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The Bright Side of Labor Unions: Evidence From Working Capital Management

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This study documents that unionization imposes a heterogeneous impact on working capital policies. We argue and demonstrate that the impact of unionization on working capital depends on financial performance. Specifically, the rent extraction effect incentivizes profitable firms to reduce working capital to gain bargaining advantages, whereas the operating risk effect motivates less profitable firms to increase working capital to hedge against risk. To establish causality, we employ instrumental variables based on the proportions of female and part-time workers, as well as a regression discontinuity design (RDD) based on union election outcomes. A difference-in-differences (DID) analysis exploiting the staggered adoption of right-to-work laws further confirms that unions influence firm behavior through their bargaining power. Additional mechanism analyzes validate the existence of both the rent extraction and operating risk effects. Moreover, we find that the impact of unionization on working capital is independent of firms' cash policies, suggesting that cash and working capital are not perfect substitutes. Finally, we provide evidence that shareholders perceive unions' influence on working capital as value-enhancing. Overall, the findings illuminate a bright side of union power and offer new insights into how labor relations shape corporate liquidity management.

Introduction

During production, firms apply labor to raw materials to produce final goods for sale. However, a mismatch arises between outlays for production inputs and the recognition of revenues (Galindo Gil, 2021). Firms therefore need funds to maintain operations in the short term, and such funds are referred to as working capital. Efficient working capital management is widely regarded as a driver of performance and shareholder wealth (e.g. Aktas, Croci and Petmezas, 2015; Ben-Nasr, 2016; Lefebvre, 2020). Nonetheless, Buchmann *et al.* (2008) show that firms tend to overlook the benefits of working capital and adopt poor working capital management practices. Recent reports by PwC (2019) and Hackett Group (2020) inattentiveness to working capital management persists, and renews interest in the forces that shape working capital policies.

In parallel, recent studies show that unions have an impact on firms' investment, financing and operating decisions (e.g. Della Seta, 2011; Ertugrul and Marciukaityte, 2021; Tong and Huang, 2018), consistent with the long-held view that corporate decision-making reflects the outcome of bargaining among all stakeholders (Jensen and Meckling, 1976). Since unionized labor, an important internal stakeholder, is involved in the daily management, production processes and operations of a firm, we posit that unions' bargaining power significantly shapes working capital policies. Taken together, this study investigates how the bargaining power shapes working capital policies, which are critical to productivity growth.

We propose two competing mechanisms through which unions affect working capital policies. First, unions' rent-extraction motives induce firms to hold less working capital, because liquid operating resources give labor a larger target for wage concessions (e.g. Klasa, Maxwell and Ortiz-Molina, 2009; Matsa, 2010; Tong and Huang, 2018). Second, unionization increases operating risk (e.g. Abraham and Medoff, 1984; Chen, Kacperczyk and Ortiz-Molina, 2011; Kahl, Lunn and Nilsson, 2019), compelling firms to reserve more working capital to mitigate operating risk. We argue that a firm's financial performance can reconcile these two channels, as the bargaining activities of unions, including seeking financial benefits and job security, vary according to firms' financial performance (e.g. Ivlevs and Veliziotis, 2017; Keune, 2021; Meardi and Trappmann, 2013). Accordingly, unions are likely to shape working capital policy heterogeneously across firms

with different performance levels. These conflicting perspectives raise the following questions: How do labor unions affect working capital decisions? Is this impact heterogeneous? How do shareholders value working capital decisions in the presence of unionization? This study aims to answer these questions.

To shed light on this subject, we analyze the relationship between unions and working capital policies using data from a panel sample of US-listed firms from 1999 to 2019. Our results show that the impact of unionization on net working capital is heterogeneous across firms with different financial performance. Unions induce firms with strong financial performance to reduce working capital, while inducing firms with weak financial performance to build working capital. We establish the causal relationship using instrument variables in a two-stage least-squares (2SLS) method and union elections in a regression discontinuity design (RDD). The additional robustness tests, using an alternative proxy for union coverage from the Asset4 database, also support our findings.

To understand the potential mechanisms of unions on working capital policies, we conduct a difference-in-differences (DID) analysis using the implementation of the right-to-work laws as the exogenous shock for the bargaining power of unions. The DID results confirm that unions influence working capital through their bargaining power. The cross-sectional analysis further confirms that the presence of divergent effects is driven by offsetting rent extraction and hedging operating risk. To corroborate the inference from our main analysis, we investigate alternative explanations. We document that the heterogeneous impact on working capital is more profound for firms with weak governance, implying that unions' bargaining power acts as an alternative governance mechanism that leads managers to make efficient decisions.

We also explore whether union-driven changes in working capital are attributable to adjustments in cash holdings. While working capital is often considered a substitute for cash (e.g. Bates, Kahle and Stulz, 2009; Bigelli and Sánchez-Vidal, 2012; Opler *et al.*, 1999), and unions have been shown to significantly influence firms' cash policies (e.g. Beuselinck, Markarian and Verriest, 2021; Klasa, Maxwell and Ortiz-Molina, 2009; Tong and Huang, 2018), we find no evidence that unions' effect on working capital is dependent on cash holdings. Our findings suggest that cash and working capital are not perfect substitutes and that unions exert an independent influence on working capital policies. Additionally, we examine how shareholders perceive union-driven working capital decisions. Given that efficient working capital management enhances firm value and performance (e.g. Aktas, Croci and Petmezas, 2015; Baños-Caballero, García-Teruel and Martínez-Solano, 2014; Lefebvre, 2020), we find that shareholders view unions' impact on working capital as value-enhancing, highlighting a potential upside to unionization in the context of financial policy.

Our study makes two main contributions to the literature. First, it relates to research on the impact of unions on corporate decisions and financial performance (e.g. Chen, Kacperczyk and Ortiz-Molina, 2011; Lee and Mas, 2012; Tong and Huang, 2018). We provide new evidence for two mechanisms, namely strategic resistance to rent-seeking (e.g. Klasa, Maxwell and Ortiz-Molina, 2009; Matsa, 2010; Tong and Huang, 2018) and operating risk mitigation (e.g. Abraham and Medoff, 1984; H. Chen, Kacperczyk and Ortiz-Molina, 2011; Kahl, Lunn and Nilsson, 2019), which shape firms' working capital policy decisions. In alignment with strategic resistance to rent-seeking, firms reduce excess working capital to constrain unions' bargaining for profit. In contrast, in alignment with operating risk-mitigation objectives, firms alleviate working capital deficiencies to reduce the operating risk, thereby accommodating unions' collective bargaining for employment security. Consistent with the literature on the monitoring role of employees (e.g. Chyz *et al.*, 2013; Cohen, 1993; Della Torre, Gritti and Salimi, 2021), we show that these divergent bargaining objectives serve as a monitoring mechanism, contributing to more efficient resource allocation in working capital. We further demonstrate that unions improve firm value by enhancing the efficiency of working capital management, suggesting that shareholders attribute greater value to union-induced enhancements in working capital policy. Overall, our study highlights the 'bright side' of union influence: unions improve firm performance by enhancing the quality of working capital management.

Second, we contribute to the literature on unions and working capital policies. While prior studies primarily focus on the impact of unions on the cash holdings (e.g. Beuselinck, Markarian and Verriest, 2021; Klasa, Maxwell and Ortiz-Molina, 2009; Tong and Huang, 2018) and find that firms strategically reduce cash reserves when facing strong union bargaining power, our study differs in two important respects. On the one hand, we examine the operating working capital rather than cash holdings, consistent with the growing emphasis on operating working capital management in recent research (e.g. Aktas, Croci and Petmezas, 2015; Buchmann *et al.*, 2008) and technical reports (Hackett Group, 2020; PwC, 2019). We show that unions influence operating working capital independently of cash policies, thereby extending the literature on the substitution role of operating working capital and cash policies (e.g. Bates, Kahle and Stulz, 2009; Bigelli and Sánchez-Vidal, 2012; Opler *et al.*, 1999) and demonstrating that they are not perfect substitutes. On the other hand, while prior research generally finds a negative relationship between unionization and firms' demand

for working capital, we document a heterogeneous effect that depends on financial performance: unions reduce net working capital in financially strong firms but increase it in financially weak firms. By highlighting these heterogeneous impacts, our results suggest that an insignificant average effect can mask economically meaningful variations across firms, potentially leading to misguided conclusions and suboptimal policy or managerial decisions. Overall, our study adds novel evidence to the existing literature and offers investors a more nuanced understanding of the role of unions in working capital management.

In summary, we highlight the positive influence of collective bargaining power on working capital policy and provide implications for both shareholders and legislation regarding regulations. For shareholders, our findings suggest the importance of weighing the resource allocation benefits against the potential costs of rent-seeking when valuing unionized firms. For regulators, our results inform the ongoing debate on whether firms should be mandated to incorporate employee voices into corporate governance structures (Ahlering and Deakin, 2007). Our study suggests that employee representation can deliver tangible benefits. Notably, the deterioration in working capital management documented in recent literature (e.g. Aktas, Croci and Petmezas, 2015; Hackett Group, 2020; PwC, 2019) may be partially attributed to the significant decline in collective bargaining power and union density across developed economies (Dobbins and Dundon, 2017).

Theoretical framework and hypothesis development

Our theoretical framework identifies two mechanisms through which unionization affects firms' working capital decisions: rent-seeking and operating risk. On the one hand, unions' rent-seeking activities can motivate firms to reduce accessible financial resources in order to limit wage and benefit demands. On the other hand, unions' bargaining power can also increase labor adjustment rigidity, thereby heightening firms' operating risk and creating a stronger incentive to maintain working capital. We argue that these two opposing forces interact with a firm's financial performance, yielding heterogeneous effects on working capital.

Working capital management

Financial flexibility theory suggests that firms should maintain financial slack to mitigate cash flow risks and address unexpected future demands for resources (Denis, 2011; Gamba and Triantis, 2008; Myers and Majluf, 1984). One way to preserve this flexibility is by building up working capital, which serves as a source of liquid funds and supports various dimensions of financial flexibility. Prior studies show that it can smooth fixed investments, offset cash flow fluctuations, and cover short-term obligations (Dunn and Cheatham, 1993; Fazzari and Petersen, 1993; Frankel, Levy and Shalev, 2017; Peel and Wilson, 1996). In addition, working capital can stimulate the growth of profit (Deloof, 2003) and strengthen the customer–supplier relationship (Wilner, 2000). Finally, investment in working capital can be a method of hedging, particularly in relation to day-to-day operating risk (Aktas, Croci and Petmezas, 2015). For instance, maintaining high inventory levels reduces firms' exposure to input price fluctuations (Blinder and Maccini, 1991; Ramey and West, 1999) and guards against stock-outs (Bils and Kahn, 2000; Kahn, 1992). Moreover, because working capital can be quickly converted into cash, it can act as a cash substitute (Bates, Kahle and Stulz, 2009; Opler *et al.*, 1999).

However, excess working capital can signal inefficient resource allocation within a firm. Excess working capital often leads to higher financing and opportunity costs, especially for firms with significant growth opportunities, because the untapped financial flexibility embedded in working capital remains uninvested. Additionally, the high liquidity property of working capital could prompt managers to pursue private benefits (Amihud and Lev, 1981; Jensen, 1986; Shleifer and Vishny, 1989). For instance, entrenched managers are willing to overinvest in working capital to accumulate excess liquidity, thereby enhancing their job security and pursuing personal objectives (Elyasiani and Zhang, 2015; Gill and Biger, 2013). Consistent with this viewpoint, Ben-Nasr (2016) argues that poorly monitored managers in government-controlled firms have incentives to overinvest in working capital, expropriating minority shareholders.

Labor unions and rent-seeking

Unionized employees, supported by the implicit threat of collective action, can exert their bargaining power to maximize their utility, including a higher level of wages, severance payments and job security (Lewis, 1986; Mclaughlin and Fraser, 1984). In labor economics, unions are often viewed as rent-seekers who seek to capture any excess profits (Bronars and Deere, 1991; Clark, 1984; Grout, 1984; Salinger, 1984; Voos and Mishel, 1986). Consequently, unionization can introduce conflict over firm profits, especially when surplus or excess profits exist. To mitigate this rent extraction, firms would strategically reduce financial slack, particularly cash and working capital, to limit unions' bargaining power and deter rent-seeking (Brander and Spencer, 1988; Bronars and Deere, 1991; Dasgupta and Sengupta, 1993; Matsa, 2010; Perotti and Spier, 1993). Because labor expenses typically account for a large share of a firm's total costs, managers seeking to preserve

profits will often minimize resources that are easily accessible, thereby curbing unions' claims on the firm's surplus (Freeman, 1986).

Extensive empirical evidence supports the notion that weak financial conditions can strengthen a firm's bargaining position relative to labor unions. For example, Hanka (1998) shows that financially distressed or highly leveraged firms negotiate lower wages, while Klasa, Maxwell and Ortiz-Molina (2009) find that constrained liquidity reduces union bargaining power. Similarly, Benmelech, Bergman and Enriquez (2012), Simintzi, Vig and Volpin (2015), Tong and Huang (2018), and Michaels, Page and Whited (2019) document that firms facing tighter financing constraints often extract wage concessions. Moreover, Schmalz (2018) highlights how certain ownership structures further impede unions' ability to secure higher wages, and Ouimet and Simintzi (2021) demonstrate that limited financial flexibility can suppress rent-extraction opportunities. Chung *et al.* (2016) further show that unions prompt firms to withhold favorable financial information to prevent rent claims. From this rent-seeking perspective, working capital can expose firms to increased union demands. Hence, in the presence of robust union bargaining power, firms may respond by reducing working capital. We define this effect as the *rent extraction mechanism*.

Labor unions and operating risk

Conversely, firms facing strong unions have an incentive to build financial flexibility to hedge operating risk. While neoclassical economics theory posits that labor inputs are fully flexible and thus have little effect on firm risk, in reality, labor union introduce an important friction that can reduce a firm's operating flexibility (Chen, Kacperczyk and Ortiz-Molina, 2011). Collective bargaining, by nature, increases layoff costs, which in turn increases operating leverage and cash flow risk (Abraham and Medoff, 1984; Ertugrul and Marciukaityte, 2021). Favilukis, Lin and Zhao (2020) and Kahl, Lunn and Nilsson (2019) demonstrate both theoretically and empirically that labor adjustment rigidity increases firms' vulnerability to economic shocks. Schoefer (2021) documents that labor adjustment rigidity squeezes internal funds in a recession, leading firms to forgo other profitable investments. Higher employment protection increases firing costs and employees' bargaining power, leading to a lower level of layoffs (Blanchard and Portugal, 2001). Consequently, firms that face amplified operating risk may attach greater value to financial flexibility, strengthening their precautionary demand for liquidity (Gamba and Triantis, 2008). Thus, the collective pressure exerted by unionized employees can push firms towards holding more liquid resources to mitigate bankruptcy risk (Agrawal, 2012).

In line with the theoretical prediction, empirical studies support that high labor cost rigidity increases the demand for financial flexibility because liquid assets serve as a hedge against operating leverage. For example, Simintzi, Vig and Volpin (2015) find that high employment protection leads to a decrease in firms' leverage, while Alimov (2015) and Karpuz, Kim and Ozkan (2020) document that high fixed labor costs increase operating leverage and distress risk, which incentivize firms to reserve more cash to hedge costly external financing. Huang *et al.* (2017) and Hamm *et al.* (2021) find that unionized firms hold excess inventory and reduce managerial compensation to mitigate the chance of union strikes. Further, Faleye, Mehrotra and Morck (2006) argue that, due to concerns about future cash flow volatility and adequacy, risk-averse employees would advocate for firms to prioritize building financial flexibility over pursuing long-term performance. Agrawal (2012) confirms that firms adopt conservative financial policies to reduce employees' unemployment concerns. Additionally, Hamm, Jung and Lee (2018) find that unions intensify a firm's incentive to minimize downside risk and smooth earnings. From this operating risk perspective, the operating risk induced by unionization could enhance the benefits of working capital. Consequently, firms reserve working capital to gain financial flexibility and hedge against daily operating risks. We define this effect as the *operating risk mechanism*.

Hypotheses

These two mechanisms, *rent extraction* and *operating risk*, lead to opposing predictions about how unionization affects firms' working capital. When a firm's financial performance is strong, unions are more likely to engage in rent extraction, which incentivizes firms to reduce their net working capital to limit the resources available for union bargaining. Conversely, when financial conditions are weak, unions prioritize employment security over wage increases. In response, firms may increase working capital to build financial buffers and hedge against operating risk.

This view is consistent with Rosen (1986), who theoretically shows that employees trade off the benefits between wages and job security, and they bargain for employment security rather than high wages under high bankruptcy risk. In line with the theory, empirical evidence also suggests that, during the financial crises when unemployment was high, unions made wage concessions to maintain their members' employment (Glassner, 2013; Ivlevs and Veliziotis, 2017; Keune, 2021; Meardi and Trappmann, 2013). These findings suggest that unions seek financial benefits when a firm's performance is strong but shift focus towards employment security when performance weakens.

This shift in union priorities implies that the impact of unions on firms' demand for financial flexibility varies with the firm's financial condition. Evidence from prior studies also supports this notion. For instance, Matsa (2010) finds that a positive cash flow shock strengthens firms' financial position and thus motivates unions' rent-seeking activities, leading firms to strategically use debt to offset unions' bargaining. Conversely, this incentive weakens in the event of a negative cash flow shock, as the shock damages firms' financial position and reduces unions' rent-seeking incentives. Schmalz (2018) finds that while the average causal effect of unionization is nearly zero, the effect varies by firm type. Specifically, unionization increases leverage and reduces cash holdings for large, financially unconstrained firms, whereas it has the opposite effect on small, financially constrained firms. Chino (2016) finds that unions increase dividend payouts only if a firm has high profitability.

Building on the shift in union priorities, we hypothesize that firms' financial conditions explain the divergent predictions of the two mechanisms on working capital, given that unions' bargaining strategies are contingent on those conditions. Unions, conditional on firms' financial performance, induce either *rent extraction* or *operating risk* effects. When firms have strong financial performance, the rent extraction effect incentivizes firms to decrease working capital to gain bargaining advantages. However, when firms have weak financial performance, unions' bargaining shifts from rent-seeking to job security. This incentivizes firms to build working capital to mitigate operating risk. We formalize the hypothesis for the heterogeneous impact of unions on working capital as follows:

H1. *The impact of unionization on net working capital is heterogeneous across firms with different financial performance.*

H2. *Unionization decreases net working capital for firms with strong financial performance but increases it for those with weak financial performance.*

Data and methodology

We collect financial information from the Compustat database for a sample of US-listed firms traded on the NYSE, AMEX, and NASDAQ. Financial and utility firms are excluded from the sample because they are subject to different regulations. We use the US consumer price index (CPI) from the Organization for Economic Co-operation and Development (OECD) to deflate all nominal values into year-2000 dollar values. Unionization rates are obtained from the Union Membership and Coverage Database, compiled from the monthly household Current Population Survey (CPS), which is updated annually by Barry Hirsch and David Macpherson. We collect board information from the BoardEx database. Our sample spans from 1999 to 2019 due to the availability of data from the BoardEx database. In addition, we drop the firms with missing net operating working capital. Our main sample consists of 37,882 firm-year observations.

To test our hypotheses, we calculate *NWC* as the proxy for a firm's working capital decision, which is inventories plus receivables minus accounts payable scaled by sales. In addition, prior studies show that there exists significant inter-industry heterogeneity in working capital policies (e.g. Aktas, Croci and Petmezas, 2015; Ben-Nasr, 2016; Filbeck and Krueger, 2005; Hawawini, Viallet and Vora, 1986; Lev, 1969). Therefore, we also follow these studies to construct *Adj NWC*, the industry-adjusted *NWC*, as an alternative proxy for working capital decisions. *Adj NWC* is calculated as the difference between a firm's *NWC* and its corresponding industry median in a given year.

Following previous studies (e.g. Chen, Kacperczyk and Ortiz-Molina, 2011; Hamm, Jung and Lee, 2018; Hamm *et al.*, 2021; Hilary, 2006), we employ the quasi-firm-level union data, *Unions*, as the proxy of union coverage. The proxy is calculated as the industry-level union coverage rate times the labor intensity ratio (i.e. the number of employees scaled by total assets). In our robustness test, we also follow Chang *et al.* (2022) and employ the alternative firm-level union membership (*Unions_Asset4*) covered by the Thomson/Refinitiv Asset4 database. Given the limited sample available in the Asset4 database, we employ *Unions* as the main proxy for union coverage. We estimate the following equations:

$$NWC_{i,t} = \beta_0 + \beta_1 Unions_{i,t-1} + \beta_2' X_{i,t-1} + \gamma + \delta + \varepsilon_{i,t}, \quad (1)$$

$$\begin{aligned} NWC_{i,t} = {} & \beta_0 + \beta_1 Unions_{i,t-1} \times ROA_{i,t-1} \\ & + \beta_2 Unions_{i,t-1} + \beta_3 ROA_{i,t-1} \\ & + \beta_4' X_{i,t-1} + \gamma + \delta + \varepsilon_{i,t}, \end{aligned} \quad (2)$$

$$\begin{aligned} NWC_{i,t} = {} & \beta_0 + \beta_1 Unions_{i,t-1} \times \text{High}profit_{i,t-1} \\ & + \beta_2 Unions_{i,t-1} \times (1 - \text{High}profit_{i,t-1}) \\ & + \beta_3' X_{i,t-1} + \gamma + \delta + \varepsilon_{i,t}, \end{aligned} \quad (3)$$

where i and t denote firm and year. To explore the impact of unions on working capital decisions, we estimate Equation (1). We employ Equations (2) and (3) to examine the heterogeneous impact of unions across financial

Table 1. Summary statistics

	Mean (1)	SD (2)	P25 (3)	Median (4)	P75 (5)	*N* (6)
NWC	−0.229	0.277	−0.439	−0.309	−0.107	37,882
Adj NWC	0.094	0.300	−0.105	0.056	0.269	37,882
Unions	0.256	0.278	0.061	0.148	0.35	37,882
Unions_Asset4	0.142	0.212	0.000	0.012	0.230	6819
ROA	0.078	0.213	0.055	0.116	0.172	37,868
Size	6.414	2.010	5.090	6.426	7.742	37,882
Sales growth	0.142	0.513	−0.022	0.070	0.187	37,882
M/B	3.568	7.769	0.967	1.574	3.024	37,882
Gross profit margin	0.088	2.168	0.225	0.373	0.562	37,882
Market share	0.023	0.054	0.000	0.003	0.016	37,882
Distress	0.296	0.457	0.000	0.000	1.000	37,882
Sales volatility	0.284	0.359	0.094	0.177	0.329	37,882
Cash	0.630	1.907	0.045	0.150	0.449	37,882
Leverage	0.218	0.222	0.013	0.178	0.337	37,882
Board independence	0.735	0.137	0.615	0.750	0.857	37,882
Board size	2.417	0.428	2.079	2.303	2.639	37,882
CEO duality	0.459	0.498	0.000	0.000	1.000	37,882
Part-time proportion	0.081	0.082	0.032	0.047	0.087	37,856
Female proportion	0.354	0.149	0.254	0.339	0.450	37,856
Operating leverage	0.799	23.585	0.126	0.240	0.411	35,060
Cash flow volatility	0.050	0.227	0.033	0.085	0.134	37,849
Market concentration	0.179	0.157	0.065	0.128	0.231	37,882
Pension expense	0.006	0.010	0.002	0.004	0.008	32,842
Institutional ownership	0.662	0.275	0.484	0.728	0.878	37,882
Hostile takeover index	0.147	0.089	0.083	0.124	0.186	25,130
E-Index	2.457	1.230	2.000	3.000	3.000	2228
Efficiency score	0.076	0.122	0.010	0.032	0.083	37,882
CCC	71.283	119.847	24.753	60.898	110.122	37,882
One-year excess return	0.035	0.578	−0.301	−0.052	0.226	85,877
Fixed asset growth	0.044	0.316	−0.053	0.046	0.179	86,375
Intangible assets	0.175	0.212	0.001	0.083	0.284	86,375
R&D	0.166	0.700	0.000	0.007	0.087	86,375
Firm risk	0.034	0.019	0.020	0.029	0.042	86,375
Age	2.382	0.672	1.792	2.398	2.944	86,375

Note: This table reports the summary statistics. Columns 1–6 show the mean, standard deviation, 25th percentile, median, 75th percentile and the number of observations for each variable, respectively. All the continuous variables are winsorized at their 1st and 99th percentiles. Variable definitions are reported in Appendix A.

performance. We calculate *ROA* as a proxy for a firm's financial performance, which is calculated as earnings before interest scaled by total assets. The vector X in Equation (1) includes the control variables that are known to have an impact on working capital in the literature. We follow Hill, Kelly and Highfield (2010) and Aktas, Croci and Petmezas (2015) to include *Size*, *Sales growth*, *M/B*, *Gross profit margin*, *Market share*, *Distress*, *Sales volatility*, *Cash* and *Leverage*. In addition, we also include proxies of internal governance quality (*Board independence*, *Board size* and *CEO duality*) that are known to have an impact on liquidity management in prior studies (e.g. Elyasiani and Zhang, 2015; Schmidt, 1977; Zahra and Pearce, 1989). γ represents industry or firm fixed effects, and δ represents year fixed effect. Table 1 reports the summary statistics for the variables used in this study. We report the details of variable construction in Appendix A.

Empirical results

Net working capital and labor unions

We start our formal tests by estimating the impact of unions on net operating working capital. In Table 2, we conduct an ordinary least squares (OLS) estimation for Equation (1). We regress *NWC* on *Unions*, control variables and a full set of industry and year fixed effects in column 1, and firm fixed effect in column 2. The coefficient of *Unions* is −0.007 and insignificant, implying that unions are insignificantly associated with working capital. Based on the initial estimation, we find no evidence that unions exert a considerable impact, on average, on working capital decisions. However, the average relationship hides the significant heterogeneous effect of unions on net working capital across firms.

Next, we explore the role of profitability by including the interactions of *Unions* and *ROA*. Columns 3

Table 2. Labor unions, profit and net working capital

Dependent variable	*NWC* (1)	*NWC* (2)	*NWC* (3)	*NWC* (4)	*NWC* (5)	*NWC* (6)	*Adj NWC* (7)	*Adj NWC* (8)	*Adj NWC* (9)	*Adj NWC* (10)
Unions	−0.007	−0.002	0.005	0.002			0.011**	0.003		
	(0.004)	(0.002)	(0.006)	(0.005)			(0.005)	(0.005)		
Unions×ROA			−0.109***	−0.047*			−0.114***	−0.052**		
			(0.029)	(0.025)			(0.027)	(0.025)		
ROA			0.128***	0.085***			0.145***	0.094***		
			(0.030)	(0.027)			(0.029)	(0.026)		
Unions×High profit					−0.008***	−0.002**			−0.008***	−0.002*
					(0.002)	(0.001)			(0.002)	(0.001)
Unions×(1-High profit)					0.002	0.004***			0.003*	0.005***
					(0.002)	(0.001)			(0.002)	(0.001)
Size	−0.001	0.006**	−0.004*	0.004*	−0.002	0.006**	−0.005**	0.005**	−0.002	0.009***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Sales growth	−0.007	0.012***	−0.005	0.011**	−0.008	0.012***	−0.004	0.010**	−0.008*	0.010**
	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)
M/B	−0.000	0.000	−0.000	−0.000	−0.001	0.000	−0.000	−0.000	−0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Gross profit margin	0.049***	0.023***	0.048***	0.023***	0.050***	0.023***	0.047***	0.023***	0.048***	0.023***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)	(0.003)	(0.003)
Market share	−0.196***	−0.026	−0.174***	−0.027	−0.132***	−0.028	−0.115**	−0.038	−0.132***	−0.051
	(0.051)	(0.033)	(0.049)	(0.034)	(0.047)	(0.033)	(0.046)	(0.032)	(0.045)	(0.033)
Distress	0.000	−0.003	0.008	−0.001	−0.007	−0.003	0.004	−0.001	−0.009*	−0.003
	(0.005)	(0.004)	(0.006)	(0.004)	(0.005)	(0.004)	(0.005)	(0.004)	(0.005)	(0.004)
Sales volatility	−0.043***	−0.013	−0.041***	−0.014	−0.047***	−0.014	−0.041***	−0.013	−0.044***	−0.009
	(0.011)	(0.009)	(0.011)	(0.009)	(0.011)	(0.009)	(0.010)	(0.009)	(0.010)	(0.009)
Cash	−0.015***	−0.011**	−0.014***	−0.011**	−0.015***	−0.011**	−0.013***	−0.011**	−0.015***	−0.012***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Leverage	−0.008	0.022	−0.019	0.015	0.000	0.021	−0.015	0.012	−0.002	0.021
	(0.014)	(0.019)	(0.014)	(0.019)	(0.014)	(0.019)	(0.013)	(0.019)	(0.013)	(0.018)
Board independence	0.005	−0.013	0.010	−0.013	0.001	−0.013	0.007	−0.015	−0.005	−0.020*
	(0.021)	(0.012)	(0.021)	(0.012)	(0.021)	(0.012)	(0.020)	(0.012)	(0.019)	(0.012)
Board size	−0.009	−0.009	−0.007	−0.007	−0.010	−0.009	−0.007	−0.004	−0.010	−0.006
	(0.009)	(0.007)	(0.008)	(0.007)	(0.009)	(0.007)	(0.008)	(0.007)	(0.008)	(0.007)
CEO duality	−0.001	−0.003	−0.001	−0.003	0.000	−0.003	−0.001	−0.002	0.002	−0.002
	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)
Industry FE	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Firm FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-square	0.345	0.709	0.349	0.710	0.355	0.709	0.300	0.682	0.279	0.675
N	37,882	37,882	37,868	37,868	37,868	37,868	37,868	37,868	37,868	37,868
p value for the difference between Unions×High profit and Unions×(1-High profit)					0.000	0.000			0.000	0.000

Note: This table presents the results from the regressions of net working capital on unions. The dependent variable is *NWC* in columns 1–6, and industry-adjusted *NWC* in columns 7–10. *NWC* is calculated as inventories plus receivables minus accounts payable scaled by total sales. Industry-adjusted *NWC* is the difference between a firm's net operating working capital-to-sales ratio and its corresponding industry median of *NWC* in a given year. *ROA* is calculated as earnings before interest scaled by total assets. *High profit* is a dummy variable that equals 1 if the firm's *ROA* is above the median value of the corresponding industry in a given year. *Size* is the market value of equity adjusted to year-2000 dollars. *Sales growth* is the annual percentage change in sales. *M/B* is the ratio of the market value of equity plus total liabilities minus payables to net assets. *Gross profit margin* is the ratio of sales minus the cost of goods sold to sales. *Market share* is firm sales as a percentage of aggregate sales in the firm's industry. *Distress* is a dummy variable that equals 1 if the firm meets the definition of financial distress and 0 otherwise. *Sales volatility* is the rolling standard deviation of sales using a 5-year window, scaled by net assets. *Cash* is cash and cash equivalents scaled by net assets. *Leverage* is the book leverage ratio, which is calculated as the sum of long-term and short-term debts scaled by total assets. Standard errors in parentheses are the robust standard errors clustered at the firm level. All the independent variables are lagged by 1 year. All the continuous variables are winsorized at their 1st and 99th percentiles. Variable definitions are reported in Appendix A.

*, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

and 4 present the results for Equation (2) with industry and firm fixed effects, respectively. The coefficient of the interaction term is negative and significant, supporting Hypothesis 1 that the relationship between unions and working capital is heterogeneous across firms and depends negatively on firm profitability. To capture this potential non-linearity in the relationship between unions and working capital, we allow the slope coefficient to be different for high and low profitability, as shown in Equation (3). In columns 5 and 6, the results show that unions tend to be negatively associated with working capital for high profitable firms, but positive for low profitable firms. For robustness, we redo the estimation for industry-adjusted *NWC* in columns 7–10 and find consistent results. The results support Hypothesis 2; unionization decreases net working capital for firms with strong financial performance, while increasing it for those with weak financial performance.[1]

Addressing endogeneity

To address endogeneity and establish the causal relationship between unions and working capital decisions, we adopt 2SLS and RDD to mitigate the potential endogenous concerns. In our 2SLS estimation, we follow prior studies to use the proportion of females (*Female proportion*) and part-time workers (*Part-time proportion*) in an industry as the instrument variables (e.g. Chen, Kacperczyk and Ortiz-Molina, 2011; Chino, 2016). Female workers are less likely to unionize than male workers because they are less attached to the labor market (Hirsch, 1980, 1982). Part-time workers have less incentive to unionize than full-time workers because they may hold multiple positions in different companies, making it difficult for them to incorporate the benefits of unionization (Chino, 2016; Hernández, 1995).

Table 3 reports the results of 2SLS regressions. Column 1 shows the result of the first-stage regression. In line with our expectation, the two instrument variables are significantly and negatively correlated with unionization. In the second-stage result in columns 3 and 4, *Unions* and *Unions* × *ROA* are instrumented by *Part-time proportion*, *Female proportion*, *Part-time proportion* × *ROA* and *Female proportion* × *ROA*. In models with industry and firm fixed effects, the instrumented interaction term is significantly negative with values of −0.156 and −0.290, respectively, suggesting a potential negative influence of unions on working capital as firm profitability increases. In columns 4 and 5, we redo the estimation for industry-adjusted *NWC*, the results remain qualitatively unchanged. Overall, the results are consistent with our baseline results, which suggest that the divergent effect of unions on working capital decisions depends on financial performance.

In the second approach, we analyze net operating working capital decisions around a set of union elections using RDD. This approach identifies the effects of a treatment by determining a cut-off point below or above which the treatment is assigned. In this design, the treatment is determined by whether the union vote share exceeds 50%, and it provides exogenous variation (i.e. local average treatment effect) for observations that pass or fail by a small margin of votes. Passing in close-call elections is highly likely to be an independent, random event, and hence, it is unlikely to be correlated with the unobservable characteristics of the firm. In addition, the outcomes of elections are unexpected due to the secret ballot mechanism and are less subject to manipulation (Farber, 1999).

We collect union election data from the National Labor Relations Board (NLRB) for the 1977–2010 period. We only keep those that have no elections in 1 year around an election close date. After the data cleaning steps, there are 438 firms in our sample, and the unionization passage rate is 34.8%, which is comparable to previous studies (Bradley, Kim and Tian, 2017; Huang *et al.*, 2017). We start our test by visually checking the effect of union victories on net operating working capital around the cut off. Figure 1 shows the graph for the relationship between working capital and vote shares with 20 equal-sized bins. To explore the union impact on working capital decisions across different profitability levels, we present regression discontinuity plots for the high-profit sample in Panel A and the low-profit sample in Panel B. The *x*-axis represents the percentage of votes for unionization, and the *y*-axis is *NWC* after union elections. The solid line shows the fitted quadratic polynomial estimation, and the dashed lines show the 95% confidence interval around the fitted value.

Both panels demonstrate a significant discontinuity at the threshold; however, they reveal different trends in how firms adjust working capital in response to voting success. Specifically, working capital decreases sharply for firms that surpass the 50% unionization vote threshold (i.e. firms that successfully unionize) in the high-profit sample, while it noticeably increases in the low-profit sample.

In Table 4, we employ the parametric local linear estimation to perform the formal RDD test. The estimated

[1]We also conduct further robustness tests employing *Unions_Asset4*, the firms' percentage of union membership covered by the Asset4 database, as an alternative proxy for union coverage. The results are generally consistent with our baseline results. Overall, we provide supportive evidence for Hypotheses 1 and 2. We report the results in Table B1. The divergent effect of unionization on working capital decisions depends on profitability; unions induce more profitable firms to build working capital reserves but lead profitable firms to reserve less working capital.

Table 3. 2SLS estimation – part-time and female workers

Dependent variable	*Unions* (1)	*NWC* (2)	*NWC* (3)	*Adj NWC* (4)	*Adj NWC* (5)
Part-time proportion	−0.342**				
	(0.157)				
Female proportion	−0.195***				
	(0.064)				
Instrument × ROA		−0.156*	−0.290***	−0.195**	−0.288***
		(0.095)	(0.089)	(0.089)	(0.086)
Instrument		−0.015	0.056*	0.015	0.088***
		(0.035)	(0.032)	(0.032)	(0.032)
ROA		0.074***	0.027***	0.071***	0.026***
		(0.007)	(0.008)	(0.007)	(0.008)
Size	−0.045***	−0.010***	0.007***	−0.006**	0.010***
	(0.006)	(0.003)	(0.003)	(0.003)	(0.003)
Sales growth	−0.009***	−0.006	0.009**	−0.002	0.008*
	(0.003)	(0.005)	(0.004)	(0.004)	(0.004)
M/B	0.002***	0.000	−0.002***	0.000	−0.002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Operating cash flows	−0.003**	0.041***	0.058***	0.039***	0.057***
	(0.001)	(0.004)	(0.004)	(0.004)	(0.004)
Market share	−0.118	−0.043	−0.026	−0.038	−0.043
	(0.244)	(0.058)	(0.036)	(0.051)	(0.037)
Distress	−0.040***	−0.006	0.001	−0.002	0.001
	(0.011)	(0.006)	(0.004)	(0.005)	(0.004)
Sales volatility	0.066***	−0.043***	−0.013*	−0.033***	−0.010
	(0.024)	(0.011)	(0.007)	(0.010)	(0.007)
Cash	−0.020***	0.003	−0.001	0.005	−0.000
	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)
Leverage	−0.066**	0.000	0.036**	−0.007	0.033**
	(0.028)	(0.014)	(0.016)	(0.013)	(0.016)
Board independence	−0.038	0.008	0.006	0.007	0.002
	(0.058)	(0.022)	(0.012)	(0.020)	(0.012)
Board size	0.051*	0.006	−0.004	0.000	−0.003
	(0.030)	(0.008)	(0.007)	(0.008)	(0.007)
CEO duality	0.010	0.001	−0.003	−0.003	−0.003
	(0.013)	(0.004)	(0.003)	(0.004)	(0.003)
Industry FE	No	No	Yes	No	Yes
Firm FE	No	Yes	No	Yes	No
Year FE	No	Yes	Yes	Yes	Yes
Adj. R-square	0.481	0.139	0.142	0.398	0.399
N	37,379	37,379	37,379	37,379	37,379

Note: This table presents the results from the regressions of net working capital on instrumented unions. The dependent variable is unions in column 1, *NWC* in columns 2 and 3, and industry-adjusted *NWC* in column 3. *Unions* are instrumented by *Part-time proportion* and *Female proportion*. Column 1 reports the results for the first-stage regression. Part-time proportion: the fraction of female workers in each industry. Female proportion: the fraction of female workers in each industry. Standard errors in parentheses are the robust standard errors clustered at the firm level. All the independent variables are lagged by 1 year. All the continuous variables are winsorized at their 1st and 99th percentiles. Variable definitions are reported in Appendix A.

*, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

model is as follows:

$$NWC_{i,t} = \beta_0 + \beta_1 \text{Union}win_{i,t} + \sum_{n=1}^{p} \beta_n (\text{Votesh}are_{i,t} - 0.5)^n + \delta + \varepsilon_{i,t}, \quad (4)$$

where *Union win* is a dummy variable equal to 1 if the election results are in favor of the union and 0 otherwise. *Vote share* is the percentage of votes that support unions. *P* is the polynomial function of order. We follow Imbens and Kalyanaraman (2012) to use the optimal bandwidth that minimizes the mean-square error (MSE).[2]

Panel A presents the results for the high-profit sample. Column 1 shows the result with the triangular kernel and the polynomials of order one ($n = 1$). The coefficient of *Union win* is significant and negative. Column 2 reports the result using the rectangular

[2]In our untabulated results, we also conduct robustness tests using 75% and 125% of the optimal bandwidth. The results remain qualitatively unchanged and are available upon request.

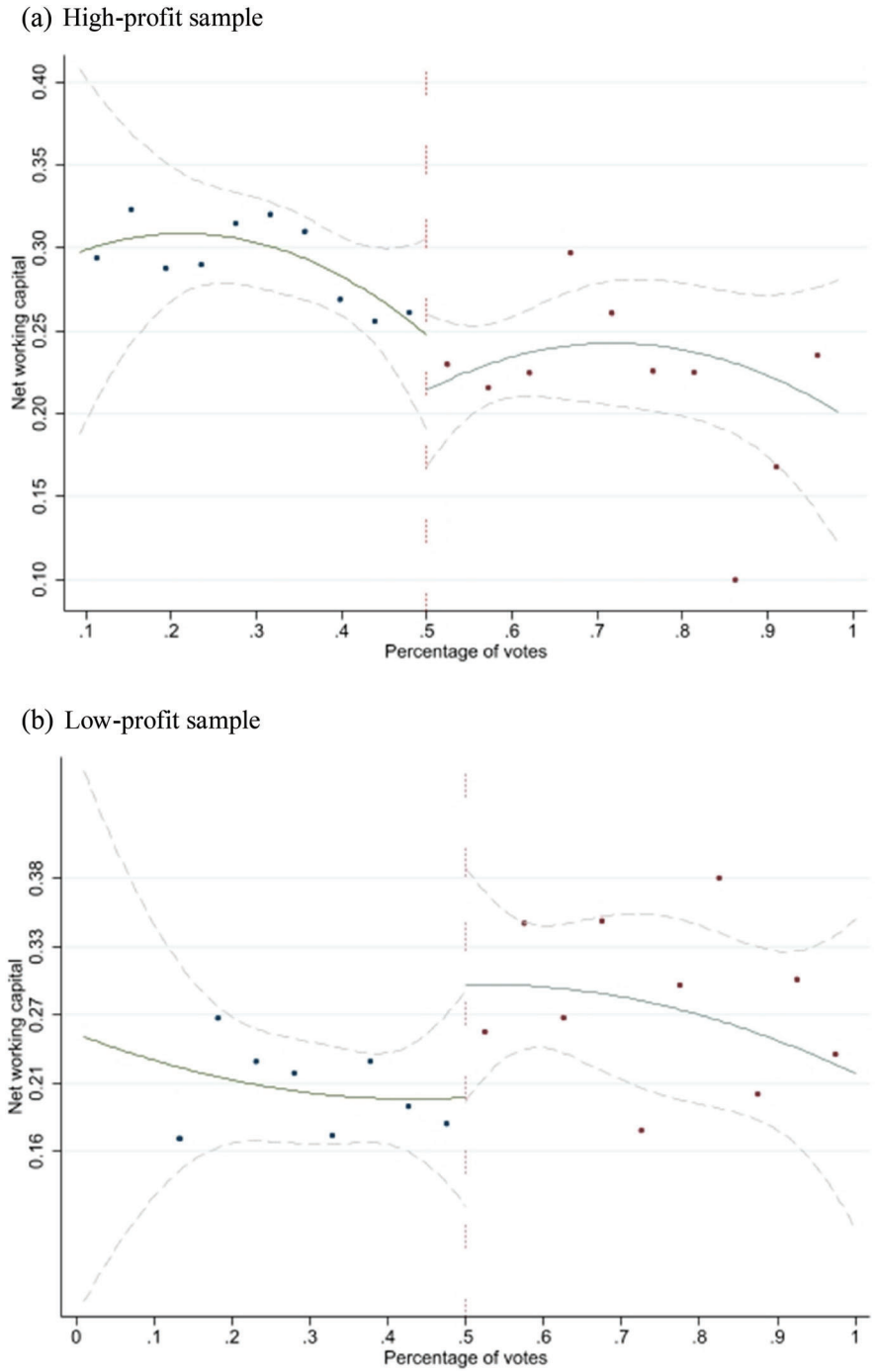

Figure 1. Regression discontinuity plots. This figure presents regression discontinuity plots using a fitted quadratic polynomial estimate with a 95% confidence interval around the fitted value. The x-axis is the percentage of votes favoring unions. The dots represent the average NWC in each of 20 equally spaced bins. Panels A and B report the relationship between the percentage of voting for high- and low-profit samples, respectively. Union election results are from the NLRB over the period 1977–2010

kernel, and column 3 reports the polynomials of order two, respectively. The RDD estimator is significantly negative across all the columns. Columns 4–6 show alternative tests using industry-adjusted *NWC*, and show similar results. Therefore, the RDD estimation also confirms the baseline results and suggests that unions reduce working capital for high-profit firms. However, in Panel B, the coefficient for *Union win* is positive, albeit statistically insignificant.

Mechanism – Bargaining power

After establishing the causal relationship between unions and net operating working capital, we next

Table 4. Regression discontinuity estimation – union elections

Dependent variable	*NWC* (1)	*NWC* (2)	*NWC* (3)	*Adj NWC* (4)	*Adj NWC* (5)	*Adj NWC* (6)
Panel A. High profit sample						
Union win	−0.117***	−0.126***	−0.112**	−0.105***	−0.099**	−0.100*
	(0.042)	(0.045)	(0.054)	(0.038)	(0.041)	(0.053)
Kernel	Triangular	Rectangular	Triangular	Triangular	Rectangular	Triangular
Orders of polynomials	1	1	2	1	1	2
N	257	257	257	257	257	257
Panel B. Low profit sample						
Union win	0.254	0.212	0.347	0.284	0.310	0.434
	(0.202)	(0.201)	(0.358)	(0.212)	(0.208)	(0.380)
Kernel	Triangular	Rectangular	Triangular	Triangular	Rectangular	Triangular
Orders of polynomials	1	1	2	1	1	2
N	181	181	181	181	181	181

Note: This table reports the local linear regression results using the optimal bandwidth following Imbens and Kalyanaraman (2012). The dependent variable is *NWC* in columns 1–3, and industry-adjusted *NWC* in columns 4 and 5. Columns 1, 3, 4 and 6 report the results based on estimations with triangular kernels, and columns 2 and 5 report the results based on estimations with rectangular kernels. Columns 1, 2, 4 and 5 show results based on estimations with polynomials of order one, and columns 3 and 6 report the results with polynomials of order two. Union election results are from the NLRB over 1980–2002. Standard errors in parentheses are the robust standard errors clustered at the firm level. All the regressions include industry fixed effect. All the continuous variables are winsorized at their 1st and 99th percentiles. Variable definitions are reported in Appendix A. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

explore the underlying mechanism for the impact. Unions' bargaining power leads profitable firms to reduce net working capital for a bargaining advantage (the rent extraction effect), while prompting less profitable firms to increase it to mitigate operating risk (the operating risk effect). Both mechanisms suggest that unions can exert their strong bargaining power to affect working capital decisions. Hence, we further explore whether the observed effect is due to the strong bargaining power of unions.

We conduct a DID analysis to obtain the causal effect of unions' bargaining power on working capital. Specifically, we employ the enactment of right-to-work laws across a number of states, which has been widely used as an exogenous shock for the bargaining power of unions in the literature (see, e.g., Chava, Danis and Hsu, 2020; Chino, 2016; Marciukaityte, 2015). In states that have enforced right-to-work laws, employees do not have to sign an agreement requiring them to join unions to obtain job opportunities or achieve employment protection. Consequently, the implementation of the laws weakens the collective bargaining of unions due to the resulting free-rider problem among union members (Ellwood and Fine, 1987; Holmes, 1998).

Following Chava, Danis and Hsu (2020), we identify seven states that introduced right-to-work laws in our sample, including Idaho (1986), Oklahoma (2001), Indiana (2012), Michigan (2013), Wisconsin (2015), West Virginia (2016) and Kentucky (2017). One concern is that the difference in firm characteristics between the treated and control groups may bias the results. To mitigate this concern, we use the propensity score matching approach to control for differences in firm characteristics between the treated and control groups. We first define a treated dummy that equals 1 if a firm's headquarter is in a state experiencing the implementation of the laws in a given year and 0 otherwise. We then conduct a logit model to calculate the predicted likelihood of being a treated firm (i.e. propensity score) using the treated dummy and all the control variables in Equation (1). In the final step, we select up to three firms for each treated firm, with replacement, using the closest score among firms that are not subject to the law's enactment as matched control firms. The matching procedure generates 111 treated firms and 293 matched control firms.

Next, we conduct the DID test using the following equations:

$$\begin{aligned} NWC_{i,t} = {} & \beta_0 + \beta_1 \text{Right}-\text{to}-work_{i,t} \times ROA_{i,t} \\ & + \beta_2 \text{Right}-\text{to}-work_{i,t} \\ & + \beta_3 ROA_{i,t} + \beta_2' X_{i,t-1} + \gamma + \delta + \varepsilon_{i,t}, \quad (5) \end{aligned}$$

$$\begin{aligned} NWC_{i,t} = {} & \beta_0 + \beta_1 \text{Right}-\text{to}-work_{i,t} \times \text{High}profit_{i,t} \\ & + \beta_2 \text{Right}-\text{to}-work_{i,t} \times (1 - \text{High}profit_{i,t}) \\ & + \beta_2' X_{i,t-1} + \gamma + \delta + \varepsilon_{i,t}, \quad (6) \end{aligned}$$

where *Right-to-work* is the DID estimator that equals 1 if a treated firm's headquarter state has experienced the enactment of right-to-work laws by time t and 0 otherwise. X is the same as in Equation (1). We control the firm (γ) and year fixed effects (δ), as the firm fixed effect absorbs the time-invariant omitted difference between treated and matched control groups. This ensures that

Table 5. Difference-in-differences analysis – right-to-work laws

Dependent variable	[−1, +1] *NWC* (1)	[−3, +3] *NWC* (2)	[−3, +3] *NWC* (3)	[−1, +1] *NWC* (4)	[−3, +3] *NWC* (5)	[−1, +1] *Adj NWC* (6)	[−3, +3] *Adj NWC* (7)	[−3, +3] *Adj NWC* (8)	[−1, +1] *Adj NWC* (9)	[−3, +3] *Adj NWC* (10)
Right-to-work×ROA	0.122***	0.148**	0.100***			0.111***	0.135**	0.089***		
	(0.030)	(0.067)	(0.035)			(0.025)	(0.062)	(0.031)		
Right-to-work	−0.011	−0.022	−0.016*			−0.011	−0.021	−0.015*		
	(0.007)	(0.015)	(0.009)			(0.007)	(0.014)	(0.009)		
ROA	−0.007	0.024	0.037			−0.014	0.023	0.038		
	(0.054)	(0.027)	(0.024)			(0.054)	(0.025)	(0.024)		
Right-to-work(-1)			0.013					0.010		
			(0.014)					(0.012)		
Right-to-work(-1)×ROA			−0.117					−0.102		
			(0.089)					(0.081)		
Right-to-work(-2)			0.000					0.000		
			(0.015)					(0.015)		
Right-to-work(-2)×ROA			−0.066					−0.076		
			(0.081)					(0.081)		
Right-to-work×High profit				0.009*	0.064**				0.008	0.060**
				(0.005)	(0.029)				(0.005)	(0.027)
Right-to-work×(1-High profit)				−0.127*	−0.015**				−0.125**	−0.014**
				(0.069)	(0.007)				(0.059)	(0.006)
Adj. R-square	0.881	0.753	0.780	0.879	0.751	0.820	0.684	0.715	0.819	0.682
N	1300	2598	2598	1300	2598	1300	2598	2598	1300	2598

Note: This table presents the difference-in-differences estimation of the adoption of right-to-work laws. We use the propensity score matching approach to select three matched firms, with replacement, with the closest propensity score from the control firms. The dependent variable is *NWC* in columns 1–5, and industry-adjusted *NWC* in columns 6–10. *Right-to-work* is the difference-in-differences estimator that equals 1 if a firm's headquarter state has enacted the right-to-work laws, and 0 otherwise. Columns 4 and 10 report the pre-trend analysis 1–2 years before the event. Standard errors in parentheses are the robust standard errors clustered at the firm level. All the regressions include control variables, firm and year fixed effects. All the continuous variables are winsorized at their 1st and 99th percentiles. Variable definitions are reported in Appendix A.
*, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

the estimation of the laws' entrenchment reflects the average within-firm changes in *NWC* over time rather than simple cross-sectional correlations. The year fixed effect captures the difference in average outcomes between the pre-enforcement and post-enforcement periods. To effectively isolate the causal effect of the right-to-work laws, we restrict the sample period to one or three years before and after each event.

Table 5 reports the DID analysis. Columns 1 and 2 show the results for the estimation of Equation (5). It is noticeable that β_1, the interaction of the DID estimator and profitability, is significant and positive regardless of whether our sample is restricted to 1 or 3 years surrounding the events. Consistent with the bargaining power hypothesis, the enactment of right-to-work laws restricts unions' ability to bargain profit, leading to higher working capital reserves.

A valid DID test requires that the treated and control groups share a similar time trend of outcome without an exogenous shock. In column 3, we include additional variables to conduct the pre-trend analysis. *Right-to-work (N)* is a dummy variable that equals 1 if a firm's headquarter state will experience the law's enactment *N* years later and 0 otherwise. *N* represents the number of years preceding the year of the events. The significance of pre-trend variables implies a violation of the parallel assumption since the observed difference in working capital between the treated and control groups already existed before the occurrence of the shock. The results show that the coefficients of pre-trend variables and corresponding interactions are insignificant, suggesting no evidence for the violation of the parallel assumption.

Columns 4 and 5 present the results for the estimation of Equation (6). The results indicate that the coefficient of the DID estimators is significantly positive for the high-profit group, and significantly negative for the low-profit group. Supporting our hypothesis, the weakened bargaining power reduces both the rent-seeking and operating leverage effects. This leads to an increase in working capital for high-profit firms and a decrease in working capital for low-profit firms. In the rest of the columns, we redo the estimation using industry-adjusted *NWC*. The results are qualitatively unchanged. Additionally, our untabulated results from the estimation of a placebo test, which falsely identified the time of law enforcement 2 years ahead, reveal that the insignificant estimates of placebo variables confirm our DID results are indeed driven by the actual shock. Overall, our DID results provide evidence that unions exert bargaining power to affect working capital decisions across different profitability levels.

Operating leverage and rent extraction

This section explores the two contradictory mechanisms through which unions influence working capital policies. Specifically, we conjecture that the rent extraction effect dominates among profitable firms due to high profits increasing their vulnerability to rent-seeking risks, while the operating risk effect plays a key role among less profitable firms, driven by the demand for working capital to mitigate operating risks.

To test the rent extraction effect, we create two variables to capture firms' vulnerability to unions' rent-seeking ability. Following Chyz *et al.* (2013), we use pension expense as the first proxy of labor unions' ability to bargain profit. Pension payments increase in line with employees' bargaining power, which allows employees to push for increased welfare in the bargaining process. Therefore, we create the dummy variable, *High pension*, that is equal to 1 if a firm has pension and retirement expenses above the median value in a given year and 0 otherwise. In addition, since firms in concentrated industries are more vulnerable to unions' bargaining power due to the persistence of economic profits (Abowd and Lemieux, 1993; Brown, Fazzari and Petersen, 2009; Klasa, Maxwell and Ortiz-Molina, 2009), we follow Klasa, Maxwell and Ortiz-Molina (2009) by using product market concentration as the second proxy of vulnerability to unions' rent-seeking. We create another dummy variable, *Low market competition*, that is equal to 1 if a firm operates in an industry with an above-median value of market concentration in a given year and 0 otherwise.

If profitable firms reduce working capital to avoid unions' rent-seeking, we expect to observe that the negative effect of union coverage on net working capital is more profound for firms that are more exposed to unions' rent-seeking activities (i.e. groups with low market competition and high pension). Panel A of Table 6 reports the corresponding results. The significantly negative coefficients of triple interaction terms in columns 1–4 show that unions reduce working capital for profitable firms in the low competition and high pension groups. We redo the estimations for the industry-adjusted *NWC* in columns 5–8, and find that the coefficients of the triple interaction term remain negative and significant. Therefore, the results are consistent with the rent-seeking channel; profitable firms that are more exposed to unions' rent-seeking activities have a higher incentive to reduce working capital in the presence of unions.

In the same vein, we create dummy variables, *High operating leverage* and *High earnings volatility*, to investigate the operating risk effect. If unions induce less profitable firms to demand more working capital to mitigate the operating risk, we expect to observe that the positive effect of unions on working capital is more profound for less profitable firms with high operating risk (i.e. groups with high operating leverage and high earnings volatility).

Panel B reports the corresponding results. The coefficients of the triple interaction term in columns 1–4 are generally significant and positive. Columns 5–8 show qualitatively similar results for the industry-adjusted *NWC*. The results support the operating leverage channel; less profitable firms with higher operating risk have a higher incentive to increase their working capital in the presence of unions. Overall, Table 6 provides supportive evidence for the two mechanisms. The vulnerability to rent-seeking risk reduces the demand for financial flexibility for profitable firms, leading to the rent extraction effect. For less profitable firms, the motive for hedging increases demand for working capital, leading to the dominating role of the operating risk effect.

Labor unions, working capital management and corporate governance

Does working capital adjustment caused by unions reflect more efficient resource allocation? Strong labor forces can improve firms' resource allocation efficiency through a governance mechanism (e.g. Cohen, 1993; Della Torre, Gritti and Salimi, 2021; Prevost, Rao and Williams, 2012). Unionized labor forces can threaten to suspend contributions to a firm and influence the decision-making outcomes, including through work stoppages, strikes and voice (Della Torre, Gritti and Salimi, 2021; Prouska *et al.*, 2023; Xu, Loi and Cai, 2023). Allen and Gale (2002) theoretically demonstrate that stakeholder capitalism, under which employees cannot be fired at will, improves the efficiency of resource allocation. In line with the theoretical argument, Chen, Thomas and Xuan (2018) find that the presence of employee representation alleviates agency conflicts with debtholders, leading to better financing abilities. Fauver and Fuerst (2006) show that firms with employee representation on the supervisory board tend to have higher firm value. Chyz *et al.* (2013) argue that unionization reduces tax aggressiveness through enhanced monitoring.

Previous studies document that managers under weak governance misallocate financial resources (Amihud and Lev, 1981; Ben-Nasr, 2016; Elyasiani and Zhang, 2015; Gill and Biger, 2013; Jensen, 1986; Shleifer and Vishny, 1989). Managers under weak governance tend to build excessive financial flexibility to build financial entrenchment or pursue private benefits by wasting financial resources. Therefore, if unions serve as alternative governance to improve resource allocation, we expect that the heterogeneous impact of unions on working capital is more profound for firms with weak governance.

We then explore whether unions' impact on working capital decisions is a mechanism of strengthened

Table 6. Rent extraction and operating risk effects

Dependent variable	*NWC* (1)	*NWC* (2)	*NWC* (3)	*NWC* (4)	*Adj_NWC* (5)	*Adj_NWC* (6)	*Adj_NWC* (7)	*Adj_NWC* (8)
Panel A. Rent seeking channel								
Unions×High profit×Low competition	−0.012***	−0.004***			−0.010***	−0.003**		
	(0.004)	(0.001)			(0.004)	(0.001)		
Unions×High profit×High pension			−0.011***	−0.003*			−0.010***	−0.002*
			(0.004)	(0.001)			(0.004)	(0.001)
Unions×High profit	−0.002	0.000	−0.004	−0.000	−0.003	−0.000	−0.004	−0.000
	(0.003)	(0.001)	(0.003)	(0.001)	(0.003)	(0.001)	(0.003)	(0.001)
Unions×(1-High profit)	0.002	0.004***	0.003	0.005***	0.003*	0.004***	0.003**	0.005***
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
Low competition	0.008**	0.004			0.001	0.002		
	(0.004)	(0.003)			(0.003)	(0.003)		
High pension			0.008	0.004			0.007	0.005*
			(0.005)	(0.003)			(0.005)	(0.003)
Industry FE	Yes	Yes	No	No	Yes	Yes	No	No
Firm FE	No	No	Yes	Yes	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-square	0.360	0.709	0.356	0.727	0.284	0.680	0.282	0.694
N	37,868	37,868	32,842	32,842	37,868	37,868	32,842	32,842
Panel B. Operating leverage channel								
Unions×(1-High profit)×High operating leverage	0.017***	0.001			0.019***	0.002		
	(0.006)	(0.003)			(0.005)	(0.003)		
Unions×(1-High profit)×High cash flow volatility			0.005**	0.003**			0.005**	0.002*
			(0.002)	(0.001)			(0.002)	(0.001)
Unions×(1-High profit)	−0.002	0.005***	−0.002	0.001	−0.001	0.005***	−0.001	0.001
	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Unions×High profit	−0.011***	−0.002***	−0.006***	−0.001	−0.011***	−0.002**	−0.006***	−0.001
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
High operating leverage	0.011	0.008**			0.009	0.009**		
	(0.007)	(0.004)			(0.006)	(0.004)		
High cashflow volatility			−0.028***	−0.021***			−0.028***	−0.020***
			(0.005)	(0.002)			(0.004)	(0.002)
Industry FE	Yes	Yes	No	No	Yes	Yes	No	No
Firm FE	No	No	Yes	Yes	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-square	0.275	0.773	0.364	0.709	0.256	0.764	0.287	0.675
N	35,050	35,050	37,849	37,849	35,050	35,050	37,849	37,849

Note: This table presents the results from the regressions of net working capital on unions, conditional on operating risk or rent-seeking vulnerability. The dependent variable is *NWC* in columns 1–4, and industry-adjusted *NWC* in columns 5–8. *High operating leverage*, *High cash flow volatility, Low market competition* and *High pension* are dummy variables that equal to 1 if the firm's value of the variable is above the median value of the corresponding variable in a given year. Standard errors in parentheses are the robust standard errors clustered at the firm level. All the regressions include control variables of Table 2. All the independent variables are lagged by 1 year. All the continuous variables are winsorized at their 1st and 99th percentiles. Variable definitions are reported in Appendix A.
*, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

governance quality for liquidity management. Following Bebchuk, Cohen and Ferrell (2009), Cain, McKeon and Solomon (2017), and Chung and Zhang (2011), we construct three dummy variables, *Low institutional ownership*, *Low takeover index* and *High E-index*, to measure the degree of agency problems. Then, we include the triple interaction terms between each dummy variable, profitability and unionization proxies in Equation (2). We expect to observe the heterogenous effect of unions on working capital is more pronounced among firms with poorer governance.

Table 7 reports the corresponding results. Columns 1–6 show that the triple interactions with weak governance indicators are significant and negative regardless of the governance proxies used. In columns 7–12, we conduct robustness using industry-adjusted *NWC* and find supportive results. Overall, our results suggest that the negative impact of unions on profitable firms' working capital is stronger under weak governance, which is

Table 7. Labor unions, net working capital and governance

Dependent variable	*NWC* (1)	*NWC* (2)	*NWC* (3)	*NWC* (4)	*NWC* (5)	*NWC* (6)	*Adj NWC* (7)	*Adj NWC* (8)	*Adj NWC* (9)	*Adj NWC* (10)	*Adj NWC* (11)	*Adj NWC* (12)
Unions×ROA×Low institutional ownership	−0.069**	−0.062*					−0.062**	−0.058*				
	(0.035)	(0.034)					(0.031)	(0.032)				
Unions×Low institutional ownership	0.016***	0.006					0.010**	0.006				
	(0.006)	(0.005)					(0.005)	(0.005)				
ROA×Low institutional ownership	0.141***	0.068**					0.138***	0.066**				
	(0.038)	(0.029)					(0.037)	(0.028)				
Low institutional ownership	−0.024***	−0.001					−0.020***	−0.000				
	(0.007)	(0.005)					(0.007)	(0.005)				
Unions×ROA×Low takeover index			−0.121**	−0.107**					−0.116*	−0.104**		
			(0.058)	(0.043)					(0.059)	(0.042)		
Unions×Low takeover index			0.025***	0.018***					0.024***	0.017**		
			(0.008)	(0.007)					(0.008)	(0.007)		
ROA×Low takeover index			0.008	0.056					−0.011	0.054		
			(0.079)	(0.045)					(0.076)	(0.044)		
Low takeover index			−0.015	−0.011					−0.012	−0.011		
			(0.012)	(0.008)					(0.011)	(0.007)		
Unions×ROA×High E index					−0.137*	−0.076*					−0.155**	−0.067
					(0.076)	(0.046)					(0.070)	(0.047)
Unions×High E index					0.015	0.011					0.021*	0.009
					(0.013)	(0.009)					(0.011)	(0.009)
ROA×High E index					−0.035	0.017					−0.030	0.027
					(0.080)	(0.106)					(0.077)	(0.105)
High E index					0.020	0.002					0.017	0.001
					(0.014)	(0.020)					(0.013)	(0.020)
Unions×ROA	−0.004	0.040*	0.004	0.071**	0.105**	0.095***	−0.015	0.029	0.003	0.067**	0.112**	0.091**
	(0.022)	(0.021)	(0.046)	(0.030)	(0.051)	(0.033)	(0.018)	(0.020)	(0.048)	(0.030)	(0.050)	(0.036)
Unions	−0.008	−0.008*	−0.013*	−0.014**	−0.022***	−0.013**	0.000	−0.006	−0.010	−0.014**	−0.020**	−0.013**
	(0.006)	(0.004)	(0.007)	(0.006)	(0.009)	(0.006)	(0.005)	(0.004)	(0.007)	(0.006)	(0.008)	(0.006)
ROA	−0.120***	−0.059***	0.044	−0.174***	0.062	0.015	−0.092***	−0.044**	0.078	−0.152***	0.059	0.011
	(0.025)	(0.023)	(0.064)	(0.036)	(0.075)	(0.063)	(0.024)	(0.022)	(0.062)	(0.035)	(0.069)	(0.062)
Industry FE	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Firm FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-square	0.500	0.794	0.300	0.785	0.416	0.830	0.469	0.777	0.238	0.765	0.301	0.783
N	37,868	37,868	25,130	25,130	2228	2228	37,868	37,868	25,130	25,130	2228	2228

Note: This table presents the results from the regressions of net working capital on unions, conditional on the quality of governance. The dependent variable is *NWC* in columns 1–6, and industry-adjusted *NWC* in columns 7–12. *Low takeover index* and *Low institutional ownership* are dummy variables that equal to 1 if a firm's value of the corresponding variable is below the median value of the corresponding variable in a given year and 0 otherwise. *High E-index* is a dummy variable that is equal to 1 if a firm's value of the variable is above the median value of the corresponding variable in a given year and 0 otherwise. Standard errors in parentheses are the robust standard errors clustered at the firm level. All the regressions include control variables in Table 2. All the independent variables are lagged by 1 year. All the continuous variables are winsorized at their 1st and 99th percentiles. Variable definitions are reported in Appendix A.
*, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

consistent with the view that unions serve as an alternative monitoring mechanism.

Is working capital a substitute for cash?

There is a long-standing view in the literature that working capital can act as a substitute for cash holdings because both provide a liquidity advantage (e.g. Bates, Kahle and Stulz, 2009; Bigelli and Sánchez-Vidal, 2012; Opler *et al.*, 1999), so the observed adjustment in working capital is potentially due to the adjustment in cash policies. For instance, if the collective bargaining of unions reduces cash holdings (Klasa, Maxwell and Ortiz-Molina, 2009; Tong and Huang, 2018), the low cash reserves could raise the demand for working capital due to the substitute role of cash. In this explanation, the observed increase in working capital could be driven by cash policies rather than the direct impact of unions. Therefore, we further investigate the role of cash policies in the heterogenous impact of unionization on working capital.

We start our test by including the interaction of *Unions* and *Cash* in Equations (2) and (3). Panel A of Table 8 presents the results. If the observed change in working capital simply reflects the change in cash policies induced by unionization, we should observe that the key independent variables of interest are insignificant. However, we find that the interactions of *Unions* with *ROA*, *High profit* and *(1-High profit)* are still significant and negative, implying that our finding is not driven by the impact of unions on cash reserves.

In Panel B, we directly test the substitution effect of cash and working capital. Specifically, if the observed adjustment in working capital is the outcome of adjustments in cash position, we should observe that the negative effect of unionization on profitable firms' working capital is weaker if they hold less cash, as the liquidity benefit of working capital is more valuable for those firms. To test the predictions, we create a dummy variable, *High cash*, that equals 1 if a firm's cash ratio is above the industry median level and 0 otherwise. We include the triple interaction of *Unions*, *High profit* and *Low cash* in Equation (3). If our results are indeed driven by the substitution effect, we should observe a positive coefficient of the triple interaction.

Columns 1 and 2 report the results. The coefficient of the triple interaction is insignificant, implying that the negative impact of unions on profitable firms' working capital cannot be explained by the substitution effect between cash and working capital. In the same vein, columns 3 and 4 show no evidence for the explanation that high cash reserves diminish the positive impact of unions on less profitable firms' working capital. In the rest of the columns, we find qualitatively similar results for the industry-adjusted *NWC*. Overall, Table 8 does not support the alternative explanation that the substitution relationship between working capital and cash holdings drives the heterogeneous impact of unions on working capital.

Implications – Firm value

So far, we document that unions serve as an alternative governance mechanism to improve the quality of working capital management by decreasing working capital for firms with strong financial performance and increasing it for those with weak financial performance.[3] In the final subsection, we aim to explore whether shareholders view the working capital adjustment influenced by unions as value-enhancing.

The literature provides mixed evidence regarding the impact of unionization on corporate performance (e.g. Addison and Hirsch, 1989; Bronars and Deere, 1994; Hirsch, 2004; Lee and Mas, 2012). Previous studies document that high-quality governance can improve the quality of working capital management (e.g. Aktas *et al.*, 2021; Ben-Nasr, 2016; Gill and Biger, 2013; Kieschnick, LaPlante and Moussawi, 2006), and efficient working capital management can increase firm value and performance (Aktas, Croci and Petmezas, 2015; Baños-Caballero, García-Teruel and Martínez-Solano, 2012, 2014; Lefebvre, 2020). Therefore, if the heterogenous impact of unions on working capital can serve as a governance mechanism that leads to high-quality working capital management, shareholders should attribute a higher value to unions' impact on working capital policies.

To test whether firm value reflects the improved quality of working capital management engendered by unionization, we estimate how shareholders value working capital decisions in the presence of unionization. Specifically, we regress 1-year excess return on the two interactions, *Unions*×*NWC*×*High profit* and *Unions*×*NWC*×*(1-High profit)*, along with control variables that are known to affect firm value. Table 9 shows the corresponding results. We find that the coefficients of *Unions*×*NWC*×*High profit* are significantly negative, implying that investors consider high working capital as value-destroying for profitable firms with strong unionization. On the contrary, the positive coefficient of *Unions*×*NWC*×*(1-High profit)* suggests that high working capital can increase firm value for less profitable firms with powerful unions. Therefore, the results in Table 9 support our conjecture. Combined with the findings in the previous section, investors reward a higher value for firms' strategic working capital management to offset unions' rent-seeking activities and mitigate operating risk.

[3]In our Internet Appendix, we test the impact of unions on the overall performance of working capital efficiency.

Table 8. Alternative explanation – the substitution of cash

Dependent variable	*NWC* (1)	*NWC* (2)	*NWC* (3)	*NWC* (4)	*Adj NWC* (5)	*Adj NWC* (6)	*Adj NWC* (7)	*Adj NWC* (8)
Panel A. Alternative explanation								
Unions×*ROA*	−0.090***	−0.061***			−0.096***	−0.064***		
	(0.028)	(0.020)			(0.027)	(0.019)		
Unions×*High profit*			−0.003*	−0.002**			−0.004**	−0.002**
			(0.002)	(0.001)			(0.002)	(0.001)
Unions×*(1-High profit)*			0.004**	0.004***			0.005***	0.005***
			(0.002)	(0.001)			(0.002)	(0.001)
Unions×*Cash*	−0.007	−0.012	−0.008	−0.016	−0.012	−0.014	−0.009	−0.018
	(0.018)	(0.011)	(0.009)	(0.013)	(0.017)	(0.011)	(0.009)	(0.012)
Unions	0.004	0.008*			0.011**	0.009**		
	(0.005)	(0.004)			(0.004)	(0.004)		
ROA	0.122***	0.087***			0.139***	0.095***		
	(0.030)	(0.026)			(0.029)	(0.026)		
Cash	−0.014***	−0.010**	−0.012***	−0.010**	−0.013***	−0.010**	−0.014***	−0.011**
	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)
Industry FE	Yes	No	Yes	No	Yes	No	Yes	No
Firm FE	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-square	0.348	0.709	0.397	0.710	0.299	0.680	0.312	0.676
N	37,868	37,868	37,868	37,868	37,868	37,868	37,868	37,868

Table 8. (Continued)

Panel B. Cash substitution								
Unions×*High profit*	−0.005*	−0.004**	−0.005**	−0.002**	−0.006**	−0.003*	−0.006**	−0.002**
	(0.003)	(0.001)	(0.002)	(0.001)	(0.003)	(0.002)	(0.002)	(0.001)
Unions×*High profit*×*Low cash*	0.000	0.002			0.000	0.001		
	(0.003)	(0.002)			(0.003)	(0.002)		
Unions×*(1-High profit)*	0.004**	0.004***	0.002	0.004***	0.004*	0.005***	0.003	0.005***
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
Unions×*(1-High profit)*×*High cash*			0.005	−0.001			0.004	−0.001
			(0.003)	(0.002)			(0.003)	(0.002)
Low cash	0.008*	0.004			0.013***	0.009***		
	(0.005)	(0.003)			(0.005)	(0.003)		
High cash			−0.012***	−0.002			−0.013***	−0.003
			(0.004)	(0.003)			(0.004)	(0.003)
Industry FE	Yes	No	Yes	No	Yes	No	Yes	No
Firm FE	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-square	0.400	0.709	0.401	0.709	0.316	0.675	0.316	0.675
N	37,868	37,868	37,868	37,868	37,868	37,868	37,868	37,868

Note: This table reports the result of examining the substitution relationship between net working capital and cash. The dependent variable is *NWC* in columns 1–4, and industry-adjusted *NWC* in columns 5–8. *High cash* is a dummy variable that equals 1 if a firm's cash ratio is above the industry median in a given year and 0 otherwise. Standard errors in parentheses are the robust standard errors clustered at the firm level. All the regressions include control variables in Table 2. All the independent variables are lagged by 1 year. All the continuous variables are winsorized at their 1st and 99th percentiles. Variable definitions are reported in Appendix A.

*, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 9. Labor unions, working capital and firm performance

	One-year excess return (1)	*One-year excess return* (2)
Unions×NWC×High profit	−0.038**	−0.036***
	(0.016)	(0.007)
Unions×NWC×(1-High profit)	0.047***	0.017**
	(0.014)	(0.007)
Unions	−0.003	−0.000***
	(0.005)	(0.000)
NWC	0.002	−0.013
	(0.020)	(0.012)
Size	−0.241***	−0.019***
	(0.005)	(0.001)
Cash	−0.013***	−0.013***
	(0.003)	(0.002)
Leverage	−0.046**	0.091***
	(0.021)	(0.012)
Fix asset growth	−0.033***	−0.077***
	(0.009)	(0.009)
Intangible assets	−0.015	−0.059***
	(0.024)	(0.012)
R&D	0.046***	0.023***
	(0.009)	(0.007)
Firm risk	0.966***	0.725***
	(0.256)	(0.194)
Age	−0.035***	0.012***
	(0.013)	(0.004)
Industry FE	Yes	No
Firm FE	No	Yes
Year FE	Yes	Yes
Adj. R-square	0.123	0.026
N	85,877	85,877

Note: This table presents the results from the regressions of firm performance on unions, conditional on working capital and profitability. The dependent variable is *One-year excess return*, which is the 12-month buy-and-hold excess stock return ending at the calendar year's end month. *Fixed asset growth* is the growth rate of net property, plant and equipment. *Intangible assets* are intangible assets scaled by net assets. *R&D* is research and development expenses scaled by net assets. *Firm risk* is the annual standard deviation of stock returns calculated using daily stock returns. *Age* is the natural logarithm of the number of years since a firm's record first appears in the Compustat database. Standard errors in parentheses are the robust standard errors clustered at the firm level. All the regressions include industry and year fixed effects. All the independent variables are lagged by 1 year. All the continuous variables are winsorized at their 1st and 99th percentiles. Variable definitions are reported in Appendix A.
*, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Conclusion

This study provides new evidence on the role of unions in shaping firms' working capital policies and their subsequent effect on firm value. We show that unions influence these policies through two distinct mechanisms: strategic resistance to rent-seeking and operating risk mitigation. Specifically, firms reduce excess working capital to resist unions' bargaining for profit and increase working capital to address deficiencies that could threaten employment security. These divergent bargaining objectives function as a monitoring mechanism, leading to more efficient working capital allocation.

To address potential endogeneity and establish causality, we employ instrumental variables using the industry-level proportions of female workers and part-time workers, both of which are negatively associated with unionization. We also implement a RDD that exploits close union election outcomes. In addition, a DID analysis using the staggered adoption of state right-to-work laws as an exogenous shock confirms that these effects operate through changes in unions' bargaining power.

Our evidence indicates that unions can function as an alternative governance mechanism, encouraging managers to allocate working capital more efficiently. We also show that this effect is independent of cash policies, underscoring that cash and working capital are not perfect substitutes. Finally, we demonstrate that improved efficiency in working capital management enhances firm value, and that shareholders attribute greater value to union-induced improvements. These findings challenge the conventional view of unions as purely value-reducing and instead highlight the 'bright

side' of union influence, showing that unions can improve firm performance by enhancing the quality of working capital management.

Appendix A

Variable definitions

NWC: net operating working capital ratio is calculated as inventories plus receivables minus accounts payable scaled by total sales.

Adj NWC: the difference between a firm's *NWC* and its corresponding industry median of *NWC* in a given year.

Unions: the industry-level union coverage multiplied by a firm's labor intensity ratio. The industry-level union coverage is the percentage of total workers who are covered by unions in collective bargaining agreements in each three-digit Census Industry Classification industry. Data are available at: http://www.unionstats.com/. The labor intensity ratio is measured as the number of employees divided by the total assets.

Unions_Asset4: a firm's percentage ratio of union membership. Data are obtained from the Thomson/Refinitiv Asset4.

ROA: earnings before interest scaled by total assets.

High profit: a dummy variable that equals 1 if the firm's *ROA* is above the median value of the corresponding industry in a given year.

Size: the market value of equity adjusted to year-2000 dollars.

Sales growth: the annual percentage change in sales.

M/B: the ratio of the market value of equity plus total liabilities minus payables to net assets.

Gross profit margin: the ratio of sales minus the cost of goods sold to sales.

Market share: firm sales as a percentage of aggregate sales in the firm's industry. Industry is classified based on the three-digit SIC code.

Distress: a dummy variable that equals 1 if the firm meets the definition of financial distress, and 0 otherwise. Following Molina and Preve (2009), the firm is considered to be in financial distress if its coverage ratio is less than 1 for two consecutive years or if it is less than 0.8 in any given year.

Sales volatility: the rolling standard deviation of sales using a 5-year window, scaled by net assets.

Cash: cash and cash equivalents scaled by net assets.

Leverage: the book leverage ratio, which is calculated as the sum of long-term and short-term debts scaled by total assets.

Board independence: the proportion of independent directors on a board.

Board size: the logarithm of the total number of directors on a board.

CEO duality: a dummy variable that equals 1 if a firm's chief executive officer also serves as the chairman of the board.

Part-time proportion: the fraction of female workers in each Census Industry Classification industry. We collect data from Current Population Survey (CPS) – Merged Outgoing Rotation Group Earnings Data.

Female proportion: the fraction of female workers in each Census Industry Classification industry. We collect data from Current Population Survey (CPS) – Merged Outgoing Rotation Group Earnings Data. Data are available at: https://www.nber.org/research/data/current-population-survey-cps-merged-outgoing-rotation-group-earnings-data.

Operating leverage: following Chen, Harford and Kamara (2019), operating leverage is calculated as selling, general and administrative expenses divided by total assets at the end of the previous year.

Cash flow volatility: the rolling standard deviation of earnings before interest and tax using a 10-year window. A minimum of 5 years of data is required.

Market concentration: the Herfindahl–Hirschman Index (HHI), which is estimated as:

$$HHI_{j,t} = \sum_{i=1}^{N_{j,t}} Market\ share_{i,j,t}^{2}$$

where $N_{j,t}$ is the number of firms operating in industry j in year t. Industry j is classified based on the three-digit SIC code.

Pension expense: the pension and retirement expense scaled by total assets.

Institutional ownership: the proportion of outstanding shares held by institutional investors. Data are obtained from Thomson Reuters Institutional (13F) Holdings.

Hostile takeover index: a proxy that measures the variation in takeover laws using a dataset of 17 different takeover laws (Cain, McKeon and Solomon, 2017). Data are available at the author's website: https://pages.uoregon.edu/smckeon/.

E-index: a proxy of corporate governance developed by Bebchuk, Cohen and Ferrell (2009). Data are available at the author's website: http://www.law.harvard.edu/faculty/bebchuk/data.shtml.

High cash: a dummy variable that equals 1 if a firm's cash ratio is above its corresponding industry median cash ratio in a given year and 0 otherwise.

One-year excess return: the 12-month buy-and-hold excess stock return ending at the calendar year's end month. The excess stock return is calculated as the difference between the monthly stock return and the monthly return of benchmark portfolios. Benchmark portfolios are the 25 Fama-French value-weighted portfolios based on size and book-to-market.

Fixed asset growth: the growth rate of net property, plant and equipment.
Intangible assets: intangible assets scaled by net assets.
R&D: research and development expenses scaled by net assets. Missing data are replaced by 0.
Firm risk: annual standard deviation of stock returns calculated using daily stock returns.
Age: the natural logarithm of the number of years since the firm's record first appears in the Compustat database.

Appendix B

Table B1. Labor unions, profit and net working capital: An alternative proxy for union coverage

	NWC (1)	*NWC* (2)	*NWC* (3)	*NWC* (4)	*Adj NWC* (5)	*Adj NWC* (6)	*Adj NWC* (7)	*Adj NWC* (8)
Unions_Asset4	0.039	0.061**			0.065**	0.053*		
	(0.031)	(0.029)			(0.031)	(0.029)		
Unions_Asset4×ROA	−0.248	−0.270*			−0.282*	−0.262*		
	(0.165)	(0.157)			(0.165)	(0.156)		
ROA	0.002	0.047			0.032	0.052		
	(0.054)	(0.073)			(0.052)	(0.072)		
Unions×High profit			−0.019**	−0.019**			0.007	0.005
			(0.009)	(0.008)			(0.009)	(0.010)
Unions×(1-High profit)			0.030**	0.029**			0.048***	0.045***
			(0.015)	(0.014)			(0.013)	(0.013)
Industry FE	Yes	No	Yes	No	Yes	No	Yes	No
Firm FE	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-square	0.341	0.733	0.511	0.460	0.283	0.702	0.801	0.785
N	6819	6819	6819	6819	6819	6819	6819	6819

Note: This table presents the results for the impact of unions on net working capital using an alternative proxy for union coverage. The dependent variable is *NWC* in columns 1–4, and industry-adjusted *NWC* in columns 5–8. Columns 1 and 2 include firm fixed effects. *Unions_Asset4* is the firm-level union coverage collected from the Asset4 database. Standard errors in parentheses are the robust standard errors clustered at the firm level. All the regressions include control variables in Table 2. All the independent variables are lagged by 1 year. All the continuous variables are winsorized at their 1st and 99th percentiles. Variable definitions are reported in Appendix A.
*, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Appendix C: Supplementary data

Supplementary results related to this article can be found in the Internet Appendix.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section at the end of the article.

Supporting Information