Debt Structure as a Strategic Bargaining Tool

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Abstract

This paper studies 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 since it affects the ease of debt contract renegotiation and thus the credibility of bankruptcy threats. We first show that the degree of wage concessions is strongly related to a firm's debt structure in the airline industry. Debt structure is further shown to be adjusted as a response to an increase in non-financial stakeholders' negotiation power. Using NLRB labor union election as a laboratory setting and employing a regression discontinuity design, we find that passing a labor union election leads to an increase in the ratio of public debt to total assets and a decrease in the ratio of bank debt to total assets in the following three years after elections, while there is no significant change in the level of debt. Syndication size of newly issued bank loans increases while creditor ownership concentration decreases once vote share for unions passes the winning threshold. Various tests confirm that the debt structure adjustment after new unionization is more likely driven by strategic concerns of management rather than more constrained access to bank loans.

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

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1 Introduction

Does a firm's management use debt policies to influence the bargaining position relative to employees? Although it has been theorized that increasing debt level could strengthen management's bargaining power (Bronars and Deere, 1991; Perotti and Spier, 1993), 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 new unionization on leverage ratio is zero on average. In this paper, we find strong causal evidence supporting the strategic bargaining view once taking debt heterogeneity into consideration.

The basic theoretical mechanism is that debt creates a 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 debt contract renegotiation. The credibility of bankruptcy threats is higher for public debt relative to bank debt, because it is difficult to renegotiate the former due to the existence of The Trust Indenture Act of 1939, while the latter can be renegotiated more easily (Gilson, John, and Lang, 1993) and is indeed frequently renegotiated before maturity (Roberts and Sufi, 2009). Within bank debt, the renegotiation likelihood also varies. It decreases with the syndication size, as 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, we examine both the *ex post* effect of debt structure on the outcomes of wage contract negotiations and 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, we employ a hand-collected dataset from balance sheet between 1991 and 2012 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. We also use new issuance data from Securities Data Company (SDC) platinum and Loan Pricing Corporation (LPC) DealScan to measure issuance behavior of each type of debt and the syndication structure of bank debt. To measure the outcomes of wage negotiations, we use a special feature of the airline industry that employees' detailed wage information is publicly available due to the filing requirements by the Bureau of Transportation. To capture incremental changes in the bargaining power of labor, we use the information on labor union election collected by the National Labor Relations Board (NLRB) and employ a regression discontinuity (RD) design to draw causal inferences. We have four main findings.

First, using data from the airline industry, we show that debt structure does affect the outcomes of wage contract negotiations. Specifically, a one-standard-deviation increase in the ratio of public debt to total assets is associated with a 4.6% decrease in annual wage per employee. Even though an increase in the leverage through bank debt does not improve wage contract negotiation outcomes on average, the effect of bank debt on wage concession is more significant when the average number of creditors in outstanding loan deals is larger. The results overall support the point the management's bargaining position is improved when outstanding debt is more difficult to be renegotiated.

Second, we show that debt structure is adjusted strategically as a response to an increase in employees' bargaining power. RD estimations show that while the causal impact of new unionization on the corporate leverage ratio is negligible, debt structure is adjusted towards debt that is more difficult to be renegotiated. 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 following three years after elections. The effects are economically significant given the sample average of public debt (bank debt) to assets ratio is 21.5-percentage-points (7.1-percentage-points). Debt structure adjustments are further shown to

be larger when elected unions are more powerful or when unions' are expected to bear larger bankruptcy costs.

We also find consistent evidence using the debt new issuance data. Compared with firms in which unions barely lose, firms in which unions barely win are 27.2% more likely to issue at least one public debt in the following 36 months after elections, but not more likely to issue bank loans. Moreover, the fraction of public debt issuance amount in total new debt issuance amount also increases 21.1-percentage-points after new unionization.

Third, we find that new unionization has impacts 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 within 36 months after elections. Such effect is shown not due to changes in loan amount after new unionization. The estimations suggest that firms having little access to corporate bond markets could strategically increase the creditor dispersion of bank debt to advance bargaining positions. Such evidence is complementary to the findings on the choice between public and bank debt.

Finally, we perform tests to rule out alternative explanations. One alternative explanation for the documented findings is that firms are more constrained from bank loan markets after new unionization and have to resort to bond market for financing. We address this concern in two ways. First, we directly examine the effects of new unionization on the spreads of bank loan and public debt. If the alternative explanation is the underlying driving force, the spread of bank loan should increase more than the public debt spread after new unionization. We find that passing an election leads to increases in both the spreads of bank loan and public debt, however, the effect of new unionization on public debt spread is shown to be larger, not smaller, than the effect on bank loan spread. Therefore the evidence is inconsistent with the alternative explanation.

Second, we exploit the cross-sectional variations in the interest alignment between labor

and management before elections. If the alternative channel drives our results, we expect the debt structure adjustments to be larger when the interests of labor unions are more aligned with managements', since labor unions then have more incentives to engage in the behavior that benefits shareholders but hurts bank creditors and exaggerate the conflicts with banks. Using the fraction of defined contribution (DC) pension assets invested in a firm's stock to measure the interest alignment, we find that debt structure adjustments are smaller, not larger, after new unionization when the interests between labor and management are more aligned before elections. Therefore, the cross-sectional evidence is inconsistent with the alternative explanation but is more consistent with the strategic bargaining view as the need for strategic bargaining is reduced when the two parties have more common interests.

This paper contributes to two strands of literature. First, this paper belongs to the literature that examines the strategic role of debt policies in the bargaining relations with labor.[1] One main contribution of this paper is that we provide 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 first evidence on how management employs corporate leverage to advance bargaining position. Bronars and Deere (1991) document that corporate leverage ratio is positively correlated with industry-level union coverage rates and Matsa (2010) shows that corporate leverage 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 in the literature is mixed. Chen, Kacperczyk, and Ortiz-Molina (2011) does not find a positive relation between corporate leverage ratio and industry union coverage rates in their sample. Lee and Mas (2012) and Schmalz (2015) further show that new unionization has little impact on corporate leverage ratio on average using the NLRB election data.

The literature ignores debt structure when examining the strategic role of debt policies.

[1]This paper is also related to the literature studying the interactions between product market and capital structural (Brander and Lewis, 1986; Chevalier, 1995b,a; Kovernock and Phillips, 1995; Mackay and Phillips, 2005). This paper provides evidence showing that corporate debt policies also respond to strategic incentives from labor markets.

This paper contributes to the literature by showing the importance of debt heterogeneity since debt structure (even after controlling for the level of total debt) affects the credibility of bankruptcy threats. Even though in this paper we focus on firms' interactions with one important non-financial stakeholder, labor unions, the conclusion can be generalized to contract negotiations with other non-financial stakeholders, as long as bankruptcy procedure imposes larger costs on them than private workouts (e.g., lessors). Therefore, our results have broader implications beyond the labor union context.

Another contribution is that this paper provides new evidence on the impacts of debt policies on the *ex post* bargaining outcomes. Benmelech, Bergman, and Enriquez (2012) present evidence showing that defined benefit (DB) pension underfunding affects wage bargaining outcomes. Towner (2015) uses U.S. hospital industry as a laboratory setting and shows that hospitals with higher leverage ratios receive higher reimbursement rates from insurance companies for a specific procedure. Using the airline industry data, our paper shows that annual wage per employee is lower for airlines when debt in capital structure is more difficult to be renegotiated. Our paper differentiates from Towner (2015) in the aspect that we show the effect of leverage ratio on bargaining outcomes is driven by debt structure, which affects the ease of debt contract renegotiation.

This paper also fits in the literature studying firms' choices of debt structure. 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. On the determinants of firms' choices of debt structure, existing studies have examined 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, 2014). This paper contributes to this strand of literature by showing that management's strategic bargaining motivation also determines a firm's financing choice.

2 Hypothesis Development

A firm's debt structure is essential for strategic bargaining between management and employees due to two reasons. First, labor unions bear larger costs under court-supervised bankruptcy than under private resolution of financial distress. Second, a firm's debt structure affects the ease of out-of-court debt contract renegotiation and thus the credibility of a bankruptcy threat (Bolton and Scharfstein, 1996).

Section 1113 of Bankruptcy Code allows firms to modify or reject a collective bargaining agreement (CBA) to achieve the goal of reducing labor cost during 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 bankruptcy filings of all large public corporations between 2001 and 2007 and presents evidence showing that debtors can reject CBAs in every 1113 motion. Recently, 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.[2]

The modification or rejection of CBAs outside of bankruptcy, however, is more costly for employers due to the existence of NLRA. Once employers and employee representatives enter a CBA, it cannot be modified during the effective period, or otherwise the employers would commit unfair labor practices (Dawson, 2015).[3]

Overall, labor unions in the U.S. bear larger costs under court-supervised bankruptcy due to reduced bargaining power. This argument is also supported by firms' actions in reality. For example, in 2006, the bankruptcy judge allowed Delta Air Lines to terminate pilot's pension plans, which led to more than $ 2 billion loss of pension benefits for pilots covered by Air Line Pilots Association (Benmelech et al., 2012). Moreover, in 2012, the management of AMR Corporation used Section 1113 of the Bankruptcy Code against American Eagle

[2] http://ww2.cfo.com/bankruptcy/2013/03/labor-unions-urge-chapter-11-reform/

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

Labor Unions to obtain cost reduction concessions.[4]

A firm's debt structure affects the credibility of a bankruptcy threat because private debt contract renegotiation likelihood varies across debt types. For public debt, a bankruptcy threat is more credible since it is more difficult to be renegotiated due to requirements in The Trust Indenture Act of 1939, which requires the bondholders' unanimity to change interest, principal or maturity of public debt. On the contrary, bank debt can be renegotiated more easily as shown in Gilson et al. (1993) and are indeed frequently renegotiated before maturity (Roberts and Sufi, 2009). Furthermore, within bank debt, the renegotiation likelihood also varies. It decreases with the syndication size of a bank loan since contract renegotiation becomes more difficult with more creditors. 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 be renegotiated, such as public debt or bank debt with larger syndication sizes. Our main hypothesis is summarized as follow:

Hypothesis: *A firm's management adjusts debt structure towards debt that is more difficult to be renegotiated (with a larger creditor dispersion) when employees' negotiation power increases.*

We test this hypothesis in two steps. First, the validity of this hypothesis builds on the assumption that debt structure affects the bargaining outcomes between management and employees. We test this assumption in the setting of wage contract negotiations between management and employees in the airline industry. We first use the ratio of public debt to assets as an empirical measure to measure the difficulty of debt contract renegotiation in capital structure. Specifically, we examine whether annual wage per employee is significantly lower for airlines with higher leverage through public debt. We then use the average number

[4]The same situation applies to other non-financial stakeholders such as lessors. Section 365 of the Bankruptcy Code states that "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 which 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 larger cost in Chapter 11, compared to under out-of-court private workouts.

of creditors in outstanding loan deals in a given year to capture creditor dispersion within bank debt. We expect the effect of bank debt on wage concession to be more significant when the number of outstanding creditors is larger.

Second, we test this hypothesis using labor union election as a laboratory. As before, the ratio of public debt to assets is one measure for creditor dispersion in capital structure. We also use the syndication size and creditor ownership concentration of newly issued bank debt as alternative measures. In particular, we examine whether management adjust debt structure to make debt contract renegotiation more difficult, such as increasing the leverage through public debt or issuing bank debt with more creditors or less concentrated creditor ownership, when there is an increase in labor's bargaining power.

3 Data and Sample Selection

3.1 Airline Data

The employee wage data for airlines come from the Form-41 database available through the Bureau of Transportation and spans from 1990 to 2013. The annual wage per employee data is constructed from Schedules P-6 and P-10 in the database. Schedule P-6 reports quarterly operating expenses for airlines with annual operating revenue larger than 20 million and contains total salaries and detailed wage information for different categories of jobs.[5] Since we are interested in the negotiations between management and rank-and-file employees, we exclude the data on the job category of the general management personnel and calculate the annual total salaries for each airline by aggregating the quarterly salaries. Schedule P-10 reports the annual total number of employees and for each airline-year observation we compute the annual wage per employee as total salaries divided by total employment.[6]

[5]The categories of jobs include: (1) general Management personnel; (2) flight personnel; (3) maintenance labor; (4) aircraft and traffic handling personnel and (5) other personnel.

[6]Our results barely change if we include the data on the job category of the general management personnel.

In order to gather financial data, we merge the employee wage data with Compustat using corporate names and then with debt structure data using GVKEY.[7] This matching procedure finally yields 25 airlines with total 275 observations spanning from 1992 to 2013.[8] We also use Thomas Reuters SDC Corporate Restructurings Database to identify airlines in Chapter 11 or Chapter 7 procedures and create a dummy variable *bankruptcy* which is equal to one if an airline is in the bankruptcy procedure in a given year and zero otherwise.[9]

Panel A of Table 1 presents the summary statistics. An average airline has 28,321 employees (Median 20,127) and pays 26,260 dollars to an employee (Median 26,756). The statistics also show that the average corporate book leverage ratio in the sample is 35.7-percentage-points. The average ratio of public debt and bank debt to total assets are 23.5-percentage-points and 8.3-percentage-points, respectively.

3.2 Debt Structure Data

3.2.1 Balance Sheet Data

Debt structure data come from firms' 10-K filings and span from 1991 to 2012. Due to SEC reporting regulations S-X and S-K, the detailed information on firms' long-term debt issues and revolving credit facilities is available and we hand-collect the debt structure information from the section "Notes to Financial Statement" in the 10-Ks. Based on the information from 10-Ks, we define public debt as the sum of outstanding amount of commercial paper

[7]For Alaska Airlines, American Airlines and United Airlines, we match with parent company data to obtain market-to-book ratio. In the final sample, firm-level financial data is mainly from Compustat . When necessary financial data are missing, we use the data from Schedules B-1 and P-1.2 in Form-41 database.

[8]The airlines in the sample are: AirTran Airways Corporation, Alaska Airlines Inc., Allegiant Air, American Airlines Inc., Atlas Air Inc., Continental Air Lines Inc., Delta Air Lines Inc., Endeavor Air Inc, Frontier Airlines, Hawaiian Airlines Inc. JetBlue Airways, Kitty Hawk Aircargo, Kitty Hawk International, Mesa Airlines Inc., Northwest Airlines Inc., Reno Air Inc., Republic Airlines, SkyWest Airlines Inc., Southwest Airlines Co., Spirit Air Lines, Tower Air Inc., Trans World Airways LLC, US Airways Inc., United Air Lines Inc. and Vanguard Airlines Inc.

[9]In our sample, the firm-year observations in which airlines filed Chapter 11 or Chapter 7 are: Allegiant Air (2000), Continental Airline (1990-1993), Delta Airlines (2005-2007), Frontier Airlines (2008-2009), Hawaiian Airlines (1993-1994 and 2003-2005), Mesa Airlines (2010-2011), Northwest Airlines (2005-2007), Tower Air Inc (since 2000), Trans World Airways (1992-1993 and 1995), United Airlines (2002-2006), US Airways (2002-2003 and 2004-2005), Vanguard Airlines (2002-2003) and Western Pacific Airlines (since 1997)

and bonds and notes for each fiscal year. Bank debt is defined as the sum of outstanding amount of revolvers, term loans, and other bank loans for each fiscal year.[10]

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

3.2.2 New Issuance Data

In order to examine the impacts of union power on debt issuance behavior, we obtain new issuance data between 1992 and 2013 from SDC platinum for corporate bond and LPC DealScan database for bank loan.[11,12] One advantage of new issuance data is that we have more detailed information on the types of corporate bonds. Following Gomes and Phillips (2012), we aggregate public bond and Rule 144-A private placement into the public debt category. We therefore assign each new issuance into one of three categories: (1) public debt, (2) non-Rule 144A private placement, and (3) bank loan. Furthermore, we consider syndication size and creditor ownership concentration of a bank loan as alternative dimensions of debt structure. We define syndication size as the number of creditors for each bank loan

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

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

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

tranche. For creditor ownership concentration, we construct a HHI variable and is defined as the sum of square of each creditor's ownership in each loan tranche (Sufi, 2007).

Panel B of Table 1 presents the summary statistics for debt structure measures based on balance sheet and new issuance data. The balance sheet data is available from one fiscal year before to three fiscal years after each labor union election and the new issuance data is selected to be within 36 months after each labor union election. In this sample, public debt and bank debt on average accounts for 68.0% and 22.9% of the firm's total debt, respectively. The summary statistics for debt issuance shows that 50.1% of firms issue at least one public debt within 36 months after each labor union election. The fractions of firms issuing at least one private placement and bank loan within 36 months after each labor union election are 9.0% and 81.4% in the sample, respectively. The average number of creditors is around 8 in a bank loan tranche or a bank loan deal. The mean HHI for creditor ownership concentration is 25.9% in the sample.

3.3 NLRB Labor Union Election Data

The labor union election data come from two sources. Data from 1992 to September 1999 are obtained from Thomas Holmes' Website.[13] Data from October 1999 to 2009 are obtained from NLRB official website.[14] This data set contains employers' names, city of election, state of election, 3-digit SIC (1992-September 1999), NAICS (October 1999-2009), close date of election, number of eligible voters, petition type and total votes for and against 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 petition in which employees seek to remove existing unions, and employer-filed petition in which employers seek to remove existing unions. We focus on the first type which ensures that the employees

[13]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 1977-1992 are from Henry Farber and Bruce Fallick; data from 1993-1994 are from National Archives and data from 1995-1999 are from NLRB.

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

in the bargaining unit are not unionized before.[15] Following Lee and Mas (2012), we keep elections in which the number of eligible voters is greater than or equal to 100. Following DiNardo and Lee (2004), we standardize the vote shares to the support for elections in which the minimum vote cast is 100.[16] Specifically, we 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. We 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, we report results using the vote share for unions as the running variable. The results using the tally-based running variable are available in Appendix A.1.

We merge labor union election data with debt structure data by firm names. The final sample in this paper spans from 1992 to 2009 and includes 851 elections involving 427 unique firms.[17] Panel C 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 by a simple majority rule. On average, the unions win 28.1% of all elections in our sample, consistent with the statistics of the vote share. Panel D 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 number of elections in the sample is presented in Figure 1 and shows that the elections in the sample concentrate on the years between 1994 and 2006.

[15] After merging with debt structure data, the number of observations for decertification and employer-filed petitions are too few to conduct formal analysis.

[16] The reason to do this is to restore the symmetry between small and large elections, otherwise we mechanically put more weights on large elections when we focus on close elections. Our results are robust without such manipulation.

[17] The details for data assembly is available in Appendix A.3.

4 Debt Structure and Wage Contract Negotiation

In this section, we present suggestive evidence to support the assumption that debt structure that decreases the ease of debt contract renegotiation effectively advances management's bargaining positions during wage contract negotiations with employees. We focus on airline industry because airlines with annual operating revenue larger than 20 million are required to disclose detailed information about employees' salaries to the Bureau of Transportation each quarter and this disclosure requirement enables empirical tests.

In particular, we use the average wage per employee as a proxy for wage bargaining outcome and estimate Equation (1) to test whether average wage per employee is lower when debt is more difficult to be renegotiated.

$$Log(Wages/Employee_{i,t}) = \alpha + \beta Renegotiability_{i,t} + \gamma Z_{i,t} + \delta f_i + \theta d_t + \xi_{i,t} \qquad (1)$$

$Log(Wages/Employee_{i,t})$ is natural logarithm of average wage per employee for airline i in year t. $Renegotiability_{i,t}$ represents the ease of debt renegotiation for airline i in year t. The vector $Z_{i,t}$ include firm size, ROA, market-to-book ratio, cash holding, tangibility, and bankruptcy dummy. Vectors f_i and d_t include airline and year fixed effects.

$Renegotiability_{i,t}$ is measured by one of the following measures : the ratio of public debt to total assets (Public/AT), the ratio of bank debt to total assets (Bank/AT), the interaction between the ratio of bank debt to total assets and the average number of creditors in outstanding loan deals (Bank/AT$\times$ # Creditor). β is the coefficient of interest. A negative and significant β for Public/AT or Bank/AT $\times$ # Creditor would provide evidence supporting the assumption.

Table 2 presents the results. In Panel A, we use Public/AT and Bank/AT to measure the negotiability of debt in capital structure. We present the effect of leverage ratio (TotalDebt/AT) on average wage per employee in the first two columns as a benchmark and then present evidence showing that the effect of leverage ratio on bargaining outcomes is driven

by the ease of debt contract renegotiation in subsequent columns. Public/AT, Bank/AT and TotalDebt/AT are standardized to be with zero mean and unit variance.

The estimations in columns (1) and (2) show that management receives better bargaining outcomes when a firm's leverage ratio is higher. Such evidence is consistent with the results in Towner (2015) in which he shows that hospitals with higher leverage ratios receive higher reimbursement rates from insurance companies.

In columns (3) and (4), the coefficients on the ratio of public debt to total assets are negative and significant. The results suggest that management does receive better bargaining outcomes when more not-easily-renegotiable debt exists in the capital structure. Based on the result in column (3), ceteris paribus, annual average wage per employee is 4.6% lower with a one-standard-deviation increase in the ratio of public debt to total assets (16.0%). Given that the sample mean of wage per employee is 26,260 dollar and the average total employment is 28,321 employees, a one percentage point increase in the ratio of public debt to total assets is associated with 2.14 million reductions in salaries per year for an average airline. In columns (5) and (6), the estimations for bank debt suggest that an increase in the leverage through bank debt has little impact on the bargaining outcomes on average, consistent with the argument that bank debt is relatively easier to be renegotiated and imposes a weaker bankruptcy threat.

In Panel B, we further present the effects of creditor dispersion within bank debt on the average wage per employee. The results suggest that the effect of bank debt on wage concession is more negative and significant when the average number of creditors in outstanding loan deals is larger. In particular, the result in column (1) suggests that, with one more bank creditor, annual wage per employee decreases by 2.1% when the ratio of bank debt to assets increases by one-standard-deviation (11.0%). To further show that the effect of number of creditor is through affecting bank loan contract renegotiation, we perform placebo tests and examine the interaction effect between the number of creditors on bank debt and the ratio of public debt to total assets. The estimations on the interaction term is small and insignificant,

suggesting that the effect of number of creditors is unlikely driven by other possibilities and is more likely operating through the channel of bank debt renegotiation. Overall, the results in Table 2 suggest that management can receive better bargaining outcomes when debt is more difficult to be renegotiated in capital structure.

The suggestive evidence in this section overall provides support to the assumption that debt structure affects the outcomes of contract negotiations. In the following sections, we turn to test how a firm's management responds to an increase in employees' bargaining power. We first describe the identification strategy and then present evidence showing that increases in labor's negotiating power lead firms' management to adjust debt structure to decrease the ease of debt contract renegotiation.

5 Labor Power and Debt Structure Adjustment: A RD Estimation

5.1 Validity Tests

In order to test the hypothesis, we use labor union elections overseen by the NLRB as a laboratory setting and employ a RD design to estimate how debt structure is adjusted when non-financial stakeholders' negotiation power increases. The exogenous variation of union power that we exploit comes from the rule that determines the winning status of labor union elections. By law, a union wins the election by a simple majority rule (i.e., strictly larger than 50% of total valid votes that are in favor of unionization). An establishment is unionized as a consequence of a secret ballot election won by a union. Consequently, employees' bargaining power increases discontinuously once votes shares for unions pass 50% (DiNardo and Lee, 2004).

The key identification assumption for RD estimation is that vote shares are not *perfectly* manipulated by voters around the cutoff. Under this assumption, the treatment of

unionization is "as good as random" for close elections (Lee, 2008) and therefore any observed post-election difference in debt structure between firms that are barely unionized and non-unionized is due to the treatment effect of new unionization. Even though the identification assumption is not directly testable, the tests of discontinuities in the distribution of vote shares and predetermined firm characteristics can provide evidence for or against the assumption. Any detected discontinuity would cast doubt on the validity of RD estimations.

5.1.1 Vote Share Density

We use the procedures developed in McCrary (2008) and Frandsen (2016) to test the discontinuities in the vote share distribution. The results of 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. The discontinuity estimate is -0.028, and the corresponding standard error is 0.173. Therefore, we cannot reject the hypothesis that there is no perfect manipulation of vote shares around cutoff at the conventional 5% level. We further use the procedure developed in Frandsen (2016), which points out that McCrary's test is not suitable for discrete running variable, to perform a second test for the discontinuity in vote share density. By applying this newly developed method, we cannot reject the null hypothesis that there is no perfect manipulation around the winning threshold with p-value equal to 0.770. For the tally-based running variable, we still cannot reject the null hypothesis that there is no perfect manipulation of vote counts around the winning threshold with p-value equal to 0.184 using the Frandsen's test. Overall, results of McCrary's and Frandsen's tests suggest that the vote share is unlikely to be perfectly manipulated in our sample.[18]

[18]We restrict to large elections in which number of eligible voters is at least 100 and do not detect the perfect manipulation around the 50% cutoff statistically even though Frandsen (2014) presents evidence showing that vote shares are perfectly manipulated around the 50% threshold. However, even if in the presence of perfect sorting around the threshold, identification is still possible if the assumption that the conditional distribution of first difference in the potential outcomes as a function of vote share for unions is continuous around the threshold (Frandsen, 2014). We test this assumption in Table A.1 in which we show that there are no discontinuities in the first difference in the predetermined variable from t-2 to t-1 between firms in which unions barely win and lose the elections.

5.1.2 Continuities in Predetermined Firm Characteristics

The identification assumption implies that there should be no systematic differences in both observable and unobservable predetermined firm characteristics between firms that are barely unionized (treatment group firms) and those that are barely non-unionized (control group firms) within the narrow band of 50% cutoff. Even though such assumption for unobservable characteristics is not testable, the balance of observable covariates is testable. We define predetermined firm characteristics as the ones one fiscal year before election close years and provide empirical evidence showing that within the vicinity of 50% cutoff, predetermined observable firm characteristics are comparable between treated and control firms.

In particular, to test the null hypothesis that unionization status has little impacts on predetermined characteristics, we implement a RD estimation with a rectangular kernel and the optimal bandwidth developed in Imbens and Kalyanaraman (2012) for each predetermined firm characteristic, including debt structure measures, firm size, book and market leverage, market-to-book ratio, tangibility, ROA and, modified Z-score. All RD estimations include vote shares allowing for different intercepts and slopes on each side of cutoff. Standard errors are robust and clustered at the firm level.

Table 3 presents the results and shows that all estimations are small and statistically insignificant. Therefore, the results suggest that there are no systematic differences in predetermined characteristics between firms in the treatment and control groups. Overall, the results in Figure 2 and Table 3 imply that the identification assumption is unlikely to be violated in our sample.

5.2 Estimation Method

There are two ways to implement a RD design: global polynomial regressions and local polynomial regression.[19] For a global polynomial regression, we use all available data and control polynomials in vote shares to achieve identification. In a local polynomial regression,

[19]Please see Lee and Lemieux (2010) for a comprehensive discussion of these two estimation methods

we estimate the causal effect by choosing appropriate kernel functions and bandwidths and controlling linear or quadratic terms in vote shares. Following the suggestions in Gelman and Imbens (2014), we use local linear regressions instead of global polynomial regressions throughout all analysis.[20] Specifically, we estimate the following specification with a weighting scheme ω_i within a chosen bandwidth h.

$$Y_i - Y_{i,-1} = \alpha + \beta_1 WIN_i + \beta_2 WIN_i \times (R_i - 0.5) + \beta_3 (R_i - 0.5) + \epsilon_i \quad (2)$$

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

[20] Gelman and Imbens (2014) argue three drawbacks of global polynomial regressions. The first issue is that the implicit weights on observations far away from cutoffs are noisy. The second issue is that estimated treatment effect is sensitive to the choice of polynomial order and the final issue is that the confidence interval obtained from global polynomial regressions is too narrow.

6 Labor Power and Deb Structure Adjustment: Main Results

6.1 Labor Unionization and Debt Structure: OLS Evidence

In this subsection, we present the OLS evidence on how labor unionization affects debt structure. The firm-level data on labor unionization come from two sources. We first construct the unionization dummy from corporate 10-K filings and then cross check and augment the measure with the data from IRS 5500 form.[21] Debt structure data are from S&P Capital IQ and a hand-collected data set from balance sheets. Table 4 presents the effect of labor unionization on corporate leverage ratio, the ratio of public debt to total assets and the ratio of bank debt to total assets.[22] In all regressions, we include firm-level controls including firm size (Ln(AT)), ROA, market-to-book ratio (MTB), tangibility, modified zscore, and dividend payer dummy. SIC2 $\times$ Year fixed effects are included in all regressions. Robust standard errors are clustered at the firm level. The time-series variation in unionization dummy is small, the main variation comes from the cross-firm variation within the same 2-digit SIC in the same year. The estimation in column (1) shows that compared with non-unionized firms, corporate leverage ratio is significantly higher in unionized firms and this result is consistent with the evidence in Bronars and Deere (1991) and Matsa (2010). However, the two studies ignore the debt heterogeneities within capital structure. The estimations in column (2) and (3) further show that the effect of unionization on corporate leverage ratio is driven by the effect on the leverage through public debt rather than bank debt. Overall, the OLS estimations are consistent with the hypothesis that management increases the amount of debt that

[21] To construct unionization dummy measure, we develop Perl scripts to extract the data from 10-K filings. The IRS 5500 data from 1990 to 2007 are available from Center for Retirement Research at Boston College at `http://crr.bc.edu/data/form-5500-annual-reports/`. The data from 2008 to 2013 are available from the Department of Labor at `https://www.dol.gov/ebsa/5500main.html`.

[22] Ideally, we should examine the effect of labor unionization on the ratio of debt that is difficult to be renegotiated to total assets. In theory, the amount of bank debt with large syndication size should also increase when labor's bargaining power is higher. However, the data collection on the number of creditors and amount of outstanding bank debt on the balance sheet is difficult, we therefore focus on the choice between public and bank debt in this subsection.

is difficult to be renegotiated when employees' bargaining power is higher. In the followings, we use a RD design to draw the causal inference on the relation between labor's bargaining power and debt structure.

6.2 New Unionization and Debt Structure Adjustment: RD Evidence

This subsection presents RD evidence showing that it is debt structure, not the debt level, is adjusted strategically as a response to new legal recognition of unions. In Table 5 we first confirm that firms' management do not strategically adjust corporate leverage ratio as a response to an increase in employees' bargaining power. Specifically, in Figure 3 we plot the empirical expected value of corporate leverage ratio adjustment condition on vote shares to see whether there is any significant discontinuity around 50% cutoff.

In each plot, the x-axis represents the vote share for unions and we use the optimal bandwidths in the estimations. Each dot represents the average corporate leverage ratio adjustment in a 2% bin. The dots are fitted using a linear line on each side of 50% cutoff. The shaded area in each plot represents the 95% confidence interval. The upper and lower plots represent the adjustment of book and market leverage ratios, respectively. In both plots, we do not observe significant discontinuities around 50% cutoff and the results suggest that new unionization has little effect on the corporate leverage ratio adjustment.

Furthermore, we estimate the treatment effect of new unionization on corporate leverage ratio using local linear estimations with different choices of bandwidths and rectangular kernels. The estimations are economically small and statistically insignificant and confirm the visual effects in Figure 3. These results are consistent with the findings in Lee and Mas (2012) and Schmalz (2015).

Next, we present results showing that firms' management actively adjust debt structure as a response to new unionization. In Figure 4, we plot the empirical expected value of debt structure adjustment condition on vote shares using the optimal bandwidths in the

estimations to see whether there is any significant discontinuity around 50% cutoff. In each plot, a dot represents the average debt structure adjustment in a 2% bin. The shaded area in each plot still represents the 95% confidence interval. The plots on the left and right-hand side represent the adjustment of debt structure measures for public and bank debt, respectively. In all plots, we observe significant discontinuities around 50% cutoff and this is the first sign of causal effect of new unionization on debt structure adjustment.

Table 6 presents the RD estimations. Panels A and B present results using rectangular and triangular kernels in estimations, respectively, and we use the IK-optimal bandwidths in all regressions. For each type of debt, we present results using three different measures 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 non-unionized 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 not only statistically significant but also economically large given the sample mean of book leverage through public and bank debt are 21.5-percentage-points and 7.1-percentage-points, respectively.

6.3 Evidence from New Debt Issuance Data

One drawback of the balance sheet data is that it does not differentiate public bond/Rule 144-A private placement from non-Rule 144-A private placement within the defined public debt. In this section, we use data at new issuance level and present further evidence.

In particular, we use data from SDC and DealScan and estimate the causal impact of new unionization on new issuance of public bond and Rule 144-A private placement, non-Rule 144-A private placement and bank debt within 36 months after elections. Table 7 present the results. The first three columns present results for issuance probability and the last three

columns present results for the fraction of each type of debt's new issuance amount in total new issuance amount.

The estimations suggest that firms in which unions barely win are 27.2% more likely to issue at least one public debt (public bond and Rule 144-A private placement) in the following 36 months, compared with firms in which unions barely lose. The impact of new unionization on the issuance probability of non-Rule 144-A private placement is negative and significant and the effect on the issuance probability of bank loans is insignificant. Moreover, the results also show that closely-won elections lead to 21.1-percentage-points (sample mean is 37.57-percentage-points) increase in the fraction of public debt amount in total new issuance amount in the following 36 months. The effect on the fraction for non-Rule 144-A private placement or bank loan is insignificantly negative. Overall, the results in Table 7 provides further evidence showing that firms' management strategically issue more debt that is more difficult to be renegotiated to advance bargaining positions after new unionization.

6.4 Cross-Sectional Analysis

In this subsection, we exploit the cross sectional variations in the bargaining power of elected unions and the bankruptcy costs expected to be borne by unions to further strengthen the identification of the effect of new unionization on a firm's debt structure adjustment.

6.4.1 Right-to-Work (RTW) Law Analysis

The RTW law is legislation that prevents union shop. 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 creates free-rider problems for unions, which makes them less economically attractive to workers to join. 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 position relative to employers, since the ability to organize strikes grants

unions much bargaining power. If unions' bargaining power is reduced in states with RTW laws, we expect the effect of new unionization to be stronger (weaker) for elections held in states without (with) RTW laws.

Since firms' management bargain with unions in each plant, we split the sample into RTW and non-RTW elections based on election states.[23] The results are reported in Panels A and B of Table 8. 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 the first column in each panel, passing a labor union election leads to a 6.3-percentage-points increase in the ratio of public debt to total assets for elections held in non-RTW states, and only 0.3-percentage-points for elections held in RTW states.

6.4.2 Union Election Size Analysis

Alternatively, we use election size as another proxy for union power. An elected union has greater bargaining power if it represents a larger fraction of employees in a firm. We measure election size as the fraction of an election's eligible voters in a firm's total employment. Specifically, we define large (small) elections as those that rank in the top (bottom) half in the sample distribution of election size. The average election size is 7.68% for large elections and 0.45% for small elections. Therefore we have meaningful variations in the election size across these two groups. We examine whether the effect of new unionization on debt structure adjustment is stronger for larger elections. Panels C and D of Table 8 present the results.

The estimations show that the effect of new unionization on debt structure adjustment is only large and significant for large elections, and is small and insignificant for small elections. Specifically, based on the results in the first column in each panel, passing a labor union election leads to a 6.3-percentage-points increase in the ratio of public debt to total assets

[23]The states that have passed Right-to-Work 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. Moreover, Michigan and Indiana passed Right-to-Work Law in 2012.

for large elections, and only 2.6-percentage-points for small elections.

6.4.3 Unions' Bankruptcy Costs Analysis

We further investigate whether our estimations vary with the costs expected to be borne by labor unions during the bankruptcy procedure. If the debt structure adjustment is strategic, the effect should concentrate on firms in which employers' bankruptcies are expected to be costly for unions, since debt structure becomes an effective bargaining tool in these firms. To capture unions' bankruptcy costs, we use a firm's predetermined underfunding status of DB pension plans. The use of this measure as a proxy for costs borne by labor during Chapter 11 can be justified by the evidence in Benmelech et al. (2012), which 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 projected benefit obligations and fair value of pension plan assets. Table 9 presents the results. The estimation in the first column in Panel A shows 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 bankruptcy costs; however, the estimation is negative 1.6-percentage-points for firms in which DB pension plans are not underfunded as shown in the first column in Panel B.

Overall the results in Table 8 and Table 9 suggest that debt structure adjustment after new unionization is stronger when unions are more powerful or when unions are expected to bear larger costs during Chapter 11, further strengthening the RD estimations in Table 6.

6.5 Robustness Checks and Placebo Tests

6.5.1 Robustness Checks

We provide robust checks for the main results in Table 6 in this subsection. The robustness checks include: (1) using alternative bandwidths in estimations; (2) inclusion of predetermined firm characteristics, and (3) using alternative sample selections for labor union

elections. The results are presented in Table 10.

In Panels A and B, we use alternative bandwidths of 5% and 10% instead of the IK-optimal bandwidths used in Table 6. The estimations are based on local linear regressions with rectangular kernels. The results show that the main results are robust to alternative choices of bandwidths. In order to further assess the sensitivities of estimations to various bandwidths, we plot the local linear estimations with rectangular kernels against bandwidths from 0.01 to 0.5 in Figure 5. The plots on the left and right-hand sides represent the results for public and bank debt, respectively. In each plot, the solid line represents the local linear estimations and dotted lines represent the 95% confidence interval. The vertical line in each plot represents the estimated results with optimal bandwidths. Figure 5 shows that the estimations are stable across the chosen bandwidths, suggesting the local linear estimations are robust to alternative choices of bandwidths.

In Panel C, we include predetermined firm characteristics including firm size, book leverage, ROA, tangibility, market-to-book ratio, and modified Z-Score, in RD estimations. The estimations show that including predetermined firm characteristics barely changes our main results. This fact also reassures the validity of main RD estimations, as it suggests that the predetermined firm characteristics are independent of the treatment status within the vicinity of 50% cutoff.

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

Overall, results in Table 10 indicate that our main results are robust to alternative choices of bandwidths, inclusion of predetermined firm characteristics and are not driven by a particular way of sample selection.

6.5.2 Placebo Tests

We also implement a placebo test to rule out the possibility that the causal relation between new unionization and debt structure adjustment is spurious. In particular, we investigate whether the impact of new unionization on debt structure documented in Table 6 disappears if we arbitrarily choose a winning threshold other than 50%. In particular, we 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 election using a local linear estimation. This exercise is repeated 5,000 times, and the histograms of the estimations are reported in Figure 6. The vertical lines represent the estimations presented in Table 6 in which the winning threshold is 50%. Figure 6 shows that all histograms are centered around 0 and therefore suggests that any impact of new unionization on debt structure adjustment disappears if an artificially winning threshold is chosen. This placebo test further strengths the causal relation documented in the previous analysis.

6.6 Syndication Structure of Bank Loan

One limitation of the analysis in Table 6 is that firms having little access to corporate bond markets are excluded from the sample. In this section, we consider another dimension of debt structure, syndication structure of bank loan, and show that firms can issue loans with a larger creditor dispersion as a response to an increase in union power even if they are constrained from corporate bond markets.

To test this idea, we restrict the estimation window to be 36 months after each election and use two measures for the syndication structure of newly issued bank loans. The first one is natural logarithm of post-election average syndication size and the second one is natural logarithm of post-election average creditor ownership concentration.[24] In order to mitigate

[24]We exclude the following loans from sample: (1) Tranches that are not syndicated in U.S.; (2) Tranches that are not denominated in U.S. dollars; (3) 364-Day Facility or loan primary purpose is for working capital and (4) Any loan with maturity less than year. These short term loans are usually treated as part of working capital instead of capital structure.

the concern that changes in syndication structure could be due to changes in loan amount, we also estimate the effect of new unionization on average loan amount within 36 months after elections. All results are estimated using local linear regressions with the optimal bandwidth and rectangular kernels. Standard errors are robust and clustered at the firm level.

Table 12 presents the results. 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. We find that syndication size of bank debt increases and creditor ownership becomes more dispersed after new unionization. In particular, the estimation in column (1) suggests that compared with firms in which unions barely lose elections, syndication size of new bank loans increases by 34.7% (or 2.7 more creditors) for firms in which unions barely win elections. The result in column (3) shows that the HHI for creditor ownership of new bank loans decreases by 50.2% once a labor union election is passed. Finally, the estimation in column (4) shows that there is little effect of new unionization on the amount of loan issuance and the concern that changes in syndication structure are due to changes in loan amount is mitigated. Overall, the results in Table 12 are consistent with the mechanism such that firms strategically structure debt to make debt contract renegotiation more difficult when union power increases and therefore are complementary to the results in Table 6.

7 Labor Power and Debt Structure Adjustment: Alternative Explanations

In this section, we perform tests to rule out alternative explanations for the documented results . Even though our results are consistent with the strategic view of debt structure, other channels could generate the same empirical results. One explanation is that after new unionization, firms are more constrained from bank loan markets and, as a consequence, firms have to resort to corporate bond market for financing. The adjustment of debt structure

after new unionization could be due to this supply side effect rather than management's strategic demand. To show that our results are not driven by this alternative channel, we provide two pieces of evidence.

7.1 The Pricing Effects of New Unionization on Bank Loan and Public Debt

In this subsection, we directly examine the effects of new unionization on the spreads of bank loan and public corporate debt, which includes both public bond and Rule 144-A private placement. If the alternative explanation drives our results, we expect the spread of public debt to be less than the spread of bank loan after new unionization. Otherwise, it is unlikely that firms resort to public debt market for financing because of higher spreads charged by banks after new unionization. Corporate public debt yield is from Mergent FISD database and treasury bond yield is from FRED database available through the Federal Reserve Bank at St. Louis. The spread of public debt is calculated as the difference between public debt yield and maturity-matched treasury yield. When the maturity of treasury bond is not exactly matched to the that of corporate public debt, we estimate the treasury bond yield using a linear interpolation.

In particular, we estimate the effects of new unionization on the spreads of bank loan and public debt within 24, 36, 48 and 60 months after elections. All regressions control a cubic polynomial in the vote share for unions, debt-level characteristics, and firm-level characteristics one fiscal year prior to the elections. One-digit SIC and debt issuance year fixed effects are also included. Standard errors are robust and clustered at the firm level.

Table 13 presents the results. The estimations show that both the spreads of bank loan and public debt increase after new unionization and the effect of new unionization on public debt spread is larger, not smaller, than the effect on bank loan spread. In particular, within 36 months after the elections, loan spread increases 26.66 basis points while public debt spread increases 42.93 basis points after new unionization. The results are therefore

inconsistent with the alternative explanation that firms issue more public debt than bank loan after new unionization due to the reason that banks charge a higher spread than the public debt spread after new unionization.

7.2 Does Interest Alignment between Labor and Management Matter?

In this subsection, we provide further evidence that our results are unlikely driven by the proposed alternative explanation. In particular, we investigate whether our estimation results vary with the interest alignment between labor and management before elections.

If our results are driven by the reason that banks charge higher spreads after new unionization due to the conflicts between banks and labor unions, we expect such conflicts to be exaggerated when the labor's interests are more aligned with management, since unions then have more incentives to engage in the behavior, such as underinvestment, that benefits shareholders but hurts bank creditors. As a result, the substitution effect between bank loan and public debt should be stronger. However, if management adjusts debt structure to advance the bargaining position relative to employees, we expect the adjustment to be mitigated if the interest alignment between labor and management is stronger as the need for strategic bargaining is reduced when the two parties have more common interests.

Following Rauh (2006b), we use two measures as proxies for the interest alignment between labor and management. The first measure is the fraction of DC pension assets invested in a firm's stock and the second measure is the fraction of a firm's equity value held by employees through DC pension assets (DC pension ownership). 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.[25]

Table 14 presents the results. Panels A and B present results for firms with smaller and

[25]The data from Center for Retirement Research at Boston College is available at `http://crr.bc.edu/data/form-5500-annual-reports/` and is available between 1990 and 2007. We exclude plan-year observations such that part or all of assets are in common or master trusts following Rauh (2006b).

larger fraction 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. In particular, based on the result in the first column in Panel A, passing a labor union election leads to a 7.8-percentage-points increase in the ratio of public debt to total assets when the interest between labor and management is more diverged; however, the estimation is negative 0.6-percentage-points for firms in which the interest between labor and management is more aligned. Panels C and D present similar results.

Overall, the results in Table 14 show that debt structure adjustment after new unionization is smaller, not larger, when the interests between labor and management are more aligned. Such evidence is inconsistent with the alternative channel but is more consistent with the view that debt structure is adjusted strategically to improve management's bargaining position against labor unions.

8 Conclusion

In this paper, we provide empirical evidence showing that debt structure, instead of level of debt, is essential for influencing management's bargaining positions relative to employees. First, we show that debt structure has impacts on wage contract negotiation outcomes in the airline industry. Second, using NLRB labor union election as a laboratory setting, we show that debt structure is adjusted towards debt that is more difficult to be renegotiated as a response to an increase in employees' power. Finally, we show that debt structure adjustment is more likely driven by management's strategic concerns rather than more constrained access to bank loan markets after new unionization.

Even though in this paper we focus on interactions between management and labor, the documented findings have more general implications. As long as bankruptcy procedure imposes 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 for non-financial stakeholders.

Figure 1: Number of Elections: Year Distribution

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

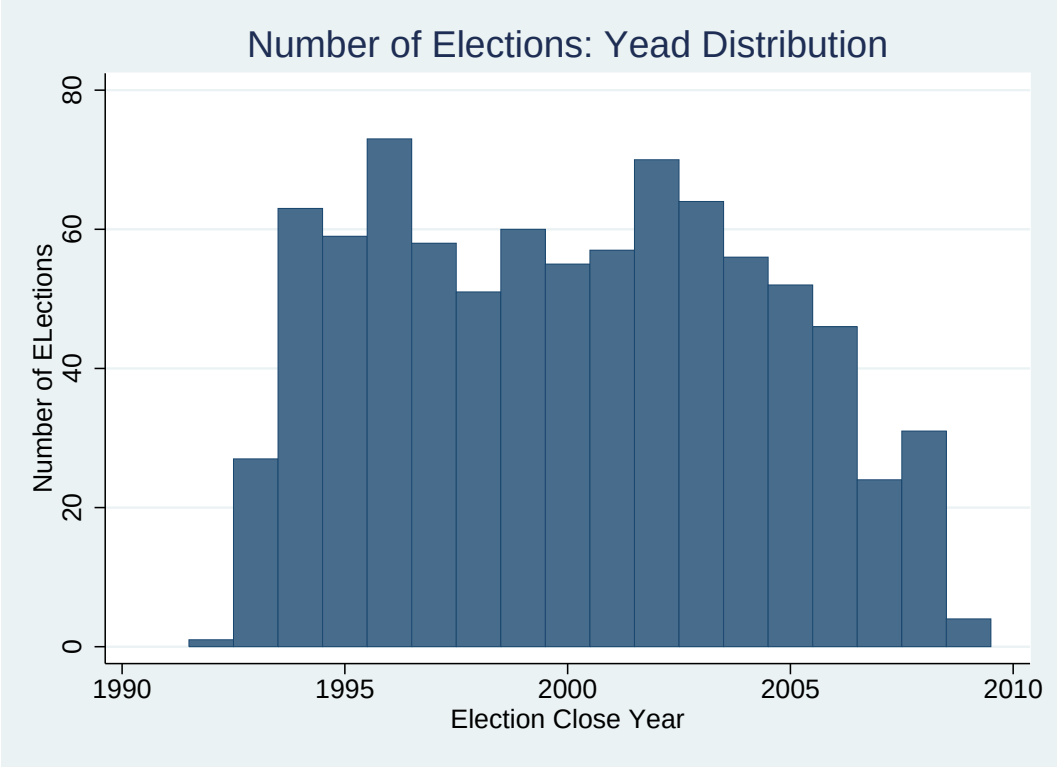
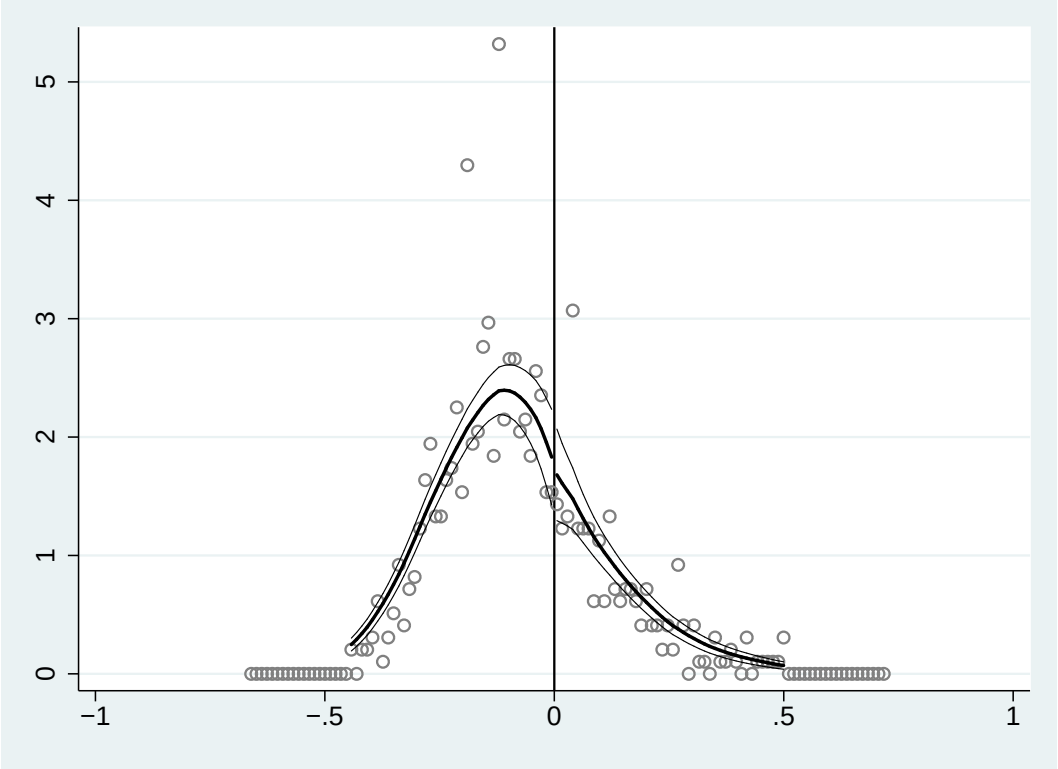


Figure 2: Vote Share Manipulation Tests

This figure shows the vote share density test developed in 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 examine the relation between 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, we 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 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.

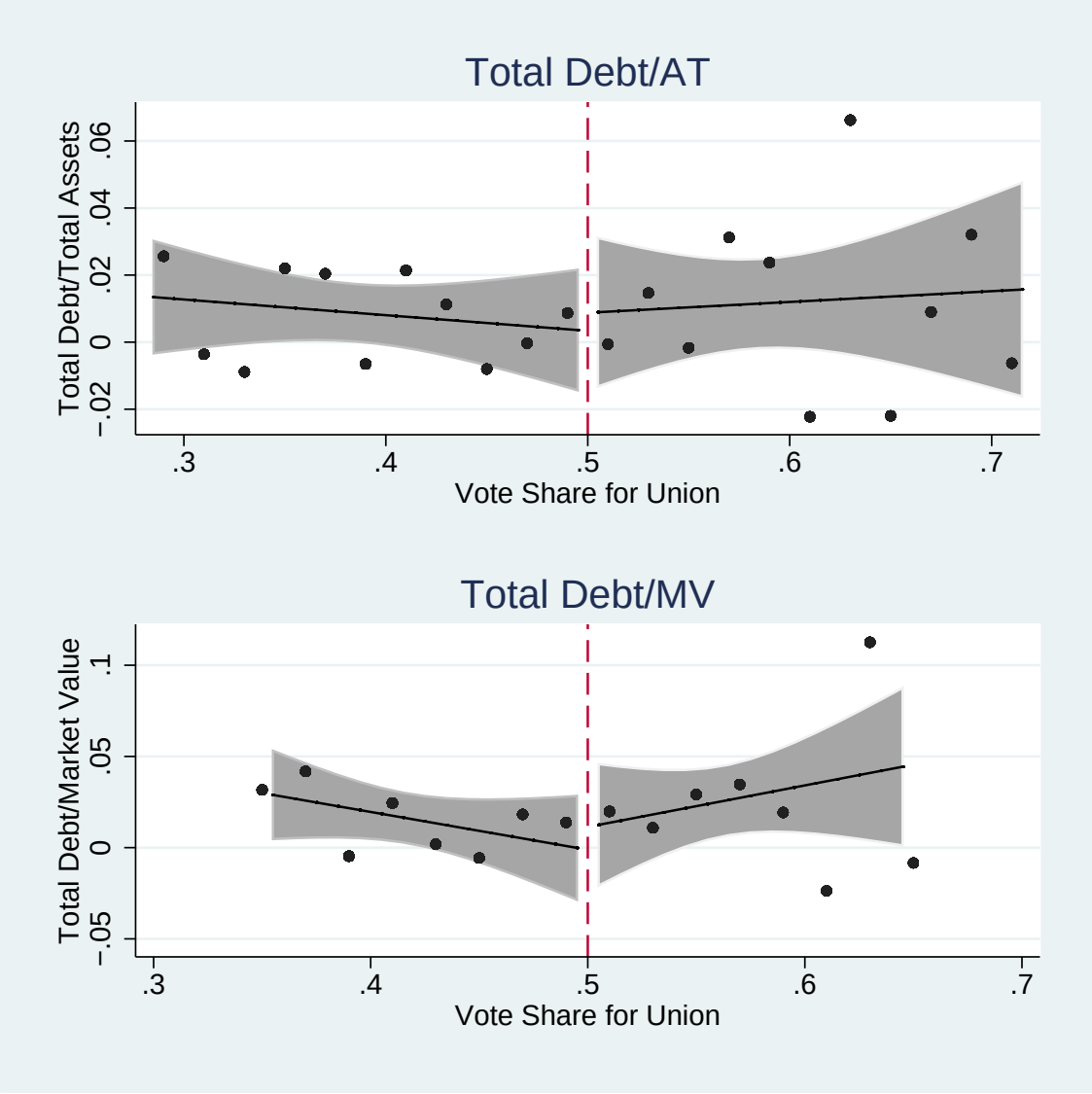


Figure 4: Graphical Analysis: Debt Structure

This figure presents regression discontinuity plots and examine 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, we 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 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.

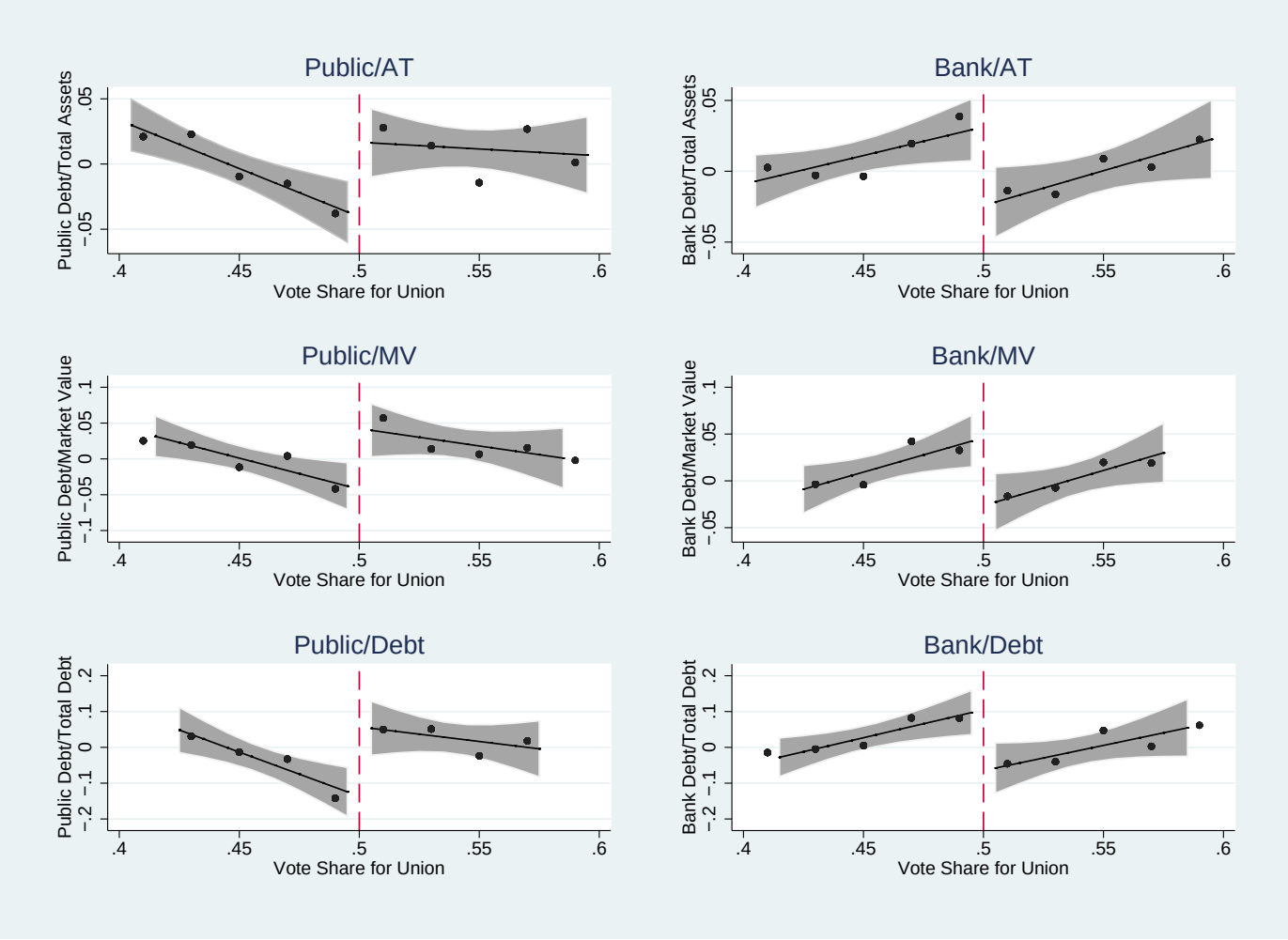


Figure 5: Local Linear RD Estimations with Varying Bandwidths

This figure presents the robustness of 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 side represent results for public and bank debt, respectively. The solid line represents the local linear estimations and dotted lines represent 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.

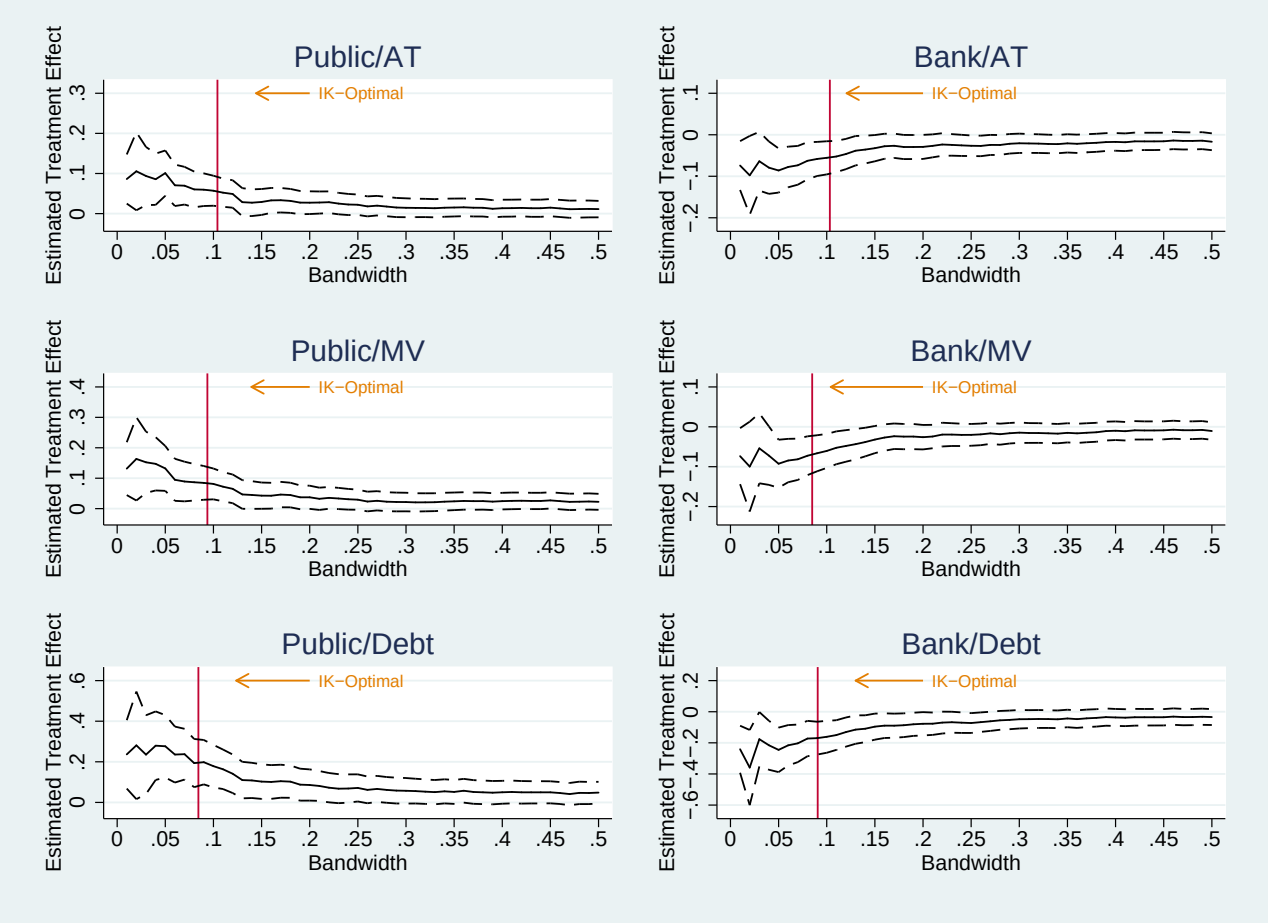


Figure 6: Placebo Effects of New Unionization on Debt Structure Adjustment

This figure presents results of placebo tests. The placebo tests are implemented as follows: we 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 new unionization on debt structure adjustment as in Table 6. 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 in panels (a) to (f). The vertical lines represent the estimated results presented in Table 6 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.

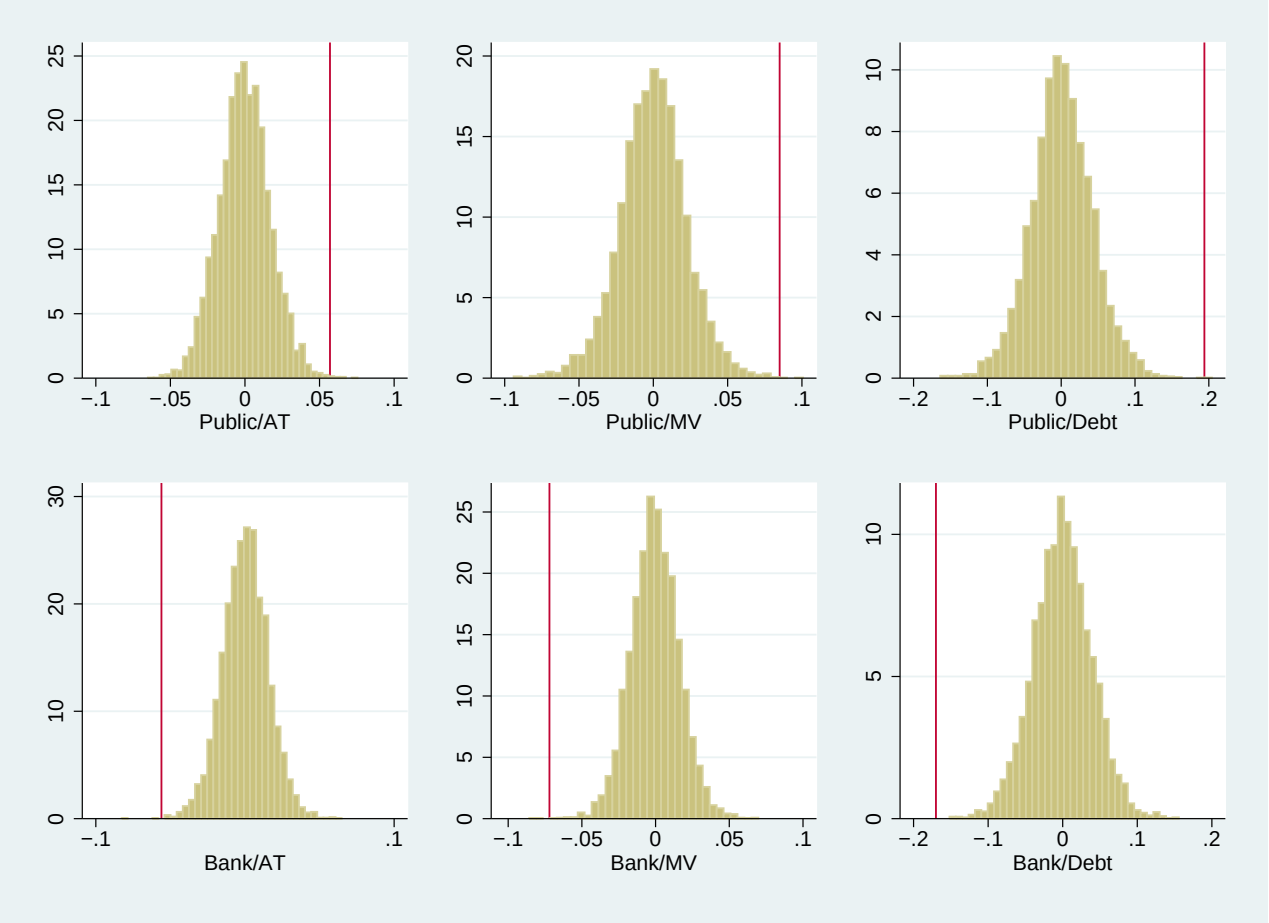


Table 1: **Summary Statistics**

This table presents the summary statistics of data in the sample. The variable details are in Appendix A.2. Panel A presents the summary statistics for the sample used to analyze the effect of debt structure on the outcomes of wage contract negotiations in airline industry. # of Employees is number of total employees. Wages/Employees ($) is wage per employee in dollars. *Total Debt/AT* is the ratio of total debt to total assets. Panel B presents the summary statistics for debt structure measures based on balance sheet and debt issuance behavior. The balance sheet data is from one fiscal year before to three fiscal years after each labor union election and the new issuance data is within 36 months after each labor union election. *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. *PublicIssue* is a dummy variable equal to one if a firm issues at least one public debt within 36 months after each labor union election and zero otherwise. *PrivateIssue* is a dummy variable equal to one if a firm issues at least one non-rule 144a private placement within 36 months after each labor union election and zero otherwise. *LoanIssue* is a dummy variable equal to one if a firm issues at least one bank loan within 36 months after each labor union election and zero otherwise. *SyndSize1* is the number of creditors in each bank loan tranche. *SyndSize2* is the number of creditors in each bank loan deal. *HHI* is a measure for creditor ownership concentration in each bank loan tranche and is defined as the sum of square of each creditor's ownership in each loan tranche. Panel C presents the statistics for labor union election data. Panels D presents the distribution of number and passage rate of elections by industry (One-digit SIC). *Vote for Unions* represents the vote share for unions in each election. *WIN* is a dummy variable equal to one if a union wins an election and zero otherwise.

Panel A: Sample for Wage Negotiation Outcomes in Airlines

	N	Mean	Std. Dev.	Median
# of Employees	275	28,321	28,217	20,127
Wages/Employees ($)	275	26,260	6,530	26,756
Total Debt/AT	275	0.357	0.168	0.368
Public/AT	275	0.235	0.160	0.211
Bank/AT	275	0.083	0.110	0.032

Panel B: 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				
PublicIssue	851	0.501	0.500	1.000
PrivateIssue	851	0.090	0.287	0.000
LoanIssue	851	0.814	0.389	1.000
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 C: 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 D: 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: **Does Debt Structure Affect Wage Contract Negotiation Outcomes?**

This table presents the effects of debt strucutre on the outcomes of wage contract negotiations in airline indsutry. All regressions control firm size, ROA, market to book ratio, tangibility, bankruptcy dummy which is one if an airline is in Chapter 11 procedure in a given year and zero otherwise. The dependent variable in all regressions is natural logarithm of annual wage per employee. *Public/AT*, *Bank/AT* and *TotalDebt/AT* are standardized by their own standard errors. *# Creditor* is average number of creditors in outstanding loan deals in a given year. Standard errors in parentheses are robust and clustered at the airline level. ***, **, and * represent significance at 1%, 5% and 10% levels, respectively.

	Panel A: Public Debt v.s. Bank Loan					
	(1)	(2)	(3)	(4)	(5)	(6)
TotalDebt/AT	-0.067***	-0.080**				
	[0.021]	[0.038]				
Public/AT			-0.046**	-0.047**		
			[0.022]	[0.020]		
Bank/AT					-0.009	-0.007
					[0.026]	[0.037]
Ln(AT)	0.103***	-0.010	0.105***	-0.015	0.106***	0.003
	[0.019]	[0.115]	[0.018]	[0.125]	[0.019]	[0.106]
ROA	-0.249	-0.061	-0.235	-0.079	-0.232	-0.070
	[0.243]	[0.345]	[0.242]	[0.392]	[0.263]	[0.388]
MTB	-0.087	-0.139*	-0.062	-0.138	-0.043	-0.127*
	[0.058]	[0.074]	[0.060]	[0.084]	[0.056]	[0.067]
Tangibility	-0.065	0.210	-0.071	0.167	-0.125	0.047
	[0.115]	[0.243]	[0.139]	[0.216]	[0.131]	[0.199]
Bankruptcy	-0.067	-0.165**	-0.021	-0.101*	-0.004	-0.087**
	[0.046]	[0.072]	[0.042]	[0.049]	[0.046]	[0.042]
Year Fixed Effect	Y	Y	Y	Y	Y	Y
Firm Fixed Effect	N	Y	N	Y	N	Y
R^2	0.449	0.683	0.438	0.672	0.417	0.664
N	275	275	275	275	275	275

	Panel B: Within Bank Loan			
	(1)	(2)	(3)	(4)
Bank/AT×#Creditor	-0.021*	-0.026**		
	[0.010]	[0.010]		
Bank/AT	0.125**	0.116**		
	[0.047]	[0.051]		
Public/AT×#Creditor			0.006	0.001
			[0.003]	[0.002]
Public/AT			-0.073***	-0.050
			[0.022]	[0.035]
#Creditor	-0.002	-0.010	0.006*	0.002
	[0.005]	[0.006]	[0.003]	[0.005]
Ln(AT)	0.054***	0.035	0.055***	-0.040
	[0.018]	[0.110]	[0.014]	[0.140]
ROA	-0.058	-0.521	-0.176	-0.262
	[0.627]	[0.662]	[0.540]	[0.745]
MTB	-0.077	-0.106	-0.076	-0.122
	[0.092]	[0.129]	[0.076]	[0.099]
Tangibility	-0.145	-0.229	-0.084	-0.033
	[0.169]	[0.229]	[0.162]	[0.223]
Bankruptcy	-0.104**	-0.100**	-0.093**	-0.119*
	[0.044]	[0.045]	[0.040]	[0.065]
Year Fixed Effect	Y	Y	Y	Y
Firm Fixed Effect	N	Y	N	Y
R^2	0.323	0.475	0.292	0.392
N	200	200	200	200

Table 3: **Tests of Discontinuities in the Level of Predetermined Characteristics**

This table presents the test results for the null hypothesis that there is no systematic difference in 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). We implement a 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 and modified Z-score. All RD estimations include vote shares allowing for different intercepts and slopes on each side of 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	-0.007	-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 Zscore	0.053	0.349

Table 4: **Unionization and Debt Structure: OLS Evidence**

This table presents the OLS evidence on the effect of labor unionization on debt structure. Unionized is a dummy variable equal to one if some fraction of employees are covered by collective bargaining agreements and zero otherwise. All regressions include firm-level controls including firm size (Ln(AT)), ROA, market-to-book ratio (MTB), tangibility, modified zscore and dividend payer dummy. SIC2 × Year fixed effects are included in all regressions. Standard errors in parentheses are robust and clustered at the firm level. ***, **, and * represent significance at 1%, 5% and 10% levels, respectively.

	Leverage	Public/AT	Bank/AT
	(1)	(2)	(3)
Unionized	0.015***	0.014***	0.005
	[0.005]	[0.005]	[0.005]
Ln(AT)	0.015***	0.023***	-0.013***
	[0.001]	[0.001]	[0.001]
ROA	-0.008	-0.030**	0.002
	[0.007]	[0.013]	[0.011]
MTB	-0.010***	-0.000	-0.009***
	[0.001]	[0.001]	[0.001]
Tangibility	0.168***	0.049***	0.088***
	[0.013]	[0.012]	[0.013]
Modified Zscore	-0.002***	-0.002***	0.001***
	[0.000]	[0.001]	[0.000]
Dividend Payer	-0.058***	-0.024***	-0.029***
	[0.005]	[0.004]	[0.004]
SIC2 × Year FE	Y	Y	Y
R^2	0.235	0.125	0.121
N	31767	31767	31767

Table 5: **Do Firms Adjust the Level of Debt as a Response to New Unionization?**

This table presents the adjustment of corporate leverage ratio to new unionization. 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. Panel A and B present results for book and market leverage, respectively. In each panel, we use various bandwidths and rectangular kernels in local linear regressions. Standard errors in parentheses are robust and clustered at the firm level. ***, **, and * represent significance at 1%, 5% and 10% levels, respectively.

Panel A: Book Leverage				
	Optimal	5%	10%	15%
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%
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 6: **Do Firms Adjust Debt Structure as a Response to New Unionization?**

This table presents adjustment of debt structure to new unionization. We use six measures throughout the analysis: 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. Panel A and B present estimation 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
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
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 7: **Do Firms Issue More Public Debt?**

This table presents results for new issuance of public debt, non-rule 144a private placement and bank loan. The first three columns present results for issuance probability and the last three columns present results for the percentage of each type of debt's new issuance amount in total new issuance amount. Public debt (Pub.) includes both public corporate bond and Rule 144-A private placement. Private placement (Pri.) includes non-Rule 144-A private placement. 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.

	Prob.			% in Total Amt.		
	Pub.	Pri.	Loan	Pub.	Pri.	Loan
WIN	0.272**	-0.122**	0.101	0.211*	-0.035	-0.191
	[0.129]	[0.056]	[0.071]	[0.120]	[0.026]	[0.122]
Bandwidth	0.084	0.117	0.150	0.072	0.172	0.069
N	242	364	463	179	455	179

Table 8: **Does Unions' Bargaining Power Matter?**

This table presents debt structure adjustment to new unionization conditional on unions' bargaining power. Panel A and B present results conditional on whether the election states have adopted the RTW laws at the time of election. Panel 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
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
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
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
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 9: **Do Bankruptcy Costs Borne by Unions Matter?**

This table presents the adjustment of debt structure as a response to new unionization conditional on predetermined bankruptcy costs expected to be borne by unions. We use a firm's underfunding status of DB pension plans as a proxy for unions' bankruptcy costs. The pension data come from Compustat Pension Annual Database. DB pension plan deficit is defined as the difference between projected benefit obligations and fair value of pension assets. We 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
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
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 10: **Robustness Checks**

This table presents robustness checks for estimations in Table 6. In Panels A and B, we use alternative bandwidths and implement local linear estimations with rectangular kernels. In Panel C we 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. 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
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
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
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
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
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

Table 11: **Donut-RD Estimations**

This table presents the estimations using donut-RD. Panels A, B and C present results for samples that exclude the elections with margin of victory (MOV) smaller than one, two and three. Standard errors in parentheses are robust and clustered at the firm level. ***, **, and * represent significance at 1%, 5% and 10% levels, respectively.

Panel A: Exclude MOV≤1						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
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
Panel B: Exclude MOV ≤ 2						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
WIN	0.043*	0.045	0.166*	-0.047*	-0.069**	-0.166**
	[0.024]	[0.036]	[0.087]	[0.027]	[0.035]	[0.077]
Bandwidth	0.104	0.094	0.084	0.103	0.085	0.091
N	276	239	207	276	207	239
Panel C: Exclude MOV≤3						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
WIN	0.041*	0.059*	0.161*	-0.038	-0.063	-0.113
	[0.023]	[0.033]	[0.085]	[0.029]	[0.039]	[0.078]
Bandwidth	0.104	0.094	0.084	0.103	0.085	0.091
N	260	224	192	260	192	224

Table 12: **Does New Unionization Affect Bank Loan Sydnication Structure?**

This table presents the effect of new unionization on syndication structure of newly issued bank loans within 36 months after new unionization. All results are estimated using local linear regressions with the optimal bandwidths and rectangular kernels. *Log(Amt)* is the natural logarithm of average loan amount. *Log(Syndsize1)* is the natural logarithm of average syndication size defined at the loan trance 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 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 13: **The Pricing Effects of New Unionization on Bank Loan and Public Debt**

This table presents the effects of new unionization on the spreads of public debt and bank loans. Panels A and B present results for bank loan and public debt, respectively. Public debt includes both public corporate bond and Rule 144A private placement. The analysis is conducted at the debt instrument level within 24, 36, 48, and 60 months after elections. All regressions control a cubic polynomial in the vote share for unions, debt-level characteristics and firm-level characteristics one fiscal year prior to the elections. One-digit SIC and debt issuance year fixed effects are also included. Standard errors are robust and clustered at the firm level. ***, **, and * represent significance at 1%, 5% and 10% levels, respectively.

	Panel A: Bank Loan			
Estimation Window:	24 Months	36 Months	48 Months	60 Months
WIN	15.985	26.660**	20.640*	19.205*
	[14.201]	[12.970]	[11.428]	[10.579]
N	777	1192	1575	1969
	Panel B: Public Debt			
Estimation Window:	24 Months	36 Months	48 Months	60 Months
WIN	36.857	42.931**	35.115*	37.172*
	[26.126]	[20.717]	[19.053]	[19.248]
N	491	744	972	1227

Table 14: **Does the Interest Alignment Between Labor and Management Matter?**

This table presents the adjustment of debt structure as a response to new unionization conditional on the predetermined interest alignment between labor and management. The interest alignment is measured by (1) 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 fraction 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. 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 $< 6.5\%$						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
WIN	0.078**	0.094**	0.170*	-0.110***	-0.124***	-0.139
	[0.034]	[0.046]	[0.093]	[0.040]	[0.042]	[0.088]
Bandwidth	0.131	0.121	0.141	0.106	0.105	0.147
N	73	66	79	58	58	86
Panel B: Fraction of DC Pension Assets Invested in the firm's Stock $\geq 6.5\%$						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
WIN	-0.006	0.025	0.108	-0.064	0.030	-0.143
	[0.030]	[0.050]	[0.136]	[0.052]	[0.044]	[0.152]
Bandwidth	0.280	0.198	0.115	0.094	0.132	0.094
N	145	113	63	44	72	44
Panel C: DC Pension Ownership $<0.18\%$						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
WIN	0.082**	0.086*	0.207**	-0.102**	-0.117***	-0.137
	[0.034]	[0.045]	[0.098]	[0.039]	[0.042]	[0.084]
Bandwidth	0.116	0.116	0.115	0.110	0.101	0.142
N	75	75	66	66	59	87
Panel D: DC Pension Ownership $\geq 0.18\%$						
	Public Debt			Bank Debt		
Scaled by:	Total Asset	Market Value	Total Debt	Total Asset	Market Value	Total Debt
WIN	-0.002	0.041	0.100	-0.017	0.020	-0.004
	[0.029]	[0.048]	[0.119]	[0.034]	[0.036]	[0.105]
Bandwidth	0.268	0.195	0.113	0.115	0.151	0.122
N	153	123	63	68	94	68

Appendix

A.1 Additional Tests

Table A.1: **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 treatment and control groups. We implement a 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 and modified Z-score. All RD estimations include vote shares allowing for different intercepts and slopes on each side of 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 Zscore	0.072	1.414

Table A.2: **Do Firms Adjust Debt Structure as a Response to New Unionization? Tally-based Running Variable**

This table presents adjustment of debt structure to new unionization. We use six measures throughout the analysis: 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. Panel A and B present estimation 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
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
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.2 Data source and variable definitions

The labor union election data are from the Thomas J. Holmes website and the NLRB website. The debt structure data come 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 a 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 the NLRB website.
Vote Share	The portion of votes for unions over total valid votes in an election. Source: Thomas J. Holmes website and the NLRB website.
Airline Data	
Wages/Employees	Total salaries in a year divided by annual total employment. Source: Schedules P-6 and P-10 in Form 41 database.
Debt Structure Data	
Public/AT	Outstanding Amount of public debt scaled by total assets. Source: A hand-collected data set and Compustat.
Public/MV	Outstanding Amount of public debt scaled by market value. Source: A hand-collected data set and Compustat.
Public/Debt	Outstanding Amount of public debt scaled by total debt. Source: A hand-collected data set and Compustat.
Bank/AT	Outstanding Amount of bank debt scaled by total assets. Source: A hand-collected data set and Compustat.
Bank/MV	Outstanding Amount of bank debt scaled by market value. Source: A hand-collected data set and Compustat.
Bank/Debt	Outstanding Amount of bank debt scaled by total debt. Source: A hand-collected data set and Compustat.
Firm Characteristics	
Firm Size	Natural logarithm of deflated Item AT (2010 dollar). 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.
Modified_ZScore	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.

Variable	Definition
Dividend Payer	A dummy variable equal to one if cash dividend is positive and zero otherwise. Source: Compustat.
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.
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.
Spread of Bank Loan	All-in-Drawn spread. Source: DealScan.
Spread of Public Bond	The difference between public bond yield and maturity-matched treasury bond yield. Source: Mergent FISD and FRED at Federal Reserve Bank at St. Louis.
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). Source: IRS 5500 Form and Compustat.
Fraction of DC pension Assets Invested in a Firm's Stock	EOYSTOCK/EOYASSET. Source: IRS 5500 Form.

A.3 Data Assembly

In order to merge labor union election data with firm-level data, we match employers' names in NLRB data with historical stock names (DSENAME file in CRSP) and Compustat firm names.[26] We call 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) We follow Lee and Mas (2012) and use a SAS algorithm to perform a fuzzy name matching between the employer' names in NLRB labor union election data and the standard firm name file.

- (2) We 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 standard firm name file, we use the LexisNexis Corporate Affiliation Database and the 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. We obtain GVKEY and CIK as identifiers for each matched election.

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

[26] We also match Compustat firm names to increase 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 firm where the election was held is possibly not matched to a Compustat firm name.

election with the largest number of eligible voters since such elections are possibly most important for corporate decisions. Moreover, for each election we 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 the similar procedures we also manually match labor union election data with DealScan by firm names in order to examine the effects of new unionization on loan issuance behavior.

A.4 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.[27]

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 outcome 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 7 days of the vote count. The outcome of an election will be set aside if conduct by either the employer or union interfered with employees' freedom of choice.

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

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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