Union Power and the Debt Maturity Structure

Roberto Pinto*

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ABSTRACT

How do powerful unions affect firms' debt maturity structure? I find that firms increase the fraction of long-term debt as a response to unionization while keeping their leverage ratio unchanged. Using a regression discontinuity design I estimate that unionized firms increase by 25% the fraction of long-term debt as compared to union-free firms. I explore several channels which are consistent with a maturity structure reshape rather than a strategic leverage increase. I find that financially constrained, less flexible, and small firms exploit the positive effects of union's monitoring activity to lengthen their maturity structure so that to reduce refinancing risks. My findings support the view that bond market values positively the presence of powerful non-financial stakeholders with aligned interests and incentives to monitor over the firm's policies.

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*Roberto is with the Vienna Graduate School of Finance (VGSF) and the WU-Vienna University of Economics and Business. Welthandelsplatz 1, 1020 Vienna. I am grateful to Reena Aggarwal, Li He, Christian Laux, Gyöngyi Lóránth, Alexander Mürmann, Florian Nagler, Marco Pagano, Domenico Pinto, Thomas Rauter, Josef Zechner. Thanks also to all the participants of the VGSF Conference, FMA Doctoral Consortium, VGSF PhD Seminar for useful comments. All the errors are my own responsibility.
E-mail: roberto.pinto@wu.ac.at

Introduction

What is the effect of a better organized and more powerful workforce on the firm's debt maturity structure? The relation between employees bargaining power and the firm's policies is a long-standing question in the literature. Much of the emphasis is on the use of debt level choices as bargaining tool. However, In this paper, I show that firms respond to an increase in workers' power by reshaping their debt maturity structure while keeping the leverage ratio unaffected. My results are consistent with the suggestive evidence that union's monitoring activity and aligned interests with other fixed claimants (e.g. debtholders) spillover positively on the credit markets affecting the cost of capital.

Shocks that increase the power and effectiveness of workers' actions (e.g. changes in labor protection laws or formation of a collective bargaining unit) are likely to trigger policy changes at the firm level. The firm's strategic response to such an event, however, is not clear from an ex-ante perspective.

On the one hand, some theories suggest that the firm should attempt to gain bargaining power over the workers by reducing the available surplus by means of a debt-for-equity swap. Specifically, raising new debt and distributing it to equity holders reduce the potential wage requests because future cash-flows are pre-committed to a third part, debtholders, and thus not available for bargaining. Pioneers of these theories are Bronars and Deere (1991) and Perotti and Spier (1993). Empirics have found mixed evidence of these predictions.

On the other hand, Berk, Stanton, and Zechner (2010) show theoretically that the firm chooses its optimal leverage trading-off tax benefits and human costs of bankruptcy. In this model, risk averse workers require a premium for bearing the human costs of bankruptcy which is proportional to the leverage ratio. The theory implies that powerful workers would oppose aggressive leverage policies without a monetary compensation for the higher exposure to unemployment risk. A debt-for-equity swap strategy would actually generate the counterproductive effect of higher wages for newly hired workers.

This project has its theoretical foundations in the latter theory. I investigate the joint effect of workers' power on both the leverage and maturity decisions. Firms are expected to use financial policies that do not increase the probability of default. Moreover, the union monitoring on the firm's activity spills-over positively on the credit markets, reducing the agency costs. I hypothesize that firms exploit the workers' unionization to change their maturity structure reducing refinancing costs stemming from the roll-over risks while keeping the leverage ratio stable. This effect is expected to be stronger for those firms who are more likely to be constrained in their maturity choice.[1]

From the supply side of capital, Chen, Kacperczyk, and Ortiz-Molina (2012) provide evidence supporting the view that bond markets value positively the presence of labor union. They show that firms in more unionized industries have a lower yield spread.

From the demand side, the ambiguous effect of unionization on firms' financing policies (leverage and maturity decisions) makes it suitable for an empirical investigation. I use establishment-level data on unionization elections to capture changes in workers' power. I assume that a union victory positively affect the workers' ability of coordinating and taking actions to protect their interests. The National Labor Relations Board[2] (NLRB) is the independent US government agency responsible for organization and supervision of union labor representation elections at the firm's establishment. Every eligible employee has the right to vote in favor or against the formation of a bargaining unit represented by labor union. A union wins if more than half of eligible workers vote in favor. The features of these elections provide a suitable laboratory to study the firm's response to unionization by means of a regression discontinuity design (RDD).

The RDD provides causal inference by using local variations in the elections' margin of victory that lead to discrete changes in union legal status. I gauge the treatment effect of unionization by contrasting the leverage and debt maturity response of firms in which union barely wins with those in which union barely loses an election. The sharp RDD implies that the treatment probability jumps to one whenever an election casts more than 50% of votes in favor of a union representation. The causal inference of this methodology rests on a set of regularity conditions that I verify in the data.

My empirical results support the view that maturity changes are preferred to aggressive financial leverage policies. I find that in the second year after the election is closed, on average, a firm respond to unionization by increasing the fraction of debt with long term maturity by 25% more with respect

[1] Agency costs and/or asymmetric information are frictions that have been shown to be relevant when choosing the optimal maturity of debt. Myers (1977) and Diamond and He (2014) study the debt-overhang problem related to the maturity choice. Flannery (1986) and Diamond (1991) provide theories of maturity when there is asymmetric information between the firm and the credit market.

[2] More info can be found on the website: NLRB

to firms who escape unionization. Further analysis shows that these firms do not display statistically significant changes in their leverage ratio (neither market nor book leverage). This result suggests that unionization causes a shift in the maturity structure. Short-term is substituted with long-term debt such that to keep the leverage ratio constant. The average firm in my dataset that becomes unionized increases the fraction of long-term debt from 49% to 61%. This effect is also economically significant, in my sample translates to $135 millions increase of long term debt financing, which is equivalent to 3% of the average firm's assets.

Generalizing this result to the average firm in Compustat leads to a smaller effect. Unionized firms would increase the fraction of long-term debt from 29% to 36%. The majority of elections in my dataset take place during the 70s' and 80s' when the fraction of long term debt is on average higher. Moreover, there is an over representation of the manufacturing industry which also has on average slightly larger fraction long term debt. However, I control for year and industry fixed effects. I also ensure robustness to different measure of long-term debt. Results are similar if I use the ratio of long-term debt over total assets (see Titman and Wessels (1988)). The latter measure captures the isolated issuance of long-term debt. It ensures that the short-term debt does not create any mechanical effect by simply maturing and increasing the fraction of long-term debt.

I furthermore study the characteristics of firms that find maturity policies optimal as response to unionization. I do so by performing subsamples analysis on firms split according to financially constraints, operating flexibility, firm's size. I use the Whited-Wu index (hereafter *ww*, see Whited and Wu (2006) for details) as measure of financial constraints. Financially unconstrained firms are those lying below the sample median according to the *ww* distribution in the year before the election. I find that financially constrained firms respond to unionization by increasing the fraction of long-term debt, while I do not find statistical significant evidence of maturity changes for financially unconstrained firms. I only find weak evidence that financially constrained firms respond to unionization by increasing the leverage ratio as predicted by the strategic use of debt theory (see Schmalz (2015),). Financially constrained firms may have limited access to debt financing, increasing the fraction of long-term would help them to reduce the risk stemming from frequent refinancing. This is consistent with the hypothesis that some firms might give more weight to the exploitation of union's positive effect rather than strategic behavior.

Building on the insights provided by Simintzi, Vig, and Volpin (2014), I study the response to unionization by firms with high and low operating flexibility before the election. I use cash holding as measure of flexibility.[3] Firms with more internal funds supposedly are more flexible in operations. I find that both low and high cash firms respond to unionization by increasing the fraction of long-term debt. However, low cash firms' response is stronger both statistically and in terms of the magnitude of the point estimate. This is consistent with recent findings by Harford, Klasa, and Maxwell (2014) which show that firms use cash to hedge against refinancing risk. Indeed I also find that these firms exploit the union's presence to lengthen the debt maturity structure and reduce refinancing costs. Furthermore, I isolate the choice of long term debt by considering the ratio between long-term debt and firm's total asset. Results show even a sharper difference in reaction between low and high cash firms.

Moreover, I find that firms of small size or with low level of tangible assets increase the fraction of long-term debt as response to unionization. However, firms of large size or with high level of tangible assets do not have statistical significant response to unionization in terms of maturity choice. These firms exhibit a behavior consistent with the strategic use of debt theory. This finding furthermore stresses the unions' monitoring effect. Smaller or low tangible firms are indeed those with potentially high asymmetric information or agency costs of debt. Positive externalities from the union's monitoring activity are more valuable relative to larger firms. Results show that indeed the latter find it optimal to gain bargaining power and protect shareholders' wealth.

Finally, I use state specific legislations to provide evidence that the driving force of my results is indeed the union power and its ability to effectively improve worker's coordination and effectiveness in taking actions. Unions in states covered by Right-to-Work laws (RWLs) are considered to be weaker. In these states, unions cannot oblige workers of unionized firms to be union members and pay fees. There are at least two reasons why a union should be weaker in these states. First, they have less financial power due to the lack of payer members. Second, RWLs also affect unions' incentives to exert high level of effort. I indeed find a statistically significant response to unionization in states that are not covered by RWLs. However, I do not find significant effects in states in which these laws are in place. This result reinforces the idea of an active role of unions within the firm.

Related Literature. My paper related to a recent strand of literature that lies in the intersec-

[3] Results are similar by using other measures such as operating leverage suggested by Novy-Marx (2011) and the Herfindahl index. The idea is that firms with high operating leverage or in highly concentrated industries have less operating flexibility.

tion between corporate finance and labor. The main interest focuses on understanding how labor market frictions affect firms' optimal financial policies. My study is related Chen et al. (2012). They show that firms in more unionized industries are able to finance cheaper. Their paper does not identify causal link but rather conduct detailed cross-sectional analysis at industry level. My paper uses their results as support for the assumption that bond market takes positively the presence of a union within the firm. However, I then move my focus to the causal link between unionization and the firm's financial policy response. Campello, Gao, Qiu, and Zhang (2015) test the hypothesis that unions increase bankruptcy costs and so in expectation bondholders recovery less in default state. Unions inefficiently lengthen the firm's liquidation. My focus is more on state of the world away from the default state. My assumption is that as long as firms in not in financial distress unions and bondholders have aligned interest. Lin, Schmid, and Xuan (2015) study firm's financial policy when labor representatives sit at the supervisory board. This paper is related because looks at the effect of workers' representative that actually have the legal status of affecting firms' policy. My mechanism is related to the implicit power that unions have on the management through different type of actions (e.g. political power, strikes, etc). Schmalz (2015) is also closely related to my paper. However, he is interested in providing evidence uniquely on the strategic use of leverage. My paper differs from several aspects. First, I introduce a new possible financial strategy that involves firms keeping the leverage ratio stable but changing the their debt maturity structure. This optimal choice is a result of the trade-off between firm's specific costs and benefits of the leverage or maturity as response to shocks on the firm's labor-side. Moreover, there is a fairly large number of papers that use unionization elections as empirical setting to study the labor and management interactions. Among others, Bradley, Kim, and Tian (2015) look at the effect of unionization on innovation. Unionization causes a 8.7% decline in patent quantity and quality three years after the election has been closed. R&D expenses also drop.He, Tian, and Yang (2016) study the change in payout policy after unionization. They find that unionization leads to a reduction of corporate payout policy. They estimate 8.7% lower dividend ratio and 17.9% lower total payout ratio with respect to firms that escape unionization.

The paper unfolds as follow. Section 1 presents data and key outcome variable. Section 2 contains the empirical strategy and main results. Section 3 explores economic mechanisms through subsample analysis. Section 4 concludes.

1 Data Description, Variables Definition and Summary Statistics

I study the effect of a better organized labor force on firms' debt financing decisions by using unionization elections at the establishment-level from the National Labor Relations Board (NLRB). I manually match elections data to Compustat industrial. Following the literature, I exclude financial companies (SIC 6000-6999) and regulated utilities (SIC 4900 4999). In the next section I discuss the content of the election dataset and matching procedure with Compustat. I then present the key outcome variables and summary statistics.

1.1 Unionization Elections

The establishment-level data on elections are from NLRB, covering the time period from 1977 to 2014. Data contain full information about the certification procedure of a representative union for a specific firm's establishment. Elections relative to the 1977-1999 period are from Holmes (2006) available on Thomas Holmes's website: www.thomas-holmes.com. Elections for the 2000-2014 period are taken form the NLRB website. I collect information on the calendar date in which an election has been officially closed, the number of eligible workers, valid votes cast in the election, votes in favor of a union, votes against, and the final outcome. An establishment is unionized if half plus one eligible workers vote in favor.

I merge the election dataset to Compustat industrial from WRDS. The election dataset lacks of a firm's identifier. This makes the matching procedure not trivial and cumbersome. I follow Lee and Mas (2012) and match datasets by using the legal name of companies. I implement the *Jaro-Winkler distance*,[4] which is an algorithm that compares two strings and assigns a matching probability q, with $q = 1$ for a perfect match. I initially keep matches with a probability $q \geq 0.9$, then manually discard all those ones that are wrong. This procedure lead to a total of 3,400

[4]Given two strings s_1 and s_2 the Jaro-Winkler distance is computed as $d_w = d_j + lp(1-d_j)$, where l is the length of common prefix at the start of the string up to a maximum of 4 digits, p is a constant scaling factor set to $p = 0.1$ as in the original Winkler's work, finally d_j is the Jaro distance with $d_j = 0$ if number of matching characters, m, between the two strings, s_1 and s_2, is equal to zero. If $m \neq 0$, then $d_j = \frac{1}{3}\left(\frac{m}{|s_1|} + \frac{m}{|s_2|} + \frac{m-t}{m}\right)$, where t is half of the number of transpositions. The Jaro-Winkler, as compared to the Jaro distance, gives a more favorable probability to strings that have the same prefix up to a maximum of four characters. This feature is appealing for matching firms' name. In these two datasets, differences in names for a given company are given by words, acronyms, abbreviations which are generally located at the end of the string. Example $s_1 = ROBERTO$ and $s_2 = ROBETRO$ with $s_1 = 7$, $s_2 = 7$, $m = 7$, $t = 1$, $l = 4$, and $p = 0.1$ give $d_j = 0.95$ and $d_w = 0.97$. The common prefix gives an additional two percentage points probability of a correct match.

elections.[5] Around 21% of elections are held in the same State in which the headquarter is located. Moreover, 41% of establishments have the same 2-digit Standard Industrial Classification (SIC) code than the headquarter. Finally, about 63% elections exhibit the same 1-digit SIC code. These numbers, similar to those in DiNardo and Lee (2004), are reassuring about the matching procedure quality. States and the industry code of establishments and headquarters need not be the same, given certain firm's structure and diversification of business.

Firms can display multiple elections across years. This happens either because an election is held many times for the same establishment (e.g. workers can re-apply for an election) or because the firm has more than one establishment hosting a unionization election. My variable of interest is computed over multiple years, I need to make sure that firms do not appear in both treated and control group because of two consecutive elections. For this reason, my main analysis is performed on a sample of firms that do not host elections in the past 4 years.[6] This procedure reduces the number of elections to 1,480. My final dataset only uses those observations for which I have full information on maturity variable. I report the number of observations/elections in each table.

Elections mostly take place at the beginning of the sample period. Figure 1 shows the total number of elections held in each year from 1977 to 2014. The average number of elections for the entire time period is 83. Figure 2 shows the cumulative distribution of the union elections across industries, which are identified by the 2-digit SIC code. Around 70% of elections takes places in firms with 2-digit SIC code from 10 to 40, including Mining, and Construction (SIC from 10 to 17) and Manufacturing (SIC from 20 to 39). These numbers are in line with the dataset in Lee and Mas (2012). I also exclude elections with less than 50 eligible voters. This exclusion helps to alleviate the concern of systematic manipulation of elections' outcome. The underlying assumption is that the probability of manipulation is decreasing in the number of election's voters. Section 2.3 discusses this assumption in more details.

[5]Examples of imperfect matches are *Shaws Supermarkets* and *Shaws Supermarket* or typos such as *Willamette* and *Wilamette*.

[6]I perform robustness checks to ensure that my results are not driven by the choice of a specific dataset.

1.2 Unionization Response Variables and Financial Controls

I test firms' joint response to unionization by focusing on maturity and leverage choices. I use the fraction of long-term debt[7] over the total debt and the ratio of long-term debt over the total assets (hereafter, long-term debt ratio) as measures of the firm's maturity structure. For the debt level variable, I use the standard book and market measures of leverage.

In the spirit Barclay and Clifford (1995) and Custódio, Ferreira, and Laureano (2013), I isolate the maturity choice from leverage decisions by computing the percentage of total debt with long term maturity. Compustat provides the value of debt due in more than one, two, three, four, and five years from the firm's fiscal year end. As Barclay and Clifford (1995) point out, whether considering debt with maturity longer than three, four, or five years is an arbitrary decision. I ensure robustness for different maturity measures.

The second maturity variable of my analysis is the long-term debt ratio. The important difference with respect to the previous measure is that this variable does not include short term debt. The fraction of long term debt can increase mechanically if, *ceteris paribus*, the firm's short term debt matures and is not substituted with a new issuance. The long-term debt ratio variable helps me to filter out this effect, so that I can capture the maturity structure changes due to the issuance of new long-term debt.

Leland and Toft (1996) and Leland (1998) stress the importance of considering the joint decision of both maturity and amount of debt when looking at financing policies. I use book and market leverage to test for debt level changes as consequences of unionization events. This test is needed to make sure that the effect on the capital structure is not due to the mechanism of strategic using of debt. Panel B in Appending A describes in more details the computation of all outcome variables.

In my regression, where controls are included, I use standards corporate finance variables. Panel C in Appending A reports the list of control variables with detailed explanations of the their computation.

[7] I use the terminology long-term as general word for debt with maturity longer than five years. However, I follow the literature and present results also for debt with maturity longer than three.

1.3 Summary Statistics

Tables 1 presents summary statistics. Panel A highlights the characteristics of election variables. The mean of the variable *Dummy Win*, which takes value one if a union wins an election and zero otherwise, is 0.35. That is, 35% of elections results in a unionization. The sample consists in 747 observations, which is the number of elections that have information on the firm's debt maturity. The proportion of winning over losing elections is 35% even considering the full dataset of 1,480 elections (e.g. including multiple elections). The average election casts a share of votes in favor of union of 46%. Figure 1 shows a stable dynamic of this statistic over the sample period. The median election comprises 122 eligible voters with an average of around 233. Following the literature, I include only elections with at least 50 eligible voters. The largest election have 4,816 eligible voters. Panel B reports summary statistics for the corporate finance variables.

2 The Causal Effect of Unionization on Debt Maturity Policies

2.1 Empirical Strategy

I use a regression discontinuity design to establish the causal link between the event of unionization and the firm's debt maturity choice. Firms who experience union elections are assigned to a treated and control group depending on the outcome. If a union wins, then the firm is in the *winners/treated* group. In case of a loss, the firm goes into the *losers/control* group. The threshold that divides treated from control is exogenously given by the election rules. A union wins if more than 50% of eligible workers vote in favor. I measure the debt maturity and leverage response to unionization as the size of the outcome variable discontinuity at 50% threshold point.

This empirical design is assumptions free. One important assumption is that the assignment of "patients" to the treatment and control group is random. Union elections are conducted with a secret-ballot mechanism. This means that the outcome of an election, from an ex-ante perspective, maintains random components. Moreover, as stressed before, the threshold separating treated and control firms is exogenous. This allows me to comfortably rely on the theoretical econometric results of the sharp RDD approach.

In order to comply with the random assignment assumption, I need to minimize the risk that the election's outcome can be manipulated. It could happen that an employer and its employees find an agreement before the election, affecting the randomness of its outcome. I follow the literature and use two strategies to minimize this concern. First, I only allow elections with at least 50 eligible workers, implying that manipulation is harder when the number of voters is large. Second, I control for the elections' winning margins. If a manipulation takes place, then we are likely to observe a sharper election outcome (e.g. everybody votes in favor or against the union).

I estimate the following regression,

$$\Delta Y_i = \beta_0 + \beta_1 \text{Dummy win}_i + f(X_i) + \epsilon_i \tag{1}$$

where ΔY_i is the firm's i maturity response to unionization, *Dummy win*$_i$ is a dummy variable equal to one if a union wins an election in firm i, and zero otherwise, and $f(X_i)$ is a flexible functional form of the X_i. The latter, often referred as running variable, is the *Share of Votes* casts in favor of a union an election. Details on the computation of this variable can be found in Panel A of Appendix A. The running variable assigns firms to treated (or control) group and also gives information on the election's winning/losing margin.

The general definition of the financial response to unionization is given by the following equation,

$$\Delta Y_i = \ln(\bar{Y}_{i;t,t+m-1}) - \ln(\bar{Y}_{i;t-1,t-n}), \tag{2}$$

where $\bar{Y}$ is the average of the financial response variable computed over m and n years. The time t is the fiscal year in which the election takes place. All RDD results presented in the tables are obtained with the setting: $n = 3$ and $m = 2$. Figure 3 shows how estimates change by letting m going from one to three. However, I fix $n = 3$ because firms' debt maturity dynamic is downward sloping over the years (see Custódio et al. (2013)), this means that taking the mean over more years in the past make it harder to find positive discontinuity for long-term debt.

2.2 RDD Main Results: Unionization on Debt Maturity

In this section I present the main RDD results. I show that, as consequence of unionization event, firms increase the fraction of long-term debt while keeping their leverage ratio stable. In the following specification I use changes in the fraction of debt with maturity longer than five years and book and market leverage changes as outcome variables. Results are similar for other maturities. In Section 3 I explore potential mechanisms that explains firms' decisions to change their maturity structure.

Figure 3 provides graphical evidence on the discontinuity of the maturity policy at the 50% winning threshold.[8] The left panel reports changes in the fraction of debt with maturity longer than three years (variable $\Delta Mat. > 3Y$). The right panel is obtained by using changes fraction of debt with maturity longer than five years (variable $\Delta Mat. > 5Y$). Moreover, for each of these two variables I use different values for the parameter m when computing the average of the outcome variable. I look at maturity response after the first ($m = 1$), the second ($m = 2$), and the third ($m = 3$) year the election has been closed, with $n = 3$ for all specifications.

Figure 3 shows that firms respond to unionization by increasing the fraction of long term debt. The effect is statistical significant already in the first year after the election has been closed and becomes stronger in the second year. The figure shows discontinuities at the 50% winning threshold and no-overlapping 90% confidence intervals for the middle plots. As one would expect this effect fades as m increases. The bottom plots show the effect becoming weaker in the third year after the election, with some overlap between confidence intervals, although statistical significant. Firms are subjected to many other events, then it is hard to isolate the unique effect of unionization as the time goes by. I repeat the analysis for the book and market leverage. Figure 4 shows no jumps at the winning threshold of 50% for neither the measures of leverage, suggesting non significant difference between treated and control groups in terms of leverage policies and market leverage reaction to unionization.

In the context of RDD is important to show the jump in the outcome variable at the predetermined 50% threshold. However, the main quantitative results are formally presented in tables. I estimate the model specification in equation (1) specifying the functional form of the running variable, $f(X_i)$, as a polynomial of order three, four, five, and six, respectively for each estimate.

Table 3 and 4 contain the main results. Firms react to unionization by increasing the fraction of

[8] The figure is obtained by fitting a quadratic polynomial separately to the left and right of the 50% threshold. Moreover, I split each side in equally-spaced bins and compute the conditional average of the outcome variables: $\Delta Mat. > 3Y$ and $\Delta Mat. > 5Y$. Finally, I jointly plot the fitted polynomial (solid lines) and scatter the conditional averages (dots) in a unique graph. This graphical exercise is useful and informative because it shows that my findings are not driven by a particular functional form choice of the running variable.

long-term debt while keeping their leverage ratios unchanged. On the maturity policy side, Panel A in Table 3 shows all positive and statistically significant coefficients. The event of unionization causes a reshape in the firm's debt maturity structure. The estimates indicate that, on average, a unionized firm holds a fraction of long-term debt between 22%-28% higher as compared to non-unionized firm.[9] By considering an average treatment of 25%, then in my sample a representative firm that experiences a union election increases the fraction of debt with maturity longer than five years from 49% to 61%.[11] This effect is also economically significant, in my sample translates to an increase of $135 millions of long term debt financing.

On the leverage side, I do not find statistical significant treatment effects for both book and market leverage changes.[12] The former tests for the possibility that firms use leverage as strategic tool to gain bargaining power over unionized and more powerful workers (see Perotti and Spier (1993) and Bronars and Deere (1991)). The latter captures the markets' reaction to unionization events rather than the manager debt financing choices. Panel A in Table 4 shows that coefficient for all the polynomial orders are statistically non significant. Panel B in Table 4 confirms the previous result also for changes in market leverage. This finding rules out the concern of strategic behavior and equity markets' negative reactions. Overall my results point towards a shift in the maturity structure. Unionized firms find optimal to increase the maturity of their debt.

Lastly, I estimate the RDD using changes in long-term debt ratio (variable: $\Delta LongTerm(>5)$) as response to unionization. This variable has the advantage of considering the joint determination of the amount and maturity of long-term debt. It also takes care of mechanical increase of long-term debt due to short-term debt maturing. The variable $LongTerm(>5)$ increases only if a firm issues new debt with maturity longer than five years. In order to strengthen my evidence, I also estimate the same model using changes in the short-term debt ratio (variable: $\Delta ShortTerm(\leq 1)$).

Panel A and B in Table 5 show that unionized firms change their maturity structure by taking on more long-term debt. Estimates in panel A are all statistically significant.[13] This strengthen

[9]As pointed out by Lee and Lemieux (2010), the RDD does not need covariates to identify the causal effect.[10] However, I show that including firms characteristics and industry fixed effects in my regression specifications do not affect my results. Panel B of Table 3 show that estimates are quantitative larger and statistically stronger even with sample size shrinkage due to missing observations of covariates.

[11]The estimated treatment effect for the fraction of debt with maturity longer than three years (variable $Mat. > 3Y$) are quantitatively smaller (on average 17% increase) but statistically significant.

[12]This result is in line with Schmalz (2015).

[13]I obtain similar result by considering the alternative long-term debt ratio variable $LongTerm(>3)$.

the previous funding that unionization leads to an increase of the long-term debt. Unionized firms substitute short- with long-term debt, without changing the leverage ratio. Although not significant, Panel B shows a negative effect on the short term debt ratio. The dynamic of the maturity substitution is gradual. If I consider the response in first year after the election ($m = 1$), I find statistically significant evidence that unionized firms reduce the short term and weakly increase the long term debt.

This section provides compelling evidence that firms respond to unionization by changing their maturity structure. Empirical results show that firms reduce the short-term debt in the first year after the unionization. Simultaneously they weakly increase the long-term debt and continue in the subsequent year. My estimates show a 25% increase in the fraction of long-term debt during the first two years after an election has been closed.

2.3 Validity Tests: Continuity of the Running Variable and Firms' Characteristics

RDD setting relies on the assumption that election's outcomes cannot be perfectly predicted. The failure of this assumption would not completely discard my results but undermine the inference power. It suffices to think that a rational manager able to perfectly forecast the result would anticipate it and react accordingly before the election is held. In this section I provide evidence suggesting that the assignment to treated and control groups can be considered as locally random. I do so by showing the compliance of two important conditions: continuity of the running variable and firms' observable characteristics at the 50% cut-off point.

Elections' results can have predictable components. However, it is important that they preserve some randomness in the outcome. There does not exists a formal way to completely rule out the possibility of manipulation. A standard condition that need to be satisfy is continuity of the running variable distribution (*Share of Votes*) around the assignment threshold of 50%. If the manager could systematically manipulate elections' outcome, then we should observe a break of the *Share of Votes* distribution right above and below assignment cut-off. An upward break of the distribution should also be observed if the sample suffers of self-selection. It might be that employees only file for an election if they are sure of the victory. This last concern is less severe because these elections would likely cast a sharp election outcome, while the RDD analysis focuses on the local effect between close unionized and escapees.

Figure 5 plots the distribution of running variable *Share of Votes* and provide preliminary evidence regarding its continuity at the 50% threshold. I perform the formal discontinuity test procedure suggested by McCrary (2008). Figure 5 plots the estimated distribution of the running variable. The function appears continuous at the threshold. The visual evidence is confirmed by the formal statistical test. The Z-statistic obtained by using the McCrary's test is 0.76, which results from an estimated coefficient of 0.141 with a standard error of 0.185). We cannot reject the null hypothesis that the distribution is continuous at the prespecified threshold of 50%.

The other important condition that needs to be satisfied is the continuity of firms' observable characteristics at 50% cut-off. Winners (treated) and losers (control) of an election should not be *ex-ante* systematically different in observable characteristics. The maturity response to unionization between these two groups should be the result only of the treatment effect. I run a standard validity test by looking at firm-level characteristics in the year preceding an election. Table 6 shows that in the year before the election firms are not statistically different, and so comparable. These results are obtained by running the following six order polynomial[14]

$$y_i = \beta_0 + \beta_1 \text{Dummy Win}_i + \sum_{j=1}^{6} \theta_j \textit{Share of Votes}_i^j + \epsilon_i, \tag{3}$$

where the dependent variable is a lagged observable firm's characteristic, Dummy Win takes value one if union wins an election and zero otherwise. I estimate this model for different election's winning/losing margins from the 50% cut-off. The coefficient of interest is β_1. If firms are comparable we should not find statistical significance.

Results of these tests suggest that even though some manipulation might have taken place, this is not strong enough to undermine the causal inference of the RDD framework. Moreover, unionized and escapee firms in the sample appear to be comparable from the observables perspective.

2.4 Robustness Checks

In this section I explore the sensitivity of RDD main results to changes in model specification. I run several robustness checks to ensure that results are not driven by: the global polynomial

[14]Robustness checks deliver similar results using polynomials of different orders.

approach, the exogenous 50% threshold, and finally I show that the sample selection is not a driving factor.

An important concern to address in an RDD framework is the trade-off between precision and bias of estimations. The global polynomial approach makes use of all the available data to estimate the treatment effect. This makes estimates more precise because of the large amount of information provided by the entire sample. However, observations away from the assignment cut-off point introduce bias. It is often difficult to guarantee that the functional form relating the conditional mean of the outcome and running variable is specified correctly over a large range of data. The local linear approach, instead, reduces the likelihood of bias because it uses only a subset of data around the assignment cut-off point. However, this approach can be statistical weaker given the lost of information due to sample size shrinkage.

To address this concern I run a set of local linear regressions using subsets of data with different bandwidths around the 50% threshold. Bandwidths span from five to forty percentage points around the 50% cut-off. Moreover, I perform the analysis using optimal bandwidths suggested by Imbens and Kalyanaraman (2012) (IK) and recently further modified by Calonico, Cattaneo, and Titiunik (2014) (CCT).[15]

Table 7 reports results for local liner regressions of close winners and losers. Estimates are statistical significance with both CCT and IK optimal bandwidths. Estimates with other bandwidths are also statistically significant. Sign and magnitude of the treatment effect are similar to the estimates using global polynomial regressions. Model (1) estimate is not statistically significant. However, the bandwidth (5%) is much smaller than the optimal suggested by CCT (18%) and IK (16%). Given the existing precision-bias trade-off, a small bandwidth can affect the statistical power of the model. This is also supported by other results which increase in statistical significance as the bandwidths approaches to the optimal.

The election setting allows me to use a sharp RDD framework. In this model the probability of treatment jumps from zero to one once a given exogenous threshold has been passed. However, it is informative to show that arbitrary chosen assignment cut-off points do not produce the same

[15]These two methods belong to the so-called "plug-in" procedures. The optimal bandwidth is estimated in terms of actual data characteristics. The objective is to find an optimal level that balances the degree of bias and precision. Heuristically more estimated bias lead to smaller bandwidth, higher conditional variance of the estimate leads to larger bandwidth. These two forces lead to an interior optimal.

results as the exogenous imposed by the election system. Table 8 reports estimates of the model in Equation (1) for a six order global polynomial and a set of arbitrary chosen cut-off points plus the true 50% threshold. Except for the latter, estimates are not statistical significant and most of them have a reversed sign. This evidence suggests that the effect of unionization on firm's debt maturity choice is not likely driven by randomness. I am indeed capturing the treatment effect of unionization on the maturity structure of debt.

The last concern regards the possibility that sample selection is driving my results. In order to minimize this concern, I estimate the RDD model using a sample in which I include only the first time that a firm experiences an election.[16] This sample contains 610 elections, 407 lost and 203 won by unions. The complete sample is 747 elections 489 lost and 258 won by unions. The sample is smaller but the proportion between winners and losers is comparable. Moreover, the average share of votes in favor of the union is also comparable between these two datasets: 0.47 for the former versus 0.46 for the latter. Table 9 presents RDD results for two sets of global polynomial regressions. The first set does not include financial control, while the second contains controls for firm's characteristics and industry fixed effects. Panel A and B show that all coefficients are statistically significant and similar in magnitude to the main RDD estimates. It is unlikely that the sample selection is driving my results.

3 What Makes Maturity Changes an Optimal Response to Unionization?

In the previous section I document a maturity change as firm's response to unionization. Firms' substitute short- with long-term debt while keeping the leverage ratio stable. It is still the case that only certain types of firms find the maturity lengthening an optimal strategy. In the remaining sections I explore the mechanism that leads firms to change the debt maturity structure. I connect my findings to the existing ones in the literature and show that the maturity structure plays an important role in the financing policy response to unionization.

[16] I estimate the RDD model on the full sample of 3,400 elections. Results display a positive and statistical significant treatment effect of unionization on the maturity structure. I also look at a subsample of firms who experienced a unique election during the sample period. The magnitude and sign of the effect is comparable to other estimations. However, the statistical power is reduced. There are few firms which have a unique election and only a small subset of theme have data on debt maturity.

I estimate the RDD using subsamples constructed according to measures that aim at capturing financial constraints, operating flexibility, agency costs of debt, and different legal status. Subsamples are obtained from the main election dataset. I verify robustness of results by employing a dataset from which I do not exclude any election. Results display similar patterns.

3.1 The Effect of Financial Constraints

I analyze the unionization response of financially constrained and unconstrained firms. I use the Whited-Wu (*ww*) measure to proxy financial constraints. A firm is unconstrained if it lies below the sample median according the *ww*-index distribution in year before the election. Schmalz (2015) finds that financially constrained firms increase their leverage in response to unionization, while unconstrained firms do the opposite. This is the result of a trade-off between strategic use of leverage and risk management. My estimates partially support his results. However, I furthermore show that financially constrained firms respond to unionization by lengthening their debt maturity structure. Table 10 reports the response to unionization estimates for leverage, maturity, and long-term debt ratio. This helps to convey the message that leverage may not be the unique or most relevant strategic policy variable that a firm can use.

On the one hand, results confirm previous findings that financially constrained firms use debt policies when the labor force becomes more organized and powerful. On the other hands, my findings suggest that financially constrained firms exploits the positive effects of a union in place by increasing the fraction of debt with longer maturity.[17] The intuition is that constrained firm may have limited access to debt financing. Long-term debt reduces the refinancing risk due to roll-over of maturing debt. Supposedly, this risk is more acute in financially constrained firms. My results suggest that constrained firms both use unionization as an opportunity to reduce refinancing risks and at the same time they also gain bargaining power by increasing the debt level.

Financially unconstrained firms have relatively less problem to raise external debt financing and this also makes the refinancing risk less severe. These firms do not have a clear incentive to change their debt structure. RDD results confirm this intuition by not showing statistical meaningful effects for these firms.

[17] Although not reported explicitly in the table. I also estimate the RDD by using the change in short-term debt ratio. I find a negative coefficient but not statistical significance. This supports the idea that firms keep the debt ratio unaltered but they change the maturity structure.

3.2 The Effect of Operating Flexibility

A common belief is that firms with more unionized workers are less flexible. The intuition is that in case of negative economic shocks these firms are more constrained in laying off workers or reducing their wages. Simintzi et al. (2014) show that increases in the operating leverage crowd out financial leverage. In their paper, the reduction in flexibility stems from changes in employment protection.

In this section I study the different response of firms with high and low operating flexibility to unionization. If firms use leverage as strategic tool, then I should find a positive effect for firms with low operating flexibility and negative for the other group. The maturity choice direction is not clear ex-ante. However, Harford et al. (2014) show that firms hedge refinancing risk, arising from holding short term debt, by keeping more cash. I use cash holding as a measure of financial flexibility. Firms that lie below the sample median according to the cash holding distribution are considered to have less operating flexibility. I test whether firms with low cash increase the maturity of their debt such that to reduce their refinancing risk.

Table 11 shows that the leverage response to unionization does not follow Simintzi et al. (2014)'s predictions. Estimates are weakly statistical significant for firms with low cash and I find no statistical significant impact on firms with high cash. Our settings are not completely comparable. I do not take into account State law heterogeneity in terms of worker protection (i.e. Unemployment Insurance). However, my results suggest that the operating flexibility is not a channel through which firms find optimal to use leverage as strategic tool.

Panel B and C of Table 11 show that in general both flexible and non-flexible firms react to unionization by increasing the maturity of their debt claims. Consistently with Harford et al. (2014), I find that the effect for firms with lower flexibility (low cash) is larger in magnitude and it has more statistical power. On average firms with lower operating flexibility increase the fraction of long term debt by around 8-percentage-points more respect to firms with higher operating flexibility.

3.3 Firm Size, Tangible Assets and the Unionization Effect

The presence of asymmetric information between firm and bond market generates a premium in the form of yield spread. I cannot test directly the presence of union's monitoring activity on firms policies. However, I can provide evidence that the presence of unions generates changes that are consistent with this hypothesis. Researchers use firm's size as a measure for potential asymmetric information and for testing theories related to agency costs of debt. Custódio et al. (2013) document that firms' size is positively associated with the maturity structure. Large firms hold a larger fraction of debt with long maturity. They obtain similar results by focusing on tangibility, which measures the fraction of tangible assets over the firm's total assets. Small and low tangibility firms have potentially higher information asymmetry and thus subjected to larger costs of debt.

I estimate a global polynomial on subsamples split according to the sample median of firms' size and tangibility distribution. I report results for both characteristics. The firm's size can be interpreted both as proxy for financial constraints and information asymmetry. Tangibility measures the extent to which a firm can collateralize its assets. As stress by Rajan and Zingales (1995), tangible assets are easy to collateralize and thus they reduce the agency costs of debt.

If unions' monitoring activities improve the information asymmetry or in general have a positive effect on agency costs of debt, then this is expected to be particularly strong in firms who are more exposed to these problems. Small and low tangibility firms are expected to have a stronger response to unionization. A caveat is due. My sample is skewed towards large firms, as compared to the whole Compustat universe. If one assumes that asymmetric information decreases continuously in the firm's size, then my result can be interpreted as a relative effect.

Table 12 reports the RDD results. Focusing on Panel A, I do not find statistically significant effects on the firm's leverage as response to unionization. The size does not affect leverage decisions as consequence of unionization. However, firm's size is important factor to determinate the maturity structure of debt as response to a union's victory. Small firms respond by increasing substantially the fraction of long term debt. On average, in the second year after a union victory, smaller firms have increased by 57% their fraction of long term debt. A further analysis on the immediate respond to unionization suggests that the process happens gradually. There is a statistical significant increase of around 40% in the first year after the election. Large firms do not exhibit a similar reaction to unionization.

It is interesting to note that results for the subsample split by tangibility are different for what it concerns the leverage response to unionization. Panel B shows that low tangibility firms do not respond to unionization by changing their leverage ratio, as for small firms. However, high tangibility firms respond to unionization by following the strategic-use-of-debt theory predictions. This implies that tangibility captures some aspect that is missing when splitting by size or using financial constraints measures such as White-Wu index. Results for the maturity response are consistent with the previous evidence. Firms with low tangibility have a stronger response to unionization.

This positive effect can be, at least for some part, attributed to a reduction in agency costs of debt. I cannot disentangle all the forces that play a role in this process. However, these findings support the idea that capital markets value positively the presence of a non-financial stakeholders, such as unions, which have incentive to monitor over the firm's activity. Firms gain access to cheaper long term financing. Some firms find it optimal to grab this opportunity, others are not affected. Consistently, firms that react by increasing the maturity structure of debt are those who have potentially higher agency costs of debt.

3.4 Right-to-Work Laws and the Union Power

I now turn to investigate the response to unionization conditional on the power that a union has on a given territory. The underline assumption of this study is that a union is able to improve coordination and effectiveness of workforce's actions. This means that weaker unions should not be as effective as stronger unions. To provide evidence on the relevance of unions' power, I use the Right-to-Work Laws (RWLs) as discriminant between weak and strong unions.[18] Unions in States covered by RWL are expected to be less powerful. The main reason is that in these States workers in unionized firms are not obliged to pay union fees. This makes unions financially weaker.

If my results are indeed due to unions being able to affect management decisions, then I should find a weaker effect in States where unions are weakened by RWLs. In order to test this hypothesis I perform the RDD analysis separately for elections that take place in States with and without

[18] The basic idea of these laws is to secure employees' right to decide for themselves whether or not to join or financially support a union. The 1935 National Labor Relations Act (NLRA) introduce the employees' right to organize into unions, engage in collective bargaining to gain better contractual terms, and take actions such as strikes. The act authorizes unions to serve as workers "exclusive bargaining representative". This requires that all employees of a unionized firms to accept the union contract. Individuals may not negotiate separately, whether or not they belong to the union. Then unions started negotiating contracts that made paying their dues a condition of employment. In response many states passed "Right-to-Work laws (RWLs) that prohibit these provisions. Under RWLs, unions cannot make dues compulsory if they elect to bargain on behalf of non-members.

RWLs. Figure 7 shows in blue US Sates covered by RWL. The majority of States have RWLs in place before my sample period starts. However, Indiana, Michigan, and Wisconsin have introduced these laws only recently.

Results in Table 13 confirm the hypothesis that unions have an active part when forming the a bargaining unit within a firm. The RDD estimates show no statistical significant changes in the maturity structure for firms whose unionized establishment is located in a State with RWLs. On the contrary, I find a strongly statistical significant effect in States without RWLs. Model (1) to (3) test maturity changes as response to unionization during the first, second, third year after the election has been closed. Estimates are robust to these changes in the maturity response specification.

4 Conclusions

In this paper I study the effect of powerful unions on firms' debt maturity decisions. When a employees decide to form a bargaining unit represented by a union, then they become more powerful and better organized. I use union elections as exogenous variation of the employees power to study the firms' financial policy response.

I find that firms respond to unionization by increasing the fraction of long maturity debt. I do not find evidence on strategic use of leverage. Moreover, I find that financially constrained, less flexible, and smaller firms exploit the positive externalities induced by the presence of a powerful non-financial stakeholder (union) to lengthen the maturity of their debt to reduce refinancing risk.

I contribute to the literature by establish an important link between labor frictions and financing policies. Moreover, I provide a new perspective in which firms do not respond to unionization by aggressive leverage policies. My findings support the idea that bond market value positively the presence of non-financial stakeholders with aligned interests and incentives to monitor over the firm's activity.

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A Variable List and Descriptions

Variable Label	Description
	Panel A: Unionization Elections Variables
Total Votes	Number of valid votes cast in an election at the firm's establishment level
Votes for Union	Number of valid votes cast in an election in favor of the unionization of the firm's establishment
Votes against Union	Number of valid votes cast in an election against the unionization of the firm's establishment
Eligible Voters	Total number of employees with the right to vote in an union election
Share of Votes	The ratio between the variable *Votes for Union* and the variable *Total Votes*
Dummy Win	Dummy variable which takes value one if the union is the winner of a given election, and zero otherwise
	Panel B: Variables for the Regression Discontinuity Design (RDD)
$Mat. > 3$	Fraction of debt with maturity longer than three years. It is computes as the dollar value of debt with maturity longer than three years (Compustat variables $dltt - dd2 - dd2 - dd3$) over the total dollar value of debt (Compustat variables $dltt + dlc$)
$Mat. > 5$	Fraction of debt with maturity longer than three years. It is computes as the dollar value of debt with maturity longer than three years (Compustat variables $dltt - dd2 - dd2 - dd3 - dd4 - dd5$) over the total dollar value of debt (Compustat variables $dltt + dlc$)
$LongTerm(> 3)$	The ratio between debt maturity longer than three years (Compustat variables $dltt - dd2 - dd2 - dd3$) over the total value of assets (Compustat variable at)
$LongTerm(> 5)$	The ratio between debt with maturity longer than three years (Compustat variables $dltt - dd2 - dd2 - dd3 - dd4 - dd5$) over the total value of assets (Compustat variable at)
Leverage	Ratio between the total book value of debt (Compustat variables $dltt + dlc$) over the total value of assets (Compustat variable at)
$MarketLeverage$	Ratio between the book value of debt (Compustat variables $dltt + dlc$) over the sum of market value of equity (Compustat variables $csho * prcc_f$) plus the book value of debt
$ShortTerm(\leq 1)$	The ratio between debt maturing withing one year (Compustat variables dlc) and the total asset value (Compustat variable at)

(Continued)

Variable Label	Description
Panel C: Other Corporate Finance Controls Variables	
Total Asset	Total value of assets (Compustat variable *at*)
Book Equity	The difference between asset value (Compustat item *at*) and total debt (the sum of compustat items *dltt* and *dlc*)
Cash	Ratio between cash and short term investment (Compustat variable *che*) and the total value of assets
Operating Leverage	Following Novy-Marx (2011), it is the ratio between cost of goods sold (Compustat item *cogs*) plus selling, general and administrative expense (Compustat variable *xsga*) over total value of assets
Market to Book (M/B)	Ratio of market value of assets (Compustat variables $at + csho * prcc_f - ceq$) over the total value of assets
Collateral (Cltr)	Ratio between the sum of inventories (Compustat variable *invt*) and property, plant and equipment (Compustat variable *ppent*) over the total value of assets
Whited-Wu (*ww*)	Computed using the following equation, $$\begin{aligned} ww = &- 0.091 * ib - 0.062 * \textit{D-divid} \\ &+ 0.021 * (dltt/at) - 0.004 * ln(at) \\ &+ 0.102 * (\textit{SIC3-growth-sale}) - 0.035 * (\textit{firm-growth-sale}), \end{aligned}$$ where *ib* is the Compustat variable income before extraordinary items, *dummy-dividend* is a dummy variable which takes value one is the firm pays dividend and zero otherwise, *dltt/at* is the ratio between long term debt to total asset, *ln(at)* is the natural logarithm of total asset, the last two terms are industry (as defined by 3-digit SIC code) sales growth and the firm's sales
Abnormal Earnings	Ratio of difference between the income before extraordinary items, adjusted for common or ordinary stock equivalents (Compustat item *ibadj*) for time t and $t-1$ over the market value of equity (Compustat variables $csho * prcc_f$).
Tangibility	Ratio between tangible assets measured by property, plant and equipment (Compustat item *ppent*) and total assets.

Figure 1. This graph plots the dynamic of the total number of elections held in each year of the sample period. Union elections data are from the National Labor Relations Board (NLBR) over the time period from 1977 to 2014.

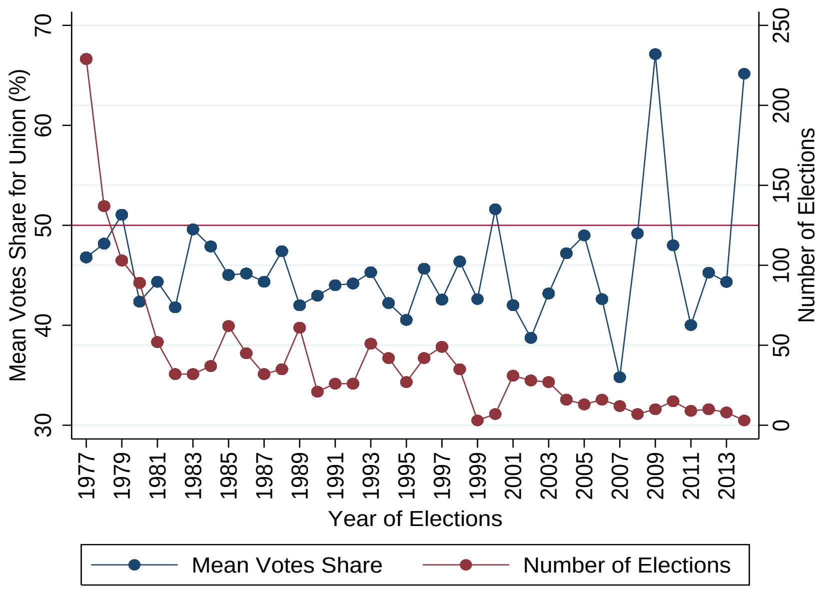


Figure 2. This figure shows the cumulative distribution of unionization elections across industries. The x-axis reports the 2-Digit Standard Industrial Classification (SIC) code. The y-axis reports the cumulative density of elections. Union elections data are from the National Labor Relations Board (NLBR) over the period 1977-2014.

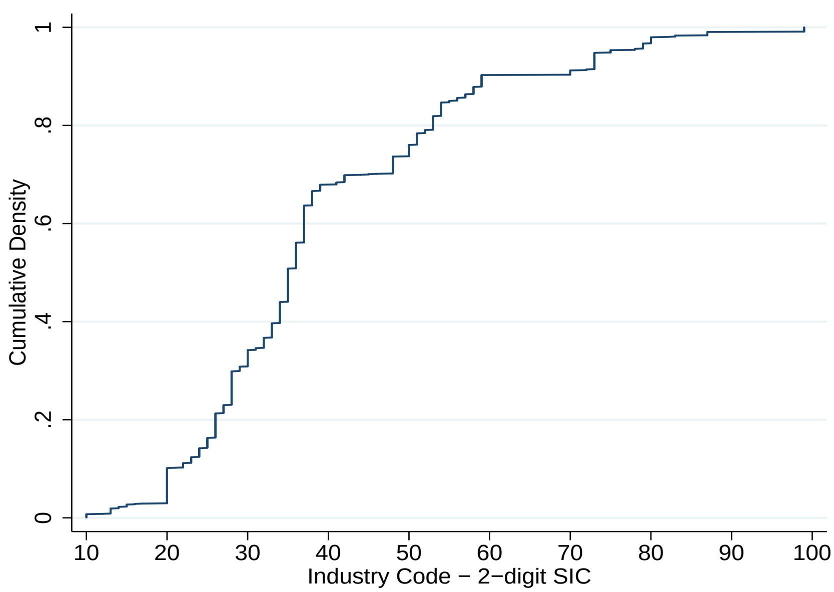


Figure 3. The figure plots debt maturity response to a unionization election. $\Delta Mat. > 3$ and $\Delta Mat. > 5$ are respectively changes in the fraction of total debt with maturity longer than three and five years. The x-axis reports the running variable *Share of Votes*, which is computed as the fraction of total votes cast in favor of unionization. The left column shows the maturity response for $\Delta Mat. > 3$ computed over the first, second and third year after the election. The right column shows the maturity response for $\Delta Mat. > 5$ computed over the first, second and third year after the election. The blue and green solid lines are fitted quadratic polynomial estimates. The gray solid lines plot the 90% confidence interval. The dots are averages of $\Delta Mat. > 3$ and $\Delta Mat. > 5$ computed over 20 equally-spaced bins. The discontinuity of the outcome variable at the 50% threshold of *Share of Votes* represents the estimated causal effect of unionization. Elections data are from NLRB. Data on the maturity are taken from Compustat.

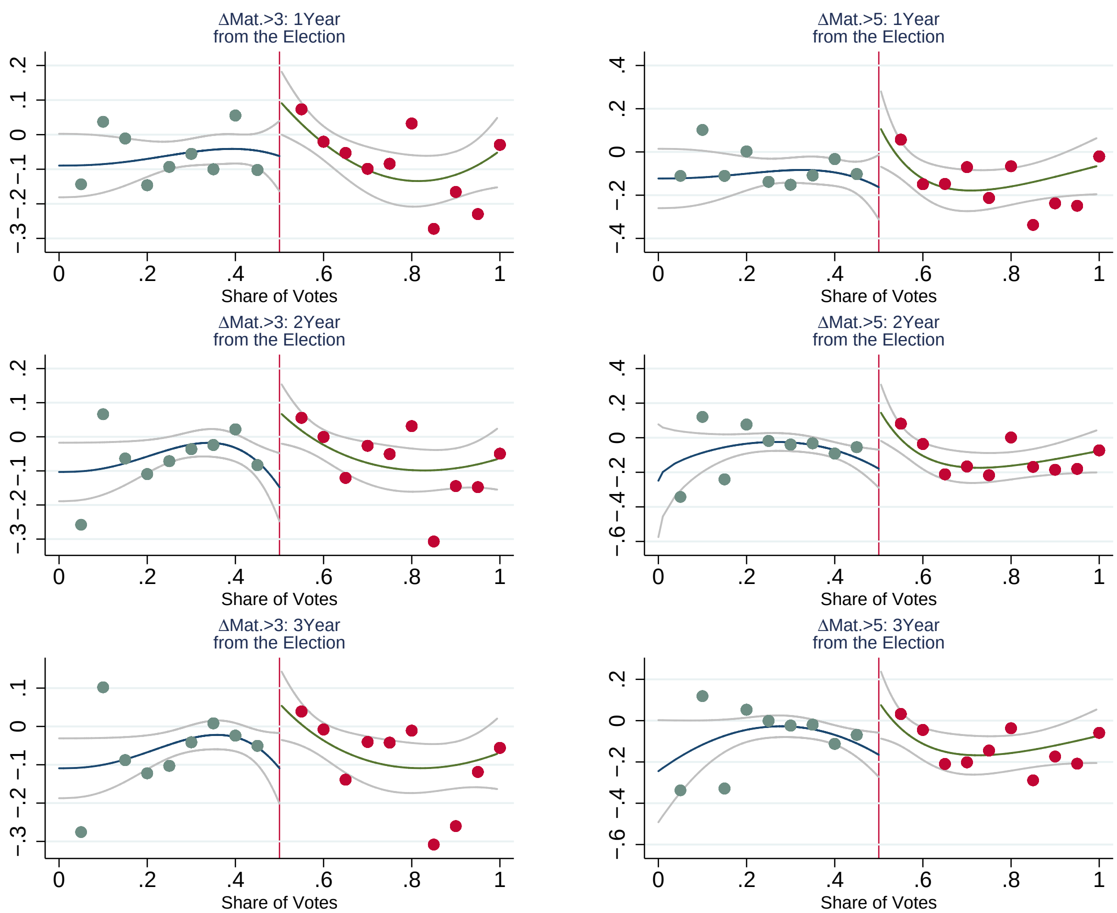
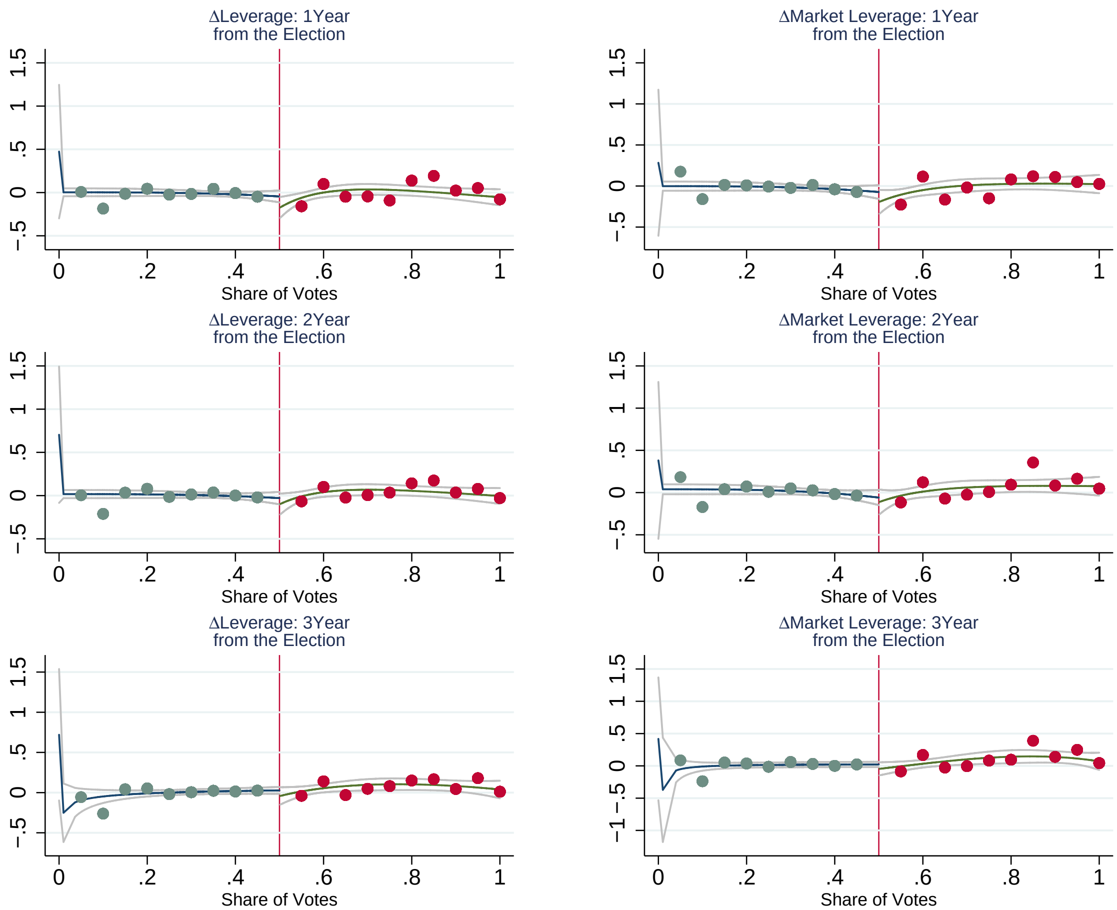


Figure 4. The figure plots book (variable $\Delta Leverage$) and market (variable $\Delta MarketLeverage$) leverage responses to a unionization election. The x-axis reports the running variable *Share of Votes*, which is computed as the fraction of total votes cast in favor of unionization. The left column shows the leverage response for $\Delta Leverage$ computed over the first, second and third year after the election. The right column shows the maturity response for $\Delta MarketLeverage$ computed over the first, second and third year after the election. The blue and green solid lines are fitted quadratic polynomial estimates. The gray solid lines plot the 90% confidence interval. The dots are averages of $\Delta Leverage$ and $\Delta MarketLeverage$ computed over 20 equally-spaced bins. The discontinuity of the outcome variable at the 50% threshold of *Share of Votes* represents the estimated causal effect of unionization. Elections data are from NLRB. Data on the maturity are taken from Compustat.



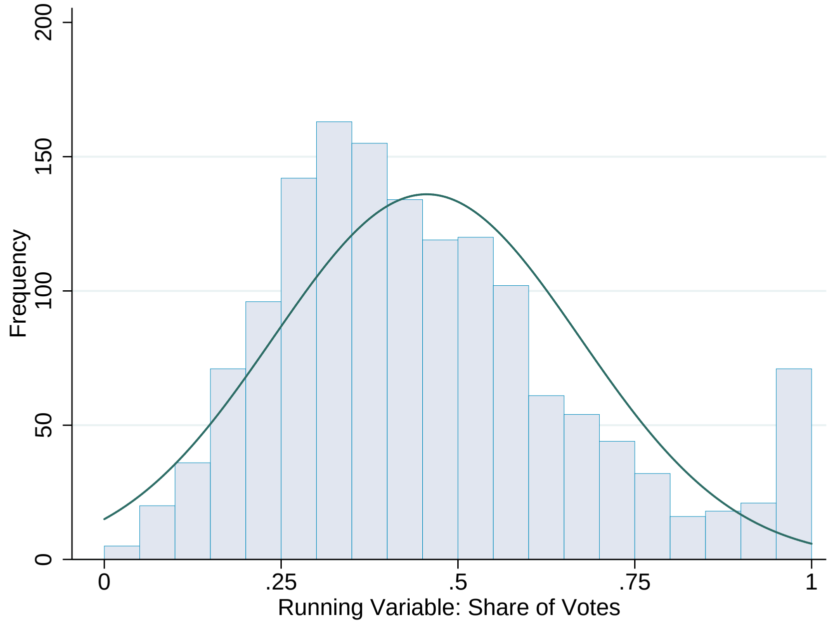


Figure 5. This figure shows the distribution of the running variable: *Share of Votes*. This variable is computed as the ratio between valid votes cast in favor of the representative union over the total valid votes cast in an election. The distribution is constructed by computing frequencies of 20 equally-spaced bins in the *Share of Votes* variable.

Figure 6. The figure plots the density of the variables *Share of Votes* (the ratio between votes for union and the total valid votes cast in an election). The procedure followed to compute and test for break at the threshold of 50% is like in McCrary (2008). The dots represents the estimated density. The solid thick line the fitted density of the running variable. The thin solid line is the 95% confidence interval around the fitted density. Union elections data are from the National Labor Relations Board (NLBR) over the period 1977-2014.

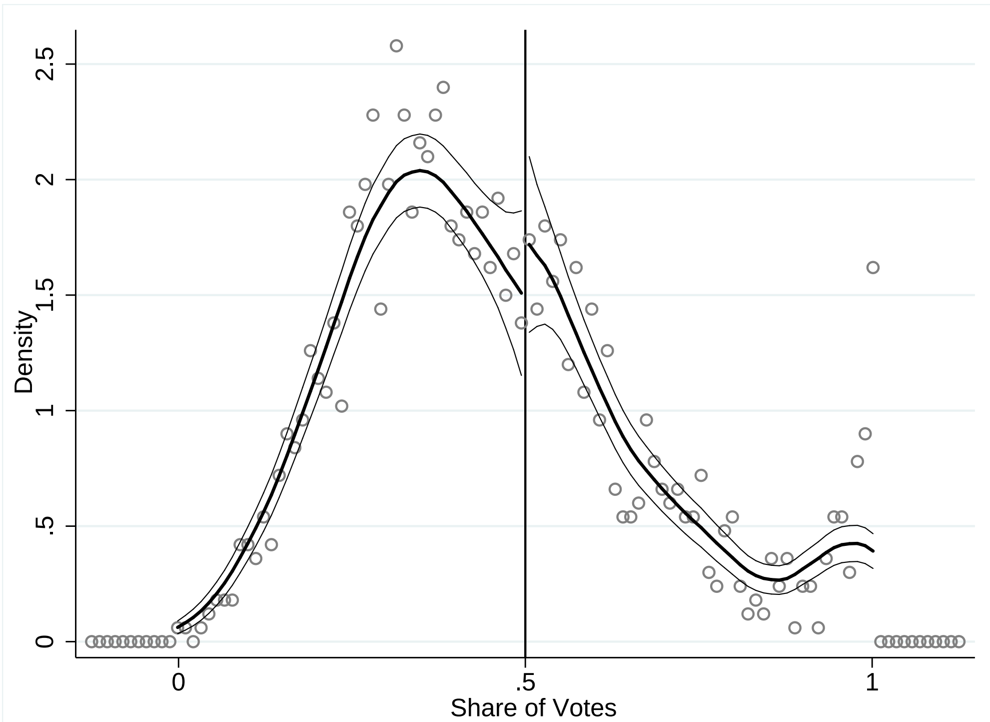


Figure 7. This figure shows in blue States covered by Right-to-Work Laws. Source: http://www.nrtw.org/rtws.htm

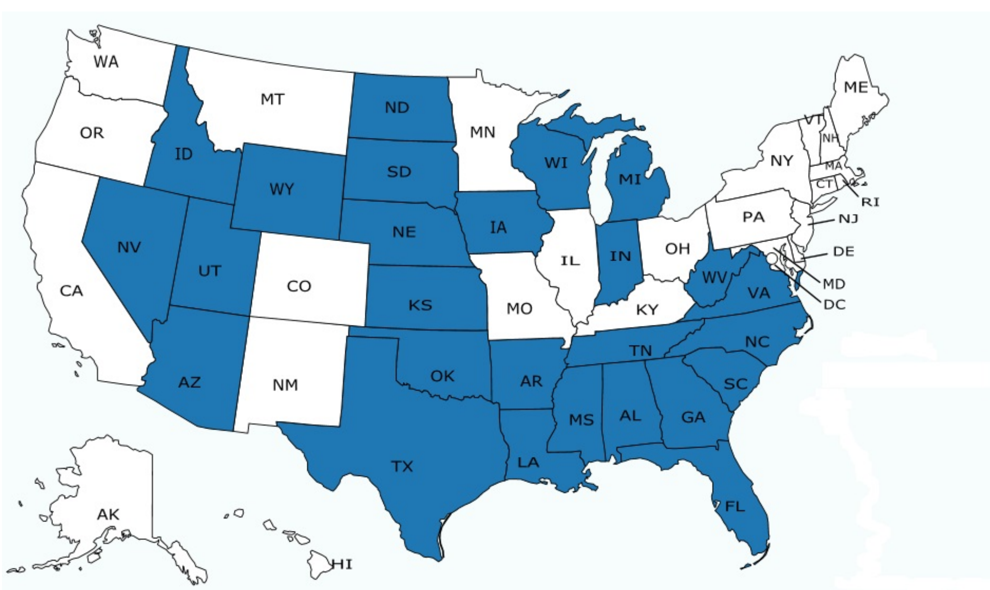


Table 1. Summary Statistics for Elections and Corporate Finance Control Variables

This table reports the summary statistics for the unionization election dataset. Panel A reports summary information on the establishment-level elections. Dummy Win is a variable that takes value one if the election is won by the representative Union, and zero otherwise. Share of votes is the ratio between votes in favor of the union over total votes cast in the election. Eligible voters indicates the number of workers with the right to vote in the unionization election. Total votes is the number of valid votes cast in an election. Vote for and against union are the number of valid votes cast in an election in favor and against the representative union respectively. Panel B reports summary statistics of standard corporate finance variables. The sample period goes from 1977 to 2014. All the corporate finance variables are Winsorized at 1% tails. Dollar value variables have been adjusted for inflations and express to a constant 2000 dollars.

Variable	Mean	25th Percentile	Median	75th Percentile	Standard Deviation	Min	Max	Obs
				Panel A: Election Variables				
Dummy Win	0.35	0	0	1	0.48	0	1	747
Share of Votes	0.46	0.30	0.41	0.57	0.22	0	1	747
Eligible Voters	233.35	75	122	229	357.09	50	4816	747
Votes for Union	92.31	29	49	92	153.32	0	1856	747
Votes against Union	118.37	34	60	119	194.37	0	2393	747
				Panel B: Other Covariates				
Total Assets	4211.62	274.75	992.31	4117.86	7369.15	5.61	29642.87	747
Total Debt	1125.65	62.95	268.81	1090.64	2017.42	0.23	8298.27	747
Book Equity (be)	3022.45	187.90	724.33	2987.53	5387.95	2.97	22283.99	741
M/B	0.95	0.64	0.79	1.07	0.75	0.22	16.17	719
Operating Leverage (ol)	1.49	0.94	1.26	1.67	1.02	0.08	7.68	704
Abnormal Earnings	-0.02	-0.02	0.01	0.02	0.29	-3.04	3.41	717
Size(Log(Sales))	7.29	6.09	7.24	8.64	1.74	1.85	10.19	746
Asset Maturity	11.02	6.27	9.28	14.93	7.00	0.32	75.84	727
Return on Assets (ROA)	0.15	0.11	0.15	0.20	0.07	-0.28	0.44	746
Cash	0.06	0.02	0.04	0.09	0.07	0.00	0.45	747
Collateral	0.60	0.51	0.62	0.71	0.17	0.06	0.95	743
Z-Score	3.36	2.40	3.04	3.95	2.18	-2.37	43.10	698

Table 2. Summary Statistics for the RDD Outcome Variables

This table reports statistics for the main variables of the regression discontinuity analysis (RDD). Panel A reports summaries of the raw variables. Panel B of Appendix A describes the construction of all variables in this table. $Mat. > 3Y$, $Mat > 5Y$, $LongTerm(> 3)$, and $LongTerm(> 5)$ are the variables capturing the debt maturity structure. $Leverage$ and $MarketLeverage$ are the variables measuring firms' debt level. Panel B reports summary statistics of the changes in the aforementioned variables. These variables are computed as the log difference between averages of the raw variable after and before the election event. This specific table reports statistics of the measure computed using three-year averages before and after the election has been officially closed. All the variables are Winsorized at 1% tails.

Variable	Mean	25th Percentile	Median	75th Percentile	Standard Deviation	Min	Max	Obs
Panel A: Key Outcome Variable for the RDD Analysis								
$Mat. > 3Y$	0.64	0.52	0.68	0.80	0.22	0.01	1	747
$Mat. > 5Y$	0.49	0.32	0.50	0.66	0.23	0	1	747
$LongTerm(> 3)$	0.18	0.10	0.17	0.24	0.13	0	0.96	749
$LongTerm(> 5)$	0.14	0.07	0.12	0.19	0.10	0	0.82	749
$Leverage$	0.29	0.18	0.27	0.36	0.15	0.01	0.86	741
$MarketLeverage$	0.35	0.20	0.34	0.49	0.20	0.01	0.94	719
Panel B: Log-Changes of the Key Variables								
$\Delta Mat. > 3Y$	-0.04	-0.17	-0.03	0.10	0.35	-1.54	1.21	747
$\Delta Mat. > 5Y$	-0.07	-0.27	-0.04	0.15	0.52	-2.12	1.38	747
$\Delta LongTerm(> 3)$	-0.06	-0.29	-0.06	0.16	0.52	-2.42	1.78	748
$\Delta LongTerm(> 5)$	-0.08	-0.34	-0.07	0.21	0.67	-2.77	1.90	749
$\Delta Leverage$	-0.01	-0.18	-0.02	0.15	0.36	-1.67	1.57	740
$\Delta MarketLeverage$	-0.02	-0.26	-0.02	0.22	0.44	-1.59	1.83	702

Table 3. RDD Results for the Debt Maturity Choice

The table presents the RDD results using the global polynomial approach. I estimate the following regression: $\Delta Mat. > 5Y_i = \beta_0 + \beta_1 Dummy\ Win_i + f(Share\ of\ Votes_i) + \epsilon_i$, where the $\Delta Mat. > 5Y_i$ is the firm's i change in the fraction of debt with maturity longer than five years, $Dummy\ Win_i$ takes value one if a union wins an election and zero otherwise, and finally $f(Share\ of\ Votes_i)$ is a flexible global polynomial in the share of votes casts in favor of the representative union. The β_1 coefficient captures the causal effect of unionization on the maturity choice. Panel A does not include controls. Panel B adds to the aforementioned regression equation standard controls for firms characteristics and industry fixed effect at one-digit SIC level. Year fixed effects are includes in both specifications. I report results for polynomials of order three, four, five, and six. Standard errors in parenthesis are robust and clustered at firm level. $***$, $**$, and $*$ indicate significance at the 1%, 5%, and 10% level, respectively

Global Polynomial	(1) Three	(2) Four	(3) Five	(4) Six
	Panel A: No Financial Controls			
Dummy Win	0.224**	0.226**	0.273***	0.284***
	(0.089)	(0.089)	(0.104)	(0.105)
Observations	747	747	747	747
	Panel B: With Financial Controls			
Dummy Win	0.312***	0.316***	0.358***	0.371***
	(0.096)	(0.096)	(0.114)	(0.116)
Observations	655	655	655	655

Table 4. RDD Results for Book and Market Leverage Variables

The table reports RDD estimates as response to unionization for the following variables: $\Delta Leverage$ and $\Delta MarketLeverage$. Panel B in Appendix A describes the computation of the $Leverage$ and $MarketLeverage$ variables. The changes are computed as log difference of the two-year after and three-years before averages. Year fixed effects are includes in all specifications. Model(1) to (4) report results for polynomials of order three, four, five, and six, respectively. Standard errors in parenthesis are robust and clustered at firm level. $***$, $**$, and $*$ indicate significance at the 1%, 5%, and 10% level, respectively

Global Polynomial	(1) Three	(2) Four	(3) Five	(4) Six
	Panel A: Book Leverage			
Dummy Win	0.0413	0.0428	0.0750	0.0713
	(0.053)	(0.052)	(0.061)	(0.061)
Observations	740	740	740	740
	Panel B: Market Leverage			
Dummy Win	0.0433	0.0456	0.0914	0.0878
	(0.067)	(0.067)	(0.078)	(0.0776)
Observations	702	702	702	702

Table 5. From Short- to Long-Term Maturity Debt

The table reports RDD estimates as response to unionization for the following variables: $LongTerm(> 5)$, $ShortTerm(\leq 1)$. They are computed as for the maturity response. The first variable (Panel A) is the ratio between the amount of debt with maturity longer than five years over total assets. The second variable (Panel B) is the ratio between debt maturing within one year over total assets. All estimates include year fixed effects. Model(1) to (4) report results for polynomials of order three, four, five, and six, respectively. Standard errors in parenthesis are robust and clustered at firm level. $***$, $**$, and $*$ indicate significance at the 1%, 5%, and 10% level, respectively

	(1)	(2)	(3)	(4)
	Panel A: Long Term Debt Ratio			
Dummy Win	0.272**	0.275**	0.361***	0.373***
	(0.108)	(0.108)	(0.124)	(0.126)
Observations	749	749	749	749
	Panel B: Short Term Debt Ratio			
Dummy Win	-0.163	-0.227	-0.141	-0.147
	(0.142)	(0.161)	(0.182)	(0.191)
Observations	749	749	749	749

Table 6. Continuity of Firms' Observables Characteristics at the Assignment Cut-off Point

This table reports the validity test results for the RDD analysis. The model tests the continuity assumption of firms' observable characteristics in the year before a unionization election. The null hypothesis is that there are no systematic observable differences between firms that win and lose a unionization election. Results are for a global polynomial of degree six in the share of votes for union (variable: *Share of Votes*). Rows report the dependent variables tested. Columns report coefficients of the explanatory variable, Dummy Win, for different winning/losing margins from the 50% threshold. Model (1) considers elections with all margins, model (2) winners and losers within a 20%, model (3) winners and losers within 10%, model (4) winners and losers within 5%. Regressions include year fixed effects. Standard errors in parenthesis are robust and clustered at firm level. $***$, $**$, and $*$ indicate significance at the 1%, 5%, and 10% level, respectively

	Explanatory variable: Dummy Win			
	Election's Winning/Losing Margin			
	(1)	(2)	(3)	(4)
Dependent Variables	[0, 1]	[0.30, 0.70]	[0.40, 0.60]	[0.45, 0.55]
Lag(Log(Sale))	0.143	0.165	-0.232	-0.207
	(0.272)	(0.420)	(0.701)	(1.229)
Lag(Book Leverage)	0.015	0.015	-0.025	0.086
	(0.026)	(0.039)	(0.058)	(0.088)
Lag(Cash)	0.006	0.0131	0.022	0.041
	(0.012)	(0.020)	(0.032)	(0.057)
Lag(M/B)	0.021	0.079	0.178	0.401
	(0.129)	(0.202)	(0.297)	(0.602)
Lag(Operating Leverage)	0.119	0.073	-0.136	-0.623
	(0.160)	(0.236)	(0.268)	(0.377)
Lag(ROA)	-0.003	0.006	0.0150	-0.009
	(0.022)	(0.019)	(0.026)	(0.042)
Lag(Z-Score)	0.213	0.041	0.495	0.246
	(0.379)	(0.568)	(0.805)	(1.447)

Table 7. Robustness: Local Linear Regression using Different Bandwidths of Data

This table reports results of local linear regression estimations. I estimate the following model $\Delta Mat. > 5Y_i = \beta_0 + \beta_1 Dummy\ Win_i + \theta Share\ of\ Votes_i + \gamma Dummy\ Win_i * Share\ of\ Votes_i + \epsilon_i$, where $\Delta Mat. > 5Y_i$ is the firm's i change in the fraction of debt with maturity longer than five years, $Dummy\ Win_i$ takes value one if an election is won by a representative union and zero otherwise, $Share\ of\ Votes_i$ is the share of valid votes cast in favor of the representative union, and the last is an interaction term between the dummy and running variable. This is equivalent to estimate a non-parametric model using a rectangular kernel. Model (1) to (8) estimate the linear regression on samples with different bandwidth of used data to the left and right of the 50% cut-off of the running variable *Share of Votes*. Model (1) considers only firms who won/lost an election with a margin of 5% from the 50% cut-off. Bandwidth's step-size increase by five percentage points for each model. The last two models are estimated using optimal bandwidth computed following the procedure in Calonico et al. (2014) (CCT) and Imbens and Kalyanaraman (2012) (IK). Standard errors in parenthesis are robust to heteroskedasticity. $***$, $**$, and $*$ indicate significance at the 1%, 5%, and 10% level, respectively

	Local Linear Regression Estimates Using Different Bandwidth of the Running Variable *Share of Votes*									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(CCT)	(IK)
	[0.45,0.55]	[0.40,0.60]	[0.35,0.65]	[0.30,0.70]	[0.25,0.75]	[0.20,0.80]	[0.15,0.85]	[0.10,0.90]	[0.32,0.68]	[0.34,0.66]
Dummy Win	0.127	0.261*	0.288***	0.231**	0.199**	0.155*	0.161**	0.125*	0.276***	0.345***
	(0.186)	(0.138)	(0.106)	(0.097)	(0.086)	(0.080)	(0.075)	(0.074)	(0.101)	(0.114)
Observations	121	226	345	453	555	608	647	678	419	369

Table 8. Robustness: RDD using Arbitrary Chosen Winning Threshold

The table reports estimates of a six order global polynomial of the main RDD model by using arbitrary assignment thresholds points. Model (1) to (3) assign to the treatment group elections that cast a share of votes in favor of the union more than 5%, 15%, and 35%, respectively. Model (5) to (7) assign to the treatment group elections that cast a share of votes in favor of the union more than 65%, 80%, and 95%, respectively. The model in the center is the one that uses the true exogenously given threshold of 50%. All specifications do not include firms characteristics and industry fixed effects. Year fixed-effects are included. Standard errors are robust and clustered at firm level. $***$, $**$, and $*$ indicate significance at the 1%, 5%, and 10% level, respectively

	Arbitrary Winning Thresholds						
	(1)	(2)	(3)	True	(5)	(6)	(7)
	5%	20%	35%	50%	65%	80%	95%
Dummy Win	0.248	-0.099	-0.093	0.284***	-0.112	-0.127	0.175
	(0.308)	(0.153)	(0.099)	(0.105)	(0.176)	(0.247)	(0.197)
Observations	747	747	747	747	747	747	747

Table 9. Robustness: RDD with First Time Elections

The table reports RDD estimates of global polynomials. The sample includes only observations of elections happened for the first time at the firm level. I used the official closing date (year and month) to determine the first election for firms who experienced multiple elections during the sample period. Model (1) to (4) estimate a global polynomial of order three, four, five, and six, respectively. Panel A reports results without including financial controls. Panel B presents results including standard controls for firm's characteristics and industry fixed effects at one-digit SIC level. Year fixed effects are included in all specifications. Standard errors are robust to heteroskedasticity. $***$, $**$, and $*$ indicate significance at the 1%, 5%, and 10% level, respectively

Global Polynomial	(1) Three	(2) Four	(3) Five	(4) Six
	Panel A: No Financial Controls			
Dummy Win	0.291***	0.297***	0.30**	0.314***
	(0.102)	(0.103)	(0.119)	(0.121)
Observations	610	610	610	610
	Panel B: With Financial Controls			
Dummy Win	0.340***	0.348***	0.379***	0.393***
	(0.111)	(0.112)	(0.133)	(0.136)
Observations	552	552	552	552

Table 10. Effect of Financial Constraints

This table reports the unionization response of financially constrained and unconstrained firms. A firm is financially unconstrained is lies below the sample median according to the Whited-Wu (ww) index. Model (1) to (4) estimate a global polynomial of order three, four, five, and six, respectively. Panel A presents the leverage response to unionization. Panel B reports the maturity response to unionization. Finally, Panel C reports the RDD results for the long-term debt ratio. Appendix A describes the computation of the leverage, debt maturity, and long-term debt ratio. All model specifications include financial controls, year and one-digit SIC industry fixed effects. Standard errors in parenthesis are robust and clustered at firm level. $***$, $**$, and $*$ indicate significance at the 1%, 5%, and 10% level, respectively

	(1)	(2)	(3)	(4)	Obs.
	Panel A: $\Delta Leverage$				
Dummy Win (Non-Constrained)	0.036	0.035	-0.025	-0.023	323
	(0.078)	(0.0778)	(0.096)	(0.095)	
Dummy Win (Constrained)	0.115	0.121	0.210**	0.194**	330
	(0.076)	(0.076)	(0.085)	(0.086)	
	Panel B: $\Delta Mat. > 5$				
Dummy Win (Non-Constrained)	0.169	0.169	0.260*	0.264*	324
	(0.126)	(0.126)	(0.157)	(0.158)	
Dummy Win (Constrained)	0.510***	0.519***	0.490***	0.489***	331
	(0.150)	(0.152)	(0.173)	(0.184)	
	Panel C: $\Delta LongTerm(> 5)$				
Dummy Win (Non-Constrained)	0.193	0.191	0.281	0.289	324
	(0.150)	(0.149)	(0.182)	(0.182)	
Dummy Win (Constrained)	0.609***	0.622***	0.675***	0.661***	331
	(0.179)	(0.181)	(0.205)	(0.217)	

Table 11. Effect of Operating Flexibility

This table reports the unionization response of firms with low and high operating flexibility. A has low operating flexibility if lies below the sample median of distribution of the variable Cash. Model (1) to (4) estimate a global polynomial of order three, four, five, and six, respectively. Panel A presents the leverage response to unionization. Panel B reports the maturity response to unionization. Finally, Panel C reports the RDD results for the long-term debt ratio. Appendix A describes the computation of cash holding, leverage, debt maturity, and long-term debt ratio. All model specifications include financial controls, year and one-digit SIC industry fixed effects. Standard errors in parenthesis are robust and clustered at firm level. $***$, $**$, and $*$ indicate significance at the 1%, 5%, and 10% level, respectively

	(1)	(2)	(3)	(4)	Obs.
	Panel A: $\Delta Leverage$				
Dummy Win (Low Cash)	0.148**	0.150**	0.0995	0.0997	334
	(0.0616)	(0.0620)	(0.0749)	(0.0748)	
Dummy Win (High Cash)	-0.0804	-0.0669	-0.0518	-0.0427	351
	(0.0969)	(0.0953)	(0.110)	(0.110)	
	Panel B: $\Delta Mat. > 5$				
Dummy Win (Low Cash)	0.376***	0.382***	0.475***	0.476***	336
	(0.132)	(0.133)	(0.167)	(0.167)	
Dummy Win (High Cash)	0.308**	0.332**	0.345**	0.372**	351
	(0.144)	(0.145)	(0.174)	(0.178)	
	Panel C: $\Delta LongTerm(> 5)$				
Dummy Win (Low Cash)	0.484***	0.492***	0.560***	0.560***	336
	(0.149)	(0.150)	(0.193)	(0.193)	
Dummy Win (High Cash)	0.306	0.336*	0.398*	0.432*	351
	(0.191)	(0.195)	(0.227)	(0.234)	

Table 12. Effect of Size and Tangible Assets

This table reports the unionization response of subsample of firms split by size (Panel A) and tangibility (Panel B). Size is computed as the natural logarithm of sales. Tangibility is the fraction of tangible assets. Small and low tangibility firms are the ones below the sample median according to the distribution of size and tangibility, respectively. Model (1) to (4) estimate a global polynomial of order three, four, five, and six, respectively. For both subsample I report results for leverage and maturity response to unionization. Appendix A describes the computation of the leverage and debt maturity. All model specifications include financial controls, year and one-digit SIC industry fixed effects. Standard errors in parenthesis are robust and clustered at firm level. $***$, $**$, and $*$ indicate significance at the 1%, 5%, and 10% level, respectively

	(1)	(2)	(3)	(4)	Obs.
Panel A: Sample Split by Size					
	Panel A.1: $\Delta Leverage$				
Dummy Win (Small)	0.099	0.108	0.179*	0.156	334
	(0.085)	(0.085)	(0.093)	(0.095)	
Dummy Win (Large)	0.049	0.048	0.013	-0.009	319
	(0.065)	(0.066)	(0.079)	(0.083)	
	Panel A.2: $\Delta Mat. > 5$				
Dummy Win (Small)	0.560***	0.575***	0.590***	0.589***	334
	(0.158)	(0.161)	(0.186)	(0.194)	
Dummy Win (Large)	0.200*	0.192	0.264*	0.243	321
	(0.121)	(0.122)	(0.153)	(0.154)	
Panel B: Sample Split by Tangibility					
	Panel B.1: $\Delta Leverage$				
Dummy Win (Low Tangible)	-0.019	-0.011	-0.055	-0.080	332
	(0.084)	(0.084)	(0.102)	(0.103)	
Dummy Win (High Tangible)	0.132*	0.131*	0.223***	0.226***	321
	(0.069)	(0.068)	(0.072)	(0.072)	
	Panel B.2: $\Delta Mat. > 5$				
Dummy Win (Low Tangible)	0.507***	0.522***	0.610***	0.609***	332
	(0.165)	(0.166)	(0.202)	(0.208)	
Dummy Win (High Tangible)	0.209*	0.208*	0.237	0.254*	323
	(0.122)	(0.123)	(0.149)	(0.152)	

Table 13. Effect of Right-to-Work Laws on Unions' Power

This table reports RDD results of the debt maturity response to unionization in States with and without Right-to-Work laws. Model (1) to (3) estimate the RDD model using different specification for the dependent variable $\Delta Mat. > 5$ computed over the first, second, third year after. All models include financial controls, year and one-digit SIC industry fixed effects. Standard errors in parenthesis are robust and clustered at firm level. $***$, $**$, and $*$ indicate significance at the 1%, 5%, and 10% level, respectively

	Dependent Variable: $\Delta Mat. > 5$		
	(1) First Year	(2) Second Year	(3) Third Year
	Dummy Win	Dummy Win	Dummy Win
With Right-to-Work	0.163	0.186	0.177
	(0.179)	(0.175)	(0.200)
No Right-to-Work	0.295**	0.359***	0.345***
	(0.135)	(0.123)	(0.127)
Observations	721	655	613