employees' outside options are reported in Table 7. The results in column (1), Panel A show that union certification leads to a 7.4-percentage-points increase in the ratio of public debt to total assets when employees have fewer outside options; however, it is only a 3.2-percentage-points increase for firms in which employees have more outside options, as shown in column (1) of Panel B.

Overall, the results in Tables 5-7 suggest that debt structure adjustments after union certification are stronger when unions are more powerful, when unions are expected to bear larger costs during Chapter 11 reorganizations, or when a firm's employees have fewer outside

options. This cross-sectional evidence further strengthens the interpretation of the RD results in Table 4.

4.3 Robustness Check Results and Placebo Tests

4.3.1 Robustness Check Results

In this subsection, I provide robustness checks for the results in Table 4. The robustness checks include: (1) using alternative bandwidths in estimations, (2) inclusion of predetermined firm characteristics, (3) using alternative sample selections for labor union elections, and (4) donut RD estimations.

In Panels A and B of Table 8, I use bandwidths of 5% and 10%, instead of the IK-optimal bandwidths used in the estimations in Table 4. The results are based on local linear regressions with rectangular kernels. The results show that the results in Table 4 are robust to alternative choices of bandwidths.[18]

I also include predetermined firm characteristics including firm size, book leverage, ROA, tangibility, market-to-book ratio, and modified Z-score and present the RD results in Panel C of Table 8. The results show that including predetermined firm characteristics barely changes the results in Table 4. This fact also verifies the validity of the estimations in Table 4 because it suggests that the predetermined firm characteristics are independent of the treatment status within the vicinity of the 50% cutoff.

In Panels D and E of Table 8, I present results for alternative sample selections for labor union elections. In Panel D, I keep the first election in each firm-year observation, and use all elections in Panel E. The results show that the results in Table 4 are robust to alternative sample constructions.

[18]In order to further assess the sensitivities of the results to various bandwidths, I plot the local linear estimations with rectangular kernels against bandwidths from 0.01 to 0.5 in Figure A.1. The plots on the left- and right-hand sides represent the results for public and bank debt, respectively. The vertical line in each plot represents the results with optimal bandwidths in Imbens and Kalyanaraman (2012). Figure A.1 shows that the results are stable across the chosen bandwidths, suggesting that the local linear estimations are robust to alternative choices of bandwidths.

In order to further mitigate the concern that the incentives for vote share manipulations are greater when the margins of victory (MOV) are smaller, I use the dobut-RD approach in Barreca et al. (2011). In the dobut-RD specification, I exclude the elections with small MOV and examine whether the results in Table 4 are robust. In Panel F of Table 8, I use the same bandwidths as in Table 4 and exclude elections in which the outcomes would have been changed by one vote. The results show that the results are robust to the exclusions of the elections that are most likely to be subject to voters' manipulations and verify the validity of the estimations. Overall, the results in Table 8 indicate that the results in Table 4 are robust to alternate bandwidths and the inclusion of predetermined firm characteristics, are not driven by a particular method of sample selection, and are robust to the donut-RD approach.

4.3.2 Placebo Tests

I also conduct a placebo test to rule out the possibility that the causal relation between union certification and the debt structure adjustments is spurious. In particular, I investigate whether the results in 4 disappear if I arbitrarily choose a winning threshold other than 50%. I randomly choose a number between 0.3 and 0.7 as the artificial threshold each time and then estimate how debt structure is adjusted as a response to the pseudo union certification using a local linear estimation. This exercise is repeated 5,000 times, and the histograms of the estimations are reported in Figure 5. The vertical lines represent the results in Table 4 in which the winning threshold is 50%. Figure 5 shows that all histograms are centered around 0, suggesting that any impact of union certification on debt structure adjustment disappears if an artificially winning threshold is chosen. This placebo test results further strengthen the causal relations in Table 4.

4.4 New Issuance Data Evidence

One drawback of the balance sheet data is that they do not differentiate public bond/Rule 144-A private placements from non-Rule 144-A private placements within the defined public debt. In this subsection, I use data from the SDC Platinum and DealScan and estimate the causal impacts of union certification on the new issuance behavior of different types of debt in the three years after union elections. Panels A, B, and C of Table 9 report estimations for public debt, non-Rule 144-A private placements, and bank debt, respectively.[19] In each panel, column (1) reports the estimation for issuance probability, column (2) reports the estimation for the average ratio of issuance size to total assets, and column (3) reports the estimation for the fraction of each type of debt's issuance size in total issuance size. The estimations suggest that firms in which unions barely win elections are 29.8% more likely to issue public debt in the following three years, compared with firms in which unions barely lose elections. The impact of union certification on the issuance probability of non-Rule 144-A private placements is negative and significant, suggesting that firms are less likely to issue private placements after experiencing union certification. The effect on the issuance probability of bank debt is small and insignificant.

Moreover, the estimations suggest that union certification leads to a 9.0-percentage-points increase in the average ratio of public debt issuance size to total assets in the three years following the election. However, the effect of union certification on the average ratio of private placements or bank debt issuance size to total assets is small and insignificant. The estimations also show that union certification leads to a 23.0-percentage-points increase in the fraction of public debt in total issuance size in the following three years. The effect on the fraction of private placements in total issuance size is small and insignificant.

The results in Table 9 suggest that management only chooses to issue more public debt, which is difficult to renegotiate, after union certification. The issuance size of private place-

[19]The number of observations for each estimation is different because the optimal bandwidth in the RD estimation (reported in the Table 9) varies.

ments or bank debt, which is easier to renegotiate, is not significantly affected by union certification. Overall, these estimates are consistent with the interpretation that management adjusts debt structure to strategically advance bargaining positions after union certification.

4.5 Union Certification and the Syndication Structure of Bank Loans

Another limitation of the results in Table 4 is that firms having little access to corporate bond markets are excluded from the sample. In this subsection, I consider another dimension of debt structure—the syndication structure of bank loans—and examine whether firms issue loans with a larger creditor dispersion as a response to an increase in employees' bargaining power if they are constrained from corporate bond markets.

I employ a 36-month window after each election and use two measures for the syndication structure of newly issued bank loans: the natural logarithm of post-election average syndication size and the natural logarithm of post-election average creditor ownership concentration.[20] In order to mitigate the concern that the differences in syndication structure could be due to the differences in loan amount, I also estimate the effect of union certification on the average loan amount in the 36 months after elections.

Table 10 presents the effects of union certification on the syndication structure of bank loans. Columns (1) and (2) present results for syndication size defined at the loan tranche level and the loan deal level, respectively. Column (3) presents the result for creditor ownership concentration and column (4) presents the result for loan amount. I find that syndication size of bank debt increases and creditor ownership becomes more dispersed after union certification. In particular, the results in column (1) suggest that compared with firms in which unions barely lose elections, the syndication size of new bank loans increases by 34.7% (or 2.7 more creditors) for firms in which unions barely win elections. The results in column (3) show that the HHI for creditor ownership of new bank loans decreases by 50.2% once a

[20]I exclude the following loans from the sample: (1) tranches that are not syndicated in the U.S., (2) tranches that are not denominated in U.S. dollars, (3) the 364-day facility or loan primary purpose is for working capital, and (4) any loan with maturity less than or equal to one year. The short-term loans are usually treated as part of working capital instead of capital structure.

labor union is certified. Finally, the results in column (4) show that union certification has little effect on the amount of loan issuance, mitigating the concern that the effects of union certification on syndication structure are driven by the effects of union certification on loan amount. Overall, the results in Table 10 suggest that firms structure debt to make debt contract renegotiation more difficult when employees' bargaining power increases. They are therefore complementary to the results in Table 4.[21]

5 Alternative Explanations

In this section, I perform tests to rule out alternative explanations for the results. Even though the results are consistent with the strategic view of debt structure, other channels could generate the same results. In subsection 5.1, I examine whether debt structure adjustments after union certification are only responses to changes in other firm characteristics and are not related to management's strategic behavior. In subsection 5.2., I examine whether the adjustments of debt structure after union certification are due to the constraints from bank loan market rather than management's strategic demand.

5.1 Does Union Certification Affect Other Firm Characteristics?

In this subsection, I examine the effects of union certification on the changes in other firm characteristics that are important for the choice of debt structure, including asset tangibility, R&D investment, capital investment, profitability, productivity, Z-score, credit rating, and bid-ask spread. A change in a firm characteristic is defined as the difference between its average value in the three years after an election and the value one year before the election.

Table 11 presents the effects of union certification on the changes in firm characteristics. The results show that union certification has little effect on these firm characteristics,

[21] I also test whether union certification has any effect on the syndication structure of bank loans issued within 12 months before elections. The results show that union certification has little effect, which suggests that there is little difference in the pre-election level of syndication structure between treatment and control groups.

suggesting that debt structure adjustments after union certification are not responses to changes in asset tangibility, corporate investment (R&D investment and capital investment), firm performance (profitability and productivity), corporate risk (Z-score), or information asymmetry (credit rating and bid-ask spread).

5.2 Are Firms More Constrained from Loan Markets after Union Certification?

In this subsection, I examine whether the results in Table 4 may be driven by the possibility that firms are more constrained from bank loan markets after union certification due to the potential conflicts between unions and banks. To mitigate this concern, I exploit the cross-sectional variation in the interest alignment between labor and management before elections.

Following Rauh (2006), I use two measures as proxies for the interest alignment between labor and management: the first is the fraction of DC pension assets invested in a firm's stock, and the second is the fraction of a firm's equity held by employees through DC pension assets (DC pension ownership).[22] The interests of labor and management are defined to be more (less) aligned in a firm if the fraction of DC pension assets invested in a firm's stock or the DC pension ownership is larger (smaller) than the sample median.

Table 12 reports the effects of union certification conditional on the interest alignment between labor and management. Panels A and B present results for firms with smaller and larger fractions of DC pension assets invested in a firm's stock, respectively. Panels C and D present results for firms with smaller and larger DC pension ownership, respectively. The results in column (1), Panel A show that passing a labor union election leads to a

[22]The data on fair value and detailed asset holdings of DC pension plans come from IRS Form 5500 through the Center for Retirement Research at Boston College and the Department of Labor. The data from 1990 to 2007 are from Center for Retirement Research at Boston College are available at `http://crr.bc.edu/data/form-5500-annual-reports/`. The post-2007 data are from the Department of Labor, available at `https://www.dol.gov/agencies/ebsa/researchers/data/retirement`. I exclude plan-year observations such that part or all of the assets are in common or master trusts, following Rauh (2006).

7.6-percentage-points increase in the ratio of public debt to total assets when the interest between labor and management is more divergent; however, the estimation is 0.8 percentage points for firms in which the interest between labor and management is more aligned. Panels C and D present similar results.

The results in Table 12 are inconsistent with the alternative channel. The conflicts between unions and banks are expected to be exaggerated when the interests of labor and management are more aligned, since labor then would have more incentives to engage in the behavior that benefits shareholders but hurts bank creditors. As a result, the substitution effect between bank loans and public debt should be stronger, not weaker, after union certification.

The results in Table 12 are more consistent with the view that debt structure is adjusted strategically to improve management's bargaining position against labor unions because the need for strategic bargaining is reduced when labor and management have more common interests.

6 Conclusion

In this paper, I provide new evidence on how management adjusts debt policies as a response to an increase in employees' bargaining power. The role of debt structure is largely ignored in the empirical literature on the strategic role of corporate debt. I show that debt structure, instead of the level of debt, influences management's bargaining positions relative to employees.

Using data on NLRB labor union elections and a regression discontinuity design, I show that debt structure is adjusted toward debt that is more difficult to renegotiate as a response to an increase in employees' bargaining power. In particular, passing a labor union election leads to an increase in the leverage through public debt and a decrease in the leverage through bank debt while the effect of union certification on corporate leverage ratio adjustment is

close to zero. Furthermore, the syndication structure of newly issued bank loans also becomes more dispersed after union certification.

I further show that the results are more likely driven by management's strategic concerns, rather than by other explanations after union certification. Specifically, union certification has little effect on the changes in other firm characteristics that are important for debt structure choice, suggesting that the debt structure adjustments are unlikely only responses to changes in other firm characteristics after union certification. Moreover, the results are unlikely driven by the possibility that firms are more constrained from loan markets after union certification due to potential conflicts between unions and banks. I show that the effects of union certification on debt structure adjustments are smaller, not larger, when the interests of labor and management are more aligned, which would exaggerate the conflicts between unions and banks.

Even though I focus on the interactions between management and labor in this paper, the findings have more general implications for non-financial stakeholders in firms. As long as bankruptcy procedures impose larger costs on non-financial stakeholders than out-of-court workouts (e.g., lessors), debt structure could serve as a strategic bargaining tool, since it alters the credibility of bankruptcy threats to non-financial stakeholders.

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Figure 1: Number of Elections: Year Distribution

This figure shows the year distribution of the number of elections in the sample.

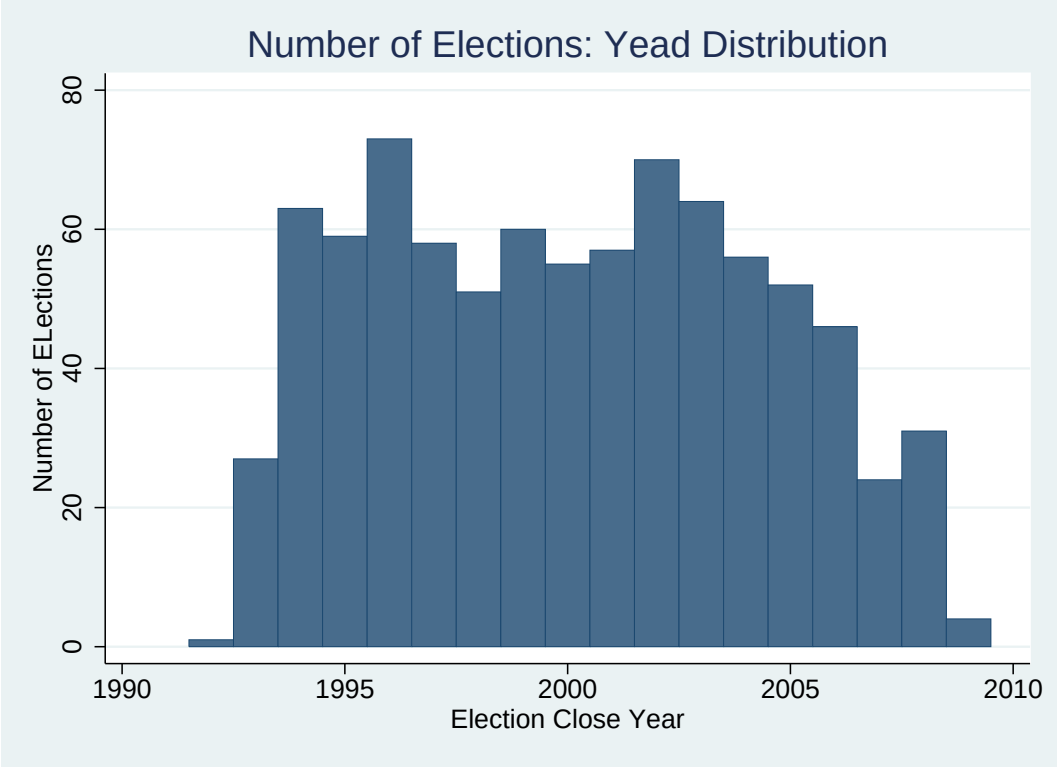
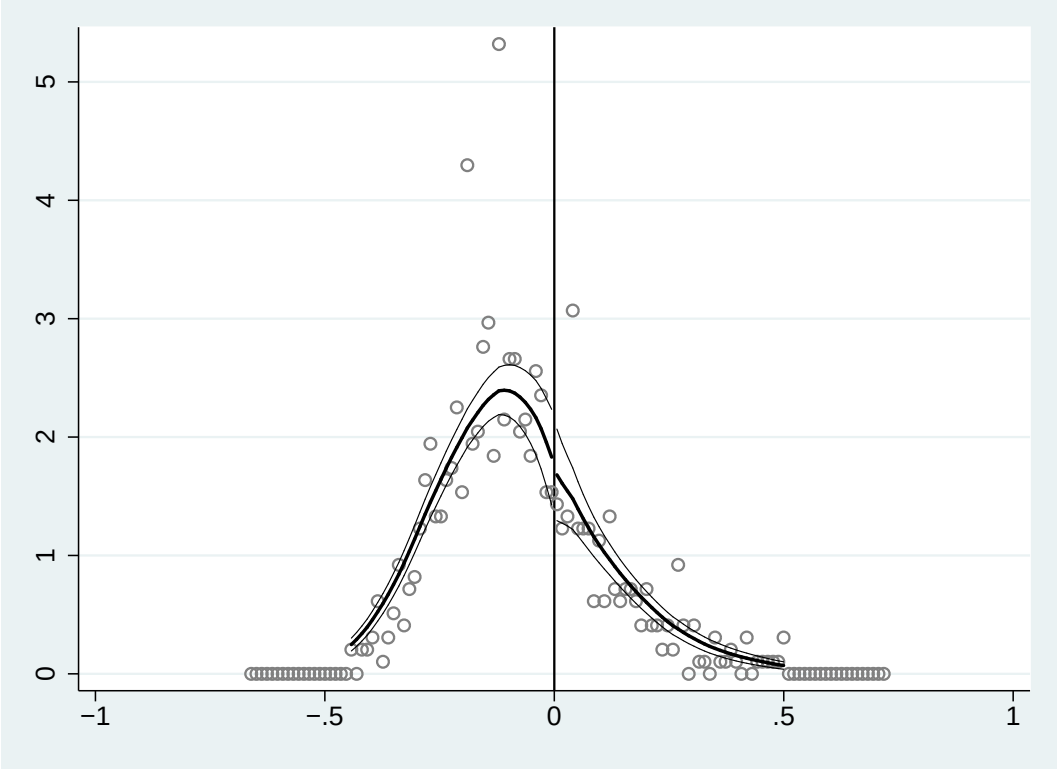


Figure 2: Vote Share Manipulation Tests

This figure shows the results of the vote share density test developed by McCrary (2008) using a triangular kernel with a bandwidth of 0.216. The x-axis is the vote share for unions, and the solid line is the fitted density with a 95% confidence interval around it. The discontinuity estimate is -0.028, and the corresponding standard error is 0.173.



McCrary's Formal Test: T-statistics = -0.162

Figure 3: Graphical Analysis: Corporate Leverage Ratio

This figure presents regression discontinuity plots and shows the relation between the corporate leverage ratio and vote share for unions non-parametrically. The upper and lower plots present the results for book and market leverage, respectively. In each plot, I use the optimal bandwidths in the estimations, and each dot represents the average of debt structure adjustment in a 2% bin. The dots are fitted using a linear line on each side of the 50% cutoff. The shaded area in each plot represents the 95% confidence interval. *Total Debt/AT* and *Total Debt/MV* represent the ratio of total debt to total assets and market value, respectively.

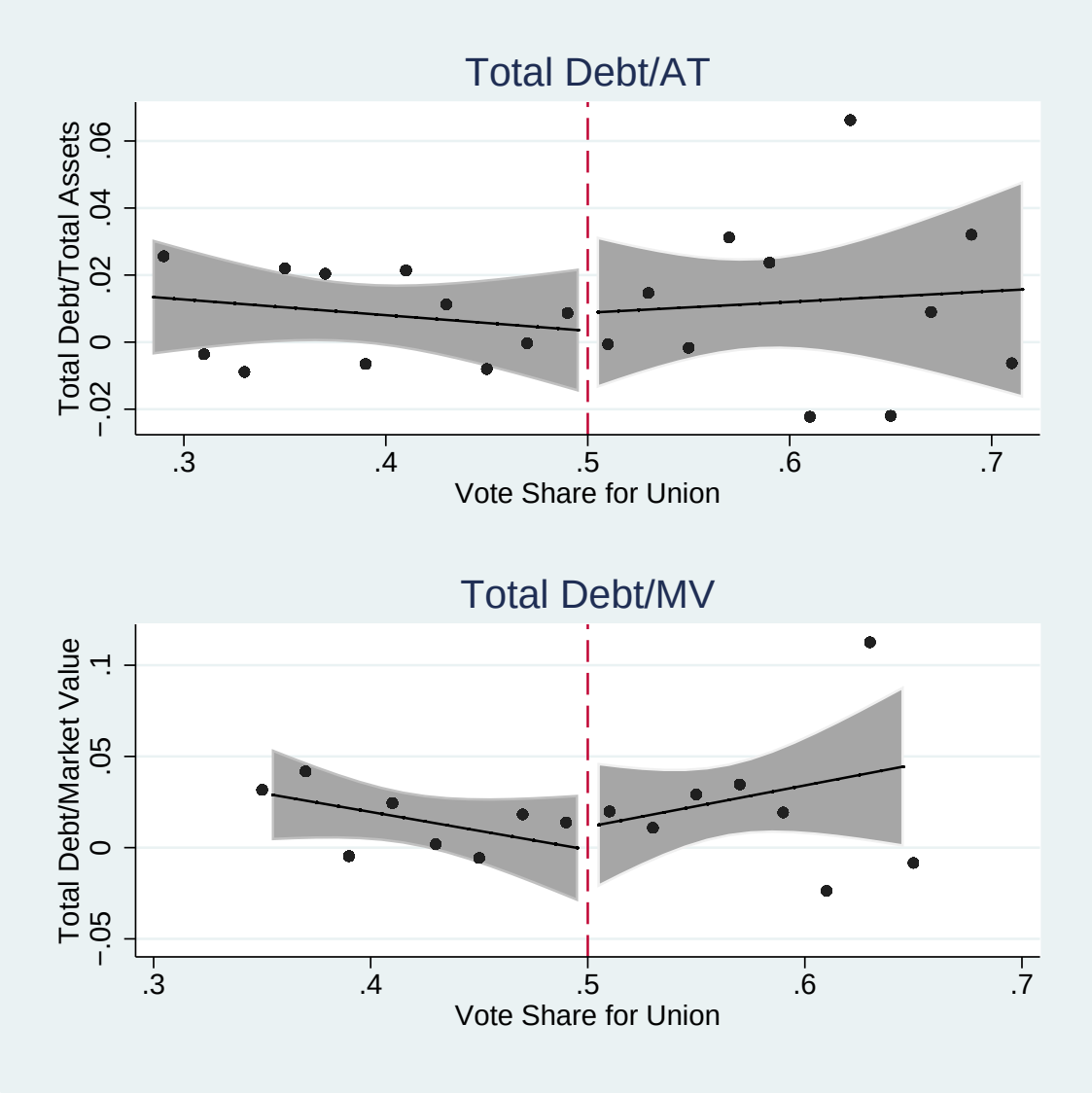


Figure 4: Graphical Analysis: Debt Structure

This figure presents regression discontinuity plots and shows the relation between debt structure adjustment and vote share for unions non-parametrically. The left and right plots present the results for public and bank debt, respectively. In each plot, I use the optimal bandwidths in the estimations, and each dot represents the average of debt structure adjustment in a 2% bin. The dots are fitted using a linear line on each side of the 50% cutoff. The shaded area in each plot represents the 95% confidence interval. *Public/AT* and *Bank/AT* represent the ratio of public and bank debt to total assets, *Public/MV* and *Bank/MV* represent the ratio of public and bank debt to market value, and *Public/Debt* and *Bank/Debt* represent the ratio of public and bank debt to total debt.

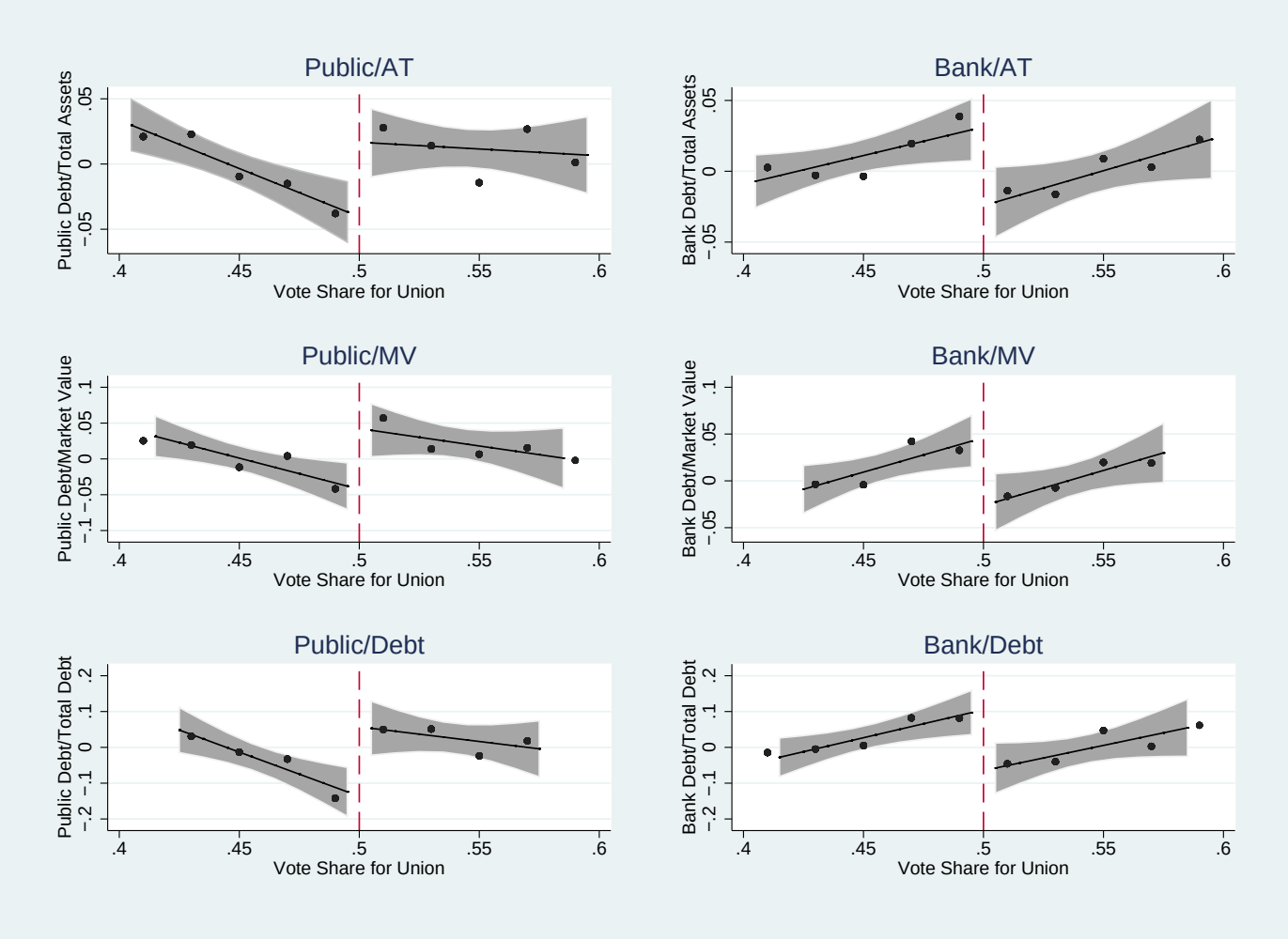


Figure 5: Placebo Effects of Union Certification on Debt Structure Adjustment

This figure presents the results of placebo tests. The placebo tests are implemented as follows. I first randomly choose a number other than 50% between 0.3 and 0.7 as the artificial winning threshold and then estimate the effect of union certification on debt structure adjustment as for Table 4. The results are estimated using local linear regressions with the optimal bandwidths and rectangular kernels. This exercise is repeated 5,000 times, and the histograms of the estimation results are reported. The vertical lines represent the estimated results presented in Table 4 when the winning threshold is 50%. *Public/AT* and *Bank/AT* represent the ratio of public and bank debt to total asset, *Public/MV* and *Bank/MV* represent the ratio of public and bank debt to market value, and *Public/Debt* and *Bank/Debt* represent the ratio of public and bank debt to total debt.

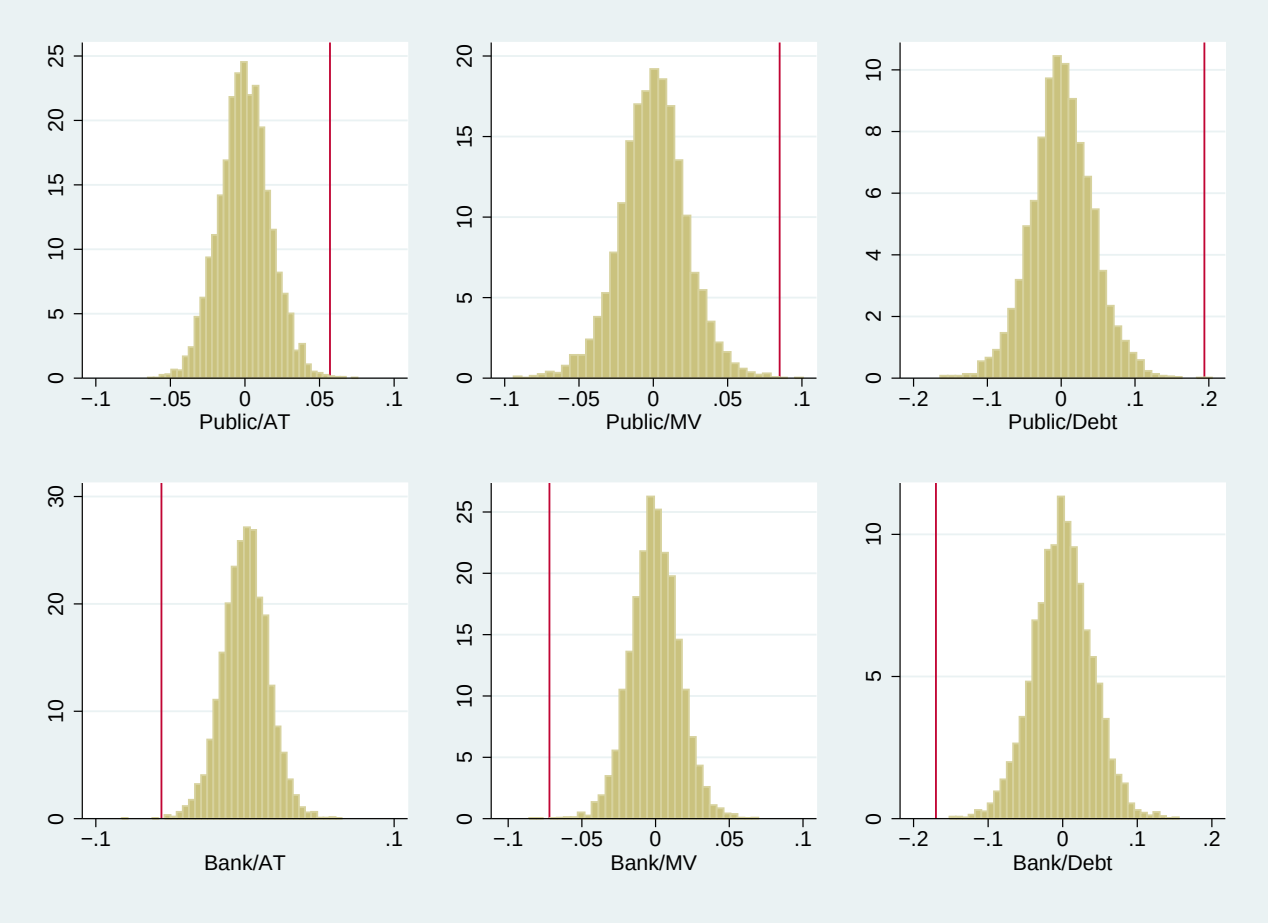


Table 1: **Summary Statistics**

This table presents the summary statistics of data in the sample. The variable definitions are in Appendix A.3. Panel A presents the summary statistics for debt structure measures based on balance sheet and new debt issuance. The balance sheet data are from one fiscal year before to three fiscal years after each labor union election and the new issuance data are from the three years after each labor union election. Panel B presents the statistics for labor union election data. Panels C presents the distribution of number and passage rate of elections by industry (one-digit SIC).

Panel A: Debt Structure

	N	Mean	Std. Dev.	Median
Balance Sheet				
Public/AT	851	0.215	0.137	0.208
Public/MV	851	0.216	0.163	0.188
Public/DEBT	851	0.680	0.320	0.792
Bank/AT	851	0.071	0.098	0.019
Bank/MV	851	0.077	0.112	0.015
Bank/DEBT	851	0.229	0.298	0.076
New Issuance				
Public Issuance Prob.	851	0.502	0.500	1.000
Private Issuance Prob.	851	0.080	0.271	0.000
Bank Issuance Prob.	851	0.800	0.400	1.000
Public Issuance Size/AT	851	0.103	0.162	0.002
Private Issuance Size/AT	851	0.006	0.030	0.000
Bank Issuance Size/AT	851	0.088	0.089	0.065
Public Issuance Size/Total Size	737	0.389	0.380	0.351
Private Issuance Size/Total Size	737	0.028	0.127	0.000
Bank Issuance Size/Total Size	737	0.582	0.379	0.562
Syndication Structure				
SyndSize1	1269	7.680	6.841	6.000
SyndSize2	1259	7.788	7.094	6.000
HHI	525	0.259	0.286	0.125

Panel B: Election Statistics

	N	Mean	Std.Dev.	Median
Vote Shares for Unions	851	0.423	0.168	0.405
WIN	851	0.281	0.450	0.000

Panel C: Election Industry Distribution

SIC	Description	# of Elections	Passage Rate
0	Agriculture	2	100%
1	Mining	16	18.75%
2	Light Manufacturing	293	26.28%
3	Heavy Manufacturing	279	27.24%
4	Transportation	48	25.00%
5	Wholesale Trade	119	16.81%
7	Services	45	44.44%
8	Health Services	48	60.42%
9	Public Administration	1	0.00%

Table 2: **Discontinuities in the Level of Predetermined Characteristics**

This table presents the test results for the null hypothesis that there is no systematic difference in the predetermined level of firm characteristics between firms in which unions barely win elections (treatment group) and firms in which unions barely lose elections (control group). I implement an RD estimation with a rectangular kernel and the optimal bandwidth for each predetermined firm characteristic including debt structure measures, firm size, book leverage, market leverage, market-to-book ratio, tangibility, ROA, modified Z-score, and cash holding. All RD estimations include vote shares allowing for different intercepts and slopes on each side of the cutoff. Standard errors are robust and clustered at the firm level.

	Coeff.	Z-stat Value
Outcome Variables		
Public/AT	-0.007	-0.318
Public/MV	-0.001	-0.042
Public/Total Debt	-0.045	-0.684
Bank/AT	0.010	0.507
Bank/MV	0.023	0.988
Bank/Total Debt	0.024	0.630
Firm Characteristics		
Log(AT)	0.098	0.541
BookLev	-0.018	-0.911
MarkLev	-0.014	-0.471
MTB	-0.056	-0.763
Tangibility	0.010	0.450
ROA	-0.008	-0.992
Modified Z-score	0.053	0.349
Cash Holding	0.003	0.356

Table 3: **Do Firms Adjust the Level of Debt as a Response to Union Certification?**

This table presents the adjustment of the corporate leverage ratio to union certification. Book leverage is defined as the ratio of total debt to total assets, and market leverage is defined as the ratio of total debt to market value. Panels A and B present the results for book and market leverage, respectively. In each panel, I use various bandwidths and rectangular kernels in local linear regressions. Standard errors in parentheses are robust and clustered at the firm level.

Panel A: Book Leverage				
	Optimal	5%	10%	15%
	(1)	(2)	(3)	(4)
WIN	0.005	-0.001	-0.004	0.000
	[0.016]	[0.032]	[0.024]	[0.020]
Bandwidth	0.221	0.050	0.100	0.150
N	643	147	311	463
Panel B: Market Leverage				
	Optimal	5%	10%	15%
	(1)	(2)	(3)	(4)
WIN	0.013	0.001	0.009	0.013
	[0.027]	[0.046]	[0.032]	[0.027]
Bandwidth	0.149	0.050	0.100	0.150
N	463	147	311	463

Table 4: **Do Firms Adjust Debt Structure as a Response to Union Certification?**

This table presents the adjustment of debt structure to union certification. I use six measures: public or bank debt scaled by total assets, public or bank debt scaled by market value, and public or bank debt scaled by total debt. All results are estimated using local linear regressions with the optimal bandwidths. Panels A and B present the results using rectangular and triangular kernels, respectively. Standard errors in parentheses are robust and clustered at the firm level. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Panel A: Rectangular Kernel						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.057***	0.085***	0.194***	-0.056***	-0.072***	-0.170***
	[0.019]	[0.028]	[0.061]	[0.020]	[0.025]	[0.054]
Bandwidth	0.104	0.094	0.084	0.103	0.085	0.091
N	311	274	242	311	242	274
Panel B: Triangular Kernel						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.054***	0.086***	0.205***	-0.056***	-0.070***	-0.176***
	[0.019]	[0.028]	[0.057]	[0.020]	[0.023]	[0.053]
Bandwidth	0.133	0.119	0.107	0.131	0.108	0.115
N	403	364	338	403	338	364

Table 5: **Does Unions' Bargaining Power Matter?**

This table presents the debt structure adjustment to union certification conditional on unions' bargaining power. Panels A and B present results conditional on whether the election states have adopted the RTW laws at the time of an election. Panels C and D present results conditional on election size, defined as the fraction of eligible voters in a firm's total employment. Large (small) elections are defined as the elections that rank in the top (bottom) half in the sample according to the election size. All results are estimated using local linear regressions with optimal bandwidths and rectangular kernels. Standard errors in parentheses are robust and clustered at the firm level. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Panel A: Non-RTW						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.067***	0.113***	0.200***	-0.063**	-0.080**	-0.188***
	[0.020]	[0.034]	[0.068]	[0.027]	[0.031]	[0.067]
Bandwidth	.105	.093	.089	.101	.089	.105
N	235	189	189	214	189	214
Panel B: RTW						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.003	0.026	0.079	-0.021	-0.022	-0.071
	[0.032]	[0.044]	[0.080]	[0.021]	[0.033]	[0.064]
Bandwidth	0.127	0.117	0.131	0.198	0.111	0.154
N	127	114	127	201	103	148
Panel C: Large Elections: Fraction of Eligible Voters in Total Employment $\geq$ 1.1%						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.063**	0.102***	0.317***	-0.090**	-0.118***	-0.286***
	[0.028]	[0.036]	[0.088]	[0.035]	[0.043]	[0.085]
Bandwidth	0.096	0.102	0.068	0.093	0.070	0.071
N	163	163	110	143	110	110
Panel D: Small Elections: Fraction of Eligible Voters in Total Employment $<$ 1.1%						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.026	0.031	0.106	-0.026	-0.029*	-0.077
	[0.027]	[0.036]	[0.066]	[0.018]	[0.017]	[0.054]
Bandwidth	0.128	0.129	0.117	0.186	0.216	0.171
N	181	181	165	269	309	248

Table 6: **Do Bankruptcy Costs Borne by Unions Matter?**

This table presents the adjustment of debt structure as a response to union certification conditional on predetermined bankruptcy costs expected to be borne by unions. I use a firm's underfunding status of DB pension plans as a proxy for unions' bankruptcy costs. The pension data come from the Compustat Pension Annual Database. DB pension plan deficit is defined as the difference between the projected benefit obligations and the fair value of pension assets. I define unions with high (low) bankruptcy costs as the firms in which DB pension plans are underfunded one fiscal year before elections. Panels A and B present results for labor unions with high and low bankruptcy costs, respectively. All results are estimated using local linear regressions with optimal bandwidths and rectangular kernels. Standard errors are robust and clustered at the firm level. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Panel A: Unions with High Expected Bankruptcy Costs						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.121***	0.109**	0.243**	-0.106***	-0.098***	-0.199**
	[0.039]	[0.043]	[0.093]	[0.032]	[0.034]	[0.090]
Bandwidth	0.071	0.102	0.092	0.068	0.074	0.084
N	90	129	115	90	90	104
Panel B: Unions with Low Expected Bankruptcy Costs						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	-0.016	0.002	0.017	-0.017	-0.028	-0.101
	[0.030]	[0.035]	[0.072]	[0.022]	[0.025]	[0.075]
Bandwidth	0.141	0.191	0.135	0.178	0.161	0.135
N	151	200	144	191	172	144

Table 7: **Do Employees' Outside Options Matter?**

This table presents the adjustment of debt structure as a response to union certification conditional on the outside options of employees. I use the number of local competitors in the 2-digit SIC industry within a 50-mile radius around a firm's headquarters as a proxy for the employees' outside options. Employees are defined to have more (fewer) outside options if the number of local rivals is above (below) the sample median. Panels A and B present results for employees with fewer and more outside options, respectively. All results are estimated using local linear regressions with optimal bandwidths and rectangular kernels. Standard errors are robust and clustered at the firm level. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Panel A: Fewer Outside Options						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.074**	0.149***	0.191**	-0.079**	-0.080*	-0.185**
	[0.034]	[0.048]	[0.081]	[0.035]	[0.041]	[0.082]
Bandwidth	0.100	0.085	0.116	0.080	0.078	0.105
N	106	85	125	85	85	114
Panel B: More Outside Options						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.032	-0.007	0.143	-0.035	-0.057	-0.113
	[0.028]	[0.038]	[0.094]	[0.033]	[0.036]	[0.087]
Bandwidth	0.116	0.140	0.090	0.110	0.096	0.103
N	154	183	118	143	133	133

Table 8: **Robustness Checks**

This table presents robustness check results for the main results in Table 4. In Panels A and B, I use alternative bandwidths and implement local linear estimations with rectangular kernels. In Panel C, I include predetermined firm characteristics including firm size, market-to-book ratio, tangibility, ROA, and modified Z-score, and we use optimal bandwidths in Panel C. Panels D and E present estimations for alternative sample selections for labor union elections. Panel F presents the donut-RD results for the sample in which elections with a margin of victory (MOV) equal to one are excluded. Standard errors in parentheses are robust and clustered at the firm level. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Panel A: 5% Bandwidth						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.066***	0.080***	0.199***	-0.059***	-0.052**	-0.149***
	[0.020]	[0.027]	[0.055]	[0.019]	[0.022]	[0.055]
N	317	317	317	317	317	317
Panel B: 10% Bandwidth						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.049***	0.059***	0.132***	-0.035**	-0.035**	-0.097**
	[0.015]	[0.020]	[0.043]	[0.016]	[0.016]	[0.042]
N	428	428	428	428	428	428
Panel C: Including Predetermined Firm Characteristics						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.059***	0.096***	0.180**	-0.059**	-0.082***	-0.201***
	[0.021]	[0.032]	[0.070]	[0.023]	[0.028]	[0.061]
Bandwidth	0.104	0.094	0.084	0.103	0.085	0.091
N	269	237	212	269	212	237

Panel D: First Election in Each Firm-Year						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.042**	0.062**	0.174***	-0.059***	-0.061***	-0.158***
	[0.018]	[0.025]	[0.054]	[0.020]	[0.022]	[0.049]
Bandwidth	0.122	0.110	0.093	0.105	0.103	0.104
N	360	334	264	303	303	303
Panel E: All Elections						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.043**	0.052*	0.158***	-0.037**	-0.061***	-0.148***
	[0.020]	[0.026]	[0.049]	[0.017]	[0.023]	[0.055]
Bandwidth	0.100	0.1071	0.086	0.111	0.075	0.079
N	385	421	343	421	262	302
Panel F: Exclude MOV = 1						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.043**	0.065**	0.150**	-0.039	-0.052*	-0.146**
	[0.022]	[0.032]	[0.073]	[0.023]	[0.031]	[0.064]
Bandwidth	0.104	0.094	0.084	0.103	0.085	0.091
N	291	254	222	291	222	254

Table 9: **Do Firms Issue More Public Debt?**

This table presents results using the new issuance data. Panels A, B, and C report results for public debt, non-Rule 144-A private placements, and bank debt, respectively. In each panel, column (1) reports the estimation for issuance probability. Column (2) reports the estimation for the average ratio of issuance size to total assets in the following three years after union elections. Column (3) reports the estimation for the fraction of each type of debt's issuance size in total issuance size. Public debt includes both public corporate bond and Rule 144-A private placements. Private placements includes non-Rule 144-A private placements. All results are estimated using local linear regressions with optimal bandwidths and rectangular kernels. Standard errors in parentheses are robust and clustered at the firm level. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

	Panel A: Public Debt		
	Issuance Prob.	Issuance Size/Total Assets	% in Total Issuance Size
	(1)	(2)	(3)
WIN	0.298**	0.090*	0.230**
	[0.128]	[0.053]	[0.109]
Bandwidth	0.079	0.075	0.079
N	242	242	203
	Panel B: Private Placements		
	Issuance Prob.	Issuance Size/Total Assets	% in Total Issuance Size
	(1)	(2)	(3)
WIN	-0.127**	-0.003	-0.035
	[0.057]	[0.007]	[0.029]
Bandwidth	0.115	0.140	0.137
N	338	428	363
	Panel C: Bank Debt		
	Issuance Prob.	Issuance Size/Total Assets	% in Total Issuance Size
	(1)	(2)	(3)
WIN	0.064	0.007	-0.202*
	[0.076]	[0.015]	[0.109]
Bandwidth	0.153	0.199	0.076
N	463	595	203

Table 10: **Does Union Certification Affect Bank Loan Syndication Structure?**

This table presents the effect of union certification on the syndication structure of newly issued bank loans within 36 months after union certification. All results are estimated using local linear regressions with the optimal bandwidths and rectangular kernels. *Log(Amt)* is the natural logarithm of the average loan amount. *Log(Syndsize1)* is the natural logarithm of the average syndication size defined at the loan tranche level. *Log(Syndsize2)* is the natural logarithm of average syndication size defined at the loan deal level. *Log(HHI)* is the natural logarithm of ownership concentration, which is defined as the sum of the square of each creditor's ownership in each loan tranche. Standard errors in parentheses are robust and clustered at the firm level. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

	Log(Syndsize1)	Log(Syndsize2)	Log(HHI)	Log(Amt)
	(1)	(2)	(3)	(4)
WIN	0.347**	0.302*	-0.502**	0.098
	[0.174]	[0.177]	[0.246]	[0.239]
Bandwidth	0.131	0.128	0.170	0.144
N	566	562	322	607

Table 11: **Does Union Certification Affect Other Firm Characteristics?**

This table presents the effects of union certification on the changes in firm characteristics that are important for the choice of debt structure. A change in a firm characteristic is defined as the difference between its average value in the following three years after an election and the value one year before the election. The definition of each firm characteristic is available in Appendix A.3. All results are estimated using local linear regressions with the optimal bandwidths. Panels A and B present the results using rectangular and triangular kernels, respectively. Standard errors in parentheses are robust and clustered at the firm level. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

	Panel A: Rectangular									
	MTB	Tangibility	R&D	Capex	ROA	TFP	Z-score	Credit Rating	Down grade	Bid-Ask Spread
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
WIN	-0.044	-0.011	0.000	-0.003	-0.003	-0.034	-0.321	0.314	-0.020	0.002
	[0.093]	[0.012]	[0.001]	[0.006]	[0.010]	[0.050]	[0.210]	[0.890]	[0.112]	[0.007]
Bandwidth	0.194	0.136	0.131	0.172	0.102	0.096	0.145	0.165	0.097	0.125
N	565	425	400	517	310	282	446	521	310	356
	Panel B: Triangular									
	MTB	Tangibility	R&D	Capex	ROA	TFP	Z-score	Credit Rating	Down grade	Bid-Ask Spread
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
WIN	-0.029	-0.014	0.001	-0.002	-0.002	-0.022	-0.343	0.051	0.021	0.002
	[0.088]	[0.012]	[0.001]	[0.006]	[0.010]	[0.049]	[0.208]	[0.942]	[0.111]	[0.007]
Bandwidth	0.2478	0.173	0.167	0.219	0.130	0.122	0.185	0.211	0.123	0.159
N	689	521	521	635	400	326	532	614	363	489

Table 12: **Does the Interest Alignment between Labor and Management Matter?**

This table presents the adjustment of debt structure as a response to union certification conditional on the predetermined interest alignment between labor and management. The interest alignment is measured by (1) the fraction of DC pension assets invested in a firm's stock or (2) the fraction of a firm's equity value held by employees through DC pension assets (DC pension ownership). Panels A and B present results for firms with smaller and larger fractions of the DC pension assets invested in a firm's stock, respectively. Panels C and D present results for firms with smaller and larger DC pension ownership, respectively. All results are estimated using local linear regressions with optimal bandwidths and rectangular kernels. Standard errors are robust and clustered at the firm level. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Panel A: Fraction of DC Pension Assets Invested in the Firm's Stock $< 6.6\%$						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.076**	0.110**	0.172*	-0.072*	-0.117***	-0.093
	[0.033]	[0.048]	[0.087]	[0.039]	[0.042]	[0.077]
Bandwidth	0.137	0.010	0.156	0.129	0.115	0.199
N	82	52	95	76	60	121
Panel B: Fraction of DC Pension Assets Invested in the Firm's Stock $\geq 6.6\%$						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.008	0.020	0.162	-0.030	0.025	-0.153
	[0.037]	[0.051]	[0.163]	[0.046]	[0.045]	[0.152]
Bandwidth	0.185	0.188	0.098	0.110	0.119	0.094
N	105	107	49	57	62	43
Panel C: DC Pension Ownership $< 0.28\%$						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.091**	0.082*	0.210**	-0.127***	-0.129**	-0.141
	[0.036]	[0.044]	[0.101]	[0.046]	[0.048]	[0.104]
Bandwidth	0.113	0.135	0.119	0.092	0.093	0.118
N	61	78	70	46	46	70
Panel D: DC Pension Ownership $\geq 0.28\%$						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.015	0.035	0.115	-0.021	0.019	-0.001
	[0.038]	[0.050]	[0.138]	[0.036]	[0.033]	[0.106]
Bandwidth	0.174	0.176	0.103	0.116	0.170	0.128
N	97	105	48	60	97	68

Appendix

A.1 Further Discussions on Identification Assumptions

A more recent study, Frandsen (2014), raises the concern that vote shares could be perfectly manipulated by unions or management and this could threaten the RD identification assumption. Even though Frandsen (2014) finds evidence showing that vote shares for unions are perfectly manipulated around the 50% threshold for elections with at least 20, 40, 60, or 80 votes, the McCrary test cannot reject the null hypothesis that there is no perfect manipulation of vote shares around the winning threshold when the number of votes is restricted to be at least 100 in Frandsen (2014). Such evidence is consistent with the results in this paper that I cannot statistically detect the perfect manipulation of the vote shares around the 50% cutoff when the number of eligible voters in elections is restricted to be at least 100.

In this paper, the identification of union certification effects depends on a weaker identification assumption than the local continuity assumption since I am interested in estimating the effects of union certification on the *adjustment* of debt structure. This weaker identification assumption requires the panel nature of the data and is proposed in Frandsen (2014) in the presence of discontinuities in the pre-election characteristics [Assumption A1' in Frandsen (2014)]. This weaker identification assumption states that the conditional distribution of the first difference in the potential outcomes as a function of vote share for unions is continuous around the threshold. Under this assumption, the union certification effect is identified by comparing the post-election change in the outcome variables.

I test this weaker assumption and the results in Table A.2 show that statistically there are no discontinuities in the first difference in the predetermined variables from t-2 to t-1 between firms in which unions barely win and unions barely lose the elections. I cannot reject the joint hypothesis that the effects of union certification for all predetermined firm characteristics equal zero with a p-value equal to 0.922. Therefore, this weaker identification assumption is more likely satisfied in the sample and the results are robust even if the local

continuity assumption for an RD estimation is violated.

Regarding the manipulations of vote shares, one may be still concerned that in elections with small margins of victory (MOV), the losing party would have great incentives to challenge the ballots in order to change the election outcomes. As a result, the observed vote counts for unions in the data are more likely to be manipulated when MOV is smaller (Frandsen, 2014). If the economic object of interest in close elections is MOV instead of the vote shares for unions, then I need to further test whether MOV is perfectly manipulated by unions or management. Since the tally-based running variable is discrete, I use the test proposed in Frandsen (2017). The results show that I still cannot reject the null hypothesis that there is no perfect manipulation of the vote counts around the winning threshold with a p-value equal to 0.184. Therefore, this evidence suggests that the RD identification assumption is more likely to be satisfied in the sample. To further mitigate the concern, I also present evidence in the robustness tests and show that the results are robust if I exclude the elections with small MOV.

A.2 Additional Tests

Table A.1: **Creditor Dispersion and Duration of Debt Contract Renegotiations**

This table presents the relation between the number of creditors in a loan facility and the duration of debt contract renegotiations. Standard errors in parentheses are robust and clustered at the firm level. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable:	**Log(Duration of Debt Contract Renegotiations)**
# of Creditors	0.008***
	[0.003]
Log(Assets)	0.079
	[0.057]
Leverage	-0.601**
	[0.288]
ROA	0.406
	[1.223]
Tangibility	-0.034
	[0.273]
Capex	-0.976
	[0.678]
Market to Book	0.011
	[0.073]
Stock Return Volatility	-6.005
	[4.859]
Log(Maturity)	0.140
	[0.101]
Log(Amount)	-0.060
	[0.061]
Loan Type & Purpose FEs	Y
Adj. R^2	0.091
N	387

Figure A.1: Local Linear RD Estimations with Varying Bandwidths

This figure presents the robustness of the main results to alternative choices of bandwidths. All results are estimated using local linear regressions with rectangular kernels. The x-axis represents the bandwidths varying from 0.01 to 0.5. The plots on the left- and right-hand sides represent results for public and bank debt, respectively. The solid line represents the local linear estimations, and dotted lines represent the 95% confidence intervals. The vertical line in each plot represents the estimated results with the optimal bandwidths in Imbens and Kalyanaraman (2012). *Public/AT* and *Bank/AT* represent the ratio of public and bank debt to total asset, *Public/MV* and *Bank/MV* represent the ratio of public and bank debt to market value, and *Public/Debt* and *Bank/Debt* represent the ratio of public and bank debt to total debt.

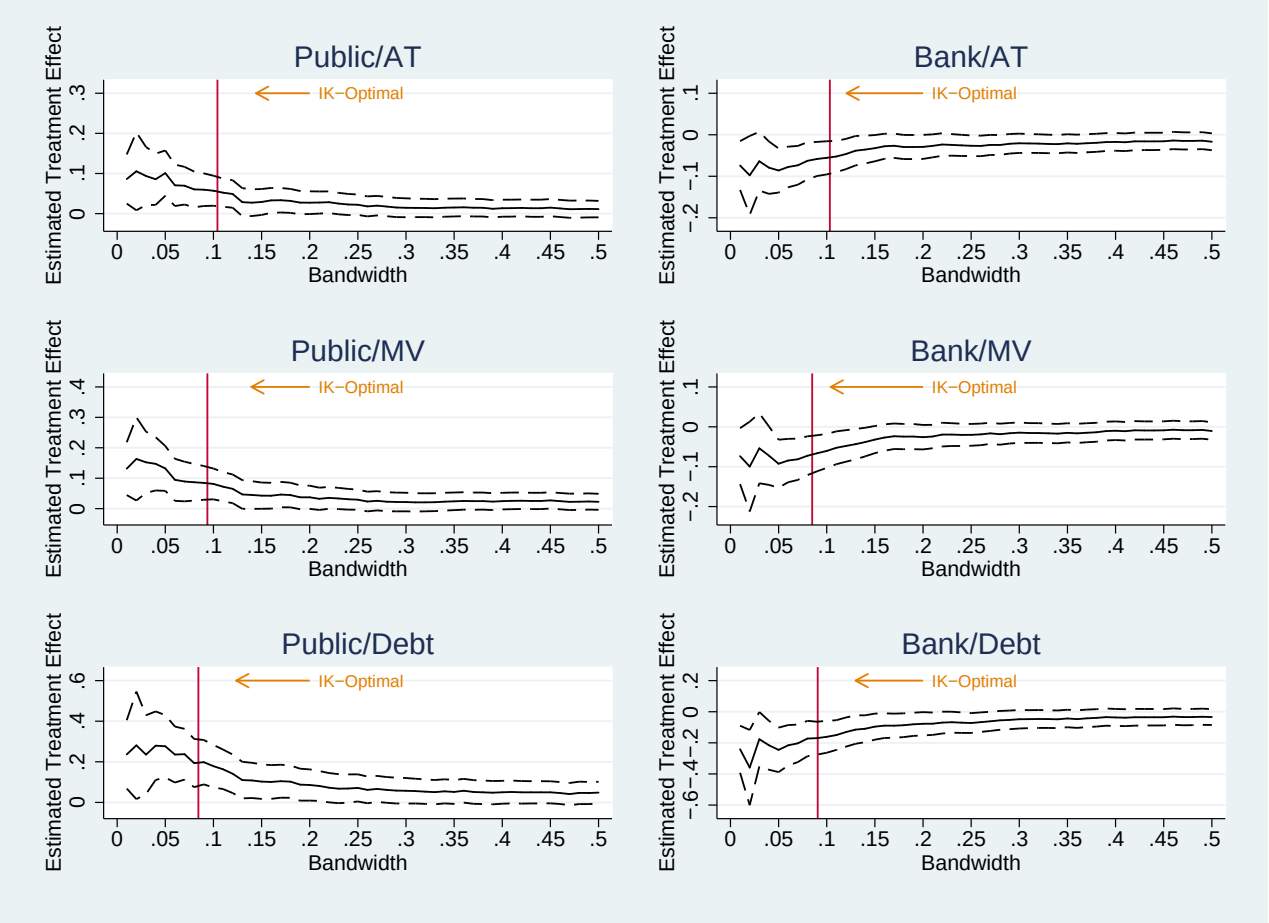


Table A.2: **Tests of Discontinuities in the First Difference in Predetermined Characteristics between *T*-1 and *T*-2**

This table presents the results of tests for the null hypothesis that there is no systematic difference in the first difference in predetermined firm characteristics from T-2 to T-1 between firms in the treatment and control groups. I implement an RD estimation with a rectangular kernel and the optimal bandwidth for each predetermined firm characteristic including debt structure measures, firm size, book leverage, market leverage, market-to-book ratio, tangibility, ROA, modified Z-score, and cash holding. All RD estimations include vote shares allowing for different intercepts and slopes on each side of the cutoff. Standard errors are robust and clustered at the firm level. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Variables:	Coeff.	Z-stat Value
Outcome Variables		
Public/AT	-0.008	-0.566
Public/MV	-0.003	-0.201
Public/Total Debt	-0.023	-0.606
Bank/AT	0.009	0.665
Bank/MV	0.005	0.301
Bank/Total Debt	0.035	0.944
Firm Characteristics		
Log(AT)	0.013	0.574
BookLev	-0.015*	-1.749
MarkLev	-0.015	-1.280
MTB	0.055*	1.752
Tangibility	-0.000	-0.034
ROA	0.002	0.751
Modified Z-score	0.072	1.414
Cash Holding	-0.001	-0.110

Table A.3: **Do Firms Adjust Debt Structure as a Response to Union Certification? Polynomial Regressions**

This table presents the adjustment of debt structure to union certification. I use six measures: public or bank debt scaled by total asset, public or bank debt scaled by market value, and public or bank debt scaled by total debt. All results are estimated using local linear regressions with a rectangular kernel. Panels A, B, C, and D present results using polynomial order equal to three, four, five, and six, respectively. Standard errors in parentheses are robust and clustered at the firm level. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Panel A: Polynomial Order = 3						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.053***	0.068**	0.154***	-0.050**	-0.052**	-0.149***
	[0.019]	[0.027]	[0.053]	[0.020]	[0.021]	[0.052]
N	851	851	851	851	851	851
Panel B: Polynomial Order = 4						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.067***	0.100***	0.222***	-0.058**	-0.067**	-0.192***
	[0.025]	[0.033]	[0.064]	[0.024]	[0.026]	[0.063]
N	851	851	851	851	851	851
Panel C: Polynomial Order = 5						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.087***	0.126***	0.283***	-0.092***	-0.103***	-0.240***
	[0.029]	[0.039]	[0.077]	[0.028]	[0.032]	[0.072]
N	851	851	851	851	851	851
Panel D: Polynomial Order = 6						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.095***	0.134***	0.297***	-0.098***	-0.104***	-0.271***
	[0.033]	[0.045]	[0.090]	[0.033]	[0.037]	[0.082]
N	851	851	851	851	851	851

Table A.4: **Do Firms Adjust Debt Structure as a Response to Union Certification? Tally-Based Running Variable**

This table presents the adjustment of debt structure to union certification. I use six measures: public or bank debt scaled by total asset, public or bank debt scaled by market value, and public or bank debt scaled by total debt. All results are estimated using local linear regressions with a rectangular kernel. Panels A and B present results using bandwidths equal to 5 and 10 vote counts, respectively. Standard errors in parentheses are robust and clustered at the firm level. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Panel A: Bandwidth=5 Vote Counts						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.101***	0.143***	0.301***	-0.083**	-0.099**	-0.266***
	[0.037]	[0.051]	[0.097]	[0.036]	[0.040]	[0.094]
N	83	83	83	83	83	83
Panel B: Bandwidth=10 Vote Counts						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
WIN	0.057**	0.084**	0.191***	-0.083***	-0.093***	-0.203***
	[0.026]	[0.035]	[0.066]	[0.026]	[0.029]	[0.064]
N	173	173	173	173	173	173

A.3 Data Sources and Variable Definitions

The labor union election data are from the Thomas J. Holmes website and the NLRB website. The debt structure data come from a hand-collected data set from the section "Notes to Financial Statement" in 10-Ks. The bond and bank loan new issuance data are from SDC Platinum and LPC DealScan database, respectively. The accounting data are from Compustat. Debt structure and Compustat variables are winsorized at the 5% level on each tail. Item names refer to Compustat annual data items.

Variable	Definition
Labor Union Election Data	
WIN	A dummy variable equal to one if a majority of employees vote for unions in an election and zero otherwise. Source: Thomas J. Holmes website and NLRB website.
Vote Share	The portion of votes for unions over total valid votes in an election. Sources: Thomas J. Holmes website and NLRB website.
Debt Structure Balance Sheet Data	
Public/AT	Outstanding amount of public debt scaled by total assets. Sources: A hand-collected data set and Compustat.
Public/MV	Outstanding amount of public debt scaled by market value. Sources: A hand-collected data set and Compustat.
Public/Debt	Outstanding amount of public debt scaled by total debt. Sources: A hand-collected data set and Compustat.
Bank/AT	Outstanding amount of bank debt scaled by total assets. Sources: A hand-collected data set and Compustat.
Bank/MV	Outstanding amount of bank debt scaled by market value. Sources: A hand-collected data set and Compustat.
Bank/Debt	Outstanding amount of bank debt scaled by total debt. Sources: A hand-collected data set and Compustat.
Debt Structure New Issuance Data	
Public Issuance Prob.	A dummy that equals to one if a firm issues public debt in the following three years after each labor union election and zero otherwise. Sources: NLRB and SDC.
Private Issuance Prob.	A dummy that equals to one if a firm issues non-Rule 144-A private placements in the following three years after each labor union election and zero otherwise. Sources: NLRB and SDC.
Bank Issuance Prob.	A dummy that equals to one if a firm issues bank debt in the following three years after each labor union election and zero otherwise. Sources: NLRB and SDC.
Public Issuance Size/AT	The average ratio of public debt issuance size to total assets in the following three years after each labor union election. Sources: NLRB, SDC, and Compustat.
Private Issuance Size/AT	The average ratio of non-Rule 144-A private placements issuance size to total assets in the following three years after each labor union election. Sources: NLRB, SDC, and Compustat.

Variable	Definition
Bank Issuance Size/AT	The average ratio of bank debt issuance size to total assets in the following three years after each labor union election. Sources: NLRB, SDC, and Compustat.
Public Issuance Size/Total Size	The fraction of public debt issuance in total new issuance in the following three years after each labor union election. Sources: NLRB and SDC.
Private Issuance Size/Total Size	The fraction of non-Rule 144-A private placements issuance in total new issuance in the following three years after each labor union election. Sources: NLRB and SDC.
Bank Issuance Size/Total Size	The fraction of bank debt issuance in total new issuance in the following three years after each labor union election. Sources: NLRB and SDC.
SyndSize1	Number of creditors defined at loan tranche level. Source: DealScan.
SyndSize2	Number of creditors defined at loan deal level. Source: DealScan.
HHI	HHI for creditor ownership concentration. Source: DealScan.
Firm Characteristics	
Firm Size	Natural logarithm of deflated Item AT (2010 dollars). Source: Compustat.
Total Debt	Item DLTT+ Item DLC. Source: Compustat.
Book Leverage	(Item DLTT+ Item DLC)/Item AT. Source: Compustat.
Market Leverage	(Item DLTT + Item DLC)/(Item PRCC_F×Item CSHO+Item DLTT + Item DLC). Source: Compustat.
Market-to-Book	(Item PRCC_F×Item CSHO+Item DLTT + Item DLC+Item PSTKL-Item TXDITC) / Item AT. Source: Compustat.
Tangibility	Item PPENT/Item AT. Source: Compustat.
ROA	Item OIBDP/Item AT. Source: Compustat.
Cash Holding	Item CHE/Item AT. Source: Compustat.
TFP	Firm-level total factor productivity. Source: Selale Tuzel's webpage avaialble at `http://www-bcf.usc.edu/~tuzel/`.
R&D	Item XRD/Item SALE. Missing values in Item XRD are replaced with zero. Source: Compustat.
Capex	Item CAPX/Item AT. Source: Compustat.
Z-score	3.3×(Item IB+Item TXT+Item XINT)/Item AT+1.4×Item RE/Item AT+Item SALE/Item AT+1.2×(Item ACT-Item LCT)/Item AT+0.6×PRCC_F×CSHO/LT. Source: Compustat.
Modified Z-score	3.3×(Item IB+Item TXT+Item XINT)/Item AT+1.4×Item RE/Item AT+Item SALE/Item AT+1.2×(Item ACT-Item LCT)/Item AT. Source: Compustat.
Dividend Payer	A dummy variable equal to one if cash dividend is positive and zero otherwise. Source: Compustat.
Credit Rating	Each S&P long-term debt rating is assigned to a numerical number. 1 for "AAA", 2 for "AA+", 3 for "AA", ...Source: Compustat.
Downgrade	A dummy variable equal to one if the average credit rating in the following three years after a labor union election is lower than the rating one year before the election. Sources: NLRB and Compustat.

Variable	Definition
Bid-Ask Spread	The median monthly bid-ask spread deflated by the stock price at the end of a fiscal year. When bid-ask spread is missing, the value is replaced by the difference between closing ask and closing bid. Source: CRSP.
Other Data	
Underfunding status of DB Pension Plan	A dummy variable equal to one if Item PPLAO is less than or equal to Item PBPRO and zero otherwise. Source: Compustat Pension Annual.
Employees' Outside Options	The number of rivals in the 2-digit SIC industry within a 50-mile radius around a firm's headquarters. Sources: 10-K filing and Compustat.
DC Pension Ownership	Fraction of a firm's equity value held by employees through DC pension assets. EOYSTOCK/(Item PRCC_F*Item CSHO*10^6). Sources: IRS 5500 Form and Compustat.
Fraction of DC Pension Assets Invested in a Firm's Stock	EOYSTOCK/EOYASSET. Source: IRS 5500 Form.

A.4 Data Assembly

In order to merge labor union election data with firm-level data, I match employers' names in the NLRB data with historical stock names (DSENAME file in CRSP) and Compustat firm names.[23] I refer to the file containing historical stock names and Compustat firm names as the standard firm name file. Three steps are involved in the name-matching process:

1. I follow Lee and Mas (2012) and use a SAS algorithm to perform a fuzzy name matching between the employers' names in the NLRB labor union election data and the standard firm name file.

2. I manually check each match to verify whether it is correct after the fuzzy matching. When one firm in the NLRB data cannot be matched with any name in the standard firm name file, I use the LexisNexis Corporate Affiliation Database and Bloomberg Businessweek to check whether this firm is a subsidiary of another firm in the standard firm name file. This step generates the NLRB-CRSP-COMPUSTAT merged data. I obtain GVKEY and CIK as identifiers for each matched election.

3. I use information on CIK to hand-collect the firm's debt structure information from a firm's 10-Ks' "Notes to Financial Statements" section in the EDGAR database for each election in NLRB-CRSP-COMPUSTAT. The debt structure information is collected from one fiscal year before an election to three fiscal years after the election.

In the database, there are multiple elections within some plants. For purely duplicative records, I simply drop the duplicative observations. For the cases in which there are multiple elections simultaneously held in the same establishment because of multiple bargaining units or unions, I retain the election with the largest vote share, as in Frandsen (2014). Because labor union elections are conducted at the plant level, it is possible to have multiple elections in one year within the same firm. For each firm-year observation, I keep the election with

[23] I also match Compustat firm names to increase the sample size, since some firms covered in Compustat are not covered in CRSP. If a firm in Compustat changed its name after the union election, then the name of the firm where the election was held is possibly not matched to a Compustat firm name.

the largest number of eligible voters, since such elections are possibly most important for corporate decisions. Moreover, for each election I also require that debt structure information is available one year before and at least one year after the election in the following three years. Finally, the final main sample used in this paper spans from 1992 to 2009 and includes 851 elections involving 427 unique firms.

Furthermore, following similar procedures, I also manually match labor union election data with DealScan by firm names in order to examine the effects of union certification on loan issuance behavior.

A.5 Institutional Background of Labor Union Elections

The following steps describe the NLRB labor union election process. The steps are largely adapted from the description on the NLRB website.[24]

1. A group of employees file a petition with the nearest NLRB Regional Office. The portion of employees who show interest in labor unions must be at least 30%. The agents will investigate whether the Board has jurisdiction, the union is qualified, and there is any wage contract in place.

2. Agents will seek an agreement between the employer and union about the conditions of elections. If an agreement is reached, then the parties will authorize the regional director to conduct an election. If no agreement is reached, the regional director will set election conditions and order an election.

3. An election is typically held within 30 days of a director's authorization or order. The outcomes of representation and decertification elections are determined by a majority of votes cast. Objections may be filed with the appropriate regional director by any party within seven days of the vote count. The outcome of an election will be set

[24]National Labor Relations Board, `http://www.nlrb.gov/what-we-do/conduct-elections`.

aside if conduct by either the employer or union interfered with employees' freedom of choice.

4. When a union is in place, another union could file an election petition as long as the labor contract has expired or is about to expire and 30% of employees show interest in the competing union. This typically leads to a three-way election, with the choices being the incumbent, the challenging one, and none.

5. If no objection is raised by either party, the union that receives the majority of the votes cast is certificated as the bargaining representative. The employer recognizes this union as the exclusive bargaining agent for employees in that unit.

Employees can use a second approach to choose a representative. They can persuade the employer to voluntarily recognize a union if they can show that majority support for the union is present among employees. These agreements are made out of the NLRB process. DiNardo and Lee (2004) also show that there is no single path to union representation.

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