Real Activity Management in the Presence of Labor Unions
: An Empirical Study Using Firm Level Union Data

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Abstract

In the presence of labor unions, management has incentives to lower earnings to prevent labor unions from extracting rents ("manipulation hypothesis") or to boost earnings through overproduction to lower costs of unit production or reducing discretionary R&D expenditures to mitigate employees' perception of unemployment risk and reduce cost to attract and retain employees ("forced cooperation hypothesis"). Strong union affects manager's decision in a way that firms end up getting lower abnormal production costs and lower abnormal R&D expenditures. We test these two hypotheses through the lens of real activity management because of labor unions' particular interest directly linked in real activities. Consistent with the forced cooperation hypothesis, we find that the power of labor unions is positively associated with real activity management, especially through the overproduction channel. The extent of upward real activity varies with union power with a magnitude that is both statistically and economically significant. The positive relation between union power and real activity is stronger when the cost of attracting and retaining employees is high, and when labor unions are valued for job security purpose. In addition, the result is consistent when states' unemployment insurance benefits suffer negative shocks, when states adopt the "right-to-work" laws, and when firms switch from unionized to non-unionized.

JEL Classification: J51, G30, G33, M41

Keyword: Labor unions, earnings management, real activities

1. Introduction

Labor unions remain a powerful stakeholder for many firms even though their representation has been declining (Matsa, 2010). Managers have incentives for downward earnings management as they try to limit the rent labor unions extract from shareholders by reporting lower earnings prior to negotiations with a powerful union (Liberty and Zimmerman, 1986; DeAngelo and DeAngelo, 1991). Because earnings are the usual basis for labor negotiations, managers can use lower earnings, pessimistic expectations, and lack of good news to prevent labor unions from extracting an increased percentage of rent from shareholder value, especially during labor contract talks (Bova, 2013; Chung, Lee, Lee, and Sohn, 2016). Even though labor unions are wary of management's downward earnings management incentives, they have difficulty to detect it due to asymmetric information.[1]

On the other hand, managers have forced incentives for upward real earnings management under strong union, due to their needs of mitigating employees' perceived job security or reducing the cost of employee hiring and retention in competitive labor markets (Bowen, DuCharme, and Shores, 1995; Agrawal and Matsa, 2013). Alternatively, strong union affects manager's decision in a way that firms end up getting lower abnormal production costs and lower abnormal R&D expenditures. For instance, strong union forces a firm to use more variable costs (that include wages) in production than fixed costs, and strong union may not allow managers to spend on high R&D expenditures. To our knowledge, there is no paper directly examine the relation between labor union and real activity management using a large sample of firm level union data. Specifically, we raise an interesting question that in the presence of labor unions what choices managers make with respect to the mixed incentives for earnings management.

[1] In general, unions do not have access to employers' production, financial, and personnel information (Leap, 1991)

Following the mixed incentives, we formulate two hypotheses, "forced cooperation hypothesis" and "manipulation hypothesis" and test them through the lens of real activity management because of labor unions' particular interest and influence in real activities (Matsa, 2010). Real activity management can be reflected in several ways: either abnormal levels of cash flows through sales management, or abnormal levels of discretionary expenditures such as R&D and advertising, or overproduction products (Roychowdhury, 2006). Much of the upward real activity incentives coincide with what labor unions emphasize as they organize labor and bargain for worker welfare.[2] Labor unions emphasize the importance of labor, seek high wages and benefits, prefer low-risk projects, and fight for job security and stable employment (Bradley, Kim, and Tian, 2016). The "forced cooperation hypothesis" states that labor unions force to managers choose upward real activity management, and the forced cooperation should increase with union strength as the cost of non-cooperating is steeper. Empirically, the forced cooperation hypothesis predicts a positive relation between labor union power and upward real activity management measures.

On the other hand, the manipulation hypothesis argues that labor unions are associated with downward earnings management as managers prevent labor unions from extracting extra rent from shareholders. Empirically, the manipulation hypothesis predicts a negative relation between labor union power and real activity measures.

To examine the effect of importance of human capital for union firms on earnings management and investment behavior, we then focus on firms with high intangibility. Firms with high intangibility is becoming more dominant in today's economy as the increased importance of

[2] Prior earnings management studies focus on accrual-based earnings management since it is easy to manipulate prior to labor negotiation contract. Thus, it is limited to labor union negotiation sample. However, our study examines the impact of labor union on real activity management and accrual-based earnings management for a broad and larger sample in panel data. We focus on real activity management because of shared interest or forced power between management and labor union.

human capital has changed the nature of today's firms (Zingales, 2000). These firms usually have high dependence over human capital, and managers appreciate the importance of human capital more because the risk of key talent departure could be devastating (Eisfeldt and Pananikolaou, 2013). Also the cost of attracting and retaining employees in competitive markets is very high (Agrawal and Matsa, 2013). Therefore, the forced cooperation between management and labor unions is stronger at these firms.[3] Managers at these firms also possess more special information advantage compared to outsiders as intangible assets are more difficult to value (Aboody and Lev, 2000), so that manipulation is also easier and more flexible.[4] By examining the real activity management at these firms in the presence of labor unions, we gain a sharper test of the manipulation versus forced cooperation hypothesis. Empirically, the manipulation hypothesis predicts a more salient *negative* relation, while the forced cooperation hypothesis predicts a more salient *positive* relation between labor union power and real activity management at firms with high intangibility and higher dependence on human capital.

With the help of a firm-level union representation measure, we examine the association between the extent of real activity and union membership, a proxy for union strength and bargaining power for a sample of U.S. firms over the period of 2002-2015. We find that higher union power is associated with more upward real activity management. Further, the positive relation between union power and real activity management is much stronger at firms with high organization capital intensity, a proxy for firm's intangibility and dependence on human capital

[3] It can be argued that for firms where skilled human capital is important, managers and skilled worker's incentive may not align with labor union. The reason is that talented and skilled worker may not need labor union. We, however, test this relation within high and low intangible industries to avoid this endogenous issue.

[4] Zang (2012) find that trade off the two earnings management methods based on their relative costs and that managers adjust the level of accrual-based earnings management according to the level of real activities manipulation realized.

(Eisfeldt and Papanikolaou, 2013; Peters and Taylor, 2017). Both findings consistently support the forced cooperation hypothesis, but not manipulation hypothesis.

There is a positive and highly significant relation between labor union membership and different measures of real activity management. Based on our findings, one standard deviation change in union membership is associated with 8% of one standard deviation change in the aggregate real activity management measure (*RM1*), 11% change in the overproduction measure (*REM_PROD*), and 5% change in the discretionary expense measure (*REM_DISX*).

The labor union effect on upward real management activities becomes much more economically significant and differ drastically for firms with high dependence on human capital. For example, in univariate analysis, for a firm in an industry with high intangibility measured by organization capital intensity (Peters and Taylor, 2017), *RM1* (sum of overproduction measure and discretionary expenses) at firms with at least 25% union membership is much higher than the firms with less or union presence. The difference of 0.17 amounts to as much as 65% of a standard deviation of *RM1,* shown in Panel A of Table 4.

Furthermore, the magnitude of the average *RM1* in the presence of labor unions increases with the power of union, measured by the percentage of union members. For firms with 50% or more of the labor force belonging to the union, the average *RM1* reaches a whopping 0.21, which is 20 times that of the mean. The average *RM1* between those with strong union power and those without reaches 94 percent of a standard deviation of *RM1* for difference. In our regression analyses where we control for both firm and year fixed effects, the labor union and high organization capital intensity interaction term is also positive and significant. The results also show that the level of forced cooperation varies with how aligned managers' and labor unions' interests are. For example, whereas firms with high organization capital intensity and powerful

union have high *RM1* measures, they do not show reduced discretionary expenses, which include SG&A as well as R&D because labor unions would have offsetting preference for such expenses.

Next, to ensure that our findings are not driven by simultaneous, unobservable changes in other factors that affect the real activity management measures, we examine changes in real activity management after external shocks to union strength. These shocks include states' adoption of right-to-work (RTW hereafter) laws, change of states' unemployment insurance benefits, and firm's change from unionized to non-unionized. We find that with union bargaining power lower after states adopt RTW laws, real activity management measures experience significant drop at firms with strong union presence. After a firm change from unionized to non-unionized, the real activity management measures experience significant drop. With union bargaining power higher after a nontrivial decrease in high-benefit states' unemployment insurance benefits, real activity management measures are higher. Results from falsification test show that these shocks do not seem to affect real activity management measures at firms with no or low union representation.

In this paper, we make several contributions to the literatures on labor unions and real activity management. While most of prior labor union studies use industry level unionization data from the Union Membership and Coverage Database from Hirsch and Macpherson (2003), we use firm level union membership data from Thomson Reuters Asset 4 and Bloomberg data to examine firm specific relation between labor unions and earnings management.[5] First, we demonstrate that managers and labor unions cooperate with respect to upward real activity management because of shared interest or forced power. Such forced cooperation strengthens with the stronger managerial incentive to please labor in firms with high organization capital intensity. Second, our paper adds to the earnings management literature fresh empirical evidence

[5] We also perform our tests using industry union membership data in robustness test.

of labor unions' effect on real activity management, through channels that labor unions care about. By examining the differential real earnings management activities under various managerial incentives, this paper also addresses a common concern over earnings management studies: that the lack of motivation into the research design of earnings management makes it difficult to identify the actual managerial incentive (Ball and Foster, 1982). Though we cannot substantiate the actual underlying incentives, we show that the observed real activity management varies with such incentives. Finally, we add to the literature on the role of organization capital, or intangible capital, in managerial decision making (Lustig, Syverson, and Van Nieuwerburgh, 2011; Eisfeldt and Pananikolaou, 2013&2014; Gourio and Rudanko, 2014; Peters and Taylor, 2017).

The paper is structured as follows. We review the prior literature and present the background for our hypotheses in Section 2 and describe the data and measurement in Section 3. Section 4 reports empirical results with endogeneity and robustness tests and Section 5 concludes.

2. Literature and Hypotheses

2.1 Real Activity Management

Managers of public firms are under constant pressure from stakeholders to deliver financial performance that is used in contracting and firm valuation. It is no wonder that 97% of managers in Graham et al (2005) survey report that they prefer smooth earnings paths and one in five companies intentionally misrepresents its earnings using discretion within generally accepted accounting principles (GAAP). The same survey finds that managers prefer real activity management to accrual-based earnings management. Real earnings management through manipulation of actual sales, production and discretionary expenses has cash flow consequences

(Roychowdhury, 2006). Upward real earnings management could be reflected by abnormally high operating cash flows, abnormally low production costs, and abnormally low discretionary expenses after controlling for sales levels.

With very few exceptions, real earnings management is believed to be associated suboptimal business consequences and therefore should be guarded against, especially by long-term shareholders (Bushee, 1998; Cohen and Zarowin, 2010; Wongsunwai, 2013; Cheng, Lee, and Shevlin, 2015; Gunny, 2010). Real earnings management activities are less likely to be scrutinized by auditors and regulators, and managers have shifted from accrual to real activity management in the post-Sarbanes-Oxley Act (SOX) period (Cohen, Dey, and Lys, 2008).

2.2 Labor-Related Incentives for Upward Real Activity Management

Managers have numerous incentives to meet or beat their earnings target (Graham et al., 2016). We focus on the labor-related incentives for upward real activity management incentives. Managers desire to satisfy implicit claims between a firm and its employees and build a good reputation (Bowen, DuCharme, and Shores, 1995), mitigate workers' exposure to unemployment risk (Agarwal and Matsa, 2013), and manage employees' perceptions of employment security (Dou. Khan, and Zou, 2016). In summary, upward real activity management helps keep down the cost of employee hiring and retention in competitive labor markets. Hence we have cooperation hypothesis (CH):

Hypothesis 1A (CH): *There is a positive relation between labor union strength and (upward) real activity management measures.*

2.3 Labor-Related Incentives for Downward Real Activity Management

Labor unions are widely believed to impose a number of costs on employers, including raising wages, strikes, higher cost of capital, and worker benefits (Lewis, 1986; Chen et al., 2012). Because earnings are the base for contractual negotiation with labor unions, managers have downward earnings management incentives to reduce labor unions' rent extraction from shareholders (Baldwin, 1983; Grout, 1984). However, past literature documents rather mixed results for the labor-related incentives, especially during contract talks, accomplished by downward earnings management, managing analysts' expectations, and withhold good news (Liberty and Zimmerman, 1986; DeAngelo and DeAngelo, 1991; D'Souza et al., 2001; Comprix and Muller 2011; Bova et al., 2015). Hence we have manipulation hypothesis (MH):

Hypothesis 1B (MH): *There is a negative relation between labor union strength and real earnings management measures.*

2.4 Forced Cooperation Hypothesis, Manipulation Hypothesis, and Organization Capital

The U.S. economy has shifted toward service- and technology-based industries, which rely heavily on human capital, innovative products, brands, patents, software, customer relationships, databases, and distribution systems (Peters and Taylor, 2017). Organization capital is taken as a durable input in production that is distinct from physical capital (Eisfeldt and Papanikolaou (2013, 2014)) and captures the intangibility of a firm, which includes both knowledge capital (R&D) and human capital (Peters and Taylor, 2017). Firms with high intangibility usually have a high dependence on human capital and it is very important for managers to be well aware of the power of labor unions and the cost of attracting labors.

So forced cooperation hypothesis predicts more cooperation between management and labor unions for upward real earnings management.

Hypothesis 2A (CH): *The positive relation between labor union strength and real earnings management is more salient at firms with high organization capital intensity.*

Alternatively, the high intangibility of these firms gives managers more flexibility with their information advantage due to more severe information asymmetry. If management has downward earnings management incentives to reduce labor unions' rent extraction from shareholders, the effect is stronger in high organization capital intensity. So manipulation hypothesis predicts even more manipulation to lower earnings at these firms.

Hypothesis 2B (MH): *The negative relation between labor union strength and real earnings management is more salient at firms with high organization capital intensity.*

3. Data

3.1 Sample

Firms are not required to report labor union representation and firm-level union representation data are scarce.[6] To secure firm-level union percentage of representation data, we start from Thomson Reuters Asset 4, which is one of the most reputable providers of environmental, social, and governance (ESG) data, with a broad coverage of firms from all over the world. Major investment houses like BlackRock rely on ESG information from ASSET4 as analysis tools (Cheng, Ioannou, and Serafeim, 2014). Asset 4's coverage of global firms started in 2002 and has increased from around 2000 to more than 4000 in 2017. We supplement Asset 4 with Bloomberg data, which started including firm-level labor union representation percentage data in 2007. Even though the time series of Asset 4 firms are longer, Bloomberg firms have a wider size variation, with many small firm additions, which complements Asset 4 data nicely.

[6] Most of the previous empirical studies on labor unions have used the Union Membership and Coverage Database constructed by Hirsch and Macpherson (2003). It contains data on union membership and coverage by industry, based on the Bureau of Labor Statistics' (BLS) monthly Current Population Survey (CSP) that collects information on characteristics of U.S. labor force, starting from 1983. Even though this data has much wider and longer coverage, it does not have a direct measure for firm level union power. The firm-level union power is inferred from the industry-level membership provided by the database and a labor intensity ratio defined by the employee counts divided by total assets.

Our sample includes all U.S. firms covered by Asset 4 or Bloomberg with information on labor union representation. We further require that all observations have Compustat financial variables such as assets, leverage, ROA, dividends, sales, and property, plant and equipment to measure real earnings management. We exclude firms in financial (with 2-digit SIC codes between 60 and 69) and utility (with 2-digit SIC codes of 49) industries because financial and utility firms are regulated and may have different managerial incentives with respect to the relation between management and labor unions. We also winsorize all continuous variables at both 1 and 99 percentiles so that extreme values have less of an impact on our results. Our final sample consists of 2,651 firm-year observations over the period of 2002 to2015.

Using a non-randomly selected sample in regressions is likely to create an omitted variable problem and can lead to estimation bias. To alleviate the concern, we use Heckman (1979) two-stage procedure to correct for the potential sample bias and find that selection bias does not seem to affect our results.[7]

3.2 Labor Union Power Proxies

We construct three variables as proxies for labor union power: *Union, Dum Union, and Union25*. *Union* is the percentage of union membership at the firm level as reported by Asset 4 or Bloomberg. *Dum Union* is a dummy variable that takes value 1 if there is labor union representation at the firm and 0 otherwise. *Union 25* (*Union33, Union50*) is a dummy variable that takes value 1 if the percentage of labor union representation is higher than 25% (33%, 50%) and 0 otherwise. The mean and median for *Union* are 18.22% and 8.97%, respectively, suggesting that the union membership percentage has a skewed distribution. The mean *Dum Union* is 0.68, suggesting that 68% of the firms in our sample has labor union representation.

[7] These results are available upon request.

Similarly, we see from the summary statistics reported in Table 1 Panel A that 30% of the firms have a union membership greater than 30%, 23% of the firms have a union membership greater than 33%, and only 11% of the firms have a union membership higher than 50%.

We also report the industry (based on SIC-2 digits) distribution of labor union memberships in Table 2. The mean union membership varies between 87% for (SIC40, railroad transportation) and 77% (SIC54, professional, scientific, and technical services) to almost 0 (SIC 15, 31, 56, 57, 58, 78: construction, leather products, apparel and accessory, home furniture, eating and drinking places, motion pictures) and 2% (SIC22, textile), showing a large variation between industries.

3.3 Real Activity Management Measures

Following Roychowdhury (2006), we estimate three individual metrics of abnormal investment and operational expenses that reflect real earnings management: abnormal cash flows from operations (*RM_CFO*), abnormal production (*RM_PROD*), and abnormal discretionary expenses (*RM_DISX*). All these individual metrics are the residuals from the corresponding estimation model that we describe in detail in the Appendix. Our main measure of real earnings management is RM1 (Zang, 2012), which is an aggregate metric that combines *RM_PROD* and *RM_DISX*. We multiply the actual residual from the models by -1 for *RM_DISX* so that high *RM_CFO, RM_PROD*, and *RM_DISX* refer to high abnormal cash flow from operations, overproduction so that per unit cost is lower, and low discretionary expenses like R&D and advertising, all evidence for upward real earnings management.

3.4 Human Capital Dependence Measures

According to Eisfeldt and Pananikolaou (2013), organization capital refers to intangible capital that is embodied in the firm's employees. They measure the stock of organization capital by firms' selling, general, and administrative (SG&A) expenses using the perpetual inventory method, following Lev and Radhakrishnan (2005). Peters and Taylor (2017) suggest that human capital dependence measure should also consider knowledge capital like research and development (R&D) alike.

Previous labor intensity measures are not fit for our labor consideration context. Not only does number of employees but the power they can exert over the firm matter.

4. Empirical Results

In order to estimate the relation between earnings management and labor union membership, we include control variables that are found to be relevant in the prior literature and in a regression setting that includes both firm- and year-fixed effects. Standard errors in all the models of base regressions are calculated after clustering at the state and industry levels as labor union membership is varied by state and industry. In our base model, we include the following explanatory variables to control for firm-specific financial performance: (1) the log of book total assets value in million U.S. dollars (*LogTA*), (2) the leverage ratio calculated by long-term debt divided by total assets (*Leverage*), (3) profitability measured by return on assets (*ROA*), (4) dividend dummy that takes value 1 if the firm pays dividends and 0 otherwise (*Dum Div*), (5) R&D intensity measured by R&D expenditure over total sales (*XRD/Sale*), (5) tangibility ratio measured by PPENT divided by total assets (*Ppent/TA*), (6) volatility of operating cash flow as a measure of risk (*OpcfVol*), and (6) Tobin's Q (*Q*). Including firm fixed effects alleviate influence from omitting time-invariant non-observable variables that matter to earnings management. We

report results in Table 3. The dependent variable in Column (1) is accrual-based earnings management measure, and those in Columns (2) – (6) are all real earnings management measures. Because accrual-based and real earnings management may be substitution of each other (Zang, 2012), we include the combined real earnings management measure (*Combined RM*) as an explanatory variable for the regression on accrual-based earnings management (Column (1)) and the accrual-based earnings management measure (*Abs DA*) as an explanatory variable for the regressions on real earnings management measures (Columns (2)-(6)).

The results show a positive and highly significant relation between the two earnings management measures, suggesting that firms with high real earnings management measures tend to have high accrual-based earnings management measures and vice versa. This result implies the complementary effect of different earnings management methods rather than substitution effect. There is a strong positive relation between volatility in operating cash flow and accrual-based earnings management measure, and between firm size and real earnings management measures. These findings are consistent with the prior literature (Hamm, Jung, and Lee, forthcoming).

More importantly, the results show a positive and highly significant relation between real earnings management measures and *Union*, percentage of firm-level union membership. This result supports the cooperation hypothesis that management and labor unions cooperate with respect to upward real earnings management and disagrees with the manipulation hypothesis. Despite the significant positive relation between *Union* and real earnings management measures, there is negative relation between accrual-based earnings management measure and *Union*, but it is not significant.[8]

[8] We also test the result without accrual-based earnings management measure in our main regression. The results are similar to report in the paper.

[Table 3 about here]

We next focus on the relation between real earnings management and labor union by comparing the extent of real earnings management at firms where managerial incentives to please labor unions differ due to their dependence on human capital to test our Hypothesis 2. We first conduct a univariate test based on the power of labor unions with *Union25* and *Union50* (both dummies, take value 1 if union membership is above 25% or 50%). We use organization capital intensity, which is the ratio of organization capital and knowledge capital to total capital, a measure of a firm's intangibility, as a proxy for a firm's dependence on human capital. Since organization capital intensity is calculated as the ratio of intangible capital to the sum of intangible and physical capital (Peters and Taylor, 2017), we take 0.5 as a threshold that intangible and physical capital is weighted equally to differentiate firms in industries with higher dependence on human capital.

Our results in Panel A of Table 4 show that in industries with above-median intangibility (organization capital intensity greater than 0.5) and when union membership has reached certain threshold to be influential (at least 25% or 50% in Table 4 Panel A), the average firm-level real earnings management measures (*RM1*, *RM Prod*, and *RM Disx*) is much higher than that of firms with less influential union membership. For example, the mean *RM1* is 0.12 when union membership is at least 25%, and -0.04 when union membership is below 25%. This difference is 67% of a standard deviation of *RM1* for the full sample. The results for firms with at least 50% of union membership and from industries with high intangibility show even more drastic difference in *RM1*, but the difference of RM1 is not significant in low intangible industries.

We next control for a number of explanatory variables (same as those in the base model), year fixed effects, and firm fixed effects to explore the relation between real earnings

management and union membership in firms from industries with high dependence on human capital. The results are reported in Panel B of Table 4. We construct a dummy variable, *Highind Intang*, which takes value 1 if the firm belongs to an industry with organization capital intensity above 0.5 and 0 otherwise. In Columns (1) – (3) where we have three real earnings management measures *RM1*, *RM Prod*, and *RM Disx* as dependent variables, respectively, the interaction term *Union*Highind Intang* is positive and highly significant while the main effect of *Highind Intang* is negative and significant (except for *RM Disx*). The main effect of *Union* is positive but insignificant. These results suggest that the union effect on upward real earnings management is much stronger in firms that have higher dependence on human capital. Furthermore, real earnings management is significantly less at firms with high dependence on human capital yet no labor union membership.

We next examine the union effect on upward real earnings management in subsamples of firms with above- and below-median organization capital intensity and report results in Columns (4) and (5). Whereas the relation between accrual-based and real earnings management is positive in both subsamples, the union effect on real earnings management only shows in firms with above-median organization capital intensity. Finally, we limit ourselves to a subsample of firms with below-median organization capital intensity and examine how union effect on upward real earnings management would vary in industries with below-median organization capital intensity. Since firms with large proportion of physical assets will need employees to operate the machines/equipment, the cost of disagreement with labor unions will be steep for these firms. We test our conjecture by evaluating the interaction term between *union* and the proportion of physical assets (*PPEnt/TA*) and find that it is positive and significant (Column (6)), consistent with our conjecture. In summary, our results suggest that union and management cooperate with

respect to upward real earnings management, and the union effect is much more salient in firms where managers see greater need to cooperate with labor unions. The needs of cooperation between labor unions and managers encourage upward real earnings management.

[Table 4 about here]

4.1. Endogeneity Tests

We also conduct a battery of endogeneity tests to establish the causal relation that strong labor unions lead to upward real earnings management. We report the results in Table 5. First, we examine changes in real earnings management after external shocks to union strength. We consider both lower union bargaining power after states adopt right-to-work (RTW hereafter) laws and higher union power after a nontrivial decrease in states' unemployment insurance benefits. We construct a dummy variable, *RTW*, which takes value 1 if the Right to Work law is effective in that year and 0 otherwise. To steer clear of the simultaneous effect of the passage of the RTW law on labor union membership, we hold labor union membership constant at pre-RTW level and examine the coefficient estimate of *Before Union*RTW*, the interaction term. By doing so, our regression resembles a difference-in-difference test with continuous treatment. To mitigate the effect of state's economic environments on both real earnings management and RTW, we control for state unemployment insurance and state real GDP growth rate. The estimation results from a regression including firm fixed effects and year fixed effects reported in Panel A of Table 5 show that *Before Union*RTW* is negative and highly significant for all upward real earnings management measures: *RM1, RM Prod, RM Disx*. Furthermore, in the subsample tests, *Before Union*RTW* is negative and significant with a larger magnitude for firms belonging to industries with high dependence on human capital. This means that the upward real

earnings management is less after RTW passage as labor unions become less powerful in general. The upward real earnings management is even less in firms where manager used to have stronger incentives to cooperate with labor unions. These findings again lend support to the cooperation hypothesis.

[Table 5 Panel A about here]

We next compare the upward real earnings management for the same firms after they switch from unionized to non-unionized. Employees can seek an election to determine if the majority of their co-workers want to drop the union. They can petition to the National Labor Relations Board (NLRB) which conducts these "decertification elections". There are four firms that changed from unionized to non-unionized in our sample. We calculate the mean change in *RM1* and *RM2* over time and report in Panel B of Table 5: $RM1_t$-$RM1_{t-1}$, the change in *RM1* prior to the vote, is positive at 0.0119, suggesting increase in upward real earnings management (which may not be statistically significant). $RM1_{t+1}$-$RM1_t$, the change in *RM1* after the vote, however, is -0.0642, negative with a much larger magnitude. The mean changes in *RM2* have similar signs. Despite the small subsample of firms that experience the firm-level change of labor union power, our findings support the cooperation hypothesis that management and labor unions cooperate with respect to upward real earnings management.

[Table 5 Panel B about here]

U.S. has an unemployment insurance system that provides temporary income to eligible workers who become involuntarily unemployed. Even though the basic framework for insurance provision is common nationwide, each state has its autonomy to set the parameters of the program so that the amount of unemployment benefits varies from state to state (Agrawal and Masta, 2013). The unemployment benefits mitigate the unemployment risk employees face and a

non-trivial negative shock to unemployment benefits, especially existing high unemployment benefits, leads employees to be more concerned about unemployment risk. Since most workers see improving job security as one of labor unions' major goals (Thomas A. Kochan, How American Workers View Labor Unions, 102 Monthly Lab. Rev. 23 (1979)), such a goal should be more emphasized when nontrivial shock to unemployment insurance hits.

Forced cooperation hypothesis predicts that upward real earnings management will be more severe after the nontrivial negative shock to unemployment benefits, especially for firms with high dependence on human capital. In Panel C of Table 5, we compare the average real earnings management measures for subsamples of firms with above- and below-median organization capital intensity and where there is at least a 10% decrease in unemployment benefits. The difference in real earnings management measures for firms with high and low union memberships (*Union25*=1 and 0) is positive and highly significant for firms with high organization capital intensity, but we do not observe the relation in industries with low organization capital intensity. This is consistent with the forced cooperation hypothesis and suggests that management has stronger incentives to cooperate with labor unions through upward real earnings management when the cost of not-cooperating is high.

[Table 5 Panel C about here]

We next estimate a regression with control of firm fixed and year fixed effects and the same explanatory variables as the base model to examine the interaction term *Union*UI Negshock*. *Negshock* is a dummy variable that takes value 1 when there is a nontrivial (more than 10%) negative shock to the unemployment benefits and 0 otherwise. Our results in Panel D of Table 5 show that the union effect on upward real earnings management is salient only in the subsample of firms that are located in states with above-median unemployment insurance

benefits. In these states, management has stronger incentives to cooperate with labor unions to mitigate unemployment risk when the protection from high unemployment insurance is threatened. Again, these findings are consistent with the forced cooperation hypothesis.

[Table 5 Panel D about here]

In Table 6, we examine evidence for labor unions' claimed objective: job security using a regression that controls firm and year fixed effects and the known explanatory variables. The dependent variables are standard deviation of operating cash flows (*Opcfsd3*) and coefficient of variation for the number of employees (*Empcv3*) in Columns (1)-(2) and (3)-(4), respectively. Both *Opcfsd* and *Empcv3* are calculated for a three-year window from *t*-1 to *t*+1 with lower values of both suggesting improved job security. Our results show a negative and significant relation between labor union membership and *Opcfsd* and *Empcv3*, meaning labor union power is associated with improved job security, consistent with labor unions' claimed objective.

[Table 6 about here]

Because firms with higher organization capital intensity tends to have managers with higher managerial ability (MA) (Demerjian, Lev, and McVay, 2012), can MA alone explain the observed labor union effect on upward real earnings management? To explore that possibility, we first compare the MA scores between firms with and without at least 25% of labor union members (*Union25*) and find the MA score is significantly lower at firms with strong union membership and at firms belonging to industries with below-median organization capital intensity. Furthermore, we estimate a regression that controls for firm and year fixed effects together with other explanatory variables and find no relation between upward real earnings management and MA scores. So MA does not drive our results that firms with strong union membership in industries with above-median organization capital intensity.

[Table 7 about here]

Finally, we use the same set of explanatory variables and control for SIC4 industry, state, and year fixed effects with state and industry double clustering and re-estimate the relation between upward real earnings management measures and *Union*. In Panel A, we use firm level union membership, and Panel B and C use industry level (SIC3) union membership. We continue to find positive and highly significant relation between upward real earnings management measures (*RM1*, *RM2*, *RM Disx*, and *RM Cfo*), with the coefficient estimates being even larger in magnitudes. For industry level union membership results in Panel B and C, we find consistent results with firm level union membership results.

[Table 8 about here]

5. Conclusion

Whereas managers have incentives both to manage earnings lower to prevent labor unions from extracting extra rent from shareholders and to boost earnings to reduce cost of attracting and retaining talents through improving employees' perception of employment security, we show that managers and labor unions are positively associated with respect to real activity management. We argue that our findings are driven by three factors: labor unions' interest in real activities, labor unions' power, and the cost of not cooperating with labor unions, hence supporting the forced cooperation hypothesis. The labor union effect on upward real activity management is of major economic significance at firms with high dependence on human capital. Our empirical strategies, including using regressions with control of firm fixed effects and year fixed effects, examining external, both negative and positive shocks to labor unions' power, and comparing changes in unionization at the same firm, help us establish that the presence of labor

unions leads managers to cooperate and results in upward real earnings management. Our findings also reject the manipulation hypothesis, suggesting that managers do not seem to manipulate labor unions with their information advantage with respect to real activity management.

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Appendix 1. Earnings management measures

(1) Accrual-based earning management

To measure the degree of accruals-based earnings management, we employ abnormal discretionary accruals as a proxy used in a number of previous studies, notably Davidson et al. (2004), Xie et al. (2003), and Teoh et al. (1998 a, b). Because earnings management is an important issue for academics and practitioners to study managerial behavior, we estimate the discretionary current accruals, which are considered as being "unexpected" or "abnormal," using the modified Jones (1991) model. A larger value of Abnormal AM means more earnings management and lower financial reporting quality. The model has been found to have "the most power in detecting earnings management" (Dechow et al., 1995). Guay et al. (1996) and Bartov et al. (2001) also provided evidence regarding the reliability of the modified Jones model to identify earnings management.

The flexibility of earnings management through accounting items can be used to artificially inflate reported earnings. Thus, we focus on a firm's current working capital accruals or discretionary current accruals that are considered abnormal compared to those of industry peers. These abnormal discretionary current accruals are utilized as a proxy for earnings management. Because the modified Jones (1991) model has been used in many studies and is presented in Teoh et al. (1998 a, b), for the sake of conciseness, we will simply summarize it here.

To capture the earnings management and managerial behavior, we use discretionary current accruals. Total current accruals are the sum of both discretionary and non-discretionary accruals. Because the total current accruals are associated with changing the industry and economic conditions, we identify the non-discretionary component of accruals using the OLS

regression-based estimates of the current accruals for the change in sales from the previous year for all non-sample firms in the same 2-digit SIC code, industry *j*, listed in Compustat for the year. Because the error terms of this regression exhibit heteroskedasticity, we deflate each variable in the model by the book value of total assets from the previous year:

$$\frac{TA_{j,t}}{Asset_{j,t-1}} = k_{0,t}\frac{1}{Assets_{j,t-1}} + k_{1,t}\frac{(\Delta REV_{j,t} - \Delta AR_{j,t})}{Asset_{j,t-1}} + k_{2,t}\frac{PPE_{j,t}}{Asset_{j,t-1}} + \varepsilon_{j,t}, \quad (1)$$

where TA is total accruals in year t, Asset is firm j's total assets in year t, $\Delta REV_{j,t}$ is firm j's change in revenues from year t-1 to year t, $\Delta AR_{j,t}$ is firm j's change in accounts receivable from year t-1 to year t, and $PPE_{j,t}$ denotes firm j's gross values of property, plant, and equipment in year t. Then, the parameters from equation (1) are used to estimate the normal level of accruals (NA), as follows:

$$NA_{j,t} = \hat{k}_{0,t}\frac{1}{Asset_{j,t-1}} + \hat{k}_{1,t}\frac{(\Delta REV_{j,t} - \Delta AR_{j,t})}{Asset_{j,t-1}} + \hat{k}_{2,t}\frac{PPE_{j,t}}{Asset_{j,t-1}} \quad (2)$$

Lastly, abnormal accruals (Abnormal AM) for firm j in year t are the difference between the actual value of total accruals and normal accruals from equation (2):

$$AbnormalAM_{j,t} = \frac{TA_{j,t}}{Asset_{j,t-1}} - NA_{j,t}. \quad (3)$$

(2) Real earnings management

In addition to abnormal accruals, we estimate a firm's real earnings management (RM). Real earnings management refers to activities that deviate from daily operations to satisfy certain earnings goals. Following Roychowdhury (2006), we estimate normal cash flows from operations using the following model:

$$\frac{CFO_{j,t}}{Asset_{j,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Asset_{j,t-1}} + \alpha_2 \frac{Sales_{j,t}}{Asset_{j,t-1}} + \alpha_3 \frac{\Delta Sales_{j,t}}{Asset_{j,t-1}} + \varepsilon, \quad (4)$$

where $CFO_{j,t}$ is cash flows from operations for firm j in year t, $Asset_{j,t-1}$ is prior-year total assets, and $\Delta Sales_{j,t}$ is the change in sales from year t-1 to t for firm j. The estimated value of normal cash flows from operations in equation (4) is then subtracted from the actual value of cash flows from operations to obtain abnormal cash flows (Abnormal CFO).

The firm may decide to lower production costs by producing more units. Then, the firm can hide fixed costs in inventory and lower the costs of goods sold, resulting in an increase in net income for the period. We estimate the cost of goods sold (COGS) and changes in inventory based on the following two regressions for each industry (2-digit SIC code) and for each year:

$$\frac{COGS_{j,t}}{Asset_{j,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Asset_{j,t-1}} + \alpha_2 \frac{Sales_{j,t}}{Asset_{j,t-1}} + \varepsilon, \quad (5)$$

$$\frac{\Delta INV_{j,t}}{Asset_{j,t-1}} = \alpha_0 + \alpha 1 \frac{1}{Asset_{j,t-1}} + \alpha_2 \frac{\Delta Sales_{j,t}}{Asset_{j,t-1}} + \alpha_3 \frac{\Delta Sales_{j,t-1}}{Asset_{j,t-1}} + \varepsilon, \quad (6)$$

where COGS is the cost of goods sold in year t, ΔINV is the change in inventory from year t-1 to year t, ΔS_{t-1} is the change in sales from year t-2 to t-1, and A_{t-1} is the total assets of year t-1. Production costs (PROD) are the sum of the cost of goods sold (COGS) and changes in inventory (ΔINV). From equations (5) and (6), we estimate the expected level of production costs (PROD), as follows:

$$\frac{\Delta PROD_{j,t}}{Asset_{j,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Asset_{j,t-1}} + \alpha_2 \frac{Sales_{j,t}}{Asset_{j,t-1}} + \alpha_3 \frac{\Delta Sales_{j,t}}{Asset_{j,t-1}} + \alpha_4 \frac{\Delta Sales_{j,t-1}}{Asset_{j,t-1}} + \varepsilon, \quad (7)$$

We subtract an estimated value from equation (7) from the actual production costs to compute the abnormal production costs (Abnormal PROD).

A firm may decide to cut discretionary expenses or postpone R&D expenditures. Discretionary expenses (DISEXP) include selling, general, and administrative expenses, R&D expenses, and advertising expenses (Roychowdhury, 2006). We estimate the normal level of discretionary expense from equation (8) and compute the abnormal discretionary expense (Abnormal DISEXP):

$$\frac{DISEXP_{j,t}}{Asset_{j,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Asset_{j,t-1}} + \alpha_2 \frac{Sales_{j,t}}{Asset_{j,t-1}} + \varepsilon, \quad (8)$$

Firms may decide to engage in the management of several real activities. We consider an aggregate measure of real earnings management, which is the sum of abnormal cash flows, abnormal production costs, and abnormal discretionary expense. For easy interpretation, we multiply abnormal cash flows and abnormal discretionary expense by -1 such that higher values of our real earnings management indicate upward (income-increasing) earnings management.

Appendix 2. Variable Definitions

Variable	Definition
Union:	Percentage of union membership at the firm level
Dun Union:	Dummy variable that takes 1 if a firm has a union, else 0
Union25 (33, 50):	Dummy variable that takes 1 if a firm union membership is more than 25% (33%, 50%), else 0
RM_CFO:	The residual from the cash flow from operations (CFO) model (Equation 4 in Appendix 1)
RM_RPOD:	The residual from production costs (PROD) model (Equation 7 in Appendix 1)
RM_DISX:	Negative of the residual from the discretionary expenses (DISX) mode (Equation 8 in Appendix 1)
RM1:	An aggregate measure of real earnings management, defined as the sum of *RM_PROD* and *RM_DISX*.
RM2:	An aggregate measure of real earnings management, defined as the sum of *RM_CFO* and *RM_DISX*.
Abs_DA:	A measure of accrual-based earnings management, the residual from normal accruals model (Equation 2 in Appendix 1)
Opcf vol:	Operating cash flow volatility, measured by the most recent five years' standard deviation of operating cash flows/total assets
Logta:	Log of total assets
Leverage:	(Long-term debt + debt in current liabilities) / total assets
ROA:	Income Before Extraordinary Items/total assets
Dum Div:	Dummy variable that takes one if a firm pays dividends, else zero
Xrd/Sale:	R&D/Sale, if R&D is missing it is treated as zero
Ppent/TA:	Net plant & equipment / total assets
Q:	Tobin's Q
Highind Intang:	Dummy variable takes value 1 if industry (using SIC3 classification) organization capital intensity is above 50%, intangible intensity is from Peter and Tyler (2017)
RTW:	Dummy variable that takes 1 if the year is the year Right to Work law passes or after, else 0
Before Union:	Firm level union membership rate year before RTW passes
UI 10k:	The maximum state unemployment benefit in 10,000 U$
Real GDP Gr:	State real GDP growth rate
UI Negshock:	Dummy variable that takes 1 if state unemployment benefits drop more than 10%, else 0
Opcfsd3 (-1 to +1):	Operating cash flow standard deviation using time t-1 to t+1
Empcv3:	Coefficient of variation of number of employees using time t-1 to t+1
MA Score:	Managerial ability score is defined in Demerjian, Lev, and McVay (2012).

Table 1. Descriptive statistics

Panel A. Overall sample

Variables	N	Mean	Median	Std	Min	Max
Abs DA	2651	0.0379	0.0246	0.0447	0.0004	0.3641
Combined RM	2550	0.0001	0.0105	0.2704	-1.1245	1.0080
RM Prod	2651	-0.0013	0.0000	0.1299	-0.4791	0.4623
RM Disx	2550	0.0150	0.0142	0.1370	-0.6502	0.4010
RM Cfo	2651	-0.0112	-0.0077	0.0657	-0.2562	0.3274
RM1	2550	0.0106	0.0189	0.2476	-1.0366	0.7545
RM2	2550	0.0031	0.0105	0.1527	-0.6199	0.4569
Union	2651	0.1822	0.0897	0.2240	0.0000	1.0000
Dum Union	2651	0.6828	1.0000	0.4655	0.0000	1.0000
Union25	2651	0.3044	0.0000	0.4602	0.0000	1.0000
Union33	2651	0.2290	0.0000	0.4202	0.0000	1.0000
Union50	2651	0.1083	0.0000	0.3108	0.0000	1.0000
Opcf vol	2651	0.0337	0.0265	0.0260	0.0002	0.2143
Logta	2651	8.5042	8.5258	1.3787	2.3444	11.2614
Leverage	2651	0.2941	0.2739	0.1432	0.0636	0.7772
ROA	2651	0.0410	0.0497	0.0872	-0.9239	0.2144
Dum Div	2651	0.6639	1.0000	0.4725	0.0000	1.0000
Xrd/Sale	2651	0.0362	0.0000	0.1603	0.0000	2.3851
Ppent/TA	2651	0.3420	0.2945	0.2466	0.0095	0.9304
Q	2651	1.7538	1.5017	0.8883	0.6120	7.2458

Panel B. Univariate tests

Variable	N	mean	N	Mean	Difference
	Dum union=0		Dum union=1		(0-1)
Abs DA	815	0.048	1752	0.033	0.015***
Combined RM	802	-0.074	1666	0.039	-0.113***
RM Prod	815	-0.025	1752	0.011	-0.036***
RM Disx	802	-0.030	1666	0.037	-0.067***
RM Cfo	815	-0.016	1752	-0.008	-0.008**
RM1	802	-0.059	1666	0.046	-0.106***
RM2	802	-0.048	1666	0.029	-0.077***
Opcf vol	815	0.041	1752	0.030	0.011***
Logta	815	7.813	1752	8.808	-0.995***
Leverage	815	0.286	1752	0.298	-0.012**
ROA	815	0.027	1752	0.047	-0.020***
Dum Div	815	0.439	1752	0.766	-0.327***
Xrd/Sale	815	0.087	1752	0.013	0.074***
Ppent/TA	815	0.354	1752	0.339	0.016
Q	815	2.030	1752	1.625	0.041***

Table 2. Industry distribution

SIC2	Union Membership %		SIC2	Union Membership %	
	Mean	Obs		Mean	Obs
1	0.038	4	39	0.096	22
10	0.541	34	40	0.867	38
12	0.317	24	42	0.390	26
13	0.032	209	44	0.200	12
14	0.246	30	45	0.552	37
15	0.001	37	46	0.260	9
16	0.073	9	47	0.441	7
20	0.288	167	48	0.191	136
21	0.070	8	49	0.185	56
22	0.251	6	50	0.054	60
23	0.022	63	51	0.065	52
24	0.232	35	53	0.042	53
25	0.163	50	54	0.776	28
26	0.432	91	55	0.009	51
27	0.277	15	56	0.000	7
28	0.171	229	57	0.000	11
29	0.252	34	58	0.000	43
30	0.313	21	59	0.046	38
31	0.000	4	70	0.129	26
32	0.330	27	72	0.023	10
33	0.241	48	73	0.070	144
34	0.215	38	75	0.205	15
35	0.155	183	78	0.000	6
36	0.120	122	79	0.176	40
37	0.283	109	82	0.099	2
38	0.060	125			
Total	0.182	2,651			

Table3. Base model: the effect of union on earnings management

The dependent variables are accrual based earnings management in Colum (1) and real earnings management in Columns (2) to (6). Sample period is from 2002 to 2016. All models include firm and year fixed effects (FEs). Standard errors are clustered at the industry and state levels, and robust t-statistics are reported in parentheses. ***, **, * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	(1) *Abs DA*	(2) *RM1*	(3) *RM2*	(4) *RM Prod*	(5) *RM Disx*	(6) *RM Cfo*
Combined RM$_t$	0.040***					
	(3.457)					
Abs DA$_t$		0.160***	0.073***	0.188***	-0.013	0.099***
		(2.706)	(2.806)	(3.418)	(-0.381)	(2.832)
Union$_{t-1}$	*-0.018*	*0.086***	*-0.001*	*0.064***	*0.031***	*-0.033*
	(-1.096)	*(2.885)*	*(-0.021)*	*(2.505)*	*(2.022)*	*(-1.249)*
Opcf Vol $_t$	0.200***	-0.281	-0.118	-0.197	-0.102	-0.079
	(3.366)	(-1.473)	(-0.730)	(-1.059)	(-1.335)	(-0.555)
Logta $_{t-1}$	-0.007	0.043***	0.037***	0.012	0.025**	0.011**
	(-1.098)	(3.063)	(3.757)	(1.141)	(2.686)	(2.509)
Leverage $_{t-1}$	0.013	-0.036	0.001	-0.057	0.023	-0.024
	(0.646)	(-0.719)	(0.053)	(-1.498)	(1.124)	(-1.148)
ROA $_{t-1}$	0.016	-0.054	-0.036	-0.080**	0.015	-0.057***
	(0.836)	(-1.275)	(-1.423)	(-2.245)	(0.819)	(-3.146)
Dum Div $_{t-1}$	0.010**	-0.005	-0.010	-0.005	0.000	-0.011***
	(2.248)	(-0.410)	(-1.316)	(-0.640)	(0.059)	(-2.706)
Xrd/Sale $_{t-1}$	0.021	-0.072***	0.017	0.008	-0.068***	0.085***
	(1.668)	(-2.803)	(0.884)	(0.269)	(-3.857)	(5.129)
Ppent/TA $_{t-1}$	-0.033*	-0.055	-0.060	0.006	-0.063*	0.009
	(-1.906)	(-0.681)	(-1.338)	(0.092)	(-1.700)	(0.409)
Q $_{t-1}$	-0.005**	-0.022***	-0.015***	-0.021***	-0.001	-0.014**
	(-2.572)	(-3.226)	(-3.328)	(-4.012)	(-0.132)	(-2.633)
Observations	2,482	2,482	2,507	2,584	2,507	2,618
Adj R-squared	0.215	0.879	0.855	0.800	0.897	0.623
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
SE clustered by	State & industry	State & industry	State & industry	State & industry	State & industry	State & industry

Table4. Real earnings management and intangible assets

RM1, which is an aggregate measure of real earnings management, defined as the sum of *RM_Prod* and *RM_Disx*. High intangible industries have above-median organization capital intensity with the median of organization capital intensity of 0.5. Low intangible industries have below-median organization capital intensity. Dummy variable that takes 1 if a firm union membership is more than 25% (or 50%), else 0.

Panel A. Real earnings management for high and low industry intangible samples

Variable	N	mean	N	Mean	Difference
	High intangible industry				
	Union25=0		Union25=1		(1-0)
RM Prod	1027	-0.0227	246	0.0507	0.0734***
RM Disx	1007	-0.0155	246	0.0734	0.0889***
RM1	1007	-0.0427	246	0.1241	0.1668***
	Low intangible industry				
	Union25=0		Union25=1		
RM Prod	759	0.0005	535	0.0175	0.0170***
RM Disx	748	0.0231	467	0.0375	0.0144**
RM1	748	0.0231	467	0.0561	0.0330***

Variable	N	mean	N	Mean	Difference
	High intangible industry				
	Union50=0		Union50=1		(1-0)
RM Prod	1224	-0.0129	49	0.1019	0.1148***
RM Disx	1204	0.1117	49	-0.0025	0.1142***
RM1	1204	-0.0191	49	0.2136	0.2326***
	Low intangible industry				
	Union50=0		Union50=1		
RM Prod	1064	0.0062	230	0.0134	0.0075
RM Disx	1048	0.0299	167	0.0208	-0.0091
RM1	1048	0.0360	167	0.0357	0.0003

Panel B. Real EM and firms in high and low intangible industries

The dependent variables are RM1, which is an aggregate measure of real earnings management, defined as the sum of RM_Prod and RM_Disx in Colum (1) and in Columns (4) to (6) and abnormal production costs (abnormal discretionary expenses) in Columns (2) and (3), respectively. Sample period is from 2002 to 2016. High intangible industries have above-median organization capital intensity with the median of organization capital intensity of 0.5. Low intangible industries have below-median organization capital intensity. All models include firm and year fixed effects (FEs). Standard errors are clustered at the industry and state levels, and robust t-statistics are reported in parentheses. ***, **, * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	(1) *RM1*	(2) *RM Prod*	(3) *RM Disx*	(4) *RM1*	(5) *RM1*	(6) *RM1*
				High	Low	Low
				intangible	Intangible	intangible
Abs DA $_t$	0.160***	0.189***	-0.013	0.136*	0.224**	0.267***
	(2.709)	(3.439)	(-0.398)	(1.855)	(2.480)	(4.126)
Union $_{t-1}$	0.027	0.036	0.002	0.102***	0.016	-0.104***
	(0.672)	(1.139)	(0.108)	(4.246)	(0.324)	(-3.777)
Highind Intang $_{t-1}$	-0.033**	-0.022**	-0.012			
	(-2.538)	(-2.322)	(-1.415)			
*Union*Highind Intang* $_{t-1}$	0.144**	0.072**	0.071**			
	(2.413)	(2.062)	(2.039)			
*Union*Ppent/TA* $_{t-1}$						0.259***
						(3.538)
Opcf Vol $_t$	-0.292	-0.203	-0.108	-0.018	-0.325	-0.214
	(-1.536)	(-1.089)	(-1.378)	(-0.075)	(-1.332)	(-1.147)
Logta $_{t-1}$	0.043***	0.012	0.025***	0.075***	0.010	0.018
	(3.043)	(1.138)	(2.769)	(3.157)	(0.625)	(1.626)
Leverage $_{t-1}$	-0.036	-0.057	0.023	-0.013	-0.047	-0.020
	(-0.714)	(-1.474)	(1.129)	(-0.180)	(-0.665)	(-0.333)
ROA $_{t-1}$	-0.053	-0.080**	0.016	-0.120*	0.013	0.017
	(-1.235)	(-2.243)	(0.858)	(-1.848)	(0.264)	(0.501)
Dum Div $_{t-1}$	-0.005	-0.005	0.001	-0.018	-0.002	-0.001
	(-0.364)	(-0.625)	(0.157)	(-0.769)	(-0.149)	(-0.104)
Xrd/Sale $_{t-1}$	-0.072***	0.008	-0.068***	-0.069**	-0.090*	0.203***
	(-2.706)	(0.266)	(-3.820)	(-2.134)	(-1.811)	(5.328)
Ppent/TA $_{t-1}$	-0.053	0.006	-0.061*	-0.137	0.010	-0.086
	(-0.661)	(0.094)	(-1.686)	(-0.579)	(0.169)	(-1.287)
Q $_{t-1}$	-0.022***	-0.021***	-0.001	-0.024**	-0.022	-0.023**
	(-3.058)	(-3.933)	(-0.124)	(-2.419)	(-1.676)	(-2.050)
Observations	2,482	2,584	2,507	1,251	1,199	1,367
Adj R-squared	0.879	0.800	0.897	0.883	0.876	0.711
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
SE clustered by	State & industry	State & industry	State & industry	State & industry	State & industry	State & industry

Table5. Endogeneity tests

Panel A. States' Right to Work (RTW) law pass and the effect of union on real earnings management

The dependent variables are RM1, which is an aggregate measure of real earnings management, defined as the sum of RM_Prod and RM_Disx in Colum (1) and in Columns (4) to (5) and abnormal production costs (abnormal discretionary expenses) in Column (2) and (3), respectively. Sample period is from 2002 to 2016. High intangible industries have above-median organization capital intensity with the median of organization capital intensity of 0.5. Low intangible industries have below-median organization capital intensity. All models include firm and year fixed effects (FEs). Standard errors are clustered at the state level and robust t-statistics are reported in parentheses. ***, **, * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	(1) *RM1*	(2) *RM Prod*	(3) *RM Disx*	(4) *RM1* High Intangible	(5) *RM1* Low intangible
Abs DA $_t$	0.025	0.083	-0.023	0.035	0.006
	(0.305)	(1.234)	(-0.388)	(0.318)	(0.053)
RTW	0.007	-0.005	0.005	0.005	0.024
	(0.347)	(-0.257)	(0.409)	(0.072)	(0.465)
*Before Union*RTW*	-0.080***	-0.034***	-0.049***	-0.149**	0.005
	(-8.129)	(-5.955)	(-3.207)	(-2.107)	(0.108)
UI 10k $_t$	0.162*	0.147***	0.059	0.093	0.273**
	(1.773)	(2.809)	(1.452)	(0.784)	(2.649)
Real GDP Gr $_t$	-0.044	-0.016	-0.055	0.119	-0.470*
	(-0.152)	(-0.119)	(-0.347)	(0.226)	(-1.846)
Opcf Vol $_t$	-0.422	-0.473*	-0.130	-0.362	-0.226
	(-1.522)	(-1.958)	(-0.549)	(-0.720)	(-0.717)
Logta $_{t-1}$	0.021	-0.015	0.032**	0.063	0.010
	(0.795)	(-0.677)	(2.747)	(1.662)	(0.283)
Leverage $_{t-1}$	0.068	0.026	0.034	0.047	0.053
	(0.783)	(0.590)	(0.666)	(0.488)	(0.509)
ROA $_{t-1}$	-0.053	-0.053	-0.024	-0.135	0.159
	(-0.490)	(-0.885)	(-0.374)	(-1.117)	(1.227)
Dum Div $_{t-1}$	-0.003	-0.009	0.004	-0.012	0.010
	(-0.187)	(-0.753)	(0.327)	(-0.425)	(0.603)
Xrd/Sale $_{t-1}$	-0.157**	-0.043	-0.108***	-0.223***	-0.045
	(-2.177)	(-0.654)	(-3.915)	(-3.890)	(-1.068)
Ppent/TA $_{t-1}$	0.019	0.115	-0.088	0.456	-0.100
	(0.107)	(0.852)	(-1.480)	(1.103)	(-0.788)
Q $_{t-1}$	-0.015	-0.008	-0.005	-0.026	0.002
	(-1.057)	(-0.894)	(-0.600)	(-1.621)	(0.290)
Observations	990	1,021	990	577	391
Adj R-squared	0.906	0.848	0.923	0.901	0.917
Year FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
SE clustered by	State	State	State	State	State

Panel B. Transition from union firms to non-union firms

There are four firms in our sample that switched from unionized to non-unionized firms. When firms unionized incremental average RM1 is positive. However, when firms become nonunionized, incremental average RM1 is negative.

	Before		*After*	
	$RM1_t$ - $RM1_{t-1}$	$RM2_t$ -$RM2_{t-1}$	$RM1_{t+1}$ - $RM1_t$	$RM2_{t+1}$ - $RM2_t$
N	4	4	3	3
Mean	0.0119	0.0456	-0.0642	-0.0915

Panel C. Unemployment insurance shock and real earnings management

Univariate comparison of real earnings measures with nontrivial negative shock to states' unemployment insurance benefits in high- and low-intangible industries, respectively.

Variable	N	Mean	N	Mean	Difference
	High intangible industry & UI negative shock				
	Union25=0		Union25=1		(1-0)
RM Prod	26	-0.040	9	0.071	0.112*
RM Disx	26	-0.041	9	0.077	0.119**
RM1	26	-0.082	9	0.149	0.224**
	Low intangible industry & UI negative shock				
	Union25=0		Union25=1		
RM Prod	25	0.004	12	0.003	0.001
RM Disx	24	0.017	8	0.039	0.022
RM1	24	0.022	8	0.035	0.014

Panel D. Regression analysis of unemployment insurance shock and real earnings management

The dependent variables are RM1, which is an aggregate measure of real earnings management, defined as the sum of RM_Prod and RM_Disx in Colum (1) and (2) and abnormal production costs (abnormal discretionary expenses) in Column (3) and (4), respectively. Sample period is from 2002 to 2016. High UI state is a state that unemployment insurance benefit in the state is above median unemployment insurance benefit. All models include firm and year fixed effects (FEs). Standard errors are clustered at the industry and state levels and robust t-statistics are reported in parentheses. ***, **, * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
VARIABLES	*RM1*	*RM1*	*RM Prod*	*RM Disx*
		High UI state	High UI state	High UI state
Abs DA $_t$	0.162***	0.134	0.207***	-0.058
	(2.797)	(1.305)	(3.489)	(-0.875)
Union $_{t-1}$	0.088***	0.084**	0.047	0.037
	(2.855)	(2.107)	(1.407)	(1.368)
UI Negshock $_{t-1}$	-0.014	-1.139**	-1.198***	-0.007
	(-1.239)	(-2.163)	(-2.819)	(-0.036)
*Union*Negshock* $_{t-1}$	0.007	3.040**	3.167***	0.055
	(0.200)	(2.241)	(2.894)	(0.105)
Opcf Vol $_t$	-0.293	-0.573***	-0.552**	-0.156
	(-1.493)	(-3.232)	(-2.569)	(-1.530)
Logta $_{t-1}$	0.044***	0.035*	0.003	0.024***
	(3.225)	(2.038)	(0.195)	(3.094)
Leverage $_{t-1}$	-0.037	-0.066	-0.068	0.010
	(-0.725)	(-0.790)	(-1.366)	(0.274)
ROA $_{t-1}$	-0.055	-0.084*	-0.131***	0.029
	(-1.294)	(-1.925)	(-3.775)	(1.126)
Dum Div $_{t-1}$	-0.006	0.001	-0.003	0.006
	(-0.427)	(0.068)	(-0.259)	(0.517)
Xrd/Sale $_{t-1}$	-0.072***	-0.102***	-0.030	-0.062**
	(-2.791)	(-3.954)	(-1.149)	(-2.374)
Ppent/TA $_{t-1}$	-0.057	0.067	0.078	-0.002
	(-0.697)	(0.474)	(0.932)	(-0.025)
Q $_{t-1}$	-0.021***	-0.023***	-0.013**	-0.010
	(-3.305)	(-2.888)	(-2.761)	(-1.560)
Observations	2,471	1,379	1,400	1,387
R-squared	0.879	0.881	0.809	0.901
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
SE clustered by	State & industry	State & industry	State & industry	State & industry

Table 6. Job security and union

The dependent variables are operating cash flow volatility in Colum (1) and (2) and coefficient of variation of number of employees in Columns (3) and (4). Sample period is from 2002 to 2016. All models include firm and year fixed effects (FEs). Standard errors are clustered at the industry and state levels and robust t-statistics are reported in parentheses. ***, **, * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
VARIABLES	*Opcfsd3*	*Opcfsd3*	*Empcv3*	*Empcv3*
	(-1 to +1)	(-1 to +1)	(-1 to +1)	(-1 to +1)
$Union_{t-1}$	-0.015		-0.205**	
	(-1.165)		(-2.483)	
$\Delta Union_t$	-0.020*		-0.169*	
	(-1.842)		(-1.901)	
$Union25_{t-1}$		-0.008**		-0.054**
		(-2.382)		(-2.566)
$\Delta Union25_t$		-0.004		-0.034*
		(-1.482)		(-1.936)
$Logta_{t-1}$	-0.009***	-0.009***	-0.038**	-0.039**
	(-3.762)	(-3.749)	(-2.077)	(-2.181)
$Leverage_{t-1}$	0.002	0.002	-0.068**	-0.068**
	(0.191)	(0.166)	(-2.448)	(-2.363)
ROA_{t-1}	0.003	0.003	0.019	0.018
	(0.472)	(0.487)	(0.596)	(0.548)
$Dum\ Div_{t-1}$	-0.000	-0.000	0.025*	0.025**
	(-0.174)	(-0.191)	(1.926)	(2.165)
$Xrd/Sale_{t-1}$	0.035***	0.035***	0.022	0.021
	(4.724)	(4.926)	(0.788)	(0.749)
$Ppent/TA_{t-1}$	-0.019*	-0.020**	-0.051	-0.065
	(-1.849)	(-2.035)	(-1.086)	(-1.353)
$Capx/Sale_{t-1}$	0.005	0.006	0.019	0.022
	(0.824)	(0.876)	(1.011)	(1.174)
Q_{t-1}	-0.001	-0.001	0.003	0.003
	(-0.591)	(-0.608)	(0.414)	(0.409)
Observations	2,719	2,719	2,700	2,700
Adj R-squared	0.563	0.564	0.329	0.329
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
SE clustered by	State & industry	State & industry	State & industry	State & industry

Table 7. Managerial ability (MA) and the Effect of Labor Unions on Real Earnings Management

Managerial ability score (MA) is defined in Demerjian, Lev, and McVay (2012). High intangible industries have above-median organization capital intensity with the median of organization capital intensity of 0.5. Low intangible industries have below-median organization capital intensity. Dummy variable that takes 1 if a firm union membership is more than 25% (or 50%), else 0.

Panel A: Univariate tests of managerial ability for high and low industry intangible samples

Variable	N Union25=0	Mean	N Union25=1	Mean	Difference (1-0 or High-Low)
MA Score	1471	0.0159	677	-0.0301	-0.0459***
			Intangible Industry		
	Low		High		
MA Score	1095	-0.0167	1123	0.0195	0.0363***
			High Intangible Industry		
	Union25=0		Union25=1		
MA Score	856	0.0315	219	-0.0285	-0.0600***
			Low Intangible Industry		
	Union25=0		Union25=1		
MA Score	615	-0.0060	458	-0.0308	-0.0249**

Panel B. Regression analysis of real earnings management, managerial ability, and unions

The dependent variables are RM1, which is an aggregate measure of real earnings management, defined as the sum of RM_Prod and RM_Disx in Colum (1) and abnormal production costs (abnormal discretionary expenses) in Column (2) and (3), respectively. Sample period is from 2002 to 2016. All models include firm and year fixed effects (FEs). Standard errors are clustered at the industry and state levels and robust t-statistics are reported in parentheses. ***, **, * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	(1) *RM1*	(2) *RM Prod*	(3) *RM Disx*
Abs DA $_{t}$	0.165***	0.194***	-0.014
	(2.794)	(3.521)	(-0.411)
MA Score $_{t-1}$	-0.009	-0.005	-0.005
	(-0.283)	(-0.320)	(-0.271)
Union $_{t-1}$	0.085**	0.064**	0.030*
	(2.655)	(2.347)	(1.921)
Opcf Vol $_{t}$	-0.329	-0.202	-0.131
	(-1.606)	(-1.070)	(-1.568)
Logta $_{t-1}$	0.045***	0.013	0.026**
	(3.024)	(1.158)	(2.568)
Leverage $_{t-1}$	-0.041	-0.060	0.022
	(-0.816)	(-1.573)	(1.039)
ROA $_{t-1}$	-0.072	-0.080**	0.006
	(-1.429)	(-2.026)	(0.304)
Dum Div $_{t-1}$	-0.005	-0.005	0.000
	(-0.389)	(-0.629)	(0.067)
Xrd/Sale $_{t-1}$	-0.102**	0.013	-0.097***
	(-2.422)	(0.342)	(-3.732)
Ppent/TA $_{t-1}$	-0.053	0.005	-0.061
	(-0.649)	(0.073)	(-1.625)
Q $_{t-1}$	-0.021***	-0.020***	-0.000
	(-3.195)	(-3.986)	(-0.093)
Observations	2,418	2,520	2,443
Adj R-squared	0.878	0.800	0.895
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
SE clustered by	State & industry	State & industry	State & industry

Table 8. Robustness tests

The dependent variables are RM1, which is an aggregate measure of real earnings management, defined as the sum of *RM_Prod and RM_Disx* in Colum (1) and RM2 in Column (2) and abnormal production costs (abnormal discretionary expenses and abnormal cash flows) in Column (3) to (5), respectively. Sample period is from 2002 to 2016. Panel A uses firm level union membership, and Panel B and C uses industry level (SIC3) union membership. All models include SIC4-digit industry (SIC2-digit industry in Panel B and C), state, and year fixed effects (FEs). Standard errors are clustered at the industry and state levels (only state level in Panel B and C), and robust t-statistics are reported in parentheses. ***, **, * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A.

	(1)	(2)	(3)	(4)	(5)
VARIABLES	*RM1*	*RM2*	*RM Prod*	*RM Disx*	*RM Cfo*
Abs DA $_t$	0.157*	0.090	0.235***	-0.059	0.167***
	(1.715)	(1.318)	(3.955)	(-1.427)	(3.685)
Union $_{t-1}$	0.172***	0.108***	0.101***	0.066*	0.039***
	(2.924)	(3.577)	(3.380)	(1.936)	(2.888)
Opcf Vol $_t$	0.127	0.136	0.189	-0.016	0.143*
	(0.408)	(1.495)	(0.900)	(-0.170)	(1.931)
Logta $_{t-1}$	-0.006	-0.005	-0.009	0.002	-0.007**
	(-0.455)	(-0.588)	(-1.096)	(0.244)	(-2.100)
Leverage $_{t-1}$	0.081	0.069	0.016	0.060	0.005
	(1.096)	(1.615)	(0.504)	(1.448)	(0.252)
ROA $_{t-1}$	0.017	-0.036	-0.116**	0.129**	-0.188***
	(0.174)	(-0.635)	(-2.244)	(2.471)	(-4.198)
Dum Div $_{t-1}$	-0.004	-0.002	-0.013	0.009	-0.011**
	(-0.237)	(-0.190)	(-1.571)	(0.961)	(-2.382)
Xrd/Sale $_{t-1}$	-0.158***	-0.053	0.022	-0.157***	0.090***
	(-3.409)	(-1.508)	(0.816)	(-3.613)	(4.019)
Ppent/TA $_{t-1}$	0.037	-0.018	-0.007	0.053*	-0.073***
	(0.744)	(-0.640)	(-0.304)	(1.788)	(-5.857)
Q $_{t-1}$	-0.062***	-0.049***	-0.034***	-0.029***	-0.018***
	(-3.900)	(-4.410)	(-4.240)	(-3.014)	(-4.256)
Observations	2,549	2,576	2,651	2,576	2,688
Adj R-squared	0.657	0.648	0.596	0.683	0.473
Year FE	Yes	Yes	Yes	Yes	Yes
Industy FE	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes
SE clustered by	State & industry	State & industry	State & industry	State & industry	State & industry

Panel B. Using industry union membership

VARIABLES	(1) *RM1*	(2) *RM2*	(3) *RM Prod*	(4) *RM Disx*	(5) *RM Cfo*
Abs DA$_t$	0.066	0.038	0.142***	-0.082**	0.102***
	(1.183)	(0.898)	(7.480)	(-2.217)	(4.318)
Industry Union$_{t-1}$	0.003***	0.002***	0.002***	0.001**	0.001***
	(3.213)	(3.765)	(3.625)	(2.554)	(4.165)
Opcf Vol $_t$	0.083	-0.002	0.158**	-0.063	0.084**
	(0.673)	(-0.030)	(2.492)	(-0.868)	(2.409)
Logta $_{t-1}$	0.009***	0.004*	0.005***	0.005***	-0.001
	(2.906)	(1.901)	(3.172)	(2.990)	(-1.059)
Leverage $_{t-1}$	0.068**	0.065***	0.007	0.062***	0.007
	(2.595)	(4.526)	(0.548)	(4.292)	(0.864)
ROA $_{t-1}$	0.021	-0.089***	-0.130***	0.143***	-0.217***
	(0.578)	(-5.495)	(-6.783)	(6.341)	(-14.265)
Dum Div $_{t-1}$	0.002	0.004	-0.004	0.005	-0.003
	(0.211)	(0.853)	(-0.952)	(1.097)	(-1.037)
Xrd/Sale $_{t-1}$	0.041	0.000	0.082***	-0.057***	0.045***
	(1.513)	(0.006)	(7.774)	(-3.528)	(5.758)
Ppent/TA $_{t-1}$	0.169***	0.066***	0.047***	0.115***	-0.050***
	(6.029)	(3.633)	(3.486)	(7.199)	(-6.018)
Q $_{t-1}$	-0.102***	-0.064***	-0.049***	-0.050***	-0.013***
	(-13.138)	(-16.905)	(-11.131)	(-9.959)	(-6.833)
Observations	14,049	14,217	14,437	14,218	14,616
Adj R-squared	0.162	0.169	0.147	0.216	0.231
Year FE	Yes	Yes	Yes	Yes	Yes
Industy FE	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes
SE clustered by	State	State	State	State	State

Panel C. Using industry union membership

VARIABLES	(1) *RM1*	(2) *RM2*	(3) *RM Prod*	(4) *RM Disx*	(5) *RM Cfo*
Abs DA$_t$	0.077	0.044	0.148***	-0.077**	0.103***
	(1.377)	(1.070)	(7.892)	(-2.056)	(4.436)
Industry Union$_{t-1}$	-0.001	-0.000	-0.000	-0.001	0.000*
	(-0.798)	(-0.345)	(-0.219)	(-1.136)	(1.874)
Highind Intang $_{t-1}$	-0.224***	-0.138***	-0.110***	-0.112***	-0.028***
	(-7.742)	(-8.662)	(-7.414)	(-7.744)	(-5.091)
*Industry Union*Highind Intang* $_{t-1}$	0.010***	0.006***	0.005***	0.005***	0.001***
	(6.781)	(6.621)	(6.948)	(5.581)	(4.880)
Opcf Vol $_t$	0.045	-0.028	0.137**	-0.084	0.079**
	(0.365)	(-0.403)	(2.212)	(-1.145)	(2.308)
Logta $_{t-1}$	0.010***	0.004**	0.005***	0.006***	-0.001
	(3.362)	(2.236)	(3.547)	(3.342)	(-1.043)
Leverage $_{t-1}$	0.046*	0.051***	-0.005	0.051***	0.004
	(1.782)	(3.509)	(-0.336)	(3.658)	(0.494)
ROA $_{t-1}$	0.013	-0.095***	-0.135***	0.138***	-0.219***
	(0.337)	(-5.740)	(-7.057)	(6.090)	(-14.339)
Dum Div $_{t-1}$	-0.006	-0.001	-0.008**	0.001	-0.004
	(-0.814)	(-0.240)	(-2.063)	(0.191)	(-1.484)
Xrd/Sale $_{t-1}$	0.066**	0.016	0.094***	-0.044***	0.048***
	(2.443)	(0.972)	(9.023)	(-2.722)	(6.100)
Ppent/TA $_{t-1}$	0.097***	0.021	0.011	0.079***	-0.059***
	(3.436)	(1.097)	(0.768)	(4.839)	(-6.739)
Q $_{t-1}$	-0.098***	-0.061***	-0.047***	-0.048***	-0.013***
	(-12.617)	(-15.756)	(-10.969)	(-9.419)	(-6.582)
Observations	14,049	14,217	14,437	14,218	14,616
Adj R-squared	0.193	0.201	0.176	0.241	0.241
Year FE	Yes	Yes	Yes	Yes	Yes
Industy FE	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes
SE clustered by	State	State	State	State	State