How Do Corporate Liquidity and Repurchase Policies Respond to Unionization at Major Customer Firms?

Annie Le and Anup Agrawal

November 2023

Comments welcome

* Both authors: University of Alabama, Culverhouse College of Business, Tuscaloosa, AL 35487-0224. Le: ntle1@crimson.ua.edu; Agrawal: aagrawal@cba.ua.edu, (205) 348-8970. We thank Aaron Burt, Traviss Cassidy, Chitru Fernando, Abhi Ganguly, Lei Kong, Lubo Litov, Bill Megginson, Shawn Mobbs, Sandra Mortal, Marios Panayides, Josh Pierce, Chris Veld (discussant), and seminar and conference participants at the Universities of Alabama, Maine, New Orleans, Oklahoma and St. Thomas, and FMA meetings for helpful comments and suggestions. Sammy Hiebsch and Jacob Hoyle provided able research assistance. Agrawal acknowledges research support from the William A. Powell, Jr. Chair in Finance and Banking.

How Do Corporate Liquidity and Repurchase Policies Respond to Unionization at Major Customer Firms?

Abstract

We employ a regression discontinuity design (RDD) to identify the causal effects of labor unionization at a major customer firm on its supplier's cash holdings and stock repurchases. We empirically test for two opposite, non-mutually-exclusive effects: shielding vs. specific investment. We find that overall, the shielding effect dominates: dependent suppliers reduce cash holdings by 3% of total assets (or 22% of the sample mean) and increase repurchases by 0.5% of total assets (or 38% of the sample mean) to shield the firm from rent-seeking by newly unionized customers. These effects are larger when the customer (1) is more important to the supplier, (2) has greater market power, (3) is located near the supplier, and (4) has had a shorter business relationship with the supplier. But for suppliers with greater specific investment or longer relationship with the customers, the specific investment effect dominates: suppliers increase their financial flexibility to incentivize the customer to preserve the customer's relationship-specific investment.

Keywords: Labor unions, Supply chain, Corporate financial policies, Cash holdings, Stock repurchases

How Do Corporate Liquidity and Repurchase Policies Respond to Unionization at Major Customer Firms?

1. Introduction

A large literature analyzes how formation of a labor union at a firm affects its corporate policies such as employee compensation (Freeman 1981, Hirsch 2004), capital structure (Bronars and Deere 1991; Matsa 2010; Simintzi, Vig, and Volpin 2015), corporate governance (Agrawal 2012) and innovation (Bradley, Kim, and Tian 2017). A few recent studies examine the effect of unionization on a firm's stakeholders, such as creditors (Campello et al 2018), customers (Chen, Judd, and Pandit 2021) or suppliers (Leung, Li, and Sun 2020). However, to our knowledge, there is currently no systematic evidence on how unionization at a major customer firm affects the financial policies of its dependent suppliers. This paper is aimed at filling this gap in the literature.

Labor unions are relatively uncommon in the private sector in the US. While about 33% of government workers are unionized, the share of unionized workforce is only 6% in the private sector.[1] So why do we care about unions? Well, unions clearly matter to unionized firms and parties related to them, including their workers, investors, customers, suppliers, and competitors. But despite their small presence in private sector firms, unions matter for the broader economy, which is highly inter-connected and relies on just-in-time supply chains. So, any disruption that affects even a small part of the economy can reverberate throughout the broader economy.

In the theory of labor unions, there is no direct link explaining the effect of unionization at customer firms on suppliers' financial policies. Prior studies suggest that unionized firms face a higher cost function following labor unionization (see, e.g., Chen, Kacperczyk and Ortiz-Molina 2011; Chen, Judd, and Pandit 2021; He et al. 2020; Hirsch 1997; Lewis 1986), forcing them to look for ways to cut costs, e.g., by squeezing their dependent suppliers (see, e.g., Leung, Ling, and Sun 2020). How do those suppliers respond to this shock? There are two competing and opposite effects. The first effect is rent-seeking by the newly unionized customers. DeAngelo, DeAngelo and Skinner (2009) suggest that a unionized firm hold lower cash balances to avoid a perception

[1] See https://www.bls.gov/news.release/pdf/union2.pdf

that the firm has deep pockets, which can make it more susceptible to rent extraction by stakeholders such as labor unions. Smith (2016) finds that firms hold less cash to shield their assets from rent-extraction by government officials. In our context, unionized customer firms can engage in rent-seeking behavior by asking their dependent suppliers for better contract terms such as lower prices or longer trade credit, as Leung, Ling, and Sun (2020) document. Anticipating such pressures, dependent suppliers have an incentive to reduce their financial flexibility (e.g., by reducing cash holdings or increasing stock repurchases) to shield the firm from such rent extraction. Larger cash holdings make the firm particularly vulnerable to customer demand for lower prices or better terms. And stock repurchases are a way to distribute excess cash to shareholders without making future payout commitments. We refer to this as the shielding effect.

A competing effect arises from the need for both customers and suppliers to make relationship-specific investments to establish and maintain their business relationship (see, e.g., Williamson 1983). Newly unionized customer firms may increase debt financing to improve their bargaining position with their employees (see, e.g., Matsa 2010; Myers and Saretto 2016). Higher leverage and higher operating costs can prompt customer firms to reduce their relationship-specific investment in the supplier (see, e.g., Chu 2012, Hennessy and Livdan 2009). To counter this effect, dependent suppliers may opt to increase their financial flexibility to encourage their unionized customers to maintain their investment in the relationship. The change in suppliers' financial policies will be greater if they have a greater need for their customers' relationship-specific investments (see, e.g., Chu 2012). The two effects (shielding and specific investment) are not mutually exclusive. So, the direction and magnitude of the net effect are empirical issues that we examine. In addition, we examine a number of specific situations where one effect is likely to be stronger than usual, so it may dominate the other effect. These cross-sectional tests provide a more nuanced investigation of the two competing hypotheses.

Using several different sources, we construct a dataset that consists of 1,269 union elections in 328 firms, affecting 2,181 dependent supplier firms, i.e., firms that rely on the unionizing customer firm for ≥10% of their sales. A labor union is certified if the vote for the union is at least 50 percent of the total votes cast. Using this 50 percent threshold, we employ a regression discontinuity design (RDD) model to measure the causal effect of labor unionization in customer firms on their dependent suppliers' financial policies. Specifically, we examine the changes in supplier cash holdings and repurchases following the unionization of customer firms. We focus on these two policies because compared to leverage and dividend payout, cash holdings and repurchase policies are quite flexible and do not require the firm to make a long-term commitment or even quasi-commitment.

We start by estimating the effects of labor unionization at customer firms on the dependent suppliers' cash holdings and repurchases. Bakke and Whited (2012) recommend estimating RDD models using local linear regressions because RDD has strong local validity, but weak global validity. In our context, local validity means around the critical vote threshold of 0.5, while global validity refers to the entire range of voting outcomes. But Lee and Lemieux (2010) suggest also estimating RDD models using global polynomial regressions, which use the entire sample and therefore have more precision. The recent empirical literature in economics and finance presents estimates using both methods, but appears to emphasize the former method.[2] Accordingly, we use local linear models for our baseline tests and global polynomial regressions as robustness checks.

Using non-parametric local linear models, we find that following customer unionization, suppliers reduce cash holdings by 3% of total assets (or 22% of the sample mean) and increase repurchases by 0.5% of total assets (or 38% of the sample mean). Under global polynomial regressions, dependent suppliers reduce their cash holdings by 2.1% of total assets (or about 16% of the sample mean) and increase repurchases by 0.4% of total assets (or 31% of the sample mean), although only the former effect is statistically significant. These findings suggest that overall, the shielding effect dominates the specific investment effect.

A couple of examples from our sample illustrate these findings. CVS Health was a major customer of Celgene Corp, accounting for 11% of Celgene's total sales in 2011. Part of CVS got unionized in 2011. In 2012, Celgene increased its stock repurchases to 17.4% of its total assets from 1.8% in 2010. Another example is United Tech Corp, which got unionized in 2010. United is a major customer of RCM Technologies Inc, representing 11.4% of RCM's sales in 2010. RCM increased its stock buybacks from 0 in 2009 to 2.9% of its total assets in 2011.

Next, we do several tests to check the robustness of these findings. First, there is a concern that our local linear estimates are sensitive to optimal bandwidth choices. Our results continue to hold when we use 75% or 125% of our baseline bandwidths selected by the method of Calonico,

[2] We discuss this issue further in section 4 and the Appendix.

et al. (2020). We also re-estimate our local linear models with alternate optimal bandwidths selected by Imbens and Kalyanaraman's (2012) method. Our results continue to hold under this method, as well as when we use 75% or 125% of these alternate bandwidths. Another concern is about the possibility that union elections tend to cluster during financial crises. If so, our results might be confounded by the resulting sharp economic downturn. To address this concern, we remove union elections triggered during the financial crisis years of 1998, and 2007 to 2009, as in Bekaert et al. (2014). Local linear regressions in the remaining subsample yield results similar to our baseline results.

Another concern is about the possibility of reverse causality, i.e., whether changes in suppliers' cash holdings and repurchases cause the unionization push at customer firms. To examine this possibility, we use the Granger causality test and estimate the linear probability, logit, and probit models to predict customer unionization by the dependent suppliers' financial variables measured one year prior to the election year. We find no evidence of such reverse causality.

Yet another concern is the possibility that our findings around the vote cutoff of 0.5 may be simply driven by chance, instead of discontinuity in the treatment.[3] If our findings around the vote cutoff of 0.5 are spurious, then if we randomly change the cutoff point for a win in the union election, we should continue to find similar and significant results. To address this concern, we conduct placebo tests in which we randomly generate a fake vote cutoff point between 0 and 1 (except 0.5) and use that to estimate the effects of a customer firm's unionization on its dependent supplier's cash holdings and repurchases. We repeat this process 10,000 times each for cash holdings and repurchases. These placebo tests show that the distribution of the estimated coefficients using the fake cutoff points is centered around 0. We then do a t-test of the null hypothesis that the true mean of the sample of coefficients estimated using these fake cutoff points equals 0. We get p-values of 0.314 and 0.364 for the models of cash holdings and repurchases, respectively. Thus, we fail to reject the null, which implies that customer unionization has no effects on supplier cash holdings and repurchases if the union election cutoff point is different from 0.5. Overall, our findings do not appear to be spurious.

[3] That is, unionization succeeds (fails) if the vote share turns out to be 0.5 or higher (less than 0.5).

We next conduct several cross-sectional tests further exploring our findings on the effects of customer unionization on liquidity and repurchase policies of dependent suppliers. We partition our sample of dependent suppliers based on the duration of the supplier-customer relationship, supplier-customer geographic distance, supplier specificity, customer share, and market concentration in the customer's industry. These tests provide a fuller and more nuanced picture of our results. They also make it more challenging for any alternative explanation to explain all of our results.

We start by examining whether the effects of customer unionization vary by the duration of the relationship between suppliers and customers. We use the number of years of transactions between a firm and its customers reported in the Compustat Segments database to measure the duration of the business relationship. We construct a variable called Relationship Duration which equals one, if the number of years of transactions between suppliers and customers is greater than the sample median and equals zero otherwise. We then partition our sample by this variable and perform local linear regressions using the optimal bandwidths estimated in the main models. We hypothesize that following customer unionization, suppliers with long-term relationships with their customers are more likely to increase their financial flexibility to induce customers to maintain their investment in the relationship, while suppliers with short relationships with their customers are more likely to reduce their financial flexibility to prevent rent extraction by their unionized customers. Consistent with these predictions, in the subsample with short business relationships, suppliers reduce their cash holdings and increase repurchases following customer unionization. In contrast, in the subsample with long-term business relationships, suppliers do not reduce their cash holdings and reduce stock repurchases following customer unionization.

Next, we examine whether the effects of customer unionization vary by the supplier-customer distance. We use supplier and customer headquarters city and state to extract their location coordinates and measure the distance between them. We construct a variable called Supplier-Customer Distance, which equals 1 if the distance between suppliers and customers is greater than the median for the sample, and equals 0 otherwise. Prior studies suggest that customers share more information with their neighboring suppliers (see, e.g., Chu, Tian and Wang (2019); Wu, et al. (2022)). So following unionization, customers are more likely to share their changed circumstances with their nearby dependent suppliers to press for better contract terms. To shield themselves from rent-seeking by customers, neighboring suppliers are more likely to reduce their financial flexibility by reducing cash holdings or increasing repurchases. Consistent with this prediction, the results show that dependent suppliers near their newly unionized customers reduce their cash holdings by 3.3 percent and increase their repurchases by 1.2 percent, while distant suppliers do not significantly change their financial flexibility.

We next examine whether the effects of customer unionization vary by the specificity of a supplier's products. Following Barrot and Sauvagnat (2016), we use the number of patents granted to a supplier in the three years prior to customer union elections as a proxy for supplier specificity. A supplier is more (less) specialized if it receives more (fewer) patents than the sample median. Specialized suppliers produce more specific products, so they are more likely to make relationship-specific investments with their customers to maintain long-term business relationships with them. The relationship-specific investment theory predicts that more specialized suppliers will increase their financial flexibility by increasing their cash holdings or reducing repurchases in response to unionization at their customers. In contrast, less specialized suppliers produce more easily substitutable products, so they have less need to make investments that are specific to their customers. So, their dominant response to customer unionization should be shielding: they are more likely to reduce their financial flexibility by reducing cash holdings or increasing repurchases. Consistent with these predictions, we find a significant increase (decrease) in supplier cash holdings in the subsample of suppliers with high (low) specificity. There is no significant effect on repurchases in either subsample. Overall, these findings confirm our predictions and suggest that the full sample results in our main local linear models are the net effects of the two competing forces.

Next, we expect the shielding effect to be larger for a firm's bigger customers. We measure customer share as the percentage of a firm's sales to a given customer and classify a customer as large (small) if this percentage is larger (smaller) than the sample median. We expect suppliers to tighten their financial flexibility (by reducing cash holdings or increasing repurchases) more in response to unionization at customers with higher share. As predicted, we see a significant decrease in supplier cash holdings in the group of customers with higher share, while there is no significant effect for the other group of customers.

Next, customers in more concentrated industries have greater negotiating power with their suppliers, who find it more difficult to find another customer in the industry. So, the shielding effect predicts that suppliers will respond to customer unionization by reducing their financial flexibility more for such customers. We measure customer market concentration as the Herfindahl-Hirschman Index in the customer's 2-digit SIC industry and define high (low) concentration as being above (below) the sample median. We find that both subgroups of suppliers reduce their cash holdings, but the effect is much larger in the subgroup of customers in more concentrated industries. This finding is consistent with the prediction of the shielding effect.

Finally, we examine the possibility that changes in supplier policies after customer unionization are driven by changes in supplier performance. So we analyze the effect of customer unionization on three measures of supplier performance and valuation: operating margin, the ratio of cost of goods sold to sales, and Tobin's Q. We find no evidence that customer unionization significantly reduces dependent suppliers' performance or valuation.

Overall, our findings suggest that the shielding effect dominates suppliers' response to unionization at a major customer: suppliers strategically restrict their financial flexibility by reducing liquidity or increasing repurchases to protect themselves from rent extraction by unionizing customers. But for suppliers with greater specific investment or longer relationships with the unionizing customer, the specific investment effect dominates: suppliers increase their financial flexibility to incentivize the customer to preserve the customer's relationship-specific investment.

This paper contributes to two streams of the literature. First, our research contributes to the literature on labor unions. Prior literature finds that labor unions influence a variety of corporate decisions and outcomes in focal firms, including employee benefits (Freeman 1981, Hirsch 2004), capital structure (Matsa 2010; Woods, Tan, and Faff 2019; Simintzi, Vig, and Volpin 2015), cost of debt (Chen, Kacperczyk, and Ortiz-Molina 2012), liquidation (Campello, et al. 2018), innovation (Bradley, Kim, and Tian 2017), corporate governance (Agrawal 2012), and firm value (Abowd 1989). These studies focus on the relationship between labor unions and unionized firms. A few recent studies examine externalities from unionization in the supply-chain context. Chen, Judd, and Pandit (2021) find that labor unionization at supplier firms disrupts their business relationships with customers. Leung, Li, and Sun (2020) find that newly unionized customers squeeze their suppliers by asking for lower prices. We extend this literature by providing evidence on how suppliers respond to customer unionization by changing their own financial flexibility. We find that overall, dependent suppliers reduce their cash holdings or increase stock repurchases to shield their firms from rent extraction by their newly unionized customers.

Our paper also contributes to the literature on rent-seeking behavior by a firm's stakeholders such as employees and the government. The existing literature has focused on studying how firms use financial leverage (Bronars and Deere 1991; Matsa 2010, Smith 2016) and dividend payout (DeAngelo, DeAngelo and Skinner 2009, Chino 2016) to mitigate rent extraction by unionized employees or government officials. We extend this literature by showing how firms use two financial policies, cash holdings and stock repurchases, to mitigate rent-seeking by newly unionized customers.

The remainder of the paper is organized as follows. Section 2 presents the development of our hypotheses. Section 3 discusses our sample construction and data sources. Section 4 presents our RDD models as identification strategy and tests its underlying assumptions. Section 5 reports our estimation results. Section 6 discusses robustness tests. Section 7 presents cross-sectional analyses of our baseline results and an analysis of firm performance. Section 8 concludes.

2. Hypotheses

The existing literature suggests that labor unions impose substantial costs on unionized firms due to increased cost stickiness (Chen, Kacperczyk and Ortiz-Molina 2011, Chen, Judd, and Pandit 2021, He et al. 2020, Hirsch 1997, Lewis 1986), lower production efficiency (Hirsh 2004), or increased bankruptcy costs (Campello et al. 2018). Given the increased operating cost caused by unionization, unionized customer firms look for operating cost savings from other channels such as seeking better prices or contract terms from their dependent suppliers (Leung, Ling, and Sun 2020). How do firms respond to such rent-seeking behavior by a major customer? DeAngelo, DeAngelo and Skinner (2009) argue that in general, firms hold less cash to avoid being perceived as having deep pockets. Smith (2016) finds that firms protect themselves from expropriation by government officials by reducing their cash holdings. Chino (2016) finds that highly profitable firms increase their dividend payout to protect their assets from labor unions. Thus, we argue that faced with the threat of rent extraction by newly unionized customers, the dependent suppliers are more likely to reduce their financial flexibility to shield the firm. This implies the following *shielding hypothesis*:

Hypothesis 1: *A supplier will reduce its cash holdings and/or increase stock repurchases following the unionization of a major customer firm to shield the firm from rent extraction by newly unionized customers.*

The literature on financial and product market interactions suggests that both customers and suppliers make relationship-specific investments that are affected by factors such as firms' bankruptcy risk and leverage (see, e.g., Titman 1984; Maksimovic and Titman 1991; and Hennessy 2009). Unionized customer firms face increases in operating costs, bankruptcy costs and bankruptcy risk, reducing their incentive to maintain relationship-specific investments in their dependent suppliers. Consequently, the dependent suppliers have an incentive to increase financial flexibility to induce their newly unionized customers to continue their relationship-specific investments. This implies the following *relationship-specific investment hypothesis*:

Hypothesis 2: *A supplier will increase its cash holdings and/or decrease stock repurchases following unionization of a major customer firm to induce the customer to maintain its relationship-specific investment.*

3. Sample and Data

We construct our sample and dataset from several sources: the National Labor Relations Board (NLRB) for union election data, Compustat Segments file for supplier-customer relationship, Compustat Annual Fundamentals file for firms' financial data, and CRSP for stock price data.

3.1 Labor Union Data

We obtain data on labor union elections for the period 1977 to 2021 from three sources: Holmes (2006) for 1977 to 1999, National Archive Catalog for 1999 to 2011, and the NLRB for 2011 to 2021. Following the prior literature (see, e.g., Lee and Mas (2012)), we remove any elections with missing outcomes and focus on representation certification (RC) elections, which is how most new unionization happens.[4] This process yields 101,088 RC elections during 1977 to 2021. We have information on employer name, city and state; election date; the number of eligible votes, votes against union, votes for union; and election outcome.

The employer name in the union election dataset typically refers to a unit such as a plant, division, warehouse or store. In many cases, this unit is owned by a company that is, in turn, a subsidiary of another public company. So, in the next step, we match the employer name to the public company that is its ultimate owner, in order to obtain firm financials from Compustat and stock price information from CRSP that our analysis requires. We do this matching by a 2-step procedure. We first use a fuzzy match function in R to match an employer name to a public company name in the CRSP-Compustat merged database based on similarities between names.[5] We then manually check the resulting match using LexisNexis' Dun and Bradstreet Corporate Family Tree. For a given union election at a customer firm in year 0, we obtain observations on its dependent suppliers for years -1 to +1. This process yields 8,082 RC union elections in 1,325 unique public companies over the period from 1977 to 2021.

3.2 Supplier-Customer Data

We next obtain the supplier-customer data provided by Cen et al (2017) and Cohen and Frazzini (2008) from Wharton Research Data Services (WRDS). This supply-chain dataset is built from historical customer segment data from Compustat Segment database. Under FASB 14 (1976) and FASB 131 (1997), a public company is required to report in its annual report (i.e., 10-K filing)

---

[4] There are two ways that employees at a non-union workplace can form a union: an RC election or a voluntary recognition (VR) election. An RC election allows employees to determine via majority vote in a secret ballot conducted by NLRB which employee organization, if any, shall be certified to represent them in their employment relations with the employer. Alternatively, in a VR election, employees persuade an employer to voluntarily recognize a union after showing majority support by signed authorization cards or other means. As one might expect, VR elections are rare because employers are not fans of unions. See https://www.worker.gov/form-a-union/

[5] We use the stringdist_join function provided by fuzzyjoin package in R.

a list of its major customers, each of whom accounts for at least 10 percent of its total dollar sales, and the sales to each of them. This dataset has more than 124,570 observations over the period from 1977 to 2021 with GVKEYs for both suppliers and customers. We remove all suppliers and customers in financial and utility industries, then merge this supply-chain data to the union election data using customer GVKEYs.

To reduce any possible confounding effects, we remove a supplier that has a union election in years -1 to +1 relative to its customers' election year, year 0. For customers with multiple RC elections in the same year, we follow the prior literature and keep the election with the largest number of eligible votes. For suppliers that have multiple customers with RC elections in the same year, we only keep the election in the largest customer using the suppliers' sales to customers. This process yields a sample of 9,669 supplier-customer-election observations. We merge this dataset with the Compustat Fundamentals Annual to obtain financial information. Due to missing values in Compustat Fundamentals, our final sample consists of 7,433 supplier-customer-year observations, covering 1,269 union elections in 328 unique customer firms, which affect 2,181 dependent suppliers. For a union election at a customer firm in year 0, our sample contains observations on its dependent suppliers for years -1 to +1.[6]

Table A.1 in the Appendix shows variable definitions and data sources. Table A.2 summarizes the number of elections, the number of customers, and the number of dependent suppliers in our final sample over 10 bins of vote share for unionization. The average number of eligible votes is about 202 in our sample of 1,269 elections.

Table A.3 shows the distribution of union elections over the years in our sample. The number of elections has declined, while the vote share to approve unionization has gone up, for the last two decades. Table A.4 presents the distribution of customer firms and the dependent suppliers in our sample by Fama-French 12 industry sectors. Union elections are heavily concentrated in the manufacturing and service sectors, which account for nearly 40 percent of all customer firms with union elections in our sample.

[6] The sample size exceeds the number of elections x 3 years (-1, 0 and +1) because an election at a given customer firm can affect multiple dependent suppliers.

Table 1 shows descriptive statistics of our union elections sample. Of the 1,269 union elections that were held, unions win 513. The average number of eligible votes is about 202, with a median of 69. The average (median) number of employees in customer firms in the election year is about 119,000 (70,000).

Table 2 shows summary statistics of dependent and control variables used in the RDD models. On average, the suppliers have cash and short-term investment of 13.4 percent of the total assets, and repurchases account for 1.3 percent of total assets. Suppliers are generally smaller, less profitable, more R&D intensive and operate in less concentrated markets than customers.

4. Empirical Models and Validation

In this paper, we try to capture the causal effects of labor unionization at customer firms on two financial policies of dependent suppliers: cash holdings and repurchases. However, estimating such causal effects is not easy in the supply-chain context due to endogeneity concerns. For instance, customer firms might experience some financial/economic difficulties such as financial crises which both motivate their workers to be unionized and affect their dependent suppliers' financial policies. So, if we use a naïve approach to compare the financial policies of the suppliers in the relationship with unionized customers to the ones in the relationship with non-unionized customers, the estimation results might be confounded by endogenous factors. Fortunately, because union election results are determined by majority rule, they allow a sharp regression discontinuity design.

We address endogeneity concerns by following Lee and Lemieux (2010) to evaluate the effects of labor unionization at customer firms on the dependent suppliers' cash holdings and repurchases using a regression discontinuity design (RDD). RDD estimates the effects of the treatment (unionization) within a narrow window around a cutoff point (i.e., just above and just below), which is used to assign the treatment. In the union election context, the running variable V (Vote share) that assigns unionization status is measured by the number of votes cast for a union divided by total votes cast. This running variable lies between 0 and 1. More importantly, the treatment, unionization, is discontinuous at 0.5; a union wins if the vote share is at least 50 percent. Thus, the union election setting meets the two key requirements of the sharp RDD approach: the running variable is continuous around the cutoff point, but the treatment is discontinuous around the cutoff point. We define Unionization as:

$$\text{Unionization} = \begin{cases} 1, & if\ V \geq 0.5 \\ 0, & if\ V < 0.5 \end{cases}$$

The key assumption is that for the dependent suppliers in the vicinity of the cutoff point of 0.5, the unionization status of their customers is plausibly randomized. This assumption facilitates the estimation of the causal effects of the unionization in customer firms on their dependent suppliers' financial policies. To capture the causal effects, we compare the financial policies of suppliers whose major customers barely won the elections to those of suppliers whose major customers barely lost the election.

Gelman and Imbens (2014) recommend estimating RDD models using non-parametric methods, using local linear regressions. So, we use these models as our baseline approach.[7] Generally speaking, local linear regressions use data within small windows around the cutoff point for estimation and can be expressed as following:

$$Y = \alpha + \gamma\ Unionization + \beta_L(V - 0.5) + (\beta_R - \beta_L).Unionization\ .(V - 0.5) + \varepsilon \qquad (1)$$

where $0.5 - h \leq \text{V} \leq 0.5 + h,$ and h is the bandwidth for the non-parametric estimation. The estimated effect of the unionization of customer firms on dependent suppliers' financial policies is $\boldsymbol{\gamma}$ For the optimal bandwidth (h) selection, we follow the data-driven bandwidth selection method for RDD by Calonico, Cattaneo, and Farrell (2020). We estimate the local linear regression models using triangular kernel, which gives higher weights to observations closer to the cutoff

[7] Unlike local linear models which assume only that the relationship between y (here, supplier financial policies) and x (here, vote share) variables is linear in a narrow band around the cutoff point (here, V=0.5), global polynomial regressions assume that this relationship has a particular functional form over the entire range of outcomes of the x variable. Therefore, the latter approach is subject to a potential bias. On the other hand, that approach may achieve greater precision by making use of all available data for estimation. Lee and Lemieux (2010) suggest using both approaches to check for robustness. We present the results of global polynomial regressions in Tables A.5 and A.6 and discuss them in the Appendix. Those results are generally similar to our baseline results using local linear regressions, especially for cash holdings.

point, and uniform (rectangular) kernel, which gives equal weights to observations within the optimal bandwidth around the cutoff point.

Before reporting the estimation results, we perform a test of the key assumptions for the validity of the RDD models. The validity of the RDD approach is dependent on two key assumptions. First, the union vote share (the forcing variable) is continuously distributed around the assignment cut-off point (50 percent). In our context, this means that there should be no manipulation of votes around the critical cut-off point of 0.5 in union elections. Second, the pre-determined outcomes and covariates are also continuously distributed around the cutoff point of 0.5. In other words, observations just above and just below the cutoff point of 0.5 are similar across the set of pre-determined outcomes and covariates.[8] To test the first assumption, we perform the McCrary (2008) test of the density discontinuity for the running variable, Vote Share. Figure 1 shows the plot of the density distribution of union vote shares using the local linear density estimation, as in McCrary (2008). The 95 percent confidence intervals of the estimated density for the running variable overlap around the cutoff point, and the McCrary (2008) test has a p-value of 0.249, implying that the null hypothesis that the vote share is continuously distributed around 0.5 cannot be rejected. Overall, we find no evidence of vote manipulation around the critical threshold of 0.5 in union elections, consistent with the conclusion of prior studies that use union elections for identification over different sample periods (see, e.g., DiNardo and Lee 2004, Bradley, Kim, and Tian 2017, and Campello et al 2018).

We first graphically analyze the relationship between vote share for unionization and suppliers' cash holdings and repurchases at the end of the first year following customer union elections in Figures 2 and 3. We divide our full sample into 30 equal-sized bins of vote shares and then calculate the average value of cash holdings and repurchases in each bin. Dots represent these mean values. We then use polynomial functions of vote shares to fit suppliers' cash holdings and repurchases. The shaded areas report the 5th and 95th percentile confidence intervals for the fitted lines. Figures 2 and 3 show a distinct drop in cash holdings and a distinct jump in repurchases from the left side to the right side of the cutoff point of a vote share of 0.5, with non-overlapping confidence intervals.

[8] We discuss the test of this assumption in section 5 and Table A.7.

5. Empirical Results

We estimate local linear regressions within small windows around the cutoff point using optimal bandwidths selected by the data-driven method developed by Calonico, Cattaneo, and Farrell (2020). The local linear regression estimation results for supplier cash holdings are reported in Table 3. We report the results using both triangular and uniform (rectangular) kernel distributions. We also estimate these models using 75 and 125 percent of the optimal bandwidth to check the sensitivity of the results to alternate bandwidths. Columns 1 and 3 show models without any covariates and dummies, and columns 2 and 4 present the results of the full models that control for characteristics of supplier and customer firms, and industry and year dummies.[9] The estimation results are generally similar across the four columns, and they are all statistically significant. The full model in column 2 with the optimal bandwidth of 0.090 is our baseline model that we later use for robustness tests. This model estimates a decline in supplier cash holdings by 3% of total assets after customer unionization or about 22% of the sample mean of 13.4% (see Table 2).[10] The results are similar to those in the global polynomial regressions.

Table 4 presents the estimation results of local linear regressions for supplier repurchases. Columns 1 and 2 show models using triangular kernel while columns 3 and 4 show models using

---

[9] Lee and Lemieux (2010) argue that the quasi-randomized setting of RDD (i.e., the assignment to treatment is independent of the baseline covariates) makes it unnecessary to include covariates to obtain consistent estimates of the treatment effect in local linear RDD models, although, in practice, the inclusion of covariates can reduce the sampling variability in the estimator. Similarly, Calonico, et al. (2019) and Cattaneo, Keele and Titiunik (2023) show that covariates can be useful for increasing precision, and local linear RDD models that include covariates are consistent as long as the treatment has no mean effect on the covariates at the cutoff point, a requirement that is satisfied in our tests, as we discuss next and present in Table A.7. So, we present the results of local linear RDD models both with and without control variables in our baseline tests in Tables 3 and 4. Given that the estimated treatment effects from the two models are quite similar, we present the results of models including control variables in our cross-sectional tests in section 7.

[10] The mean cash holding is almost identical (13%) in the subsample constructed by the optimal bandwidth (i.e., with a vote share of 0.5 ± 0.09).

uniform kernel distribution. Columns 1 and 3 have no covariates and dummies, and columns 2 and 4 report results for the full models with all supplier and customer firm characteristics and industry and year dummies. We find positive and significant effects of customer unionization in both full models. Our baseline model in column 2 shows an increase in repurchases of 0.5% of total assets after customer unionization or about 38% of the sample mean of 1.3% (see Table 2).[11] These results support the shielding effect. Figures 2 and 3 show a decrease in supplier cash holdings and a jump in supplier repurchases right above the cutoff point of 0.5. Overall, these results suggest that in response to unionization in customer firms, dependent suppliers tighten their financial policies, by decreasing cash holdings and increasing stock repurchases, to shield firm assets from rent extraction by newly unionized customers.

The validity of the RDD results is dependent on the key assumption that pre-determined outcomes and covariates are continuous around the cutoff point of 0.5. To test this assumption, we perform local linear regressions similar to those in column 2 of Tables 3 and 4 for all pre-determined outcomes (cash holdings and repurchases in year t-1) and all other covariates using the optimal bandwidths reported in Tables 3 and 4. Table A.7 reports the estimation results. In each model, the dependent variable is either a pre-determined outcome and a covariate. The coefficient estimates are statistically insignificant in most of the models, which implies that we cannot reject the null hypothesis that the pre-determined outcomes and covariates are continuous within a narrow window around the vote cutoff point of 0.5.

6. Robustness Tests

We next conduct several robustness check of our baseline results in Tables 3 and 4. These tests deal with potential concerns that our findings, that suppliers of unionizing major customer firms reduce their financial flexibility by reducing their cash holdings and increasing repurchases, are due to our choice of bandwidth, financial crises, reverse causality, or simply chance.

[11] The mean of repurchases is almost identical (1.2%) in the subsample constructed by the optimal bandwidth (i.e., with a vote share of 0.5 ± 0.09).

6.1. Alternative bandwidths

We first examine whether our local linear estimates are sensitive to alternate bandwidths. As Bradley, Kim and Tian (2017) explain, the choice of bandwidth involves a trade-off between precision and bias. A wider bandwidth includes more observations in the regression and yields more precise estimates, but can bias the estimates because the linear specification is less likely to hold. The reverse argument holds for a narrower bandwidth. Our baseline results reported in Tables 3 and 4 are quite robust to using 75 or 125 percent of the optimal bandwidth, as shown in those tables.

As a further robustness check, we next examine whether our results are sensitive to using a different method of selecting the optimal bandwidth. We re-estimate the local linear models in Tables 3 and 4 using the data-driven method of Imbens and Kalyanaraman (2012) to select the optimal bandwidths. The results are reported in Tables A.8 and A.9. The resulting bandwidths are substantially larger than those using our baseline approach (Calonico, Cattaneo, and Farrell (2020)) in Tables 3 and 4. Nevertheless, the results continue to be similar to those in Tables 3 and 4. Moreover, they are also generally similar when we use 75% or 125% of the optimal bandwidths selected under this alternate approach.[12] Thus our results do not appear to be driven by the method of selecting the optimal bandwidths.

6.2 Financial crises

Second, there is a concern that our results may be driven by negative shocks such as a financial crisis that leads customer firms to unionize and also causes supplier to change their financial policies. To address this concern, we exclude union elections that occurred during the financial crisis years of 1998, 2007, 2008, and 2009 (see, e.g., Bekaert et al (2014)). We then re-estimate the models in Tables 3 and 4 and report the results in Tables A.10 and A.11. Again, the results are similar to those reported in Tables 3 and 4 for our full sample. Thus, our results do not appear to be driven by financial crises.

[12] Except when we use 125% of the optimal bandwidth in Table A.9, which spans nearly the entire distribution.

6.3. Reverse Causality

Next, we consider the possibility that our results are driven by reverse causality. That is, for some reason, suppliers change their financial policies, which negatively affects both customer firms and their workers, who then vote for a union to protect themselves from such negative impacts. In this scenario, suppliers' cash holdings and repurchases one year before the election would have predictive power for the likelihood of the unionization at customer firms. This logic follows the Granger causality relationship. To address this concern, we predict the unionization in customer firms using linear probability, logit, and probit models in which the dependent variable is a binary indicator variable for unionization in the customer firm, and the main independent variables are suppliers' cash holdings and repurchases one year before the election. These models include control variables for supplier and customer firm characteristics. In Table A.12, the coefficients of supplier cash holdings and repurchases in year t-1 are statistically insignificant. Moreover, the AUC (Area Under the Curve) score for the logit model equals 0.6702, which implies that supplier financial policies one year before customer union election poorly predict the election outcome. Thus, our evidence does not support a (Granger) reverse causal relationship between customer unionization and suppliers' cash holdings and repurchases.

6.4 Placebo Tests

We find a discontinuity in supplier cash holdings and repurchases in Figures 2 and 3 and Tables 3 and 4 around the vote threshold of 0.5. We next do a series of placebo tests to check the possibility that similar discontinuities exist at other randomly chosen vote cut-offs. We first randomly select a 'fake' alternative vote threshold other than 0.5 within the range of 0 to 1 to determine the election outcome. We then perform local linear models of supplier cash holdings and repurchases similar to model 2 in Tables 3 and 4 using this fake vote cutoff and obtain the coefficient estimate of unionization. We then repeat this procedure 10,000 times to obtain a large distribution of the estimated coefficients with these randomized fake cutoff points. Figure 4 shows that the empirical distribution of these estimated coefficients is centered around 0, suggesting that the effect of customer unionization is largely absent around these alternative vote cutoff points. We also perform a t-test of the null hypothesis that the true mean of these estimated coefficients using the fake cutoff points equals 0. The t-tests have p-values of 0.314 and 0.364 for cash holdings and repurchase models, respectively, which fail to reject the null hypothesis. The evidence suggests that the increase in supplier financial flexibility (i.e., decrease in cash holdings and increase in repurchases) that we observe in our baseline tests is not driven by chance and therefore our RDD models are unlikely to be spurious.

7. Cross-sectional Analyses and Firm Performance

In this section, we conduct a number of cross-sectional tests further exploring the effects of unionization at a firm on its dependent suppliers' cash holdings and repurchases.[13] Finally, we examine whether customer unionization affects its dependent supplier's performance.

7.1 Relationship Duration

We start by examining the variation in the effects of customer unionization on supplier financial flexibility across different degrees of supplier-customer relationship duration. Generally, both customers and suppliers make relationship-specific investments to establish and maintain their business relationship. The longer the relationship, the bigger such investments are likely to be, making it harder for suppliers to exit the relationship without hurting themselves. Therefore, a supplier in a long-term relationship with a unionizing customer is more likely to relax its financial flexibility following customer unionization to induce the customer to keep its investment in the relationship. In contrast, a supplier with a short-term business relationship with its unionizing customer has a lower incentive to maintain the relationship because its cost of exiting the relationship is lower. So, these suppliers are more likely to reduce their financial flexibility to mitigate rent extraction following customer unionization.

To test these predictions, we use the number of years during which transactions between customers and suppliers are reported in the Compustat Segments database to measure supplier-customer relationship duration. We then partition our full sample into two sub-groups of long (i.e., above the sample median) vs short (i.e., the rest) relationship duration, and estimate local linear

[13] The pairwise correlations among the partitioning variables used in these tests are relatively small (< 0.2), alleviating a potential concern that these tests are not independent of each other.

regressions similar to those in column 2 of Tables 3 and 4 for each sub-sample. Table 5 reports the results. In the sub-group of long-term supplier-customer relationship, coefficient of Unionization is positive for cash holdings and negative for repurchases, although only the latter is statistically significant. These results imply that following customer unionization, dependent suppliers relax their financial flexibility by reducing stock repurchases by 1.1 percentage points. In contrast, in the sub-group of short-term supplier-customer relationship, dependent suppliers tighten their financial flexibility by significantly reducing their cash holdings and increasing repurchases to reduce rent extraction by their newly unionized customers. The magnitude of the reduction in cash holdings is a striking 6.8 percentage points in this subsample.

7.2 Supplier-Customer Distance

Prior studies find that geographic proximity affects a variety of corporate policies such as dividend payout (John, Knyazeva and Knyazeva 2011), investment (Giroud 2013), and corporate governance (Kang and Kim 2008). Specifically, geographic proximity between suppliers and customers affects a supplier's investment efficiency (Wu et al. 2022), risk-taking (Huang and Fan 2022), and innovation (Chu, Tian and Wang 2019) due to greater information-sharing between customers and their neighboring suppliers. Thus, unionizing customers are more likely to share their new reality with neighboring suppliers to get better contract terms. In turn, neighboring suppliers are more likely to reduce their financial flexibility to improve their negotiating power.

To test this conjecture, we use the headquarters city and state of a supplier and its unionizing customer to measure the distance between them. We partition our sample at the sample median of Supplier-Customer Distance into Near and Far customers. We then estimate local linear regressions similar to those in column 2 of Tables 3 and 4 for cash holdings and repurchases for each of these two sub-samples. Table 6 reports the results. Consistent with our predictions, neighboring suppliers reduce their financial flexibility by reducing their cash holdings by 3.3 percentage points and increase their stock repurchases by 1.2 percentage points in response to unionization at a major customer firm. In contrast, far-off suppliers do not make significant changes to their financial flexibility.

7.3 Supplier Specialization

We next examine the variation of the effects of customer unionization on supplier financial policies by the degree of supplier specialization (or specificity). Suppliers with high specificity produce highly specialized products required by a small group of customers. So these suppliers make relationship-specific investments to maintain long-term business relationships with their customers. So in response to customer unionization, such suppliers are likely to relax their financial policies (by increasing cash holdings and reducing repurchases) to maintain their commitment to their customers. In contrast, suppliers with low specificity, who produce more general-purpose products, have less need to make such relationship-specific investments. For them, the shielding effect should dominate. They should respond to customer unionization by reducing their financial flexibility, i.e., reduce cash holdings and increase repurchases.

Following Barrot and Sauvagnat (2016), we measure supplier specificity using the number of eventually granted patents applied for by the supplier during the three years before the union election at the customer firm. We call a supplier more (less) specific if the number of these patents is greater than (less than or equal to) the sample median. Table 7 reports the results. As predicted by the relationship-specific investment theory, we see a positive and significant effect of 2.4 percentage points on supplier cash holdings for suppliers producing highly specialized products. In contrast, less specialized suppliers reduce their cash holdings by 5 percentage points following unionization at their customer firms, as predicted by the shielding effect. The coefficient of customer unionization on supplier repurchases is statistically insignificant in both subsamples. Overall, these results suggest that the effects of customer unionization on supplier cash holdings and repurchases reported in Tables 3 and 4 are net effects.

7.4 Customer Share

A supplier who relies on a newly unionized customer for a larger share of its total sales is more susceptible to rent-seeking by such customer. Such suppliers are more likely to strategically tighten their financial policies in response to customer unionization than suppliers who are less dependent on the newly unionized customer. To test this prediction, we partition our sample based on the percentage of a supplier' total sales to a unionizing customer into subsamples of Big (i.e., above-median) and Small (at or below-median) customers. We then local linear models of cash holdings and repurchases similar to those in column 2 of Tables 3 and 4, and report the results in Table 8. We expect to see a larger shielding effect in the subsample of Big customers.

Consistent with our prediction, we see a decline in supplier cash holdings by 5.1 percentage points after customer unionization for Big customers, while there is essentially no effect for Small customers. There is no significant effect on repurchases in either subsample. These results confirm the prediction that the effect of labor unionization at customer firms on dependent suppliers' cash holdings are stronger if the unionized customer is more important to the supplier.

7.5 Customer Market Concentration

We next examine the effects of customer unionization on supplier cash holdings and repurchases by the degree of market concentration in the customer's industry. If a customer is in a more concentrated market, it is costly and difficult for the dependent suppliers to replace them. Thus, following customer unionization, these suppliers are more likely to strategically tighten their financial policies to reduce rent extraction. In contrast, suppliers whose unionizing customer is in a less concentrated market faces less pressure to tighten its financial flexibility. Thus, the shielding effect predicts a stronger effect of customer unionization on the group of customers with high market concentration.

We measure customer market concentration using their Herfindahl-Hirschman Index (HHI) based on the customer's industry, identified by their 2-digit primary SIC code reported in Compustat. We classify a customer to have high (low) market concentration, if its HHI is larger (equal to or smaller) than the sample median. Table 9 reports the results of estimations similar to those in column 2 of Tables 3 and 4 for each of the two samples. Once again, supplier behavior regarding their cash holdings confirms the predictions of the shielding effect. While there is a significant reduction in supplier cash holdings in both samples, the magnitude of the reduction is larger in the sub-sample of high customer market concentration. There is no significant effect on repurchases in either sub-sample.

7.6 Firm Performance

Finally, we test whether the effects of customer unionization on dependent suppliers' cash holdings and repurchases are driven by a change in the dependent suppliers' performance following customer unionization. We measure suppliers' performance by their operating margin, the ratio of cost of goods sold to sales, and Tobin's Q. Table 10 reports the results of estimations similar to those in column 2 of Tables 3 and 4, except that the dependent variable is now a measure of suppliers' performance. Overall, we find no evidence of an effect of customer unionization on dependent suppliers' performance. This finding suggests that our results on suppliers' cash holdings and repurchases are not driven by a change in their performance.

8. Summary and Conclusion

This paper examines the causal effect of labor unionization of customer firms on their dependent suppliers' financial flexibility, measured by cash holdings and repurchases. Suppliers' reaction to customer unionization is shaped by two opposite, non-mutually exclusive hypotheses: shielding and relationship-specific investment. The shielding hypothesis predicts that faced with the threat of rent-seeking behavior by a major customer following its labor unionization, the dependent supplier will reduce its financial flexibility by reducing cash holdings and increasing repurchases. In contrast, the relationship-specific investment theory predicts that dependent suppliers will increase their financial flexibility by increasing cash holdings and reducing repurchases to induce the customer to maintain their investment in the relationship.

We employ the RDD approach to estimate these effects. In the full sample, dependent suppliers that face a close unionization vote at a major customer firm respond to a successful vote by decreasing their cash holdings by an average of 3 percentage points (or 22% of the sample mean) and increasing their stock repurchases by 0.5 percentage points (or 38% of the sample mean) to forestall rent-seeking by their newly unionized customers. These effects are even larger when the unionized customer (1) is more important to the supplier, (2) is in a more concentrated industry, (3) is located near the supplier, and (4) has had a short relationship with the supplier. These effects generally reverse for suppliers with greater specific investment or longer relationship duration.

Our findings suggest that overall, the shielding effect dominates: dependent suppliers reduce their financial flexibility by reducing cash holdings and increasing repurchases to protect the firm from the threat of rent extraction by their newly unionized customers. But for suppliers with greater specific investment or longer relationship with the customer, the specific investment effect dominates: suppliers increase their financial flexibility to preserve their relationship-specific investment in the customer.

Our study raises two important questions. First, are these attempts by suppliers to shield their assets successful in combating rent-seeking by their newly unionized customer firms? We do not have the granular customer-level data on product prices and terms of trade needed to answer this question. Second, while our paper analyzes firms in the US, what happens in other countries where unionization is more prevalent? These are interesting issues that we leave for future research.

Appendix

Global Polynomial Regressions

The global polynomial regression for the RDD model requires estimating two separate regressions (A.1) and (A.2) on each side of the cutoff point (Lee and Lemieux 2010). The estimated effect of the unionization status in customer firms on the dependent suppliers' financial policies is the difference between the intercepts of the following two n^{th}-order polynomial regressions:

$$Y = \alpha_L + \beta_{L,1}(V\text{-}0.5) + \beta_{L,2}(V\text{-}0.5)^2 + \ldots\ldots + \beta_{L,p}(V\text{-}0.5)^p + \varepsilon \text{ , where } V \leq 0.5 \qquad \text{(A.1)}$$

$$Y = \alpha_R + \beta_{R,1}(V\text{-}0.5) + \beta_{R,2}(V\text{-}0.5)^2 + \ldots\ldots + \beta_{R,p}(V\text{-}0.5)^p + \varepsilon \text{ , where } V \geq 0.5 \qquad \text{(A.2)}$$

The combined equation for (1) and (2) is the following:

$$Y = \alpha + \gamma \ Unionization + \sum_{n=1}^{p} \beta_{L,n}.(V - 0.5)^n + Unionization . \sum_{n=1}^{p} \left(\beta_{R,n} - \beta_{L,n}\right).(V - 0.5)^n + \varepsilon \qquad \text{(A.3)}$$

Y is the outcome variables including cash holdings and repurchases measured at the first year after the election. The coefficient of interest is γ, which equals $(\alpha_R - \alpha_L)$. Equation (A.3) is estimated on the full sample, so it is called the global polynomial regression. Because this approach assumes that the relationship between the suppliers' outcomes (the y variables) and customer unionization (the x variable) is linear over the full sample, it is subject to a potential bias.

We report the estimation results of equation (A.3) for dependent suppliers' cash holdings in Table A.5. Supplier cash holdings is measured in the first year after customer union elections. All the control variables are measured one year prior to customer union elections. Year and industry dummies are included in some models to control for year and industry heterogeneity. We use the Fama-French 48 industry classification to construct industry dummies and report industry-clustered robust standard errors in parentheses. The first three columns in Table A.5 report the first-order polynomial RDD models in which column 1 has no controls and fixed dummy variables, column 2 includes both supplier and customer control variables, and column 3 is the full model with all controls and dummies. The models in columns 4, 5, and 6 are similar to those in the first three columns except the fact that they are estimated using the second-order polynomial. Models in the last three columns are estimated using the third-order polynomial. If the shielding hypothesis dominates, then the effects of customer unionization on suppliers' cash holdings should be negative and significant. Except for the first three columns, we capture the negative and significant results at 1% level for the remaining models. According to the results in column 9, following the unionization of major customers, suppliers reduce their cash holdings, on average, by 2.1 percent. This result is consistent with the predictions under the shielding effect.

The results of the global polynomial RDD models for suppliers repurchases are reported in Table A.6. The first three columns report the results of the first-order polynomial models. The next three columns, Column 4, 5, and 6, are the results of the second-order polynomial models. The last three columns are estimated using the third-order polynomial method. Columns 1, 4, and 7 have no control variables and fixed dummies. Columns 2, 5, and 8 include both supplier and customer firm characteristics. Columns 3, 6, and 9 are the full models which include all control and dummy variables. Under the shielding effect, we expect to get positive and significant results for the coefficients of Unionization. Although all coefficients are positive, only model 1 returns a positive and significant coefficient at 10% level. Overall, the results from the global polynomial regressions suggest that following unionization in customer firms, dependent suppliers reduce their cash holdings.

References

Abowd, J.M., 1989. The effect of wage bargains on the stock market value of the firm. *The American Economic Review*, 774-800.

Agrawal, A.K., 2012. Corporate governance objectives of labor union shareholders: Evidence from proxy voting. *Review of Financial Studies*, *25*(1), 187-226.

Bakke, T. and Whited, T., 2012. Threshold events and identification: A study of cash shortfalls. *Journal of Finance* 67, 1083–1111.

Barrot, J.N. and Sauvagnat, J., 2016. Input specificity and the propagation of idiosyncratic shocks in production networks. *Quarterly Journal of Economics*, *131*(3), 1543-1592.

Bekaert, G., Ehrmann, M., Fratzscher, M. and Mehl, A., 2014. The global crisis and equity market contagion. *Journal of Finance*, *69*(6), 2597-2649.

Bradley, D., Kim, I. and Tian, X., 2017. Do unions affect innovation? *Management Science*, *63*(7), 2251-2271.

Bronars, S.G. and Deere, D.R., 1991. The threat of unionization, the use of debt, and the preservation of shareholder wealth. *Quarterly Journal of Economics*, *106*(1), 231-254.

Calonico, S., Cattaneo, M.D. and Farrell, M.H., 2020. Optimal bandwidth choice for robust bias-corrected inference in regression discontinuity designs. *Econometrics Journal*, *23*(2), 192-210.

Calonico, S., Cattaneo, M., Farrell, M. and Titiunik, R., 2019. Regression discontinuity designs using covariates. *Review of Economics and Statistics*, 101(3): 442‑451.

Calonico, S., Cattaneo, M.D. and Titiunik, R., 2014. Robust nonparametric confidence intervals for regression-discontinuity designs. *Econometrica*, *82*(6), 2295-2326.

Campello, M., Gao, J., Qiu, J. and Zhang, Y., 2018. Bankruptcy and the cost of organized labor: Evidence from union elections. *Review of Financial Studies*, *31*(3), 980-1013.

Cattaneo, M., Keele, L. and Titiunik, R., 2023. Covariate adjustment in regression discontinuity designs. *Handbook of Matching and Weighting in Causal Inference*, eds. J. R. Zubizarreta, E. A. Stuart, D. S. Small and P. R. Rosenbaum, Chapman and Hall, Ch. 8, 153-168.

Cen, L., Maydew, E.L., Zhang, L. and Zuo, L., 2017. Customer–supplier relationships and corporate tax avoidance. *Journal of Financial Economics*, *123*(2), 377-394.

Chen, H.J., Kacperczyk, M. and Ortiz-Molina, H., 2011. Labor unions, operating flexibility, and the cost of equity. *Journal of Financial and Quantitative Analysis*, *46*(1), 25-58.

Chen, G., Judd, J.S. and Pandit, S., 2021. Firm unionization and disruptions in customer relationships. *Contemporary Accounting Research*, *38*(4), 2951-2981.

Chino, A., 2016. Do labor unions affect firm payout policy?: Operating leverage and rent extraction effects. *Journal of Corporate Finance*, *41*, 156-178.

Chu, Y., 2012. Optimal capital structure, bargaining, and the supplier market structure. *Journal of Financial Economics*, *106*(2), 411-426.

Chu, Y., Tian, X. and Wang, W., 2019. Corporate innovation along the supply chain. *Management Science*, *65*(6), 2445-2466.

Cohen, L. and Frazzini, A., 2008. Economic links and predictable returns. *Journal of Finance*, *63*(4), 1977-2011.

DeAngelo, H. and DeAngelo, L., 1990. Dividend policy and financial distress: An empirical investigation of troubled NYSE firms. *Journal of Finance*, *45*(5), 1415-1431.

DeAngelo, H. and DeAngelo, L., 1991. Union negotiations and corporate policy: A study of labor concessions in the domestic steel industry during the 1980s. *Journal of Financial Economics*, *30*(1), 3-43.

DeAngelo, H. and DeAngelo, L., and Skinner, D.J., 2009. Corporate payout policy. *Foundations and Trends in Finance*, *3*(2–3), 95-287.

DiNardo, J. and Lee, D.S., 2004. Economic impacts of new unionization on private sector employers: 1984–2001. *Quarterly Journal of Economics*, *119*(4), 1383-1441.

Fama, E.F. and French, K.R., 1993. Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, *33*(1), 3-56.

Freeman, R.B., 1981. The effect of unionism on fringe benefits. *ILR Review*, *34*(4), 489-509.

Gelman, A. and Imbens, G., 2019. Why high-order polynomials should not be used in regression discontinuity designs. *Journal of Business & Economic Statistics*, *37*(3), 447-456.

He, J., Tian, X., Yang, H. and Zuo, L., 2020. Asymmetric cost behavior and dividend policy. *Journal of Accounting Research*, *58*(4), 989-1021.

Ghaly, M., Kostakis, A. and Stathopoulos, K., 2021. The (non-) effect of labor unionization on firm risk: Evidence from the options market. *Journal of Corporate Finance*, *66*, 101816.

Giroud, X., 2013. Proximity and investment: Evidence from plant-level data. *Quarterly Journal of Economics*, *128*(2), 861-915.

Hennessy, C.A. and Livdan, D., 2009. Debt, bargaining, and credibility in firm–supplier relationships. *Journal of Financial Economics*, *93*(3), 382-399.

Hirsch, B., 1997. Unionization and Economic Performance: Evidence on Productivity, Profits, Investment and Growth, in: F. Mihlar (ed.), *Unions and Right-to-Work Laws: The Global Evidence of Their Impact on Employment*, Fraser Institute, Vancouver British Columbia Canada.

Hirsch, B., 2004. What do unions do for economic performance?. *Journal of Labor Research*, *25*(3), 415-455.

Holmes, T.J., 2006. Geographic spillover of unionism. NBER Working Paper No. 12025.

Huang, Y. and Fan, Y., 2022. Risk along the supply chain: Geographic proximity and corporate risk taking. *Finance Research Letters*, *50*, p.103150.

Imbens, G. and Kalyanaraman, K., 2012. Optimal bandwidth choice for the regression discontinuity estimator. *Review of Economic Studies*, *79*(3), 933-959.

John, K., Knyazeva, A. and Knyazeva, D., 2011. Does geography matter? Firm location and corporate payout policy. *Journal of Financial Economics*, *101*(3), 533-551.

Kang, J.K. and Kim, J.M., 2008. The geography of block acquisitions. *Journal of Finance*, *63*(6), 2817-2858.

Klasa, S., Maxwell, W.F. and Ortiz-Molina, H., 2009. The strategic use of corporate cash holdings in collective bargaining with labor unions. *Journal of Financial Economics*, *92*(3), 421-442.

Kogan, L., Papanikolaou, D., Seru, A. and Stoffman, N., 2017. Technological innovation, resource allocation, and growth. *Quarterly Journal of Economics*, *132*(2), 665-712.

Lee, D.S. and Lemieux, T., 2010. Regression discontinuity designs in economics. *Journal of Economic Literature*, *48*(2), 281-355.

Lee, D.S. and Mas, A., 2012. Long-run impacts of unions on firms: New evidence from financial markets, 1961–1999. *Quarterly Journal of Economics*, *127*(1), 333-378.

Leung, W.S., Li, J. and Sun, J., 2020. Labor unionization and supply-chain partners' performance. *Production and Operations Management*, *29*(5), 1325-1353.

Lewis, H.G., 1986. Union relative wage effects. *Handbook of Labor Economics*, *2*, 1139-1181.

Maksimovic, V. and Titman, S., 1991. Financial policy and reputation for product quality. *Review of Financial Studies*, *4*(1), 175-200.

Matsa, D.A., 2010. Capital structure as a strategic variable: Evidence from collective bargaining. *Journal of Finance*, *65*(3), 1197-1232.

McCrary, J., 2008. Manipulation of the running variable in the regression discontinuity design: A density test. *Journal of Econometrics*, *142*(2), 698-714.

Myers, B.W. and Saretto, A., 2016. Does capital structure affect the behavior of nonfinancial stakeholders? An empirical investigation into leverage and union strikes. *Management Science*, *62*(11), 3235-3253.

Simintzi, E., Vig, V. and Volpin, P., 2015. Labor protection and leverage. *Review of Financial Studies*, *28*(2), 561-591.

Smith, J.D., 2016. US political corruption and firm financial policies. *Journal of Financial Economics*, *121*(2), 350-367.

Titman, S., 1984. The effect of capital structure on a firm's liquidation decision. *Journal of Financial Economics*, *13*(1), 137-151.

Williamson, O.E., 1983. Credible commitments: Using hostages to support exchange. *American Economic Review*, *73*(4), 519-540.

Woods, K., Tan, K.J.K. and Faff, R., 2019. Labor unions and corporate financial leverage: The bargaining device versus crowding-out hypotheses. *Journal of Financial Intermediation*, *37*, 28-44.

Wu, Y., Lee, C.C., Lee, C.C. and Peng, D., 2022. Geographic proximity and corporate investment efficiency: evidence from high-speed rail construction in China. *Journal of Banking and Finance*, *140*, 106510.

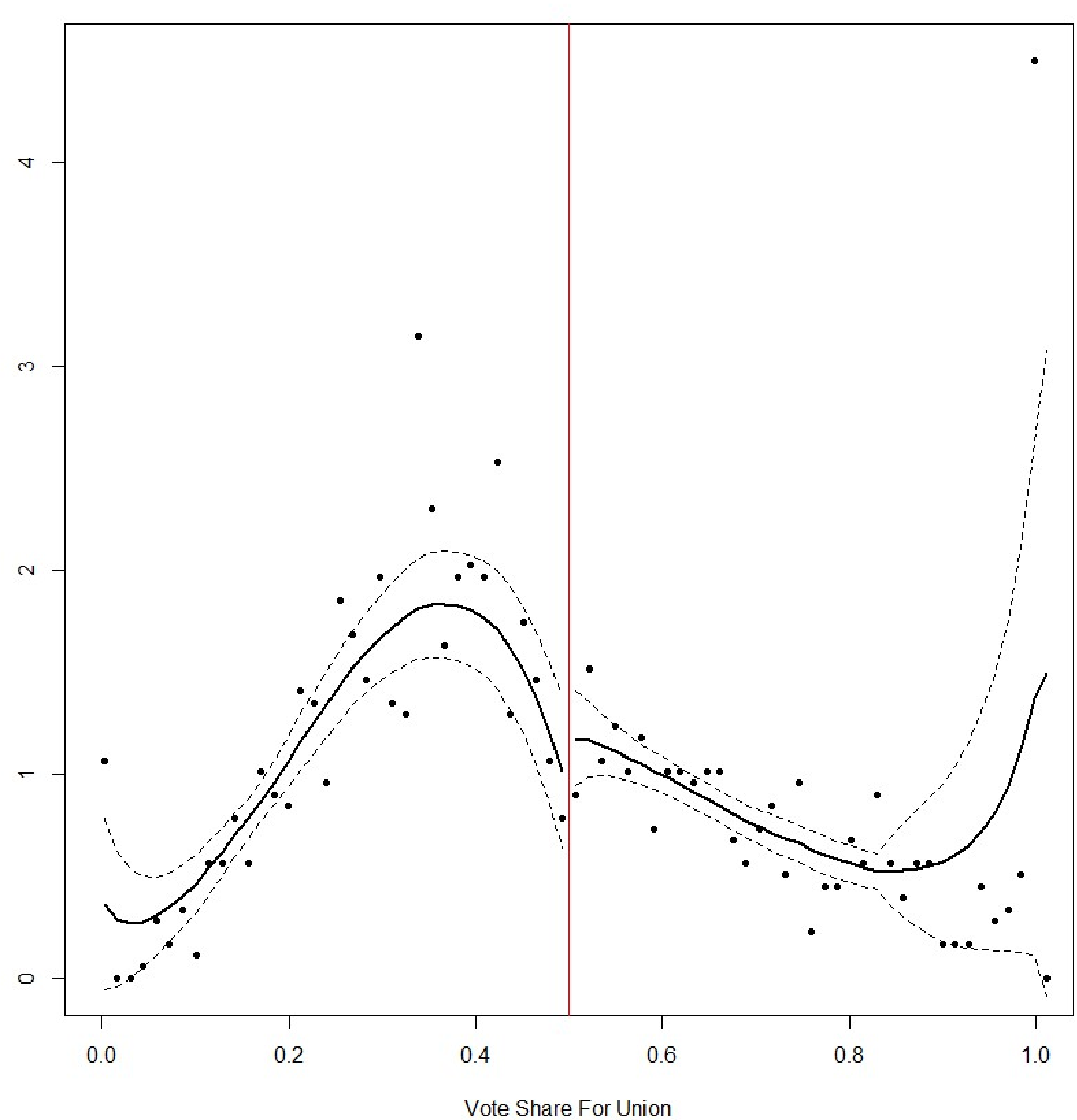

Figure 1
Density of Union Vote Shares

The figure shows the plot of the density distribution of union vote shares using the local linear density estimation around the vote threshold of 0.5, as in McCrary (2008). The dots represent the observed density, the solid curve plots the local linear density estimate, and the 95% confidence bands are indicated by the dotted curves.

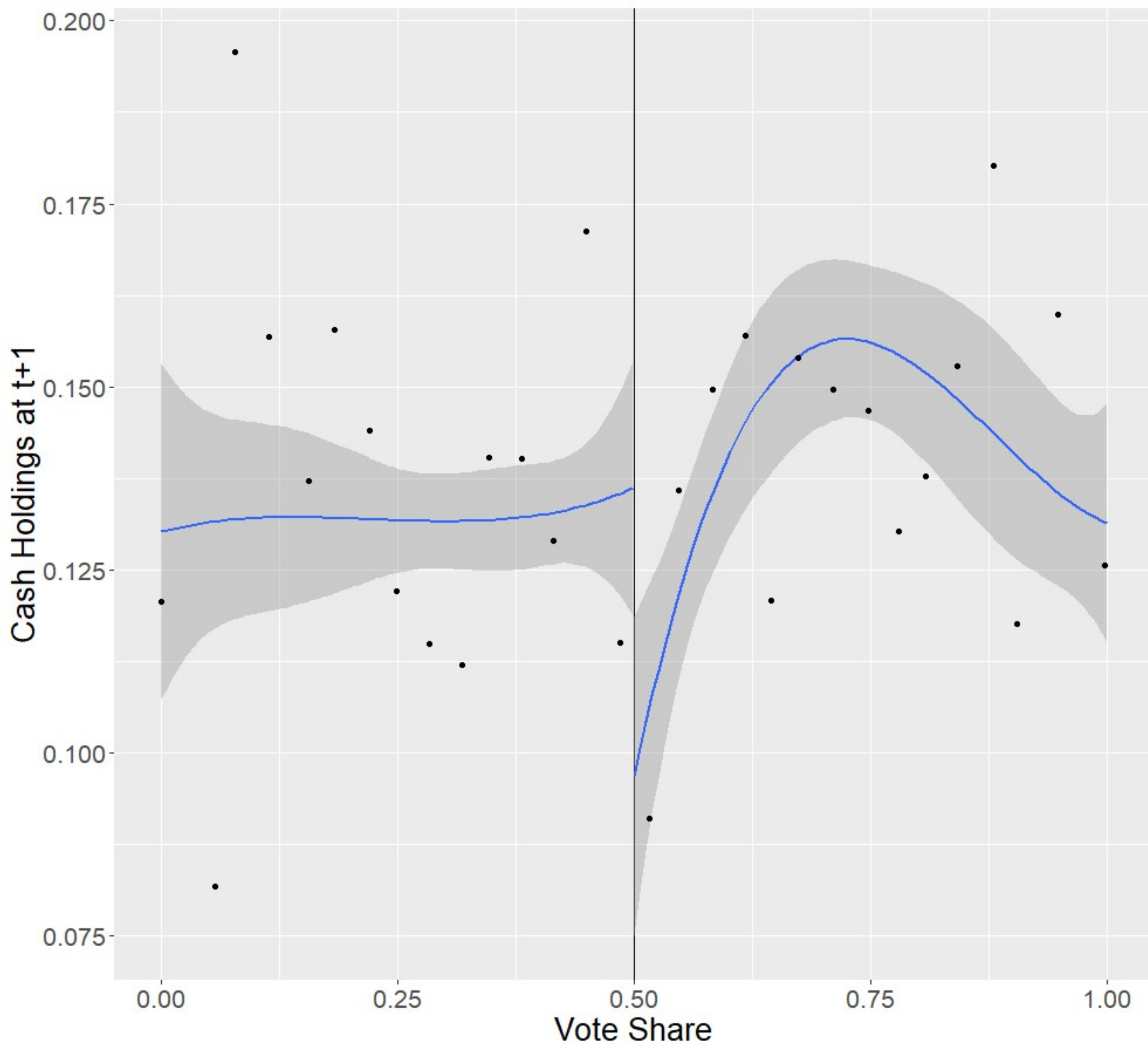

Figure 2
Suppliers' Cash Holdings

The figure shows suppliers' cash holdings one year after customer unionization. The horizontal axis is the vote share for the union. Dots show the average cash holdings for each of 30 equally sized bins of vote share. The solid curve represents the fitted line estimated by the third-order polynomial regression. The shaded area represents 95% confidence intervals of the polynomial estimation.

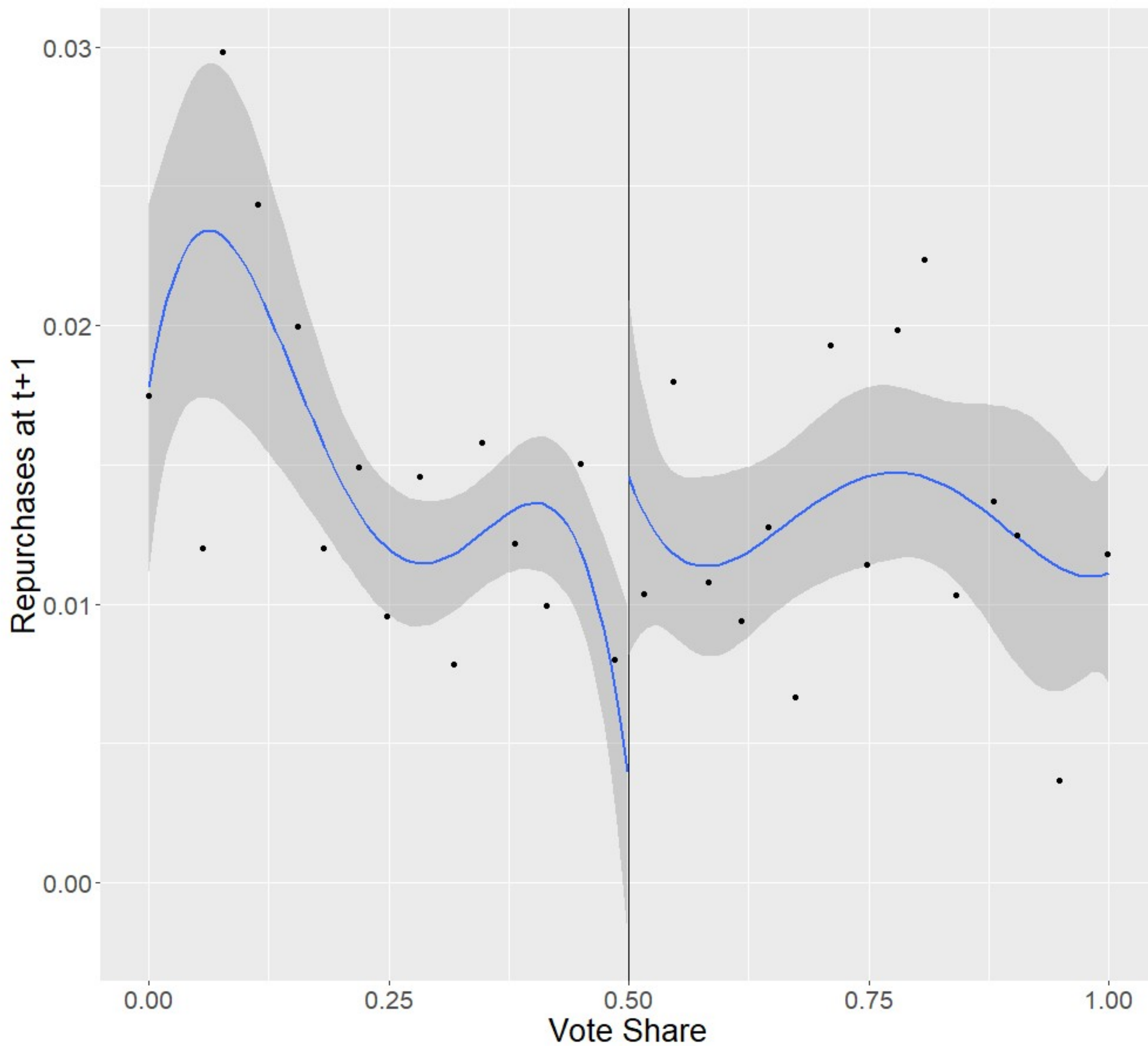

Figure 3
Suppliers' Stock Repurchases

The figure shows suppliers' stock repurchases one year after customer unionization. The horizontal axis is the vote share for the union. Dots show the average stock repurchases for each of 30 equally sized bins of vote share. The solid curve represents the fitted line estimated by the fourth-order polynomial regression. The shaded area represents 95% confidence intervals of the polynomial estimation.

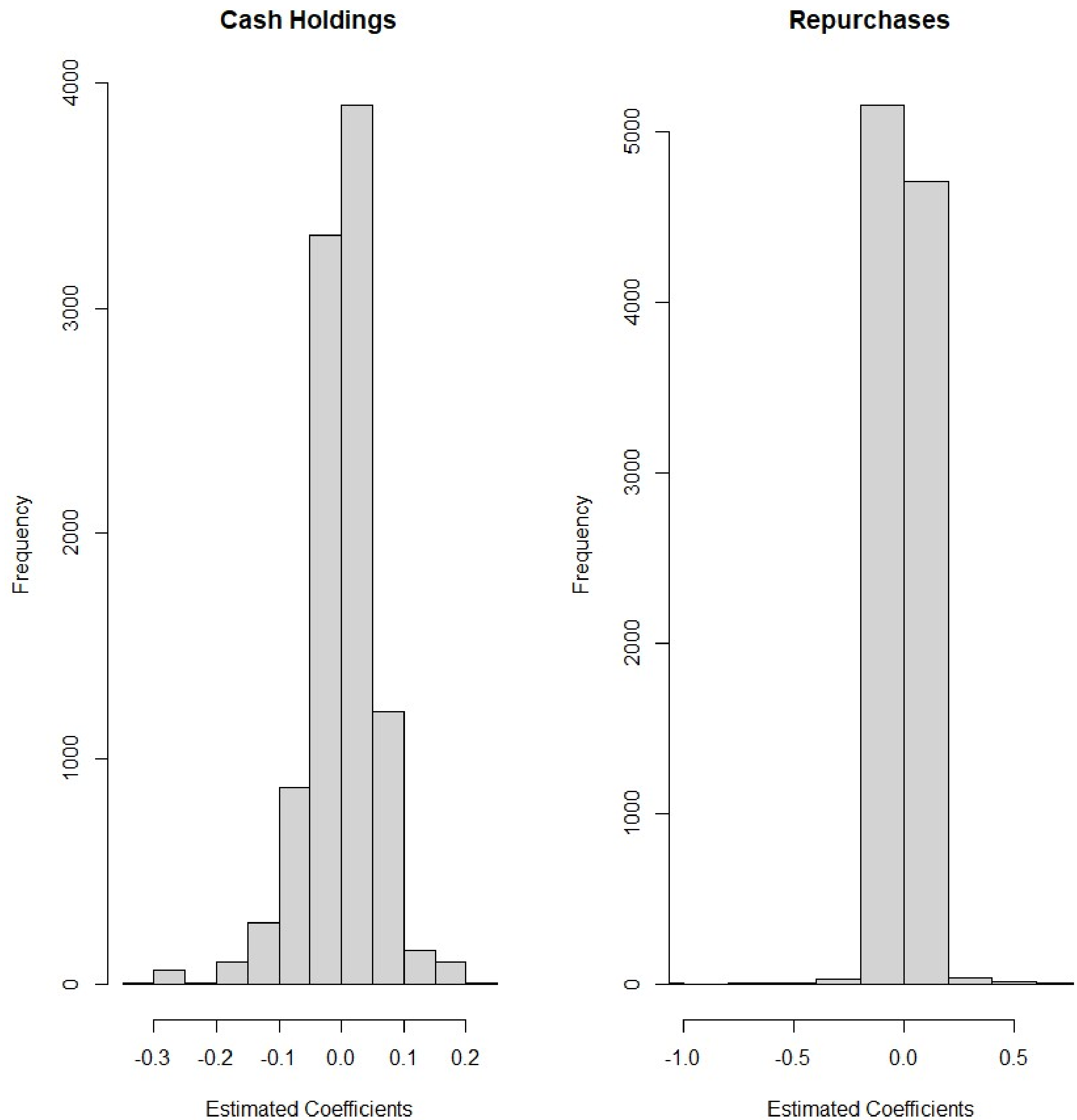

Figure 4
Placebo Test for Cash Holdings and Repurchases

The figure shows histograms of the distribution of the estimated coefficients using local linear RDD models using the Triangular kernel method for cash holdings and repurchases from the placebo tests.

Table 1. Summary Statistics of Union Elections

Statistic	N	Mean	St. Dev.	Quartile 1	Median	Quartile 3
Vote Share	1,269	0.485	0.25	0.303	0.426	0.647
Eligible Votes	1,269	201.52	661.696	23	69	179
Unionization	1,269	0.404	0.491	0	0	1
Customers' Employees ('000)	1,269	118.697	147.258	31	70.2	144

Note: The table reports descriptive statistics of our union election sample. Unionization is a dummy variable that equals 1 if the union wins, and 0 otherwise. The number of customer employees is in the election year.

Table 2. Descriptive Statistics of Dependent and Control Variables

Statistic	N	Mean	St. Dev.	25%	Median	75%
Dependent Variables						
Cash Holdings	7,433	0.134	0.172	0.016	0.061	0.188
Repurchases	7,433	0.013	0.046	0.000	0.000	0.003
COGS/SALE	7,433	0.805	3.588	0.559	0.699	0.796
Operating Margin	7,433	-0.129	4.644	0.041	0.100	0.158
Tobin's Q	6,768	1.740	1.880	1.011	1.282	1.848
Control Variables						
Suppliers						
Profitability	7,433	0.090	0.234	0.057	0.125	0.185
Tangibility	7,433	0.290	0.223	0.116	0.231	0.405
Firm Size	7,433	4.815	2.161	3.268	4.647	6.310
Capital Investment	7,433	0.069	0.079	0.023	0.046	0.086
Efficiency	7,433	0.877	5.601	0.557	0.697	0.789
R&D	7,433	0.043	0.103	0.000	0.004	0.044
Suppliers' HHI	7,433	0.073	0.072	0.036	0.057	0.076
Customers						
Profitability	7,433	0.136	0.056	0.095	0.134	0.168
Tangibility	7,433	0.343	0.182	0.204	0.336	0.484
Firm Size	7,433	10.481	1.353	9.706	10.517	11.395
Capital Investment	7,433	0.071	0.043	0.035	0.067	0.097
Efficiency	7,433	0.737	0.136	0.683	0.77	0.830
R&D	7,433	0.020	0.024	0.000	0.008	0.036
Customers' HHI	7,433	0.094	0.072	0.054	0.073	0.103

Note: The table reports summary statistics of the variables of interest in our samples including dependent variables measured one year after the union election at the customer firm, and supplier and customer firm characteristics measured one year before the election. Table A1 defines the variables.

Table 3. Nonparametric Local-Linear RDD Estimates of Suppliers' Cash Holdings

	(1)	(2)	(3)	(4)
Optimal Bandwidth	-0.033**	-0.030***	-0.029*	-0.024***
	(0.016)	(0.008)	(0.016)	(0.009)
Observations	1747	1747	1524	1524
75% Optimal Bandwidth	-0.032*	-0.041***	-0.035*	-0.061***
	(0.018)	(0.009)	(0.018)	(0.010)
Observations	1260	1260	1110	1110
125% Optimal Bandwidth	-0.044***	-0.033***	-0.048***	-0.030***
	(0.015)	(0.007)	(0.015)	(0.010)
Observations	2288	2288	1888	1888
Supplier Control	No	Yes	No	Yes
Customer Control	No	Yes	No	Yes
Industry Dummies	No	Yes	No	Yes
Year Dummies	No	Yes	No	Yes
Kernel Distribution	Triangular	Triangular	Uniform	Uniform
Optimal Bandwidth	0.090	0.090	0.077	0.077
75% Optimal Bandwidth	0.068	0.068	0.058	0.058
125% Optimal Bandwidth	0.113	0.113	0.096	0.096

Note: The table reports nonparametric local linear RDD regression models in which the dependent variable is suppliers' *Cash Holdings* measured at the end of the first year after the union election at the customer firm. We estimate the optimal bandwidths using the data-driven method of Calonico, Cattaneo, and Farrell (2020). Supplier and Customer controls include *Profitability*, *Tangibility*, *Firm Size*, *Capital Investment*, *Efficiency*, and *R&D Investment* all measured one year before the election year. Table A.1 in the Appendix shows variable definitions and data sources. Industry dummies are based on the Fama-French 48-industry classification. Some models include supplier controls, customer controls, year dummies, and industry dummies. Industry-clustered robust standard errors are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 4. Nonparametric Local-Linear RDD Estimates of Suppliers' Repurchases

	(1)	(2)	(3)	(4)
Optimal Bandwidth	0.004	0.005**	0.006*	0.005*
	(0.003)	(0.002)	(0.003)	(0.003)
Observations	1566	1566	1885	1885
75% Optimal Bandwidth	0.003	0.008***	0.006*	0.005*
	(0.003)	(0.003)	(0.004)	(0.003)
Observations	1175	1175	1303	1303
125% Optimal Bandwidth	0.003	0.005**	0.004	0.007***
	(0.003)	(0.002)	(0.003)	(0.003)
Observations	2147	2147	2386	2386
Supplier Control	No	Yes	No	Yes
Customer Control	No	Yes	No	Yes
Industry Dummies	No	Yes	No	Yes
Year Dummies	No	Yes	No	Yes
Kernel Distribution	Triangular	Triangular	Uniform	Uniform
Optimal Bandwidth	0.083	0.083	0.095	0.095
75% Optimal Bandwidth	0.062	0.062	0.071	0.071
125% Optimal Bandwidth	0.104	0.104	0.119	0.119

Note: The table reports nonparametric local linear global RDD regression models in which the dependent variable is *Repurchases* measured at the end of the first year after the union election at the customer firm. We estimate the optimal bandwidths using the data-driven method of Calonico, Cattaneo, and Farrell (2020). Supplier and Customer controls include *Profitability*, *Tangibility*, *Firm Size*, *Capital Investment*, *Efficiency*, and *R&D Investment* all measured one year before the election year. Table A.1 in the Appendix shows variable definitions and data sources. Industry dummies are based on the Fama-French 48-industry classification. Some models include supplier controls, customer controls, year dummies, and industry dummies. Industry-clustered robust standard errors are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 5. Unionization and Supplier-Customer Relationship Duration

	Cash Holdings		Repurchases	
	Long	Short	Long	Short
Unionization	0.009	-0.068***	-0.011***	0.011***
	(0.011)	(0.013)	(0.002)	(0.004)
Observations	975	772	863	703
Kernel	Triangular	Triangular	Triangular	Triangular
Optimal Bandwidth	0.090	0.090	0.083	0.083
Supplier Controls	Yes	Yes	Yes	Yes
Customer Controls	Yes	Yes	Yes	Yes
Industries Dummies	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes

Note: The table reports nonparametric local linear RDD regression models for subsamples with long (i.e., above the sample median) and short (i.e., below median) duration of the relationship between suppliers and customers. The dependent variables are *Cash Holdings* and *Repurchases* measured in the first year after the elections. The optimal bandwidths (h = 0.090 for models of Cash Holdings and h = 0.083 for models of Repurchases) are estimated using the data-driven method of Calonico, Cattaneo, and Farrell (2020), as in column 2 of Tables 3 & 4. The triangular kernel distribution is used for the models in this table. Supplier and Customer controls include *Profitability*, *Tangibility*, *Firm Size*, *Capital Investment*, *Efficiency*, and *R&D Investment* all measured one year prior to the year of elections. Table A.1 in the Appendix shows variable definitions and data sources. Industry dummies are based on the Fama-French 48-industry classification. Industry-clustered robust standard errors are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 6. Unionization and Supplier-Customer Distance

	Cash Holdings		Repurchases	
	Far	Nearby	Far	Nearby
Unionization	-0.022	-0.033***	-0.009	0.012***
	(0.017)	(0.011)	(0.006)	(0.003)
Observations	604	812	540	726
Kernel	Triangular	Triangular	Triangular	Triangular
Optimal Bandwidth	0.090	0.090	0.083	0.083
Supplier Controls	Yes	Yes	Yes	Yes
Customer Controls	Yes	Yes	Yes	Yes
Industries Dummies	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes

Note: The table reports nonparametric local linear RDD regression models for subsamples of suppliers whose unionizing customer is located far (i.e., above-median distance) or nearby (i.e., below-median distance), based on the geographic distance between them. The dependent variables are *Cash Holdings* and *Repurchases* measured in the first year after the elections. The optimal bandwidths (h = 0.090 for models of Cash Holdings and h = 0.083 for models of Repurchases) are estimated using the data-driven method of Calonico, Cattaneo, and Farrell (2020), as in column 2 of Tables 3 & 4. The triangular kernel distribution is used for the models in this table. Supplier and Customer controls include *Profitability*, *Tangibility*, *Firm Size*, *Capital Investment*, *Efficiency*, and *R&D Investment* all measured one year prior to the year of elections. Table A.1 in the Appendix shows variable definitions and data sources. Industry dummies are based on the Fama-French 48-industry classification. Industry-clustered robust standard errors are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 7. Unionization and Supplier Specificity

	Cash Holdings		Repurchases	
	High	**Low**	**High**	**Low**
Unionization	0.024**	-0.050***	0.000	0.005
	(0.010)	(0.012)	(0.003)	(0.004)
Observations	676	1071	612	954
Kernel	Triangular	Triangular	Triangular	Triangular
Optimal Bandwidth	0.090	0.090	0.083	0.083
Supplier Controls	Yes	Yes	Yes	Yes
Customer Controls	Yes	Yes	Yes	Yes
Industries Dummies	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes

Note: The table reports nonparametric local linear RDD regression models for subsamples partitioned by Supplier Specificity, which is classified as High (Low), if the number of eventually granted patents applied for by the supplier during the three years before the customer union election is greater (equal or less) than the sample median. The dependent variables are *Cash Holdings* and *Repurchases* measured in the first year after the election. The optimal bandwidths (h = 0.090 for models of Cash Holdings and h = 0.083 for models of Repurchases) are estimated using the data-driven method of Calonico, Cattaneo, and Farrell (2020), as in column 2 of Tables 3 and 4. The triangular kernel distribution is used for the models in this table. Supplier and Customer controls include *Profitability*, *Tangibility*, *Firm Size*, *Capital Investment*, *Efficiency*, and *R&D Investment*, all measured one year before the election year. Table A.1 in the Appendix shows variable definitions and data sources. Industry dummies are based on the Fama-French 48-industry classification. Industry-clustered robust standard errors are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 8. Unionization and Customer Share

	Cash Holdings		Repurchases	
	Big	**Small**	**Big**	**Small**
Unionization	-0.051***	-0.013	0.002	0.004
	(0.011)	(0.010)	(0.003)	(0.003)
Observations	891	856	792	774
Kernel	Triangular	Triangular	Triangular	Triangular
Optimal Bandwidth	0.090	0.090	0.083	0.083
Supplier Controls	Yes	Yes	Yes	Yes
Customer Controls	Yes	Yes	Yes	Yes
Industries Dummies	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes

Note: The table reports nonparametric local linear RDD regression models for subsamples partitioned by Customer Share, which is classified as Big (Small) if the percentage of a supplier's sales to the unionizing customer is bigger (equal to or smaller) than the sample median. The dependent variables are *Cash Holdings* and *Repurchases* measured in the first year after the election. The optimal bandwidths (h = 0.090 for models of Cash Holdings and h = 0.083 for models of Repurchases) are estimated using the data-driven method of Calonico, Cattaneo, and Farrell (2020), as in column 2 of Tables 3 and 4. The triangular kernel distribution is used for the models in this table. Supplier and Customer controls include *Profitability*, *Tangibility*, *Firm Size*, *Capital Investment*, *Efficiency*, and *R&D Investment* all measured one year prior to the year of elections. Table A.1 in the Appendix shows variable definitions and data sources. Industry dummies are based on the Fama-French 48-industry classification. Industry-clustered robust standard errors are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 9. Unionization and Customer Market Concentration

	Cash Holdings		Repurchases	
	High	**Low**	**High**	**Low**
Unionization	-0.068***	-0.034***	-0.014	-0.001
	(0.013)	(0.010)	(0.011)	(0.002)
Observations	752	995	666	900
Kernel	Triangular	Triangular	Triangular	Triangular
Optimal Bandwidth	0.090	0.090	0.083	0.083
Supplier Controls	Yes	Yes	Yes	Yes
Customer Controls	Yes	Yes	Yes	Yes
Industries Dummies	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes

Note: The table reports nonparametric local linear RDD regression models for subsamples by Customer Market Concentration, which is classified as High (Low), if the customer HHI is higher (equal to or lower) than the sample median. The dependent variables are *Cash Holdings* and *Repurchases* measured in the first year after the elections. The optimal bandwidths (h = 0.090 for models of Cash Holdings and h = 0.083 for models of Repurchases) are estimated using the data-driven method of Calonico, Cattaneo, and Farrell (2020), as in column 2 of Tables 3 and 4. The triangular kernel distribution is used for the models in this table. Supplier and Customer controls include *Profitability*, *Tangibility*, *Firm Size*, *Capital Investment*, *Efficiency*, and *R&D Investment* all measured one year prior to the year of elections. Table A.1 in the Appendix shows variable definitions and data sources. Industry dummies are based on the Fama-French 48-industry classification. Industry-clustered robust standard errors are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 10. Unionization and Supplier Performance

	Operating Margin		COGS/Sale		Tobin's Q	
Optimal Bandwidth	0.454	0.015	-0.382	0.142	-0.140	-0.243
	(0.282)	(0.041)	(0.270)	(0.218)	(0.131)	(0.152)
Observations	1296	981	1546	3013	2179	1495
75% Optimal Bandwidth	0.030	0.032	-0.482**	-0.091	-0.232*	-0.225
	(0.027)	(0.028)	(0.209)	(0.119)	(0.140)	(0.178)
Observations	1031	808	1116	2253	1569	1114
125% Optimal Bandwidth	0.334	0.605	-0.286	0.109	-0.113	-0.153
	(0.255)	(0.478)	(0.203)	(0.249)	(0.100)	(0.130)
Observations	1694	1202	2090	3807	2818	2037
Supplier Control	Yes	Yes	Yes	Yes	Yes	Yes
Customer Control	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Kernel Distribution	Triangular	Uniform	Triangular	Uniform	Triangular	Uniform
Optimal Bandwidth	0.070	0.051	0.080	0.144	0.120	0.087
75% Optimal Bandwidth	0.053	0.038	0.060	0.108	0.090	0.065
125% Optimal Bandwidth	0.088	0.064	0.100	0.180	0.150	0.109

Note: The table reports nonparametric local linear models for suppliers' performance. The dependent variables are O*perating Margin, COGS/Sales,* and *Tobin's Q* measured in the first year after the elections. The optimal bandwidths are estimated using the data-driven method of Calonico, Cattaneo, and Farrell (2020). The triangular and uniform kernel distributions are used for the models in this table. Supplier and Customer controls include *Firm Size*, *Tangibility*, *Profitability*, *Capital Investment*, *Efficiency*, and *R&D Investment* all measured one year prior to the year of elections. Table A.1 in the Appendix shows variable definitions and data sources. Industry dummies are based on the Fama-French 48-industry classification. Industry-clustered robust standard errors are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Appendix

Table A.1 Variable Definitions

Variables	Variable Code	Sources
Dependent Variables		
Cash Holdings	Che/at	Compustat
Repurchases	Prstkc/at	Compustat
Profitability	Ebitda/at	Compustat
Tangibility	Ppent/at	Compustat
Firm Size	Log(at)	Compustat
Capital Investment	Capx/at	Compustat
Efficiency	Cogs/at	Compustat
R&D Investment	Max(xrd,0)/at	Compustat
Operating Margin	Oibdp/sale	Compustat
Tobin's Q	(at + prcc*csho-(seq+txdb+itcb-pstk))/at	Compustat
HHI	The sum of squared market share within each 2-digit SIC industry.	Compustat
Specificity	The number of eventually granted patents applied for during the 3 years before the union election	Kogan et al (2017)
Union Variables		
Unionization	a dummy variable, equal 1 if a labor union is certified and 0 otherwise.	NLRB Thomas J. Homes' Website National Archive Catalog
Vote Share	votes for unions/total votes cast	NLRB Thomas J. Homes' Website National Archive Catalog

Note: The table shows variable definitions and data sources.

Table A.2 Election Distributions Over Different Levels of Vote Share

Range		Vote Share			No. Elections	Avg. Eligible Votes	Affecting	
>	≤	Mean	Min	Max			No. Customers	No. Suppliers
0	0.1	0.036	0	0.1	36	63.44	35	218
0.1	0.2	0.159	0.108	0.2	89	348.9	71	368
0.2	0.3	0.256	0.202	0.3	190	230.8	119	414
0.3	0.4	0.354	0.301	0.4	248	233.4	138	777
0.4	0.5	0.443	0.402	0.5	195	201	113	952
0.5	0.6	0.549	0.502	0.6	139	262.5	93	801
0.6	0.7	0.649	0.601	0.7	113	94.49	83	523
0.7	0.8	0.752	0.703	0.8	78	70	59	399
0.8	0.9	0.851	0.808	0.9	67	43.36	51	332
0.9	1	0.987	0.909	1	114	239.16	69	327
				Total	1,269	201.52		

Note: The table reports the distribution of 1,269 union elections in customer firms in our full sample over 10 ranges of Vote Shares. It also shows the numbers of affected customers and affected suppliers in each range of vote share.

Table A.3. Distribution of Union Elections Over the Years

Year	No. Elections	Avg. Vote Share	Avg. Eligible Votes	No. Customers	No. Suppliers
1979	6	0.449	447.500	6	17
1980	28	0.456	178.179	28	179
1981	1	0.320	457.000	1	33
1983	14	0.542	52.000	14	107
1984	31	0.514	273.677	31	176
1985	35	0.415	147.743	35	268
1986	32	0.463	145.625	32	187
1987	29	0.454	194.552	29	193
1988	32	0.455	360.844	32	202
1989	44	0.496	334.318	44	235
1990	34	0.474	126.088	34	242
1991	33	0.478	362.061	33	230
1992	36	0.402	143.167	36	229
1993	51	0.443	265.451	51	302
1994	50	0.458	210.020	50	342
1995	50	0.404	210.900	50	310
1996	59	0.427	196.492	59	284
1997	55	0.463	191.745	55	360
1998	41	0.500	270.024	41	186
1999	41	0.378	232.390	41	214
2000	45	0.514	256.733	45	242
2001	49	0.473	518.837	49	272
2002	45	0.488	219.467	45	192
2003	48	0.447	144.125	48	180
2004	45	0.463	153.467	45	191
2005	32	0.464	91.094	32	184
2006	29	0.659	92.517	29	119
2007	24	0.507	83.292	24	120
2008	30	0.552	77.767	30	108
2009	21	0.504	120.333	21	102
2010	30	0.527	111.300	30	137
2011	23	0.486	131.913	23	85
2012	15	0.601	118.333	15	73
2013	16	0.559	105.125	16	53
2014	21	0.594	340.143	21	62
2015	14	0.692	44.071	14	39
2016	17	0.607	62.588	17	65
2017	14	0.633	103.071	14	43
2018	16	0.546	116.375	16	41
2019	17	0.630	79.529	17	48
2020	14	0.609	100.143	14	36
2021	2	0.436	49.500	2	2

Note: The table reports the distribution of 1,269 union elections in customer firms by year. It also reports the average vote share, average eligible votes, and the number of affected customers and suppliers for each year.

Table A.4. Industry Distribution of Customers and Suppliers

Fama-French 12	Industries	No. Customer	%	No. Suppliers	%
1	Consumer Nondurables	27	8.23%	237	10.87%
2	Consumer Durables	23	7.01%	149	6.83%
3	Manufacturing	53	16.16%	379	17.38%
4	Energy, Oil, Gas, and Coal Extraction and Products	24	7.32%	187	8.57%
5	Chemicals and Allied Products	18	5.49%	53	2.43%
6	Business Equipment	21	6.40%	531	24.35%
7	Telephone and Television Transmission	32	9.76%	81	3.71%
9	Wholesale, Retail, and Some Services	76	23.17%	113	5.18%
10	Healthcare, Medical Equipment, and Drugs	20	6.10%	181	8.30%
12	Other	34	10.37%	270	12.38%
Total		328		2,181	

Note: This table shows the distributions of 328 unique customer firms and 2,181 unique suppliers in our sample by the Fama-French 12 industry sectors, excluding the finance and utility industries.

Table A.5. Global Polynomial RDD Estimates of Suppliers' Cash Holdings

	Dependent variable:								
	Cash Holdings								
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Unionization	-0.003	0.008	0.003	-0.028***	-0.022***	-0.017***	-0.039***	-0.041***	-0.021***
	(0.010)	(0.007)	(0.006)	(0.008)	(0.006)	(0.006)	(0.011)	(0.009)	(0.007)
Vote Margin	0.007	0.023	0.026	0.019	0.136***	0.128**	0.056	0.288**	0.148
	(0.029)	(0.020)	(0.018)	(0.079)	(0.049)	(0.051)	(0.195)	(0.135)	(0.134)
Vote Margin^2				0.026	0.250***	0.232**	0.220	1.039	0.332
				(0.142)	(0.089)	(0.097)	(0.912)	(0.674)	(0.636)
Vote Margin^3							0.261	1.066	0.134
							(1.229)	(0.932)	(0.834)
Unionization* Vote Margin	0.023	-0.029	-0.034	0.335**	0.132	0.031	0.561	0.336	0.095
	(0.032)	(0.023)	(0.023)	(0.167)	(0.110)	(0.086)	(0.405)	(0.326)	(0.306)
Unionization* Vote Margin^2				-0.650***	-0.779***	-0.555***	-2.164	-3.350***	-1.072
				(0.217)	(0.166)	(0.128)	(1.425)	(0.949)	(0.704)
Unionization* Vote Margin^3							1.435	1.224	0.402
							(2.370)	(1.835)	(1.768)
Constant	0.134***	0.274***	0.274***	0.135***	0.288***	0.291***	0.136***	0.291***	0.292***
	(0.015)	(0.038)	(0.023)	(0.015)	(0.039)	(0.025)	(0.016)	(0.037)	(0.025)
Supplier Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Customer Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year Dummies	No	No	Yes	No	No	Yes	No	No	Yes
Industry Dummies	No	No	Yes	No	No	Yes	No	No	Yes
Observations	7,433	7,433	7,433	7,433	7,433	7,433	7,433	7,433	7,433
Adjusted R^2	0.0002	0.237	0.324	0.002	0.239	0.324	0.002	0.239	0.324

Note: The table reports the first-, second-, and third- order global polynomial RDD models in which the dependent variable is *Cash Holdings* measured at the first year after the election. *Unionization* is a dummy variable, which equals 1 if a union wins the election, and 0 otherwise. Vote Margin is the Vote Share for unionization from the cutoff point of 0.5. Supplier and Customer controls include *Profitability, Tangibility, Firm Size, Capital Investment, Efficiency,* and *R&D Investment* all measured one year prior to the election year. Table A.1 in the Appendix shows variable definitions and data sources. Industry dummies are based on the Fama-French 48-industry classification. Some models include supplier controls, customer controls, year dummies, and industry dummies. Industry-clustered robust standard errors are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table A.6. Global Polynomial RDD Estimates of Suppliers' Repurchases

	Dependent variable:								
	Repurchases								
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Unionization	0.003*	0.002	0.002	0.002	0.001	0.002	0.004	0.003	0.004
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)
Vote Margin	-0.017***	-0.012**	-0.010	-0.014	-0.001	-0.008	-0.043	-0.015	0.015
	(0.007)	(0.006)	(0.006)	(0.014)	(0.018)	(0.017)	(0.038)	(0.038)	(0.040)
Vote Margin^2				0.007	0.024	0.004	-0.146	-0.045	0.127
				(0.028)	(0.033)	(0.035)	(0.190)	(0.178)	(0.194)
Vote Margin^3							-0.207	-0.093	0.169
							(0.255)	(0.234)	(0.253)
Unionization* Vote Margin	0.016*	0.009	0.001	0.032	0.011	0.001	0.024	-0.038	-0.097*
	(0.009)	(0.009)	(0.009)	(0.028)	(0.030)	(0.030)	(0.052)	(0.049)	(0.052)
Unionization* Vote Margin^2				-0.045	-0.049	-0.008	0.297	0.334	0.247
				(0.058)	(0.056)	(0.058)	(0.295)	(0.272)	(0.273)
Unionization* Vote Margin^3							-0.035	-0.312	-0.651**
							(0.351)	(0.302)	(0.303)
Constant	0.010***	0.016*	0.092	0.010***	0.017*	0.092	0.009***	0.017*	0.093
	(0.002)	(0.009)	(0.061)	(0.002)	(0.009)	(0.061)	(0.002)	(0.009)	(0.062)
Supplier controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Customer controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year Dummies	No	No	Yes	No	No	Yes	No	No	Yes
Industry Dummies	No	No	Yes	No	No	Yes	No	No	Yes
Observations	7,433	7,433	7,433	7,433	7,433	7,433	7,433	7,433	7,433
Adjusted R^2	0.001	0.030	0.055	0.001	0.029	0.055	0.001	0.029	0.055

Note: The table reports the first-, second-, and third- order global polynomial RDD models in which the dependent variable is *Repurchases* measured at the first year after the election elections. Unionization is a dummy variable, which equals 1 if a union wins the election and 0 otherwise. Vote Margin is the vote share for unionization from the cutoff point of 0.5. Supplier and Customer controls include *Profitability*, *Tangibility*, *Firm Size*, *Capital Investment*, *Efficiency*, and *R&D Investment*, all measured one year prior to the election year. Table A.1 in the Appendix shows variable definitions and data sources. Industry dummies are based on the Fama-French 48-industry classification. Some models include supplier controls, customer controls, year dummies, and industry dummies. Industry-clustered standard errors are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A.7 Continuity Test of Pre-determined Outcomes and Covariates

	Cash Holdings Models		Repurchases Models	
Suppliers'	**Triangular**	**Uniform**	**Triangular**	**Uniform**
Cash Holdings$_{(t-1)}$	-0.021 (0.015)	-0.028 (0.017)		
Repurchases$_{(t-1)}$			0.005 (0.004)	0.001 (0.004)
Profitability$_{(t-1)}$	0.004 (0.011)	-0.005 (0.011)	0.006 (0.011)	0.000 (0.010)
Tangibility$_{(t-1)}$	-0.012 (0.012)	-0.005 (0.014)	-0.013 (0.012)	-0.013 (0.012)
Firm Size$_{(t-1)}$	-0.062 (0.162)	-0.115 (0.176)	-0.058 (0.166)	-0.057 (0.154)
Capital Investment$_{(t-1)}$	-0.009* (0.005)	-0.012* (0.007)	-0.008* (0.005)	-0.012* (0.007)
Efficiency$_{(t-1)}$	-0.436 (0.266)	-0.488 (0.356)	-0.438* (0.279)	-0.416 (0.531)
R&D Investment$_{(t-1)}$	-0.011 (0.011)	-0.010 (0.011)	-0.012 (0.011)	-0.001 (0.004)
Customers'				
Profitability$_{(t-1)}$	-0.002 (0.003)	0.002 (0.003)	-0.003 (0.003)	-0.002 (0.003)
Tangibility$_{(t-1)}$	0.009 (0.012)	0.017 (0.015)	0.017 (0.012)	0.003 (0.009)
Firm Size$_{(t-1)}$	-0.130 (0.081)	-0.063 (0.096)	-0.080 (0.080)	-0.247** (0.123)
Capital Investment$_{(t-1)}$	0.001 (0.002)	-0.002 (0.002)	0.002 (0.002)	-0.002 (0.003)
Efficiency$_{(t-1)}$	0.001 (0.007)	0.015 (0.010)	-0.005 (0.007)	0.010 (0.008)
R&D Investment$_{(t-1)}$	0.001 (0.001)	0.000 (0.001)	0.002 (0.001)	0.004** (0.002)
Optimal Bandwidths	**0.090**	**0.077**	**0.083**	**0.095**

Note: This table reports the continuity test for the pre-determined outcomes and covariates at the optimal bandwidths for the models in Tables 3 & 4. We estimate the pre-determined outcomes and covariates one-by-one using nonparametric local linear models. Industry-clustered robust standard errors are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table A.8 Cash Holdings Models with Imbens and Kalyanaraman (2012) Method

	(1)	(2)	(3)	(4)
Optimal Bandwidth	-0.040***	-0.027***	-0.041***	-0.026***
	(0.014)	(0.006)	(0.014)	(0.008)
Observations	5338	5338	4143	4143
75% Optimal Bandwidth	-0.049***	-0.026***	-0.070***	-0.025***
	(0.015)	(0.006)	(0.010)	(0.007)
Observations	3991	3991	3153	3153
125% Optimal Bandwidth	-0.039***	-0.026***	-0.037***	-0.025***
	(0.014)	(0.005)	(0.009)	(0.006)
Observations	6024	6024	5234	5234
Supplier Control	No	Yes	No	Yes
Customer Control	No	Yes	No	Yes
Industry Dummies	No	Yes	No	Yes
Year Dummies	No	Yes	No	Yes
Kernel Distribution	Triangular	Triangular	Uniform	Uniform
Optimal Bandwidth	0.262	0.262	0.206	0.206
75% Optimal Bandwidth	0.197	0.197	0.155	0.155
125% Optimal Bandwidth	0.328	0.328	0.258	0.258

Note: The table reports nonparametric local linear RDD regression models in which the dependent variable is *Cash Holdings* measured at the first year after the election elections. We estimate the optimal bandwidths using the data-driven method of Imbens and Kalyanaraman (2012). Supplier and Customer controls include *Profitability*, *Tangibility*, *Firm Size*, *Capital Investment*, *Efficiency*, and *R&D Investment* all measured in the election year. Table A.1 in the Appendix shows variable definitions and data sources. Industry dummies are based on the Fama-French 48-industry classification. Some models include supplier controls, customer controls, year dummies, and industry dummies. Industry-clustered robust standard errors are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table A.9 Repurchase Models with Imbens and Kalyanaraman (2012) Method

	Model 1	Model 2	Model 3	Model 4
Optimal Bandwidth	0.005**	0.004**	0.007***	0.005**
	(0.002)	(0.002)	(0.002)	(0.002)
Observations	6688	6688	6023	6023
75% Optimal Bandwidth	0.007**	0.007***	0.007**	0.007***
	(0.003)	(0.002)	(0.003)	(0.002)
Observations	5858	5858	4834	4834
125% Optimal Bandwidth	0.003	0.002	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.002)
Observations	7433	7433	6679	6679
Supplier Control	No	Yes	No	Yes
Customer Control	No	Yes	No	Yes
Industry Dummies	No	Yes	No	Yes
Year Dummies	No	Yes	No	Yes
Kernel Distribution	Triangular	Triangular	Uniform	Uniform
Optimal Bandwidth	0.417	0.417	0.327	0.327
75% Optimal Bandwidth	0.313	0.313	0.245	0.245
125% Optimal Bandwidth	0.521	0.521	0.409	0.409

Note: The table reports nonparametric local linear RDD regression models in which the dependent variable is *Repurchases* measured at the first year after the union elections. We estimate the optimal bandwidths using the data-driven method of Imbens and Kalyanaraman (2012). Supplier and Customer controls include *Profitability*, *Tangibility*, *Firm Size*, *Capital Investment*, *Efficiency*, and *R&D Investment* all measured in the election year. Table A.1 in the Appendix shows variable definitions and data sources. Industry dummies are based on the Fama-French 48-industry classification. Some models include supplier controls, customer controls, year dummies, and industry dummies. Industry-clustered robust standard errors are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table A.10 Cash Holdings Excluding Crisis Years

	Model 1	Model 2	Model 3	Model 4
Optimal Bandwidth	-0.033**	-0.031***	-0.033**	-0.031***
	(0.016)	(0.008)	(0.016)	(0.009)
Observations	1601	1601	1413	1413
75% Optimal Bandwidth	-0.051***	-0.042***	-0.045**	-0.065***
	(0.018)	(0.009)	(0.018)	(0.010)
Observations	1179	1179	1045	1045
125% Optimal Bandwidth	-0.045***	-0.026***	-0.047***	-0.022**
	(0.015)	(0.008)	(0.015)	(0.010)
Observations	2129	2129	1741	1741
Supplier Control	No	Yes	No	Yes
Customer Control	No	Yes	No	Yes
Industry Dummies	No	Yes	No	Yes
Year Dummies	No	Yes	No	Yes
Kernel Distribution	Triangular	Triangular	Uniform	Uniform
Optimal Bandwidth	0.090	0.090	0.077	0.077
75% Optimal Bandwidth	0.068	0.068	0.058	0.058
125% Optimal Bandwidth	0.113	0.113	0.096	0.096

Note: The table reports nonparametric local linear RDD regression models using the sample without the crisis years. The dependent variable is *Cash Holdings* measured in the first year after the election elections. We estimate the optimal bandwidths using the data-driven method of Calonico, Cattaneo, and Farrell (2020). Supplier and Customer controls include *Profitability*, *Tangibility*, *Firm Size*, *Capital Investment*, *Efficiency*, and *R&D Investment* all measured in the election year. Table A.1 in the Appendix shows variable definitions and data sources. Industry dummies are based on the Fama-French 48-industry classification. Some models include supplier controls, customer controls, year dummies, and industry dummies. Industry-clustered robust standard errors are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table A.11 Repurchases Excluding Crisis Years

	Model 1	Model 2	Model 3	Model 4
Optimal Bandwidth	0.004	0.007***	0.008**	0.006**
	(0.003)	(0.002)	(0.003)	(0.003)
Observations	1442	1442	1738	1738
75% Optimal Bandwidth	0.004	0.010***	0.001	0.008**
	(0.003)	(0.002)	(0.004)	(0.003)
Observations	1110	1110	1222	1222
125% Optimal Bandwidth	0.005	0.007***	0.005	0.006**
	(0.003)	(0.002)	(0.003)	(0.003)
Observations	1989	1989	2209	2209
Supplier Control	No	Yes	No	Yes
Customer Control	No	Yes	No	Yes
Industry Dummies	No	Yes	No	Yes
Year Dummies	No	Yes	No	Yes
Kernel Distribution	Triangular	Triangular	Uniform	Uniform
Optimal Bandwidth	0.083	0.083	0.095	0.095
75% Optimal Bandwidth	0.062	0.062	0.071	0.071
125% Optimal Bandwidth	0.104	0.104	0.119	0.119

Note: The table reports nonparametric local linear RDD regression models using the sample without the crisis years. The dependent variable is *Repurchases* measured at the first year after the election elections. We estimate the optimal bandwidths using the data-driven method of Calonico, Cattaneo, and Farrell (2020). Supplier and Customer controls include *Profitability*, *Tangibility*, *Firm Size*, *Capital Investment*, *Efficiency*, and *R&D Investment*, all measured in the election year. Table A.1 in the Appendix shows variable definitions and data sources. Industry dummies are based on the Fama-French 48-industry classification. Some models include supplier controls, customer controls, year dummies, and industry dummies. Industry-clustered robust standard errors are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table A.12 Granger Reverse Causality Test

	Unionization		
	OLS	*logistic*	*probit*
Cash Holdings$_{(t-1)}$	0.054	0.247	0.159
	(0.038)	(0.175)	(0.107)
Repurchases$_{(t-1)}$	0.020	0.097	0.062
	(0.083)	(0.390)	(0.236)
Supplier Book Leverage$_{(t-1)}$	-0.052**	-0.247**	-0.151**
	(0.024)	(0.115)	(0.069)
Supplier Profitability$_{(t-1)}$	-0.042	-0.189	-0.119
	(0.028)	(0.131)	(0.079)
Supplier Tangibility$_{(t-1)}$	0.191***	0.869***	0.537***
	(0.034)	(0.155)	(0.094)
Supplier Firm Size$_{(t-1)}$	0.020***	0.091***	0.056***
	(0.003)	(0.013)	(0.008)
Supplier Efficiency$_{(t-1)}$	-0.0005	-0.002	-0.001
	(0.001)	(0.005)	(0.003)
Supplier R&D$_{(t-1)}$	0.092	0.419	0.253
	(0.064)	(0.290)	(0.177)
Supplier Capital Investment$_{(t-1)}$	0.089	0.395	0.230
	(0.085)	(0.382)	(0.235)
Customer Profitability$_{(t-1)}$	-0.101	-0.326	-0.250
	(0.124)	(0.571)	(0.347)
Customer Tangibility$_{(t-1)}$	-0.279***	-1.310***	-0.768***
	(0.046)	(0.217)	(0.131)
Customer Firm Size$_{(t-1)}$	0.024***	0.114***	0.065***
	(0.004)	(0.021)	(0.012)
Customer Efficiency$_{(t-1)}$	-0.244***	-1.062***	-0.656***
	(0.044)	(0.199)	(0.122)
Customer R&D$_{(t-1)}$	1.002***	4.573***	2.900***
	(0.252)	(1.140)	(0.697)
Customer Capital Investment$_{(t-1)}$	0.708***	3.221***	1.879***
	(0.182)	(0.838)	(0.510)
Constant	0.159**	-1.573***	-0.912***
	(0.067)	(0.310)	(0.188)
Observations	7,261	7,261	7,261
Adjusted R^2	0.039		
Log Likelihood		-4,546.426	-4,548.109
AIC		9,124.852	9,128.217

***Note**:* The table reports results of the Granger reverse causality test. The dependent variable is Unionization. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.