

Disclosure tone management and labor unions

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ABSTRACT

By analyzing the influence of labor unions on the narrative content of corporate disclosures, we provide empirical evidence that managers deflate the tone of earnings press releases in order to convey to unions a less optimistic image of firm financial performance. We find that the tone of the qualitative information in earnings press releases is significantly less optimistic as the degree of unionization increases, and particularly when financial performance is strong. The results of quasi-natural experiments suggest that labor unions causally affect the use of tone deflation, and the deflation is stronger during labor negotiations. Our findings also indicate that labor unions lead to a significant weakening of the signaling value of the tone of earnings press releases in predicting future performance.

KEYWORDS: Tone Management, Labor Unions, Earnings Press Releases, Union Elections, Right-to-Work, Employee Relations

DATA AVAILABILITY: Union size and election data are publicly available through the FMCS (<https://www.fmcs.gov/>) and NLRB (<https://www.nlr.gov/>). Press release data is publicly available through the EDGAR platform of the SEC (<https://www.sec.gov/edgar/searchedgar/companysearch.html>). Other relevant financial and accounting information is obtained from subscription sources (Compustat, IBES, MSCI KLD).

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1 Introduction

Research on financial disclosure content generally focuses on the conflict of interest between managers and shareholders by examining incentives such as option awards and stock-based compensation [see [Arslan-Ayaydin et al., 2016](#); [Huang et al., 2014](#)], litigation risk [[Rogers et al., 2011](#)], and insider trading [[Tama-Sweet, 2014](#)]. However, corporate narratives are also directed at stakeholders other than investors [[Chung et al., 2016](#); [Lehavy et al., 2011](#)]. As such, we investigate how firms strategically vary the narrative content of their corporate disclosures in response to an important group of stakeholders: labor unions. Given that unions tend to extract rents from firms, we examine whether firms with higher labor union power alter the tone of their earnings press releases to convey a less optimistic picture about the firm's financial performance.

Unions are prevalent in many industries, especially in large firms. On average, around 24% of the employees in S&P500 firms are unionized [[Marciuikaityte, 2014](#)], which provides unions with a significant platform to demand benefits and results in a substantial decrease of firm value [[Chen et al., 2011](#)]. [Baldwin \[1983\]](#) and [Grout \[1984\]](#) propose a model where unions are considered rent-seekers because they may use strikes and other means to increase wages and benefits. Consequently, managers facing strong labor unions have incentives to safeguard firm resources and weaken union bargaining power. For instance, to lower union rents, firms have been shown to hold less cash [[Klasa et al., 2009](#); [Tong, 2015](#); [Tong & Huang, 2018](#)], increase leverage [[Bronars & Deere, 1991](#)], and reduce tax aggressiveness [[Chyz et al., 2013](#)].

Several studies also examine this rent extraction theory in the context of financial reporting. For instance, [DeAngelo & DeAngelo \[1991\]](#) document downward earnings management during union negotiations, while [Bova \[2013\]](#) finds that firms with strong unions tend to manage earnings downward and miss earnings targets more frequently. Further, [Chung et al. \[2016\]](#) show that unionized firms time the release of news to preserve bargaining power against labor unions. In particular, firms tend to withhold good news during labor negotiations while promoting bad news. Altogether, the literature concludes that firms facing strong labor unions attempt to influence perception of the labor unions

about the financial prospects of firms.

We investigate whether managers who face strong labor organizations adjust the content of corporate disclosures. A growing body of literature establishes that the linguistic tone of corporate disclosures is, on average, incrementally informative to hard news such as earnings [Davis et al., 2012; Henry, 2008; Tetlock, 2007] and management forecasts [Baginski et al., 2016] in explaining firms' cash flows and stock returns. However, recent evidence suggests that the tone of corporate disclosures can also be used to mislead shareholders. For instance, Huang et al. [2014] find that managers tend to inflate (deflate) the linguistic tone before events that offer the incentive to increase (decrease) stock prices (e.g., stock option grants, mergers and acquisitions, seasoned equity offerings).

Yet, opportunistic deviations from the norm to manipulate perceptions can also be costly to managers. Probably the most important cost is the associated loss of credibility, which has been shown to be an important trigger of investors' reactions [Hirst et al., 1999]. Drawing from persuasion models, Mercer [2004] reports that investors are less likely to rely on corporate disclosures when managers have the incentive to be misleading or untruthful at the time of the disclosure. In the presence of situational incentives, such as when labor unions are present, the skepticism that surrounds the credibility of financial narratives means that rational users are more likely to discount qualitative information [El-Haj et al., 2019]. This in turn reduces the effectiveness of tone deflation to infer the impression of lower performance to stakeholders. In line with this argument, Arslan-Ayaydin et al. [2016] find that the credibility of the narratives in earnings press releases decreases as the sensitivity of managers' equity incentives to the firm's stock price increases. In turn, this results in a lower stock price reaction at the earnings announcement, relative to the optimism of the press release. This is all the more important since tone deflation already bears a direct cost for managers in the form of a lower stock price reaction at the earnings announcement [Arslan-Ayaydin et al., 2016], as well as through a diminished post-earnings announcement drift [Henry & Leone, 2016].

Against this backdrop, the question is whether managers of unionized firms engage in a downward manipulation of corporate disclosure tone despite the direct negative impact on stock prices at the earnings announcement and the lower credibility associated with narrative disclosures. Managers need to trade-off the benefits of reducing labor union pressure against the potential costs of tone deflation to other stakeholder groups, in particular shareholders. We thus expect the presence of unionization to act as a constraint on the natural tendency for management to report optimistically. That is, instead of manipulating perceptions downwards, the presence of labor unions mitigates managers' incentive to engage in upward manipulation.

Earnings press releases are the focus of this paper for several reasons. They are the primary mechanism by which managers announce quarterly earnings to investors and other stakeholders [Davis et al., 2012]. Whereas quantitative disclosures are subject to the Generally Accepted Accounting Principles (GAAP) enforced by independent auditors or the SEC monitoring of periodic filings, the key feature of earnings press releases is that they are less regulated than other disclosures such as 10-Ks, giving management more discretion on what information to disclose [Henry, 2008; Huang et al., 2014; Libby & Emett, 2014].¹ Such narratives are more difficult to regulate or litigate against compared to pure quantitative information and they offer managers the opportunity to manipulate stakeholders' perceptions of firm performance in a more subtle manner.

We use the degree of unionization as a proxy for union strength and bargaining power at the establishment level. We follow the National Labor Relations Board (NLRB) definition of establishment as a separate location of a company's business activity, which relies on employees. As not all employees of an establishment are represented by a labor union, bargaining power is defined as the bargaining unit size (i.e., number of employees covered by the union contract) divided by the total number of establishment employees [Chung et al., 2016; Chyz et al., 2013]. To compute the

¹Best practice guidelines of both the National Investor Relations Institute and Financial Executives Institute recommend managers to present in earnings press releases a "reasonably balanced perspective of operating performance" that are "accurate and complete so as not to mislead" [Trautmann & Hamilton, 2003]. However, certain regulations do exist. For example, to curtail potentially misleading disclosures, Regulation G requires SEC registrants using non-GAAP measures to give equal or greater attention to the most directly comparable financial measure calculated and presented in accordance with GAAP.

linguistic tone in earnings press releases, we rely on a bag-of-words approach at the sentence level. We focus on the sentence-level tone because authors generally try to confine each sentence to one or a few related ideas. This means that the different sentences in a paragraph can hold different tones, and bundling them together would introduce noise [Li, 2010]. This sentence-level granularity is therefore likely to increase the power of our tests. Based on the financial word lists of Henry [2008], we measure the linguistic tone of each press release as the average sentence-level difference between the number of positive and negative words relative to the total number of words.

We verify our hypotheses by using two different estimation strategies, both of which build on our proxy for union bargaining power. The first measures the cross-sectional relationship through a direct linear regression, while the second is less direct but avoids the potential biases of cross-sectional estimation by using adoption of state-level right-to-work (RTW) laws as a source of exogenous variation in union power. We find the power of labor unions to be negatively associated with the tone of press releases. Additionally, we find that this opportunistic behavior is stronger for firms with superior financial performance, greater financial flexibility, those in democratic states, and for those that do not maintain favorable employee relations with employees. Overall, our findings are consistent with the expectation that the managers of unionized firms shy away from overly optimistic disclosures and report a more neutral tone in their earnings press releases.

The analyses of the effects of changes in labor laws confirm that labor unions influence disclosure decisions. RTW laws outlaw employment contract provisions that require employees to join or financially support a union. As such, these laws expose unions to a free-rider problem, whereby non-union employees benefit from collective bargaining without paying their dues, which substantially reduces unions' negotiation power [Marcuikaityte, 2014, 2018]. RTW laws are initiated by state legislators and are therefore exogenous to firms or managers. We exploit a quasi-natural experiment of RTW law adoption by Indiana and Michigan in 2012. Following this approach, our results show how the changes in the legal system causally affect managers' disclosure behavior and that the adoption of RTW laws reduces manipulation of financial narratives.

Because managers have few incentives to decrease the firm's stock price, they also have few incentives to exaggerate bad news. Therefore, we expect managers to deflate the tone of earnings press releases by decreasing the proportion of positive words, rather than increasing the number of negative words. We decompose tone into positivity (i.e., count of the positive words in the disclosure) and negativity (i.e., number of negative words), and find that the managers of unionized firms achieve a more neutral tone by decreasing the frequency of positive words, whereas the proportion of negative words remains relatively unchanged. These results suggest that the strategy of firms is to convey the message in a more conservative (i.e., neutral) manner, rather than projecting negativity concerning their outlook. This is in line with the idea that unionized labor acts as a constraint on management's natural tendency toward optimism.

We conduct a number of identification tests to ensure that our results are not driven by confounding factors. The first and most important is analyzing earnings management in relation to labor negotiations and disclosure tone. To ensure that the effect of labor unions on tone is separate and cannot be explained by downward earnings management [DeAngelo & DeAngelo, 1991], we divide the sample based on signed discretionary accruals. If the less optimistic tone of unionized firms is solely driven by downward earnings management, our results should be concentrated in the subsample that has experienced downward earnings changes. Conversely, we find that the relationship between labor unions and tone also persists in the subsample with upward earnings management. Therefore, the effect of labor unions on the tone of earnings press releases appears to be an independent disclosure strategy from earnings management.

In addition, using an event study setting, we examine changes in the tone of earnings press releases around labor union elections, conditioning our analysis on whether a union wins or loses the election [Chyz et al., 2013]. The employees of a firm become unionized when the union wins the election. As a result, these employees are represented in the formation of a labor agreement by the union through a collective bargaining process with the firm's management. Consistent with our expectations, we find that the tone of earnings press releases decreases in the period after the labor union wins the

election. This result verifies the causality of tone manipulation as a response to unions, and suggests the presence of timely behavior.

Our paper makes several contributions to the literature. First, we add to the disclosure literature by providing novel empirical evidence on the relationship between labor unions and reporting behavior. In a study similar to ours, [Chung et al. \[2016\]](#) examine the effects of labor unions on firms' overall disclosure frequency. They find that disclosure frequency is negatively related to labor union strength and firms with strong labor unions withhold good news and promote bad news to preserve their bargaining power against organized labor. As such, our research is related to but distinct from that of [Chung et al. \[2016\]](#). Similar to [Chung et al. \[2016\]](#), we evidence that managers facing organized labor tend to make strategic choices in their financial disclosures. However, labor unions are not only affected by the flow of good and bad news, but also by the information contained in the narratives of firms' financial disclosures [[Hilary, 2006](#)]. We thus contribute to the literature by examining the relationship between organized labor and the narrative content of corporate disclosures. It however is beyond the scope of this paper to examine whether tone manipulation has the desired effect on unions' demands. Future research should investigate whether manipulating the tone of corporate narratives lowers the costs associated with labor unions' rent extracting behavior.

Second, our paper provides empirical evidence on the rarely discussed notion of tone deflation. Although various reasons can motivate managers to be overly optimistic in disclosures, their tendency to be less optimistic is not often discussed in the literature. The only exception is that managers do so in the period immediately preceding option grant dates to lower the exercise price of their options [[Huang et al., 2014](#)]. We thus add a new piece of evidence to this literature stream by focusing on another factor that leads managers to provide less optimistic disclosures.

Third, our paper contributes to the literature on the timing of strategies in the disclosure of information in the context of labor relations [[Bova, 2013](#); [Chung et al., 2016](#)]. The literature focuses on whether the strategies used by managers to shelter their resources from labor unions are permanent or specific to labor negotiation periods. While some studies show that the managers of

unionized firms withhold good news during the collective bargaining process and then release it a smooth fashion, [Chung et al., 2016], Bova [2013] suggests that unionized firms are more likely to miss mean consensus analysts' earnings forecasts, regardless of when negotiations are taking place. In light of these conflicting results, we show that managers strategically deflate the tone of earnings press releases during labor negotiations after a union wins the elections. If the union loses the election, we find no statistical difference in the level of tone either before or after the election.

Finally, in contrast to Chung et al. [2016], who study a sample of South Korean firms, we focus on U.S. firms to provide evidence that the relationship between labor unions and managers' reporting strategies is significantly affected by the confounding effects arising from the regulatory framework. This is particularly relevant, given the current debate in the U.S. on the introduction of a national RTW law, which would significantly diminish the union membership rate and labor unions' bargaining power [Reuters, 2017]. For regulators and standard setters interested in the consequences of RTW laws, our findings show how the adoption of these laws would reduce the opportunistic use of corporate narratives towards unions.

The rest of this paper is organized as follows. Section 2 reviews the literature and develops the research hypotheses. Section 3 summarizes the research design and variables. The main results are discussed in Section 4. Section 5 provides the results of the cross-sectional tests and Section 6 describes our additional analyses. Section 7 provides the robustness tests, while Section 8 concludes.

2 Literature review and hypotheses development

2.1 Literature review

Labor unions are often viewed as rent-seekers that cause harm to shareholders' wealth [Faleye et al., 2006; Hirsch, 1991]. Although some studies show unions can increase productivity and decrease labor costs by reducing quit rates and labor turnover [e.g., Freeman, 1980], most prior studies suggest that unions raise wage costs and decrease management flexibility [Connolly et al., 1986]. To measure the

net effects of labor unions, [Ruback & Zimmerman \[1984\]](#) examine the abnormal returns on a sample of 253 NYSE listed firms from 1962 to 1980. They show that unionization is, on average, associated with a reduction in equity value. Using a longer sample period with more recent observations, [Lee & Mas \[2012\]](#) find that there are substantial losses in market value of around 10% (or \$40,500 per unionized worker) following union election victories. [Chen et al. \[2011\]](#) further find that labor unions increase firms' costs of equity by decreasing their operating flexibility. [Agrawal \[2012\]](#) also notes that union pension funds have progressively become more vocal about corporate governance matters, such as corporate director elections. [Jensen & Murphy \[2010\]](#) describe union leaders as uninvited but influential guests at the managerial bargaining table, emphasizing their influence on the manager-shareholder relationship.

Given the threat of strikes and other methods used by labor unions to extract rents from firms, the labor economics literature models labor unions as rent-seekers that strive to claim excess profits [[Baldwin, 1983](#); [Grout, 1984](#)]. As a response, empirical research points out that managers aim to shelter firm resources from employees and weaken labor unions' bargaining power. For instance, [Bronars & Deere \[1991\]](#) show that firms respond to unionization threats by increasing their leverage ratios. Although this practice is costly, it can protect shareholders from union rent extraction, as the decrease in future net cash flows makes the formation of a union less lucrative. Similarly, [Klasa et al. \[2009\]](#) show that firms facing more powerful unions hold smaller strategic cash reserves and [Faleye et al. \[2006\]](#) find that strong labor representation induces firms to reduce their investment in long-term assets and undertake less risky investments.

Prior research also tests the rent extraction theory in the context of financial reporting. [DeAngelo & DeAngelo \[1991\]](#) show that managers manipulate earnings numbers downwards to reflect a negative firm image to unions and improve their bargaining position. [Bova \[2013\]](#) shows that unionized firms are more (less) likely than a non-unionized control group to just miss (meet or beat) mean consensus analysts' earnings forecasts. More recently, [Hamm et al. \[2018\]](#) find a positive relationship between labor unions and income smoothing and [Chyz et al. \[2013\]](#) show that managers use less tax aggressive

strategies in unionized firms, as the generated after-tax cash flow is more vulnerable to union capture. In a study similar to ours, [Chung et al. \[2016\]](#) find that the management's overall disclosure frequency is negatively related to the firm's labor union strength, and that these firms tend to withhold good news so as to reduce union bargaining demands.

2.2 Labor unions and the management of tone in earnings press releases

The aforementioned studies support the notion that managers actively aim to preserve their bargaining power vis-à-vis labor unions. We argue that, in order to improve their bargaining position, managers of unionized firms manipulate the content of corporate narratives by providing disclosures with a less optimistic tone.

There exists strong evidence that stakeholders use qualitative information from corporate disclosures to infer managers' private information on firm financial performance. For instance, [Henry \[2008\]](#) concludes that the tone of earnings press releases is significantly and positively correlated with short-window contemporaneous returns around the disclosure release date, beyond the firm's financial results. Additionally, [Davis et al. \[2012\]](#) examine the information value of earnings press releases and document the positive correlations between the tone of earnings press releases and current or future firm profitability and between tone and investors' reaction at the earnings announcement. Similarly, [Boudt et al. \[2018\]](#) find that the tone of earnings press releases provides information value to shareholders and the informativeness of the tone increases with the level of information asymmetry. Overall, the literature supports the notion that the qualitative information in earnings releases signals a firm's financial situation.

However, the incentive to deflate the tone of corporate disclosures to reduce the pressure from labor unions is competing with the objective of shareholders' wealth maximization. Specifically, by deflating the tone of corporate disclosures, managers not only face the risk of a lower stock price reaction around the earnings announcement but are also likely to experience a diminished post-earnings announcement drift [[Arslan-Ayaydin et al., 2016](#); [Henry, 2008](#)]. In fact, the literature

provides evidence that managers may use the tone to mitigate the negative repercussions of a negative earnings surprise on the post-earnings announcement drift [see, e.g., [Garcia Osma & Guillamon-Saorin, 2011](#); [Henry & Leone, 2016](#)]. This makes the downward manipulation of the tone “a double-edged sword” at the expense of firm value.

Drawing from persuasion models, [Mercer \[2004\]](#) argues that investors are less likely to rely on corporate disclosures when managers have incentives to be misleading or untruthful at the time of disclosure. In the presence of situational incentives, such as in the case with labor union presence, the skepticism that surrounds the credibility of financial narratives means rational users are more likely to discount qualitative information [[El-Haj et al., 2019](#)], which reduces the effectiveness of using tone deflation as an impression management tool to negotiate with labor unions. If voluntary corporate narratives are interpreted as being boilerplate with no real incremental value, it is unlikely that the management would alter the wording to manage the labor union’s impression about the firm’s performance. Conversely, if the tone provides incremental information value to the quantitative information, managers would benefit from engaging in the manipulation of corporate narratives and we should observe a significant negative relationship between tone and labor union power.

If the managers of unionized firms tend to deflate the tone of corporate disclosures, we expect this strategy to occur through a reduction in the frequency of positive words rather than an increase in the use of negative ones. This choice is critical, given that positive and negative words contain different informational properties and have a different impact on the stock price reaction at the earnings announcement. Managers have been shown to aggressively use positive words in the earnings press releases for self-serving purposes (e.g., stock-based compensation or future M&A announcements) [[Arslan-Ayaydin et al., 2016](#); [Huang et al., 2014](#)]. However, such positive words contain little information value to explain investors’ behavior. In fact, [Hutton et al. \[2003\]](#) find that bad news forecasts are inherently more credible than good news forecasts, and therefore have a much larger effect on stock prices. Consistent with the prospect theory, [Henry & Leone \[2016\]](#), [Tetlock \[2007\]](#), and [Tetlock et al. \[2008\]](#) show that investors place a lower weight on positive news than negative

news and estimate a stock reaction to negative words that is more than 20% higher than that of positive words. In sum, because managers have limited incentives to jeopardize the stock price reaction at earnings announcements, we expect the propensity to deflate the tone of earnings press releases to be primarily driven by a reduction in the number of positive words. This means that union presence serves as a constraint on the natural tendency for management to report optimistically.

Hypothesis 1 – Firms facing stronger labor unions deflate the tone of earnings press releases, which results from a reduction in the ratio of positive words rather than an increase in that of negative words.

This research question complements the study of [Chung et al. \[2016\]](#) and aims to establish that, in addition to delaying the reporting of positive news to shelter the firm's resources from labor unions, managers also strategically choose the words in the narrative sections of corporate disclosures.²

Central to this hypothesis is that good financial performance is more likely to entice labor unions to increase their demands. [DeAngelo & DeAngelo \[1991\]](#) show that increases (decreases) in a firm's profitability weaken (improve) the firm's bargaining position relative to a union. [Chino \[2016\]](#) further shows that, as firm profitability increases, so does the rent that unions are able to extract. Therefore, managers tend to increase their payout policy to reduce this rent and undermine unions' rent-seeking power. Similarly, we argue that the managers of profitable firms may have increased incentives to resort to tone deflation to improve their bargaining positions. For a given level of unionization, this may lead the tone of press releases to be more neutral for unionized firms with good performance.

Hypothesis 2 – The relationship between union power and the tone deflation in earnings press releases is more pronounced for well performing firms.

²Note that [Chung et al. \[2016\]](#) rely on a different database than ours. Their data covers general news operated by the Korea Exchange (KRX), as well as the Data Analysis, Retrieval and Transfer (DART) System operated by the Financial Supervisory Service (FSS).

2.3 The impact of right-to-work laws

Labor laws may also influence the impact of labor unions regarding the way financial information is reported by managers. In states where the RTW law applies, unions cannot require dues or fees as a condition for employment. Even after winning the majority of votes in union certification elections, the unions in RTW states can only collect payment from voluntary members, creating a free-rider incentive for workers. As their financial resources decrease, unions' ability to support political parties, lobby the government, and engage in long-lasting strikes is undermined.^{3,4}

Therefore, RTW laws tend to release some of the pressure on managers and create a more favorable bargaining environment. For example, [Marciukaityte \[2014\]](#) finds that the positive relationship between leverage and unionization exists only in the states without RTW laws. Additionally, [Marciukaityte \[2018\]](#) shows that unionized firms in non-RTW states underperform by about 7 percentage points per year. Similarly, we expect firms in states without RTW laws to have more incentives to present a less positive outlook through the tone of earnings press releases:

Hypothesis 3 – The relationship between union power and tone deflation in earnings press releases is stronger in the states without RTW laws.

2.4 Union elections and tone deflation

To ensure the causality of the hypothesized relationship between tone manipulation and union power, we exploit the setting of union elections. Prior literature has already indicated that disclosure manipulation may have a timely component. For instance, [Aboody & Kasznik \[2000\]](#) show that managers opportunistically time the release of information to increase the value of their stock option awards. In particular, they find that CEOs manage investors' expectations around award dates by

³At the end of 2018, there were 27 RTW states, with the most recent addition being Kentucky in 2017.

⁴Note that, although the free rider problem associated with RTW states results in lower levels of unionization (which directly reduces the financial means of a union), there are also indirect costs that impede unions' financial power. First, unions in RTW states spend significantly more on organizing and maintenance costs, since union shops can not be used to curb free riding [[Hirsch, 1980](#); [Moore & Newman, 1985](#); [Seeber & Cooke, 1983](#)]. In addition, the lack of uniformity and consensus among workers can arguably reduce their bargaining power and demands. As such, everything else equal, unions in RTW states are expected to be somewhat weaker than unions in non RTW states.

delaying good news and emphasizing bad news. Evidence concerning such timely behavior in the context of labor unions, however, remains scarce and, more importantly, lacks consensus. On one hand, Bova [2013] finds that unionized firms are more likely to miss analysts' earnings forecasts by using both earnings management and expectation management to signal a less positive outlook to unions, but this tendency is not restricted to the period just before the labor negotiation process and takes place regardless of negotiations. On the other hand, DeAngelo & DeAngelo [1991] find a significant increase in earnings management in the year of union contract negotiations. Similarly, using a sample of Korean firms, Chung et al. [2016] show that managers time the disclosure of good news and release it gradually when the bargaining season is over. Chyz et al. [2013] also report that firms become less tax aggressive in the period after their union wins the election.

We test whether the tone significantly changes in periods when union negotiations take place. We follow Chyz et al. [2013] and condition our analyses on whether a union wins or loses the unionization election. Employees become unionized when the union wins the election. Subsequently, these employees are represented by the union in the formation of a labor agreement through a collective bargaining process with their firm's management. We thus expect managers to manipulate the tone of earnings press releases downwards in firms that experience successful union election.

Hypothesis 4 – Ceteris paribus, the tone of earnings press releases is less optimistic after firms are unionized.

3 Variable definitions, and research design

3.1 Research design

To test Hypothesis 1, we estimate the following cross-sectional regression:

$$Tone = \alpha + \delta \cdot UnionCoverage + \beta \cdot Controls + \varepsilon, \quad (3.1)$$

where ε are Newey–West standard errors, corrected for heteroskedasticity and autocorrelation. *UnionCoverage* is the unionization rate at the establishment level, measured as the ratio of bargaining unit size to the establishment size provided by the FMCS database. δ is the coefficient of interest, which captures the impact of labor unions on the tone of earnings press releases. If firms deflate the tone strategically as union coverage increases, we expect δ to be negative. *Controls* represent a set of determinants that explain the tone of press releases. Each variable is defined in Table 1.

< Insert Table 1 about here. >

Hypotheses 2 and 3 respectively examine how firm financial performance and RTW laws affect the relationship between labor union power and tone. We test the following model by introducing an interaction term in Equation 3.1 between *UnionCoverage* and the variable of interest (*Factor*):

$$\begin{aligned} \text{Tone} = & \alpha + \xi \cdot \text{UnionCoverage} \cdot \text{Factor} \\ & + \delta \cdot \text{UnionCoverage} + \tau \cdot \text{Factor} + \beta \cdot \text{Controls} + \varepsilon, \end{aligned} \quad (3.2)$$

where ε are Newey–West standard errors, corrected for heteroskedasticity and autocorrelation. *Controls* is the same set of control variables and fixed effects as in Equation 3.1. *Factor* either represents the firm’s financial performance, defined as the next quarter’s return on assets (*FROA_{Q1}*) or whether the establishment is located in a state without RTW laws (*NR_{RTW}*). If the impact of labor unions is more pronounced for profitable firms and firms located in non-RTW states, we should expect a negative coefficient ξ on the interaction variable.

Hypothesis 4 tests the evolution of tone around union elections, which marks the start of the collective bargaining period. To examine the changes in tone around elections, we perform an event

study analysis using the following regression:

$$\begin{aligned} \text{Tone} = & \alpha + \rho \cdot \text{UnionPeriod} \cdot \text{UnionOutcome} + \omega \cdot \text{UnionPeriod} \\ & + \chi \cdot \text{UnionOutcome} + \beta \cdot \text{Controls} + \varepsilon, \end{aligned} \quad (3.3)$$

where ε are Newey–West standard errors, corrected for heteroskedasticity and autocorrelation. *UnionPeriod* is a dummy variable that takes the value one for all the earnings announcements that take place after the election date, and zero otherwise. The dummy variable *UnionOutcome* is equal to one for firms that eventually win the labor union elections through a majority vote, and zero otherwise. The control variables are consistent with Equation 3.1. We argue that managers react strategically by providing a less optimistic outlook on a firm’s performance during contract negotiations. We thus predict the coefficient ρ on the interaction variable to be negative.

3.2 Measuring the tone in earnings press releases

Our analysis focuses on the tone of earnings press releases at the sentence level, rather than at document level [see, e.g., Bao & Datta, 2014; Büschken & Allenby, 2016]. As authors generally try to confine each sentence to one idea or a few related ones, bundling all sentences together is likely to introduce noise [Li, 2010]. As a result, the sentence-level granularity of sentiment detection can help reduce noise and increase the power of our tests. We identify sentences using “sentence-splitter 1.4”, the Python version of Perl’s “Lingua::Sentence” module. After stemming and stopwording, we use the bag-of-words approach, which counts the number of positive and negative words [Arslan-Ayaydin et al., 2016; Boudt & Thewissen, 2019; Davis et al., 2012; Tetlock, 2007; Tetlock et al., 2008].⁵

To identify positive and negative words, we rely on the word lists developed by Henry [2008]. These lists contain 105 positive and 85 negative words and they have been specifically developed to analyze the content of earnings press releases. As such they are more powerful than other wordlists

⁵We refer the reader to the online Appendix for a more in-depth discussion on the processes of stemming and stopwording. This appendix also elaborates on the construction of a temporal tone, which is used later on in the paper.

used in past research in explaining the market reaction at earnings announcements [Henry & Leone, 2016].⁶ We follow Gordon et al. [2013], Tetlock [2007], Tetlock et al. [2008] and Davis et al. [2012], and define tone as the average spread in the number of positive (PW_s) and negative words (NW_s), relative to the total number of words (TW_s) in each sentence s of the press release:

$$Tone = \frac{1}{N_s} \sum_{s=1}^{N_s} \frac{PW_s - NW_s}{TW_s}, \quad (3.4)$$

where N_s is the total number of sentences in the earnings press release.⁷

3.3 Control variables

As a firm's disclosure content is largely influenced by its performance [Miller, 2002], we expect the tone of corporate disclosures to be associated with a variety of economic attributes, such as firm-specific characteristics, firm's information environment, earnings uncertainty, and earnings management. By introducing these controls, we can isolate the effect of labor unions on the tone of disclosures.

We include two benchmarks that directly control for current firm performance: (i) quarterly return-on-assets (ROA) and (ii) analysts' forecast error (FE), defined as the difference between the realized earnings per share and the median expectations of financial analysts. Similar to Huang et al. [2014] and Davis & Tama-Sweet [2012], we expect a positive association between these measures and $Tone$. As an additional performance proxy, we control for the firm's abnormal returns by including the estimated intercept of an event study regression ($Alpha$) based on a market model that spans the $[d - 315; d - 63]$ time window preceding the end of the fiscal quarter, where $d = 0$ is the earnings announcement day.

⁶Consistent with Loughran & McDonald [2011] and Li [2010], we take simple negations into account for identifying positive words, that is, when negation words (i.e., "no", "not", "none", "neither", and "never") immediately precede a positive word, we consider that positive word as negative.

⁷Our definition of tone follows the majority of textual analysis studies [Boudt & Thewissen, 2019; Boudt et al., 2018; Henry, 2008; Henry & Leone, 2016; Loughran & McDonald, 2011]. However, domain-specific libraries are being progressively defined and a consensus has yet to be reached on how to optimally measure tone (for alternative measures of tone, see for example Boudt & Thewissen [2019], Huang et al. [2014], and Jegadeesh & Wu [2013]). In Section 4.3.2, we test the robustness of our results to alternative definitions of tone, such as an abnormal tone [Huang et al., 2014]. Further, in Section 6.3, we segment the forward-looking, contemporaneous, and backward-looking sentences in the earnings press release.

Consistent with [Arslan-Ayaydin et al. \[2016\]](#), we expect *Alpha* to have a positive relationship with *Tone*. Next, we include two market-related variables and exploit their forward-looking properties: (i) the buy-and-hold returns (*Returns*) and (ii) the book-to-market ratio (*BTM*). In doing so, we include the present value of future cash flows, as well as information about the firm's growth prospects [[Huang et al., 2014](#); [Marquez-Illescas et al., 2019](#)].

We capture the risk environment in which the firm operates by the following three measures: (i) the standard deviation of return-on-assets over the last four quarters preceding the quarter of the considered earnings announcement (σ_{ROA}) as per [Core & Guay \[2002\]](#), (ii) the firm's systematic risk (*Beta*) estimated in the event study regression (see *Alpha* for the event study window specifications), and (iii) the standard deviation of buy-and-hold returns in the 12-month period preceding the fiscal quarter's end (σ_{RET}).

To control for the firm's information environment, we follow [Huang et al. \[2014\]](#) and [Boudt et al. \[2018\]](#), and include two benchmarks that proxy for the complexity with which the firm exercises its daily practices: (i) number of geographical segments (*GeoSeg*) and (ii) number of business segments in which the firm is active (*BusSeg*). Following the literature [[Chen et al., 2018](#); [Davis et al., 2012](#); [Huang et al., 2014](#)], we include firm size as the logarithm of the market capitalization (*Size*). We follow [Arslan-Ayaydin et al. \[2016\]](#) and [Huang et al. \[2014\]](#) and control for the firm's stage in its life-cycle by including its age (*Age*). Finally, in addition to the aforementioned control variables, we also include two-digit SIC industry dummies, as well as year- and quarter-fixed effects.

Finally, [Huang et al. \[2014\]](#) and [Garcia Osma & Guillamon-Saorin \[2011\]](#) show that managers tend to use disclosure tone manipulation to complement quantitative earnings management to disinform investors. Therefore, we control for earnings management and predict its positive relationship with *Tone*. We follow [Huang et al. \[2014\]](#) and include the discretionary accruals (*DA*) as defined by [Dechow et al. \[1995\]](#).

3.4 Data selection

We retrieve earnings press releases from S&P1500 firms for the period of January 2004 up to December 2015, using the EDGAR website of the SEC. In accordance with Section 409 of the Sarbanes-Oxley Act of 2002, public companies are required to provide their earnings releases to the SEC on a 8-K form within four business days of their issuance. We start in 2004, as this is the first full year when the SEC required publicly listed firms to file their earnings press releases. By excluding the earlier years, we avoid the potential selection bias and noise caused by voluntary reporting. We extract the press release (Item 2.02) from the downloaded 8-K HTML files and remove all redundant HTML encoding, as well as the tables and figures [see, e.g., [Davis et al., 2012](#); [Loughran & McDonald, 2011](#)]. As a result, we obtain the narrative section of the press release. To further ensure that the sample includes only earnings press releases, we read all electronic files with sizes below 10 kilobytes and eliminate the files containing conference call announcements or other non-earnings related announcements.

Following [Chyz et al. \[2013\]](#), [Klasa et al. \[2009\]](#), and [Matsa \[2010\]](#), the unionization rate serves as our proxy for union strength and bargaining power. We collect information on labor unions at the establishment level. We obtain the data on union labor size and contract periods from the Federal Mediation and Conciliation Service (FMCS) database. According to the NLRA, the establishments with labor union contracts are required to file their notices of contract expiration with this agency to prepare for potential strike mediations. The FMCS database not only provides information on contract expiration dates but also on the bargaining unit and establishment sizes for union contracts. We match the FMCS establishments with the firms in the Compustat database in two steps. First, we compute the Levenshtein distance between firm names in the FMCS and Compustat databases to identify the correct match.⁸ Second, we verify all matched pairs manually and delete observations for which the generalized Levenshtein distance exceeds 10%. We also remove all variables for which the size of

⁸The generalized Levenshtein distance encompasses the number of deletions, insertions, or substitutions required to transform one string into another. As such, minimizing this distance leads us to the closest possible match.

the bargaining unit is larger than the size of the total workforce and the observations for which the total workforce amounts to zero. The remaining observations are further matched with our tone and control variables. The final sample used to test Hypotheses 1–3 contains 4,504 unique year-quarter observations from 212 firms.⁹

Hypothesis 4 examines the change in tone over the period around labor union elections. We use data from the National Labor Relations Board (NLRB), which provides information on union election dates and the number of votes at the bargaining unit level. Similar to the FMCS database, the NLRB does not collect any other company-identifying information beyond the name of the company. We therefore revisit the two-step procedure above. Firms can own multiple subsidiaries and establishments that face union elections at similar points in time. This could result in different elections taking place for the same firm, within and across establishments, and distorts the outcome of our event study. Therefore, we keep only those firm–establishment combinations where only one union election takes place within a 6 quarter window around the election quarter. Finally, the data period in our sample encompasses three quarters before and three quarters after each union election closing date. After merging with relevant control variables, the final sample consists out of 1,357 observations for 127 firms.

4 Results

4.1 Descriptive statistics

Panel A of Table 2 provides the descriptive statistics for the full sample. The average tone in the earnings press releases is positive and equal to 0.037, and has a relatively high standard deviation, which indicates strong content differences across the sample. We further find that the degree of unionization (*UnionCoverage*) is, on average, 60%, but displays large variation. The average firm in the FMCS dataset has a market capitalization of 1,861 million, is around 40 years old, and has a book-to-market ratio of 0.529. The average number of geographical and business segments is six and seven,

⁹Our sample size is similar to that of Chyz et al. [2013], who rely on the same database for 1990–2007. After merging union data with Compustat, their final sample contains 749 firm-year observations from 129 distinct firms with non-missing data.

respectively. Panel B summarizes the average firm characteristics of two subgroups: higher-than-median unionization and low-than-median unionization firms. When we compare our tone measures across groups, we find that firms with a higher unionization level have a less optimistic tone on average ($Tone$, $t = 4.912$), which is consistent with our prediction. Additionally, firms with lower unionization tend to be older (Age), riskier (σ_{RET} and $Beta$), and active in more business segments ($BusSeg$).

< Insert Table 2 about here. >

In Panel C, we report the Pearson correlation among the variables in the multivariate regression for the FMCS sample. Consistent with our expectations, we find a negative and highly significant correlation between $UnionCoverage$ and $Tone$. Additionally, $NRTW$ and $Tone$ are negatively correlated, which suggests a lower earnings announcement tone for firms whose establishments are located in states without an RTW law. These correlations are in line with our expectations. Furthermore, $NRTW$ and $UnionCoverage$ display a positive correlation, which is in line with the literature showing that unions in RTW states are smaller in size due to a free-rider issue. Finally, consistent with Huang et al. [2014], we find a positive and significant correlation between DA and $Tone$, which indicates complementarity between tone and earnings management.

In Panel A of Table 3, we present the summary statistics for the variables corresponding to Hypothesis 4, which are similar to those presented in Table 2. In Panel B, we split the sample into subgroups based on whether the labor union won or lost the election. We then test the evolution of the tone in earnings press releases in both subgroups over time. Time point “0” reflects the quarter in which the union elections were held. Prior to the election, we find no statistical difference in $Tone$ amongst the two subgroups. Conversely, we find a statistically significant decrease in tone in the post-election period for firms where the labor union won the election and a statistically lower tone in the second quarter after the union election, relative to firms where the union lost the election. Panel C of Table 3 provides the correlations amongst the dependent and control variables.

< Insert Table 3 about here. >

4.2 Results from the multivariate regressions

Table 4 reports the results of Equation 3.1. Model (1) provides the results of the baseline regression, using only *UnionCoverage* and industry and year fixed effects. Our variable of interest, *UnionCoverage*, is negative and significant at the 95% significance level, which is consistent with Hypothesis 1 and shows that firms facing stronger unions exhibit a less optimistic (or more neutral) tone in their earnings press releases. In Model (2), we add the control variables to exclude a potential alternative explanation for our findings, which substantially increases Adj. R^2 from 11% to 21%. We find that our results are not driven by firm characteristics, profitability, earnings uncertainty, earnings management, or information environment, as the coefficient on *UnionCoverage* remains statistically significant.

< Insert Table 4 about here. >

While the results in Table 4 suggest a significant decline in linguistic tone in the presence of labor unions, it remains unclear whether managers become less positive, more negative, or both in their communications with investors. We therefore distinguish between positive and negative linguistic tone as dependent variables. Models (3) and (4) of Table 4 report the results for the positive and negative tones, respectively. We find *UnionCoverage* is significantly and negatively associated with the number of positive words, while no significant association with the number of negative words exists. These results suggest that the presence of labor unions mitigates managers' incentive to engage in upward manipulation, rather than project a negative outlook for the firm. This reduction in the use of positive words attenuates the negative impact of a less optimistic tone on the stock price reaction at earnings announcement.

The sign of the control variables in our model are consistent with those of prior research. We find that *Tone* increases with profitability (*ROA*, *Returns*, *FE*) and abnormal returns (*Alpha*), but decreases with uncertainty (σ_{RET} and σ_{ROA}) [see, e.g., Arslan-Ayaydin et al., 2016; Davis et al., 2012; Huang et al., 2014]. Additionally, we find a positive and significant relationship between *DA*

and *Tone*, which is consistent with Huang et al. [2014], who shows a positive relationship between earnings and tone management. We also find that a firm's size (*Size*) and age (*Age*) are positively associated with tone.

Table 5 reports the regression results for Hypothesis 2 and shows that $UnionCoverage \cdot FROA_{Q1}$ is negatively associated with the tone of earnings press releases. This suggests that managers are more pessimistic when the firm's future financial performance is stronger. In Models (2) and (3), we split the sample in firms with lower-than-median and higher-than-median future performances, respectively, and find that the effect of *UnionCoverage* on *Tone* is significant when operational performance is high. However, we do not find any evidence on the significance of *UnionCoverage* in Model (2). Overall, this suggests tone deflation is mostly used to sway labor unions when a firm's profitability is high.¹⁰ Finally, in Models (4) and (5), we show that the negative coefficient loading on $UnionCoverage \cdot FROA_{Q1}$ stems only from the manipulation of the positive words.

< Insert Table 5 about here. >

The regression results for Hypothesis 3 are reported in Table 6. In line with our expectations, Model (1) shows the impact of *NRTW* on *Tone* to be negative and highly significant at the 99% confidence level. This means that the tone of earnings press releases is, on average, significantly lower in states without RTW laws. In Model (2), we include the interaction variable $NRTW \cdot UnionCoverage$ and obtain a negative and highly significant coefficient. That is, for a given level of unionization, managers deflate the tone of their earnings press releases more in a state without a RTW law. In fact, the baseline coefficient on *UnionCoverage* in Table 6 is -0.003 and, for the same degree of unionization, the coefficient on *NRTW* further reduces the tone by -0.001. When we include the control variables, our results remain qualitatively similar (see Model (3)).

< Insert Table 6 about here. >

¹⁰We obtain similar results if we interact *UnionCoverage* with contemporaneous performance (*ROA*), or when we proxy future firm performance through $FROA_{Q1-Q4}$ (i.e., the average return on assets over the next four quarters). These results are available upon request.

Hypothesis 4 tests the evolution of tone around union elections, which marks the start of the collective bargaining period. To examine the changes in tone around elections, we perform an event study analysis, as described in Equation 3.3. The results are presented in Table 7.

< Insert Table 7 about here. >

Consistent with Hypothesis 4, the coefficient on *UnionPeriod* · *UnionOutcome* is negative and significant. This suggests that firms become more neutral in the periods after a union win, compared to firms facing a union loss. These results provide additional evidence for our association tests and suggest that union influence is potentially a causal mechanism driving its negative association with tone. Interestingly, in Model (1), the coefficient on *UnionOutcome* is negative and highly significant. This indicates that, on average, the tone of earnings press releases is comparatively less optimistic for firms with labor unions that win labor union elections than others. This could be explained by a heterogeneity in labor union power, in that firms where unions win the election are more likely to have stronger organized labor, and are thus more likely to be less optimistic as a consequence thereof.

Overall, these findings suggest that managers' tone deflation is more pronounced during collective bargaining processes to gain a competitive bargaining advantage. When we split the sample between firms where the union loses the labor union elections (Model (2)) and where the union wins the elections (Model (3)), we find that *UnionPeriod* is negatively and significantly associated with *Tone* in the subsample where the labor unions won the election. This negative coefficient suggests that, on average, the tone of earnings press releases is more neutral for those firms in the periods after a union election, relative to the periods before a union election. Models (4) and (5) further show that, whereas the frequency of negative words remains unchanged, the use of positive words in earnings press releases decreases after successful labor union elections.

4.3 Robustness tests

4.3.1 Endogeneity test – Change in right-to-work laws in Michigan and Indiana

Our analyses report a robust negative association between labor unions and managers' use of tone deflation. However, it is difficult to establish causal inferences based on this association due to potential endogeneity concerns. One form of the endogeneity concern in our setting is that some omitted variables might drive both the power of labor unions and managers' use of tone management. Here, we thus establish causal inferences by conducting tests that explicitly account for potential endogeneity.

Our identification strategy is to exploit the natural experiments in Indiana and Michigan, which adopted RTW laws in 2012. Both states voted the RTW law due to an increase in firms moving their headquarters away [see e.g., [Reuters, 2012](#)]. To operationalize our identification strategy, we construct a treatment variable (*ChangeRTW*), which is a dummy taking the value one if the establishment is located in Indiana or Michigan. Next, we introduce a dummy (*Post*), which takes the value one for observations in 2012 or after. The interaction of these variables captures the direct impact of the change in legislation on the earnings announcement tone. We apply this strategy on two control groups. The first group includes establishments in all states, whereas the second is made of establishments from the neighboring states (i.e., Illinois, Kentucky, Ohio, and Wisconsin). As these states are geographically close and economically integrated, they are likely to be exposed to common industry and aggregate shocks. However, they did not change their RTW status around 2012. We thus estimate the following regression model:

$$\begin{aligned} Tone = & \alpha + \phi \cdot ChangeRTW \cdot Post + \varphi \cdot ChangeRTW \\ & + \kappa \cdot Post + \beta \cdot Controls + \varepsilon, \end{aligned} \tag{4.1}$$

with Newey-West standard errors (ε), corrected for heteroskedasticity and autocorrelation.

Model (1) in Panel A of Table 8 documents that, on average, there is no statistical difference in the tone of earnings press releases between Indiana and Michigan and the other states. However, the firms located in Indiana or Michigan become significantly more optimistic in the tone of their press releases after the introduction of the RTW law, as indicated by the positive coefficient on $ChangeRTW \cdot Post$. In Model (2), we further interact variable $ChangeRTW \cdot Post$ with the labor union power ($UnionCoverage$). The coefficient on the three-way variable $ChangeRTW \cdot Post \cdot UnionCoverage$ is positive and significant. This indicates that, whereas the baseline coefficient on $UnionCoverage$ is negative, this relationship is mitigated once the state adopts an RTW law. The results in Models (3) and (4) suggest that the introduction of the RTW law results in an increase in positive words, while the frequency of negative words remains relatively unchanged.

< Insert Table 8 about here. >

In Panel B, we repeat the regression results for establishments in the states surrounding Indiana and Michigan, and find qualitatively similar results. Altogether, our results confirm that firms have fewer incentives to deflate the tone of earnings press releases as labor unions lose their influence.

4.3.2 Measures of tone and CEO fixed effects

Next, we consider alternative libraries to measure the tone of earnings press releases. In Models (1) and (2) of Panel A of Table 9, we respectively report the results for the DICTION 7.0 and Loughran & McDonald [2011] dictionaries. We find that, for each library, the tone used in the earnings press releases is negatively related to labor unions' power. We next use the method of Henry [2008] to measure the tone of earnings press releases. Instead of normalizing the spread of positive and negative words by the total number of words, Henry [2008] divides the spread by the sum of positive and negative words. Model (3) of Panel A reports the results using this tone measure and we find similar results. In Model (4), we introduce a different measure, namely the abnormal tone ($AbTone$), as defined by Huang et al. [2014]. The abnormal tone proxies unexpected sentiment by controlling

for quantitative information (see Table 1 for a more detailed definition). Again, the coefficient on *UnionCoverage* remains negative and significant.

< Insert Table 9 about here. >

Instead of considering the sentence as the level of analysis, prior research usually counts the number of words in the entire narrative and measures the spread in the number of positive and negative words, scaled by the total number of words. In Panel B, we consider this document-level bag-of-words approach traditionally used in the literature [Davis et al., 2012; Henry, 2008]. Models (1) to (3) report the regression results of Equation 3.1 for the libraries of Loughran & McDonald [2011] and DICTION 7.0 and the method of Henry [2008], respectively. We find that, for each model, the coefficient on *UnionCoverage* remains negative and statistically significant. Model (4) reports the bag-of-words measure (scaled by the total number of words) at the document-level using Henry [2008]’s library. Again, we report a negative and significant coefficient between *Tone* and *UnionCoverage*.

Finally, to ensure our results are not driven by CEO-specific factors that are fixed over time (e.g., personal writing style), we re-estimate the results in Table 4 by introducing CEO fixed effects. In Panel C of Table 9, we find *UnionCoverage* remains negative and highly significant. Additionally, we confirm that tone deflation occurs through a decrease in the number of positive words. Finally, our conclusions are not affected by the choice of the library used to measure tone, the aggregation method to construct tone, nor CEO fixed effects.

5 Cross-sectional variations in response to labor unions

In the previous section, we established the causal main effect that labor unions induce managers to manipulate the tone of earnings press releases to signal a less optimistic outlook. However, managers’ responses to labor unions are likely to differ across firms. Here, we conduct three cross-sectional analyses that test whether this rent-seeking behavior varies for firms that (i) favor their relations with

employees¹¹, (ii) are located in states whose inhabitants predominantly vote for the Democratic Party, and (iii) experience a higher financial flexibility.

5.1 Employees' well-being

There exists some evidence in the literature that fair employee treatment is relevant in explaining managerial decisions. For example, [Bae et al. \[2011\]](#) and [Verwijmeren & Derwall \[2010\]](#) consider the stakeholder theory of capital structure, which posits that social responsibility may affect financing decisions. They find that firms engaging in more employee-friendly corporate social responsibility hold less leverage to safeguard the firm's employees from a potential bankruptcy. Similarly, we expect employees' well-being to affect firms' disclosure decisions. Particularly, we argue that firms that entertain employees' well-being engage less in strategic actions that reduce union bargaining positions. As such, the relationship between tone and union bargaining power is expected to be attenuated by the quality of a firm's employee treatment.

Our measure for employee well-being (*CSR_EMP*) is based on MSCI KLD data. This dataset rates firms across several strengths and weaknesses for multiple dimensions, such as environmental and social relations. For each category, KLD assigns a binary value if the firms score high on a strength or concern. We construct a variable of employees' well-being in the firm (*CSR_EMP*) by taking the spread of the number of strengths and concerns.¹²

We re-estimate Equation 3.1 by introducing variable *CSR_EMP*, which we interact with *UnionCoverage*. The results are reported in Table 10. We find that the coefficient on interaction term *UnionCoverage* · *CSR_EMP* is negative and statistically significant at the 99% significance level, which confirms that the relationship between tone deflation and union power is less prominent for firms that emphasize employee CSR. Aligned with our previous findings, the significance of this interaction stems from an increase in the number of positive words.

¹¹We would like to thank the anonymous reviewer for this suggestion.

¹²The employee strength categories of KLD are *Union Relations*, *No-layoff Policy*, *Cash Profit Sharing*, *Employee Involvement*, *Retirement Benefit Strength*, *Health and Safety Strength*, and *Other Strengths*. The employee concern categories are *Union Relations*, *Health and Safety*, *Workforce Reductions*, *Retirement Benefit Concerns*, and *Other Concerns*.

< Insert Table 10 about here. >

5.2 Political affiliation

In the U.S., the Democratic Party tends to favor unions, which reinforces the effectiveness of unions' actions. Historically, unions became identified with the Democratic Party during the Great Depression and remain so until today [Lipset & Katchanovski, 2001]. As a result, unions representing workers in states under the influence of the Democratic Party are more likely to benefit from its support and thus have stronger bargaining power. We re-estimate Equation 3.1 and introduce variable *Democrat*, which we interact with *UnionCoverage*. *Democrat* is an indicator variable equal to one if the establishment's operations are located in a state where the Democratic Party has won the majority of electoral votes in the most recent presidential election prior to/in that year, and zero otherwise.

The estimation results are reported in Panel A of Table 11. From Model (1), there is a negative and significant relationship between tone and the political electoral preference of a state. This finding suggests that the tone of earnings press releases in democratic states is lower. In Model (2), we find that the coefficient on our variable of interest, *Union·Democrat*, is negative, indicating that the effect of labor unions' bargaining power on tone deflation is reinforced in the states where the bargaining environment is favorable to labor unions.

< Insert Table 11 here. >

5.3 Financial flexibility

Financial flexibility is expected to play an important role in forming labor union demands. Prior research [see, e.g., Kleiner & Bouillon, 1988] confirms that disclosing information about a firm's financial situation, productivity, and future investments significantly relates to a higher level of wages and benefits for the employees in unionized firms. Although Kleiner & Bouillon [1988] do not directly test the impact of financial flexibility on labor union demands, their results point to a positive relationship between a firm's financial flexibility and unions' requests of increasing employee wages

and benefits. To preserve bargaining power, we expect firm-level financial flexibility to create an unfavorable negotiating environment and increase managerial incentives to deflate the tone of earnings press releases.

Following [Arslan-Ayaydin et al. \[2014\]](#), we define financially flexible firms in three ways: (i) low leverage firms (i.e., firms with leverage ratio lower than the sample median), (ii) high cash firms (i.e., firms with the ratio of cash and marketable securities to total assets higher than the sample median), and (iii) low leverage and high cash firms. We test Equation 3.1 for both financially flexible and inflexible firms, for which the results are represented in Panel B of Table 11. Consistent with our prediction, the relationship between *UnionCoverage* and *Tone* is negative and significant for financially flexible firms. However, when firms are less flexible, this relationship is not significant, suggesting the substitutionary nature of cash flow deferrals and signaling through tone deflation.

6 Additional analyses

To ensure that our results are not driven by confounding factors, this section introduces three additional analyses. We first investigate whether tone manipulation is independent from firms' downward earnings management. We then examine the impact of the presence of labor unions on the informational value of tone to predict future firm performance. Finally, we test whether tone management persists through all temporal components of the press release narrative.

6.1 Earnings management

As indicated in Table 4, there exists a positive and significant relationship between earnings management and tone. However, we need to ensure that tone manipulation is separate from firms' downward earnings management practices. The literature finds that managers jointly use earnings and tone management to achieve their earnings goals. Particularly, [Godfrey et al. \[2003\]](#) focus on CEO changes and find evidence of income reducing earnings management in the year of the CEO change, but no evidence of unfavorable impression management. Conversely, they find a positive correlation

between earnings and impression management in the year after the CEO change. More recently, [Guillamon Saorin et al. \[2016\]](#) examine the relationship between impression management in annual results press releases as well as accruals and real earnings management in audited financial statements. They find that earnings management is positively associated with impression management. Therefore, the less optimistic narrative in the earnings press release could be a consequence of deflated earnings figures, rather than the effect of union presence.

To ensure that tone deflation is a separate strategy, we use signed discretionary accruals to proxy earnings management and partition the sample based on its quartiles. If tone deflation is solely driven by downward earnings management, it should be concentrated only in the subsample of lower earnings management quartiles. Panel A of Table 12 shows the results partitioned by signed abnormal accruals. In contrast to the earnings management alternative view, the relationship between labor unions and tone deflation exists in both the positive non-positive abnormal accruals subsamples. The coefficient estimates are statistically significant in all subsamples, except for Q2. This result indicates that the managers of unionized firms tend to deflate the narrative tone, regardless of their earnings management strategy. We thus conclude that the effect of labor unions on the tone of earnings press releases appears to be a persistent but independent disclosure strategy from earnings management.

< Insert Table 12 about here. >

6.2 Information value of tone under labor union power

We next examine the consequences of tone deflation on financial reporting quality. [Davis et al. \[2012\]](#) show that the tone of earnings press releases contains information value that is incremental to the “hard” financial information in predicting future firm performance. However, if the tone is also used as a strategic tool to sway labor unions, this predictive value would be undermined. To test this notion,

we construct the following model:

$$Y = \alpha + \gamma \cdot Tone \cdot UnionCoverage + \lambda \cdot Tone + \delta \cdot UnionCoverage + \beta \cdot Controls + \varepsilon, \quad (6.1)$$

where Y is a proxy of future firm performance. We measure this variable as (i) the next quarter's return on assets ($FROA_{Q1}$) and (ii) the average return on assets, over the four following quarters ($FROA_{Q1-Q4}$). We predict a negative and significant coefficient γ , on interaction term $Tone \cdot UnionCoverage$. ε represent robust standard errors, corrected for heteroskedasticity and autocorrelation.

The results of Equation 6.1 are presented in Panel B of Table 12. Model (1) in Panel B shows that, on average, the tone of earnings press releases is an informative signal of future operational performance. This confirms the results of Davis et al. [2012] and indicates that the tone of earnings press releases contains information to predict future performance that is incremental to the quantitative information. In Model (2), we include the level of unionization, interacted with tone, and find that the coefficient loading on the interaction term is negative and significant at the 90% confidence level. We provide similar evidence in Panel B, where the dependent variable is the average return on assets over the four following quarters ($FROA_{Q1-Q4}$). These results indicate that the tone of earnings press releases by firms with strong labor unions is a weaker predictor of future firm performance.

6.3 A mix of information: Backward-, current, and forward-looking statements

As a final test, we consider the temporal focus of earnings press releases, and question whether managers tend to deflate the tone of backward-looking, contemporaneous, or future-looking statements. There exists some evidence that managers rely on the temporal focus of corporate disclosures to manage stakeholders' impression. For instance, Clatworthy & Jones [2006] find that the accounting narratives of profitable companies focus more on current results than future ones, but

unprofitable companies will focus on the future. Similarly, [Athanasakou & Hussainey \[2014\]](#) find that disclosures with higher frequencies of forward-looking statements are more informative about future earnings and better correlated with future stock prices. They argue that, as forward-looking statements are not immediately verifiable or auditable, managers may also use them when they have incentives to be misleading or untruthful at the time of the disclosure. As such, we examine whether the manipulation of the tone of unionized firms is a function of the temporal focus of the statements in the press release, which can either refer to the firms' past performance (backward-looking statements), current performance (contemporaneous statements), or future prospects (forward-looking statements) [[Bowen et al., 2002](#)].

We predict that the managers of unionized firms will consistently deflate past and contemporaneous statements when they face better-than-expected performance. Intuitively, when they experience lower-than-expected performance, managers have no incentive to be less optimistic in their backward-looking or contemporaneous statements in the corporate narratives. By contrast, and in line with [Athanasakou & Hussainey \[2014\]](#), we expect managers to decrease the tone of their future-looking statements, regardless of firm performance. By providing less optimistic forward-looking narratives, the managers may persuade labor representatives that their demands are not sustainable in the long term, irrespective of today's earnings.

To separate the temporal focus of each sentence in each press release in its past, present, or future components, we rely on a combination of heuristics and natural language processing.¹³ For each temporal focus, we define the tone as the spread in the number of positive (PW_s) and negative words (NW_s) relative to the total amount of words (TW_s) in sentence s of the earnings press release. We average the tone for each section:

$$Tone^{Temp} = \frac{1}{N^{Temp}} \sum_{s=1}^{N^{Temp}} \left(\frac{PW_s^{Temp} - NW_s^{Temp}}{TW_s^{Temp}} \right), \quad (6.2)$$

¹³Due to space considerations, the details of the method used to distinguish between past, present, and future components can be found in the Appendix.

where $Temp$ refers to sentences of the press release relating to past (BS), contemporaneous (CS), or future (FS) statements. N^{Temp} is the total number of forward/backward, or contemporaneous sentences in the earnings press release.

We repeat Equation 3.1 for each of the three temporal sections in the press release and report the results in Table 13. We find three important results as follows. First, as expected, there is a significantly negative association between *UnionCoverage* and *Tone* for all temporal sections, which confirms our main hypotheses. In fact, the magnitude and significance of *UnionCoverage* increases as we move from backward-looking to forward-looking statements. In untabulated results, this relationship is mostly driven by a decrease in the number of positive words, while the frequency of negative words remains statistically unchanged. Second, when we segregate firms based on their earnings surprises (FE), we draw a different conclusion on the relationship between tone and union coverage. Particularly, managers tend to deflate the tone of backward-looking and contemporary statements when the firm's performance is better than expected ($FE \geq 0$). Conversely, when the firm's performance is lower than expected ($FE < 0$), the tone of backward-looking and contemporary statements is unrelated to *UnionCoverage*. Third, the managers of unionized firms tend to strategically provide less optimistic forward-looking statements regardless of the firm's current performance. Since the coefficient on *UnionCoverage* is negative and highly significant for both profitable and unprofitable firms (Models (8) and (9)), the effect of unionization on tone management appears to be mostly associated with future news.

< Insert Table 13 about here. >

7 Conclusions

Labor unions are important stakeholders with rent-extracting capabilities that adversely affect shareholder value. This leads managers to have incentives to take actions to increase their relative bargaining position. In this paper, we investigate whether labor unions induce managers

to strategically manipulate the content of their corporate disclosures downwards to increase their bargaining position with labor unions. Despite the likelihood of a lower stock price reaction and the skepticism over the credibility of narrative disclosures, we find that managers tend to opportunistically use a less optimistic tone in earnings press releases as the degree of unionization increases. Moreover, we exploit the exogenous regulatory changes in two U.S. states to derive causal inferences that labor unions influence managers' use of tone deflation. Our evidence suggests that unionized labor acts as a constraint on management's natural tendency toward optimism.

We also use several cross-sectional tests to provide further evidence on the effect of labor unions on the tone of earnings press releases. We find that the financial flexibility and profitability of a unionized firm reinforces tone manipulation. Further, tone deflation is less pronounced among firms that support their employees' well-being. Taken together, our results are consistent with the management manipulating the content of corporate narratives by deflating the tone of earnings press releases. In doing so, we extend the findings of [Chung et al. \[2016\]](#), who find that managers tend to withhold good news and promote bad news to preserve their bargaining power against labor unions. In addition to delaying the reporting of positive news to shelter the firm's resources from organized labor, we also show that managers strategically adjust the content of the narrative sections of corporate disclosures.

These results form a basis for future research on whether the manipulation of corporate disclosures increases a firm's bargaining position. For instance, future studies could investigate whether a less optimistic tone is associated with a lower likelihood of strikes and employee demands from unions. There already exist evidence on the influence of impression management in bargaining settings. For instance, [Croson et al. \[2003\]](#) show that cheap talk strategies can negatively affect outcomes under incomplete information. Yet, such models are laboratory-based and require extended empirical analysis in real-life settings to complement our understanding on the use of corporate narratives to sway perceptions and demands.

8 Online Appendix

In this Appendix, we explain the procedure to extract the textual information from the earnings press releases, identify sentence-level time orientation and construct the measures of tone. Note that the overall tone of the press releases, as used in the main hypotheses of the paper, are constructed by skipping Section 8.2 and considering all sentences in one vector.

8.1 Extraction of the press release

We obtain our press releases from EDGAR, made available by the SEC. We start with downloading the index files, to obtain the links to the full filings 8-K filings that correspond to the reporting date from compustat.¹⁴ Next, we obtain the items listed in the SGML files, around the earnings announcement day and download those tagged “Item 2.02”, which indicates an earnings press release. We ultimately obtain filings in HTML encoding and we ensure that these documents contain “<TYPE>EX-99.1”, otherwise the document is discarded.

We use several regular expressions to remove unnecessary data. We start by first removing all the uuencoding, which is some form of binary-to-text encoding and may correspond to attachments in different formats such as .xls, .zip, .pdf, .jpg and .png. We also re-encode characters such as &NBSP (blank space) or & (&) back to their original ACSII form. We further remove redundant information such as the header of the filings. We then consider the information contained in the actual press release. In particular, we cut and paste all the information that is contained within the paragraph-environments [`<p>`] and move it into an empty vector. This environment should generally comprise most of the relevant text of the press release.

Next, we consider the information contained in table environments, which we are able to identify through HTML’s [`<table>`] tag:

¹⁴See <https://www.sec.gov/Archives/edgar/full-index/>

```
text = filing.read()

soup = BeautifulSoup("".join(text), convertEntities=BeautifulSoup.HTML_ENTITIES)

tab = soup.findAll('table')
```

For each table, we extract the content by using the ‘BeautifulSoup’ package from python and compute the ratio of digits to overall text in the table. If this ratio is lower than 10%, we cut and paste the information in our vector. If not, we remove the information from the filing. We thereby ensure that the text in the tables consist out of sentences and add a ‘.’ if the textual information from the tables does not end with a proper sentence delimiter. After removing all the tables from the filing, we consider the textual information contained within the <div> environment and again ensure that a maximum of 10% of the information in each <div>-tag is related to digits. If that is the case, it is added to the vector.

By following this procedure, we are ultimately, able to transform any press release into a vector of text, for which we require a minimum length of 100 words, consistent with [Davis et al. \[2012\]](#). We next identify all distinct sentences by using the python package “sentence-splitter 1.4” (the python equivalent of Perl’s `Lingua::Sentence` module).¹⁵ This step cuts the press release into different sentences based on appropriate delimiters. We further impose that a sentence holds at least five non-numeric characters to remove any remaining ‘loose’ numbers from the <table> and <div> environments. After this step, we have a vector of distinct sentences that can be used for textual analysis.

8.2 Identifying sentence-level time orientation

To determine the temporal focus of each sentence in each press release and differentiate between its past, present or future components, we use a two step approach. First, we rely on the word list developed by [Muslu et al. \[2015\]](#) and consider a sentence as forward-looking if it contains any of the

¹⁵See <https://pypi.org/project/sentence-splitter/>.

following:¹⁶

1. Keywords that are commonly used to refer to the future: “will”, “future”, “next (fiscal) month/period/quarter/year”, “incoming (fiscal) month/period/quarter/year”, “coming (fiscal) month/period/quarter/year”, “upcoming (fiscal) month/period/quarter/year”, “subsequent (fiscal) month/period/quarter/year”, “following (fiscal) month/period/quarter/year”.
2. Verb conjugations that relate to the future: “believe”, “anticipate”, “assume”, “commit”, “estimate”, “expect”, “forecast”, “foresee”, “hope”, “intend”, “plan”, “project”, “seek”, “target”, etc.¹⁷
3. Numerical references to future years/dates relative to the year/date when the earnings press release is written.

We then count if any of these keywords or word combinations are present in the sentence. If so, the sentence is categorized as ‘forward-looking’, and saved in a separate vector. If not, the sentence proceeds to the next step. Consider the following example of sentences:

“Third quarter gross margin increased to 40 percent from 38 percent in the second quarter of 2004. The improvement was largely driven by strong sales growth and excellent execution of technology transitions in both businesses. We expect decreases to take place during the coming quarter”

Herein the last sentence holds the word ‘expect’ and makes a clear reference to the future quarter (‘coming quarter’), such that it can be considered a forward-looking statement.

We classify the remaining sentences as either contemporaneous or backward-looking using the tenses in which they are written. We use the part of speech (POS) taggers from the Stanford CoreNLP Python `[from stanfordcorenlp import StanfordCoreNLP]` to identify the temporal

¹⁶An alternative to the use of a word list is to identify forward-looking sentences through machine learning. However, using a machine-learning algorithm poses certain research risks. In particular, the initial step in classifier algorithms typically involves human coding and thus comes with potential problems of inter-rater reliability.

¹⁷We do not include “shall” in describing the searching process because it is usually associated with legal language and boilerplate disclosures.

focus of each verb in a sentence (see Manning et al. [2014] on the use of Stanford CoreNLP).¹⁸

This allows us to identify the tense in which the sentence are written. We consider our example again, which now contains two unidentified sentences and one forward-looking sentence:

- **Unidentified sentences:**

“Third quarter gross margin increased to 40 percent from 38 percent in the second quarter of 2004. The improvement was largely driven by strong sales growth and excellent execution of technology transitions in both businesses.”

- **Forward-looking sentences:**

“We expect decreases to take place during the coming quarter”

We apply the POS tagging `[nlp.pos_tag(sentence)]` to these unidentified sentences and obtain information on the function of each word within the sentence:

“Third (JJ) quarter (NN) gross (JJ) margin (NN) increased (VBD) to (TO) 40 (CD) percent (NN) from (IN) 38 (CD) percent (NN) in (IN) the (DT) second (JJ) quarter (NN) of (IN) 2004 (CD). The (DT) improvement (NN) was (VBD) largely (RB) driven (VBN) by (IN) strong (JJ) sales (NNS) growth (NN) and (CC) excellent (JJ) execution (NN) of (IN) technology (NN) transitions (NNS) in (IN) both (DT) businesses (NNS).”

Among others, we observe the presence of nouns (NN), adjectives (JJ), and prepositions (such as IN) and we refer the reader to the Penn Part of Speech Tags for a more in-depth understanding of the different abbreviations.¹⁹ For the purpose of identifying the contemporaneous and backward-looking statements, it suffices to look at the POS tags associated with verbs. In particular we define

¹⁸More specifically we employ the Python wrapper of the Stanford CoreNLP (`stanfordcorenlp`) developed by Lynten Guo: <https://github.com/Lynten/stanford-corenlp>. It requires the installment of the Java-version of Stanford CoreNLP through <https://stanfordnlp.github.io/CoreNLP/history.html>. Herein we rely particularly on the `pos_tag` function for every sentence. Note that other built-in taggers are available as well such as PerceptronTagger from the ‘nltk’ package. When using this tagger we find no significant difference in our sentence-level classification.

¹⁹See <https://cs.nyu.edu/grishman/jet/guide/PennPOS.html>.

contemporaneous statements through present tenses (**VBP** – e.g. ‘take’ / **VBZ** – e.g. ‘takes’ / **VBG** – e.g. ‘taking’). On the contrary, we define backward-looking tenses as past tenses and participles (**VBD** – e.g. ‘took’ / **VCN** – e.g. ‘taken’):

```
nlp = StanfordCoreNLP(r'PATH TO Stanford CoreNLP')

tense = {}

tense["present"] = len([word for word in nlp.pos_tag(sentence) if
word[1] in ["VBP", "VBZ", "VBG"]])

tense["past"] = len([word for word in nlp.pos_tag(sentence) if
word[1] in ["VBD", "VCN"]])
```

When the majority of tenses are related to the past: `[tense["past"] > tense["present"]]`, we consider that sentence as being a backward-looking one and it gets stored in a separate vector of backward-looking sentences. In the case of an equal or higher number of present tenses, we consider it as a contemporaneous one: `[tense["present"] >= tense["past"]]`.^{20,21}

For example, the first sentence (“*Third quarter gross margin increased (VBD) to 40 percent from 38 percent in the second quarter of 2004.*”) is categorized as being backward-looking due to the presence of a past tense (‘increased’) as its only verb. The second sentence (“*The improvement was (VBD) largely driven (VCN) by strong sales growth and excellent execution of technology transitions in both businesses.*”) also gets categorized as being backward-looking due to the presence of two past tenses (‘was’ and ‘driven’).

To further ensure the reliability of our results, we randomly select 100 earnings press releases from our sample and manually categorize their content as forward-looking, backward-looking, and

²⁰The reason we give the benefit of the doubt to classify a sentence as being contemporaneous rather than backward-looking in the case of equal occurrence of present and past tenses, is that past participles (**VCN**) may also be used to make connections to the present, such as in the case of the simple present perfect (e.g. ‘is driven’).

²¹Note that POS tagging also has the capacity to recognize modal verbs (**MD** – e.g. ‘can’, ‘may’), which often refer to future statements. Since we have already relied on the word list of Muslu et al. [2015] to define the future statements, we ignore any remaining modal verbs in the sentence.

contemporaneous. We find that our method correctly categorizes the temporal direction in around 86.7% of the cases, which is in line with the classification accuracy in the literature [e.g., Li, 2010]. Ultimately, after this step, we obtain three vectors of sentences: (i) the forward-looking sentences, based upon heuristics and expressions, and (ii) the contemporaneous ones and (iii) backward-looking ones based upon POS tagging.

8.3 Sentence preprocessing steps

Prior to performing the bag-of-words analysis at the sentence-level, we clean each sentence by performing (i) stopwording, and (ii) stemming.

Stopwording implies that we remove a number of words that are typically short and occurring frequently. Technically, removing stopwords results in a reduction of the total number of words in the sentence which could inflate the overall measure of tone. However, typical stopwords usually only have a small grammatical function within a sentence, and do not carry much information value.²² Stopwords include articles, case particles, conjunctions, pronouns, auxiliary verbs, and common prepositions, such as “the”, “and”, “it”, “is”, and “of”.²³ For illustrative purposes, we apply the stopwording principle to the sentences used in the example above, where the removed stopwords are put in bold:

- **Backward-looking sentences:**

*“Third quarter gross margin increased **to** 40 percent **from** 38 percent **in the** second quarter of 2004. **The** improvement **was** largely driven **by** strong sales growth **and** excellent execution of technology transitions **in both** businesses.”*

²²In fact, in the previous step we have already exploited the grammatical function of several stopwords (such as ‘is’) to categorize sentences as being contemporaneous and backward-looking. In untabulated tests, we find that the impact is marginal, which is in line with the argument of Loughran & McDonald [2011] that most business applications of textual analysis focus on word counts from sentiment categories, so that the elimination or special treatment of stop words is typically unnecessary.

²³We refer to the ‘generic’ stop word list of Loughran & McDonald [2011] available at: <https://sraf.nd.edu/textual-analysis/resources/#StopWords>. This list contains 121 frequently used stop words. However, we exclude the words “no” and “not” for negation purposes (See Section 8.4).

- **Forward-looking sentences:**

*“We expect decreases **to** take place during **the** coming quarter.”*

Next, we apply the stemming principle. This is the process of transforming inflected (or sometimes derived) words to their base or root forms (e.g., “dependent” to “depend”). The advantage of applying stemming is that it results in simpler words and removes complex word-level and grammatical transformations. Specifically, we rely on python NLTK’s PorterStemmer [`from nltk.stem import PorterStemmer`], which uses suffix stripping to obtain a short set of root words.²⁴ After stemming [`porter.stem(sentence)`], our example text looks as follows:

- **Backward-looking sentences:**

*“Third quarter gross margin increas 40 percent 38 percent second quarter 2004. Improv larg
driven strong sale growth excel execut technolog transit busi.”*

and

- **Forward-looking sentences:**

“Expect decreas take place dure come quarter.”

Altogether, the earnings press release is transformed into three vectors containing forward-looking, backward-looking, and contemporaneous stemmed sentences, respectively

8.4 Temporal tone – Sentence-level bag-of-words

For each of the three temporal vectors, we measure tone at the sentence level. That is, we take the difference between the number of positive and the number of negative words in each sentence following the stemmed positive and negative word lists of Henry [2008]. Herein, we take a simple

²⁴Note that there exist other stemming methods, such as the LancasterStemmer.

form of negation into account. That is, if a positive word is preceded immediately by a negative one: “no”, “not”, “none”, “neither”, or “never”, that specific word is not counted as a positive one, but as a negative one. Applied to our example sentences, this becomes:

- **Backward-looking sentences:**

*“Third quarter gross margin **increas** 40 percent 38 percent second quarter 2004. **Improv** larg
driven **strong** sale **growth excel** execut technolog transit busi.”*

The first sentence has one positive word and zero negative words, on a total of twelve words. As such, the overall tone of this sentence is $\frac{1 - 0}{12}$, or 0.083. The second sentence contains four positive words and zero negative ones, on a total of eleven words. As such, the overall tone of this sentence is $\frac{4 - 0}{11}$, or 0.363.

- **Forward-looking sentences:**

*“Expect **decreas** take place dure come quarter.”*

In contrast to the backward-looking sentences, the forward-looking one contains zero positive words and one negative word (‘decreas’) on a total of 7 words, such that the overall tone is $\frac{0 - 1}{7}$, or -0.142.

Ultimately, we measure the temporal tone of a document as the average of the tone contained in each sentence in each temporal vector:

$$Tone^{Temp} = \frac{1}{N^{Temp}} \sum_{s=1}^{N^{Temp}} \left(\frac{PW_s^{Temp} - NW_s^{Temp}}{TW_s^{Temp}} \right),$$

where N is the number of sentences in the vector, PW_s (NW_s) is the number of positive (negative) words in sentence s . The temporal tone of the two backward-looking sentences ($Tone^{BS}$) would equate to: $\frac{0.083 + 0.363}{2}$, or 0.223. The temporal tone for the forward-looking part ($Tone^{FS}$) in this case is -0.142. Note that, the overall tone of these sentences ($Tone$) is constructed in a similar manner by neglecting the temporal component and would amount to $\frac{0.083 + 0.363 - 0.142}{3}$, or 0.101.

References

- Aboody, D. & Kasznik, D. (2000). CEO stock option awards and the timing of corporate voluntary disclosures. *Journal of Accounting and Economics*, 29(1), 73–100.
- Agrawal, A. K. (2012). Corporate governance objectives of labor union shareholders: Evidence from proxy voting. *The Review of Financial Studies*, 25(1), 187–226.
- Arslan-Ayaydin, Ö., Boudt, K., & Thewissen, J. (2016). Managers set the tone: Equity incentives and the tone of earnings press releases. *Journal of Banking and Finance*, 72, 132–147.
- Arslan-Ayaydin, Ö., Florackis, C., & Ozkan, A. (2014). Financial flexibility, corporate investment and performance: Evidence from financial crises. *Review of Quantitative Finance and Accounting*, 42, 211–250.
- Athanasakou, V. & Hussainey, K. (2014). The perceived credibility of forward-looking performance disclosures. *Accounting and Business Research*, 44, 227–259.
- Bae, K.-H., Kang, J.-K., & Wang, J. (2011). Employee treatment and firm leverage: A test of the stakeholder theory of capital structure. *Journal of Financial Economics*, 100(1), 130–153.
- Baginski, S., Demers, E., Wang, C., & Yu, J. (2016). Contemporaneous verification of language: Evidence from management earnings forecasts. *Review of Accounting Studies*, 21(1), 165–197.
- Baldwin, C. (1983). Productivity and labor unions: An application of the theory of self-enforcing contracts. *Journal of Business*, 56(2), 155–185.
- Bao, Y. & Datta, A. (2014). Simultaneously discovering and quantifying risk types from textual risk disclosures. *Management Science*, 60(6), 1371–1391.
- Boudt, K. & Thewissen, J. (2019). Jockeying for position in CEO letters: Impression management and sentiment analytics. *Financial Management*, 48(1), 77–115.
- Boudt, K., Thewissen, J., & Torsin, W. (2018). When does the tone of earnings press releases matter? *International Review of Financial Analysis*, 57, 231–245.
- Bova, F. (2013). Labor unions and management's incentive to signal a negative outlook. *Contemporary Accounting Research*, 30, 14–41.
- Bowen, R. M., Davis, A. K., & Matsumoto, D. A. (2002). Do conference calls affect analysts' forecasts? *The Accounting Review*, 77(2), 285–316.
- Bronars, S. & Deere, D. (1991). The threat of unionization, the use of debt, and the preservation of shareholder wealth. *The Quarterly Journal of Economics*, 106, 231–254.
- Brown, J. & Matsa, D. (2016). Boarding a sinking ship? An investigation of job applications to distressed firms. *The Journal of Finance*, 71(2), 507–550.
- Büschken, J. & Allenby, G. M. (2016). Sentence-based text analysis for customer reviews. *Marketing Science*, 35(6), 953–975.
- Chen, H., Kacperczyk, M., & Ortiz-Molina, H. (2011). Labor unions, operating flexibility, and the cost of equity. *Journal of Financial and Quantitative Analysis*, 46, 25–58.
- Chen, J., Demers, E., & Lev, B. (2018). Oh what a beautiful morning! Diurnal influences on executives and analysts: Evidence from conference calls. *Management Science*, 64(12), 5899–5924.
- Chino, A. (2016). Do labor unions affect firm payout policy? Operating leverage and rent extraction effects. *Journal of Corporate Finance*, 41, 156–178.
- Chung, R., Lee, B., Lee, W., & Sohn, B. (2016). Do managers withhold good news from labor unions? *Management Science*, 62, 46–68.
- Chyz, J., Leung, W., Li, O., & Rui, O. (2013). Labor unions and tax aggressiveness. *Journal of Financial Economics*, 108, 675–698.
- Clatworthy, M. & Jones, M. (2006). Differential reporting patterns of textual characteristics and company performance in the chairman's statement. *Accounting and Business Research*, 19, 493–511.
- Connolly, R., Hirsch, B., & Hirschey, M. (1986). Union rent seeking, intangible capital, and market value of the firm. *The Review of Economics and Statistics*, 68, 567–577.
- Core, J. & Guay, W. (2002). Estimating the value of employee stock option portfolios and their sensitivities to price and volatility. *Journal of Accounting Research*, 40, 613–630.
- Croson, R., Boles, T., & Murnighan, J. (2003). Cheap talk in bargaining experiments: Lying and threats in ultimatum games. *Journal of Economic Behavior & Organization*, 51, 143–159.

- Davis, A., Piger, J., & Sedor, L. (2012). Beyond the numbers: Measuring the information content of earnings press release language. *Contemporary Accounting Research*, 29, 845–868.
- Davis, A. & Tama-Sweet, I. (2012). Managers' use of language across alternative disclosure outlets: Earnings press releases versus MD&A. *Contemporary Accounting Research*, 29, 804–837.
- DeAngelo, H. & DeAngelo, L. (1991). Union negotiations and corporate policy. *Journal of Financial Economics*, 30, 3–43.
- Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1995). Detecting earnings management. *The Accounting Review*, 70(2), 193–225.
- El-Haj, M., Rayson, P., Walker, M., Young, S., & Simaki, V. (2019). In search of meaning: Lessons, resources and next steps for computational analysis of financial discourse. *Journal of Business Finance & Accounting*, 46, 265–306.
- Faleye, O., Mehrotra, V., & Morck, R. (2006). When labor has a voice in corporate governance. *Journal of Financial and Quantitative Analysis*, 41, 489–510.
- Freeman, R. (1980). Unionism and the dispersion of wages. *Industrial and Labor Relations Review*, 34, 3–23.
- Garcia Osma, B. & Guillamon-Saorin, E. (2011). Corporate governance and impression management in annual results press releases. *Accounting, Organizations and Society*, 36, 187–208.
- Godfrey, J., Mather, P., & Ramsay, A. (2003). Earnings and impression management in financial reports: The case of CEO changes. *Abacus*, 39, 95–123.
- Gordon, E., Henry, E., Peytcheva, M., & Sun, L. (2013). Discretionary disclosure and the market reaction to restatements. *Review of Quantitative Finance and Accounting*, 41, 75–110.
- Grout, P. (1984). Investment and wages in the absence of binding contracts: A nash bargaining approach. *Econometrica*, 52(2), 449–460.
- Guillamon Saorin, E., Garcia Osma, B., & Aerts, W. (2016). Earnings management and impression management. *Working Paper University Carlos III of Madrid*.
- Hamm, S., Jung, B., & Lee, W. (2018). Labor unions and income smoothing. *Contemporary Accounting Research*, 35(3), 1201–1228.
- Henry, E. (2008). Are investors influenced by how earnings press releases are written? *Journal of Business Communications*, 45, 363–407.
- Henry, E. & Leone, A. (2016). Measuring qualitative information in capital markets research: Comparison of alternative methodologies to measure disclosure tone. *The Accounting Review*, 91, 153–178.
- Hilary, G. (2006). Organized labor and information asymmetry in the financial markets. *Review of Accounting Studies*, 11, 525–548.
- Hirsch, B. (1980). The determinants of unionization: An analysis of interarea differences. *Industrial and Labor Relations Review*, 33(2), 147–161.
- Hirsch, B. (1991). Labor unions and the economic performance of firms. *Kalamazoo, Michigan: Upjohn Institute for Economic Research*.
- Hirst, D., Koonce, L., & Miller, J. (1999). The joint effect of management's prior forecast accuracy and the form of its financial forecasts on investor judgment. *Journal of Accounting Research*, 37, 101–125.
- Huang, X., Teoh, S., & Zhang, Y. (2014). Tone management. *The Accounting Review*, 89, 1083–1113.
- Hutton, A., Miller, G., & Skinner, D. (2003). The role of supplementary statements with management earnings forecasts. *Journal of Accounting Research*, 41, 867–890.
- Jegadeesh, N. & Wu, D. (2013). Word power: A new approach for content analysis. *Journal of Financial Economics*, 110(3), 712–729.
- Jensen, M. C. & Murphy, K. J. (2010). CEO incentives - It's not how much you pay, but how. *Journal of Applied Corporate Finance*, 22(1), 64–76.
- Klasa, S., Maxwell, W., & Ortiz-Molina, H. (2009). The strategic use of corporate cash holdings in collective bargaining with labor unions. *Journal of Financial Economics*, 92, 421–442.
- Kleiner, M. & Bouillon, M. (1988). Providing business information to production workers: Correlates of compensation and profitability. *ILR Review*, 41, 605–617.
- Lee, D. & Mas, A. (2012). Long-run impacts of unions on firms: New evidence from financial markets 1961–1999. *The Quarterly Journal of Economics*, 127, 333–378.
- Lehavy, R., Li, F., & Merkley, K. (2011). The effect of annual report readability on analyst following and the properties of their earnings forecasts. *The Accounting Review*, 86(3), 1087–1115.

- Li, F. (2010). The information content of forward looking statements in corporate filings – A naive bayesian machine learning approach. *Journal of Accounting Research*, 48, 1049–1102.
- Libby, R. & Emett, S. A. (2014). Earnings presentation effects on manager reporting choices and investor decisions. *Accounting and Business Research*, 44(4), 410–438.
- Lipset, S. & Katchanovski, I. (2001). The future of private sector unions in the U.S. *Journal of Labor Research*, 22, 229–244.
- Loughran, T. & McDonald, B. (2011). When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks. *Journal of Finance*, 66, 35–65.
- Manning, C. D., Surdeanu, M., Bauer, J., Finkel, J., Bethard, S. J., & McClosky, D. (2014). The stanford corenlp natural language processing toolkit. *Proceedings of the 52nd Annual Meeting of the Association for Computational Linguistics: System Demonstrations*, (55-60).
- Marciukaityte, D. (2014). Right-to-work laws and financial leverage. *Financial Management*, 44, 147–175.
- Marciukaityte, D. (2018). Labor laws and firm performance. *Journal of Financial Research*, 41(1), 5–32.
- Marquez-Illescas, G., Zebedee, A., & Zhou, L. (2019). Hear me write: Does CEO narcissism affect disclosure? *Journal of Business Ethics*, 159, 401–417.
- Matsa, D. (2010). Capital structure as a strategic variable: Evidence from collective bargaining. *Journal of Finance*, 65, 1197–1232.
- Mercer, M. (2004). How do investors assess the credibility of management disclosures? *Accounting Horizons*, 18, 185–196.
- Miller, G. (2002). Earnings performance and discretionary disclosure. *Journal of Accounting Research*, 40, 173–204.
- Moore, W. J. & Newman, R. J. (1985). The effects of right-to-work laws: A review of the literature. *Industrial and Labor Relations Review*, 38, 571–585.
- Muslu, V., Radhakrishnan, S., Subramanyam, K. R., & Lim, D. (2015). Forward-looking MD&A disclosures and the information environment. *Management Science*, 61(5), 931–1196.
- Reuters (2012). Michigan weakens union rights in home of auto industry. Retrieved from <http://www.reuters.com/article/us-usa-unions-michigan/michigan-weakens-union-rights-in-home-of-auto-industry-idUSBRE8B91AJ20121211>.
- Reuters (2017). Republican lawmakers introduce national ‘right-to-work’ legislation. Retrieved from <https://www.reuters.com/article/usa-employment-unions/republican-lawmakers-introduce-national-right-to-work-legislation-idUSL1N1FN0FZ>.
- Rogers, J., Van Buskirk, A., & Zechman, S. (2011). Disclosure tone and shareholder litigation. *The Accounting Review*, 86, 2155–2183.
- Ruback, R. & Zimmerman, M. (1984). Unionization and profitability: Evidence from the capital market. *Journal of Political Economy*, 92, 1134–57.
- Seeber, R. & Cooke, W. (1983). The decline in union success in NLRB representation elections. *Industrial Relations: A Journal of Economy and Society*, 22, 34–44.
- Tama-Sweet, I. (2014). Changes in earnings announcement tone and insider sales. *Advances in Accounting*, 30(2), 276–282.
- Tetlock, P. (2007). Giving content to investor sentiment: The role of media in the stock market. *Journal of Finance*, 62, 1139–1168.
- Tetlock, P., Saar-Tsechansky, M., & Macskassy, S. (2008). More than words: Quantifying language to measure firms’ fundamentals. *Journal of Finance*, 63, 1437–1467.
- Tong, Z. (2015). Labor unions and forms of corporate liquidity. *Journal of Business Finance & Accounting*, 42, 1007–1039.
- Tong, Z. & Huang, H. (2018). Labor unions and corporate cash holdings: Evidence from international data. *Journal of Financial Research*, 41(3), 325–350.
- Trautmann, B. & Hamilton, G. (2003). *Informal corporate disclosure under federal securities law: Press releases, analyst calls, and other communications*. Chicago, IL: CCH Incorporated.
- Verwijmeren, P. & Derwall, J. (2010). Employee well-being, firm leverage, and bankruptcy risk. *Journal of Banking & Finance*, 34(5), 956–964.

Table 1: **Variable definitions**

Variable	Variable description
Tone variables	
<i>Tone</i>	The tone in the earnings press release of firm i during quarter q of year t. The tone is measured as: $Tone = \frac{1}{N_s} \sum_{s=1}^{N_s} \frac{PW_s - NW_s}{TW_s},$ where TW represents the total amount of words in the sentence. Positive words (PW) and negative words (NW) at the sentence level are defined using the positive and negative word lists of Henry [2008]. N_s is the total number of sentences in the earnings press release. For robustness tests, we apply the same method using the positive and negative word lists of Loughran & McDonald [2011] ($Tone^{LM}$), as well as the optimism-increasing/decreasing lists of DICTION 7.0 ($Tone^{DIC}$). Furthermore, we follow Henry [2008] and construct $Tone_{HEN}^{HEN}$, where we replace the denominator from TW to $PW_s + NW_s$.
<i>PosWords</i>	The number of positive words in the earnings press release of firm i during quarter q of year t. <i>PosWords</i> is measured as: $PosWords = \frac{1}{N_s} \sum_{s=1}^{N_s} \frac{PW_s}{TW_s},$ where TW represents the total amount of words in the sentence. Positive words (PW) at the sentence level are defined by the word lists of Henry [2008]. N_s is the total number of sentences in the earnings press release.
<i>NegWords</i>	The number of negative words in the earnings press release of firm i during quarter q of year t. <i>PosWords</i> is measured as: $NegWords = \frac{1}{N_s} \sum_{s=1}^{N_s} \frac{NW_s}{TW_s},$ where TW represents the total amount of words in the sentence. Negative words (NW) at the sentence level are defined by the word lists of Henry [2008]. N_s is the total number of sentences in the earnings press release.
<i>AbTone</i>	The residuals of a regression estimation of tone, following Huang et al. [2014]: $Tone = \alpha + \beta \cdot Controls + u,$ where u represents the abnormal tone and <i>Controls</i> represent a set of relevant variables as per Huang et al. [2014]: profitability (ROA), stock returns (<i>Returns</i>), size (<i>Size</i>), book-to-market ratio (BTM), earnings volatility (σ_{RET}, σ_{ROA}), age (<i>Age</i>), and operational complexity (<i>BusSeg</i>, <i>GeoSeg</i>).
Union variables	
<i>UnionCoverage</i>	Bargaining unit size/Total workforce of the establishment (FMCS).
<i>NRTW</i>	Dummy variable that takes one if the state does not enforce right-to-work laws, and zero otherwise.
<i>ChangeRTW</i>	Dummy variable that takes one for firms incorporated in Indiana and Michigan, and zero otherwise.
<i>Post</i>	Dummy variable that takes one for observations occurring in 2012 or after, 2012 being the year of the legislative change in RTW laws, and zero otherwise.
<i>UnionPeriod</i>	Dummy variable that takes one starting from the first quarter after the union election was held, and zero otherwise.
<i>UnionOutcome</i>	Dummy variable that takes one when a labor union wins an election in quarter q , and zero otherwise.
Control and other variables	
<i>ROA</i>	Income of firm i in quarter q of year t , before extraordinary items/total assets.
<i>Returns</i>	Buy-and-hold returns of firm i in quarter q of year t , for the 12-month period preceding the end of quarter q .
σ_{RET}	Standard deviation of the buy-and hold returns over the 12 months period preceding the end of quarter q .
σ_{ROA}	Standard deviation of ROA for firm i over the last four quarters preceding q .

<i>Size</i>	Logarithm of the market capitalization of firm <i>i</i> on quarter <i>q</i> 's last day (<i>d</i>), relative to year <i>t</i> (in \$ mil), that is, $P \cdot CSHO$, where <i>P</i> represents the stock price of firm <i>i</i> in quarter <i>q</i> of year <i>t</i> and <i>CSHO</i> captures the number of common shares outstanding of firm <i>i</i> at the end of quarter <i>q</i> of year <i>t</i> .
<i>BTM</i>	Logarithm of the book-to-market ratio for firm <i>i</i> measured at quarter <i>q</i> of year <i>t</i> .
<i>FE</i>	(<i>I/B/E/S</i> actual earnings per share (<i>EPS</i>) - median <i>EPS</i> of most recent analysts forecasts)/(stock price at the fiscal year-end, for firm <i>i</i> in quarter <i>q</i> of year <i>t</i>).
<i>BusSeg</i>	$\log(1 + \# \text{ of business segments of firm } i \text{ in quarter } q \text{ of year } t)$.
<i>GeoSeg</i>	$\log(1 + \# \text{ of geographical segments of firm } i \text{ in quarter } q \text{ of year } t)$.
<i>Age</i>	$\log(1 + \# \text{ years since firm } i \text{ first appears in the CRSP monthly file, relative to time } t)$.
<i>Alpha</i>	Intercept $\hat{\alpha}$ of the market model, estimated over the [<i>d</i> - 315; <i>d</i> - 63] time window, where <i>d</i> represents the day of earnings announcement within quarter <i>q</i> of year <i>t</i> .
<i>Beta</i>	$\hat{\beta}$ of stock <i>i</i> in quarter <i>q</i> of year <i>t</i> , based on the market model that spans the [<i>d</i> - 315; <i>d</i> - 63] time window, where <i>d</i> represents the day of earnings announcement within quarter <i>q</i> of year <i>t</i> , that is, $\beta = cov(R; R_M) = var(R_M)$, whereas R_M represent the returns of the S&P500 on day <i>d</i> of quarter <i>q</i> of year <i>t</i> and <i>R</i> represent firm <i>i</i> 's returns on day <i>d</i> of quarter <i>q</i> of year <i>t</i> .
<i>DA</i>	The signed discretionary accruals, computed as regression residuals (i.e., <i>v</i>) for firm <i>i</i> 's two-digit SIC industry cross-sectional modified Jones model for quarter <i>q</i> of year <i>t</i> :

$$TotalAcc = \beta_0 \cdot \frac{1}{TA} + \beta_1 \cdot (\Delta Sales - \Delta AR) + \beta_3 \cdot \frac{PPE}{TA} + v,$$

where *TA* are the total assets of firm *i* of the previous year (i.e., *q* - 4); $\Delta Sales$ is the change in sales relative to *q* - 4; ΔAR are the changes in accounts receivables relative to *q* - 4; and *PPE* are the gross property, plant, and equipment value at *q*. *TotalAcc* are the total accruals, computed as the sum of the earnings before extraordinary items, the extraordinary items and discontinued operations excluding the cash flows from operations.

Sensitivity test variables

<i>CSR_EMP</i>	The employee wellbeing index for firm <i>i</i> in year <i>t</i> , defined as the difference between the number of strengths and number of concerns on the employee relationship dimensions as per the KLD data. The dimensions of the strengths are: <i>Union relations</i> , <i>No-layoff policy</i> , <i>Cash profit sharing</i> , <i>Employee involvement</i> , <i>Retirement benefit strength</i> , <i>Health and safety strength</i> , and <i>Other strengths</i> . The dimensions of the concerns are: <i>Union relations</i> , <i>Health and safety</i> , <i>Workforce reductions</i> , <i>Retirement benefit concerns</i> , and <i>Other concerns</i> .
<i>FROA_{Q1}</i>	Average income before extraordinary items, standardized by total assets, over the following quarter relative to <i>q</i> of year <i>t</i> .
<i>FROA_{Q1-Q4}</i>	Average income before extraordinary items, standardized by total assets, over the four following quarters relative to <i>q</i> of year <i>t</i> .
<i>Cash</i>	Cash and marketable securities of firm <i>i</i> in quarter <i>q</i> of year <i>t</i> , divided by the total assets at the end of quarter <i>q</i> of year <i>t</i> .
<i>Leverage</i>	Long-term debt of firm <i>i</i> in quarter <i>q</i> of year <i>t</i> , divided by the total assets at the end of quarter <i>q</i> of year <i>t</i> .
<i>Democrat</i>	Indicator variable equal to one if the firm's operations are located in a state where the Democratic Party received the majority of the votes in the latest presidential election relative to year <i>t</i> , and zero otherwise.

Table 2: Summary statistics for the FMCS sample

Panel A: Summary statistics of the dependent variables, tone measures, and controls

	N	Mean	Std. dev.	Q1	Median	Q3
<i>Tone</i>	4,504	0.018	0.017	0.002	0.016	0.047
<i>UnionCoverage</i>	4,504	0.590	0.204	0.373	0.623	1
σ_{RET}	4,504	0.012	0.018	0.006	0.012	0.019
<i>ROA</i>	4,504	0.018	0.013	0.010	0.014	0.020
<i>Size</i> ⁺ (in mil.)	4,504	1,862	2,982	0,309	0,921	2,025
<i>BTM</i> ⁺	4,504	0.529	0.417	0.289	0.457	0.693
<i>FE</i>	4,504	0.004	1.127	−0.017	0.050	0.178
<i>Age</i> ⁺	4,504	39.670	24.714	19	36	57
<i>GeoSeg</i> ⁺	4,504	6.591	7.371	2	6	9
<i>BusSeg</i> ⁺	4,504	7.081	6.521	0	6	12
<i>Alpha</i>	4,504	0.000	0.003	−0.001	0.0001	0.001
<i>Beta</i>	4,504	0.974	0.500	0.617	0.906	1.226
σ_{ROA}	4,504	0.009	0.013	0.002	0.004	0.008
<i>Returns</i>	4,504	0.103	0.391	−0.081	0.085	0.237
<i>DA</i>	4,504	−0.009	0.318	−0.058	−0.003	0.032
<i>FROA</i> _{Q1}	4,504	0.020	0.012	0.016	0.019	0.024

Panel B: Average firm characteristics by subsample

	Low unionization	High unionization	t-stat
<i>Tone</i>	0.021	0.016	4.912***
<i>ROA</i>	0.018	0.018	0.318
σ_{RET}	0.013	0.011	2.206**
<i>Size</i> ⁺ (in mil.)	1,821	1,925	0.903
<i>BTM</i> ⁺	0.530	0.528	0.123
<i>FE</i>	0.004	0.005	0.751
<i>Age</i> ⁺	40.632	38.685	2.611**
<i>GeoSeg</i> ⁺	6.677	6.375	1.421
<i>BusSeg</i> ⁺	7.463	6.688	3.941***
<i>Alpha</i>	0.0001	0.0001	0.041
<i>Beta</i>	0.989	0.960	1.909*
σ_{ROA}	0.008	0.009	0.314
<i>Returns</i>	0.104	0.102	0.199
<i>DA</i>	−0.008	−0.008	1.378
<i>FROA</i> _{Q1}	0.020	0.020	0.241

Panel C: Correlation table

	<i>Tone</i>	<i>UnionCoverage</i>	<i>NRTW</i>	<i>ROA</i>	σ_{RET}	<i>BTM</i>	<i>Size</i>	<i>FE</i>	<i>Age</i>	<i>GeoSeg</i>	<i>BusSeg</i>
<i>Tone</i>	1.000										
<i>UnionCoverage</i>	-0.048***	1.000									
<i>NRTW</i>	-0.028***	0.086***	1.000								
<i>ROA</i>	0.095***	-0.005	-0.126***	1.000							
σ_{RET}	-0.123***	0.019	-0.047***	-0.084***	1.000						
<i>BTM</i>	-0.154***	0.001	0.070***	-0.281***	0.195***	1.000					
<i>Size</i>	0.322***	-0.040***	-0.054***	0.172***	-0.551***	-0.332***	1.000				
<i>FE</i>	0.012***	-0.030**	-0.089***	0.273***	-0.077***	-0.043***	0.142***	1.000			
<i>Age</i>	0.218***	-0.040***	-0.168***	0.068***	-0.222***	-0.117***	0.462***	0.121***	1.000		
<i>GeoSeg</i>	0.016**	-0.022*	0.048***	0.085***	0.019	0.036***	0.081***	0.041***	-0.112***	1.000	
<i>BusSeg</i>	-0.056***	-0.045***	-0.206***	-0.012	0.149***	0.189***	0.243***	0.071***	0.266***	0.029**	1.000
<i>Alpha</i>	0.413***	-0.008	-0.046***	-0.108***	0.418***	0.074***	0.014	0.082***	0.005	-0.054***	-0.054***
<i>Beta</i>	-0.087***	-0.029**	-0.087***	-0.007	0.522***	-0.106***	-0.414***	-0.056***	-0.151***	0.213***	0.219***
σ_{ROA}	-0.189***	0.090***	0.099***	0.011	0.161***	0.106***	-0.285***	-0.057***	-0.219***	0.090***	0.064***
<i>Returns</i>	0.225***	-0.055***	-0.117***	0.040***	-0.367***	-0.309***	0.238***	0.040***	0.151***	-0.041***	-0.004
<i>DA</i>	0.082***	-0.054***	0.028*	0.001	-0.002	-0.048***	0.016	0.000	0.011	0.080***	-0.001
<i>FROAQ1</i>	0.137***	-0.002	-0.212***	0.713***	-0.73***	-0.244***	0.054	0.093***	0.028*	-0.121***	-0.007
	<i>Alpha</i>	<i>Beta</i>	σ_{ROA}	<i>Returns</i>	<i>DA</i>	<i>FROAQ1</i>					
<i>Alpha</i>	1.000										
<i>Beta</i>	0.055**	1.000									
σ_{ROA}	-0.152***	0.188***	1.000								
<i>Returns</i>	-0.073***	0.046***	-0.095***	1.000							
<i>DA</i>	-0.018	0.051***	0.009	0.050***	1.000						
<i>FROAQ1</i>	-0.143***	-0.001	0.017	0.065***	0.003	1.000					

Panel A presents the descriptive statistics for the FMCS sample on the effect labor union power on the tone of earnings press releases. The variable definitions are presented in Table 1. ⁺ indicates that the variable is logarithmized in the regressions but is untransformed here for interpretation purposes. Panel B compares the relevant variables for two subgroups: firms with higher-than-median unionization, and firms with lower-than-median unionization. For each variable, the mean is reported alongside a t-test between the two subgroups. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. Panel C presents the Pearson correlations among all relevant variables in the sample, where *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 3: Summary statistics for the NLRB sample

Panel A: Summary statistics of the dependent variables, tone measures, and controls

	N	Mean	std. Dev.	Q1	Median	Q3
Tone	1,357	0.018	0.023	0.001	0.017	0.042
UnionPeriod	1,357	0.239	0.427	0	0	0
UnionOutcome	1,357	0.448	0.497	0	0	1
ROA	1,357	0.013	0.020	0.021	0.013	-0.008
σ_{RET}	1,357	0.018	0.012	0.011	0.016	0.021
Size ⁺	1,357	0, 927	0, 105	0, 888	0, 953	1, 002
BTM ⁺	1,357	0.480	0.302	0.234	0.429	0.635
FE ⁺	1,357	0.041	0.188	-0.004	0.027	0.058
Age	1,357	29.515	20.951	17	19	35
GeoSeg ⁺	1,357	6.773	5.517	4	5	8
BusSeg ⁺	1,357	5.133	4.932	1	4	10
Alpha	1,357	0.0001	0.002	-0.001	-0.00003	0.001
Beta	1,357	0.938	0.330	0.700	0.890	1.105
σ_{ROA}	1,357	0.008	0.016	0.002	0.003	0.006
Returns	1,357	0.045	0.276	-0.166	0.073	0.231
DA	1,357	-0.164	0.237	-0.334	-0.129	-0.009

Panel B: Evolution of tone before and after union election

Quarter	$\overline{Tone}$							
	All	-3	-2	-1	0	+1	+2	+3
UnionWin	0.017	0.021	0.021	0.014	0.017	0.015	0.010	0.012
UnionLoss	0.019	0.019	0.021	0.013	0.016	0.021	0.021	0.020
t-stat	0.372	0.492	1.371	1.257	0.356	-0.228	-1.847*	-0.613
	$\overline{Tone}$ Before				$\overline{Tone}$ After			t-stat
UnionWin	0.017				0.014			2.213**
UnionLose	0.018				0.019			0.37

Panel C: Correlation table

	<i>Tone</i>	<i>UnionPeriod</i>	<i>UnionOutcome</i>	<i>ROA</i>	σ_{RET}	<i>BTM</i>	<i>Size</i>	<i>FE</i>
<i>Tone</i>	1.000							
<i>UnionPeriod</i>	0.018	1.000						
<i>UnionOutcome</i>	0.017***	-0.016	1.000					
<i>ROA</i>	0.120***	0.043	0.043	1.000				
σ_{RET}	-0.043***	0.025	0.007	-0.142***	1.000			
<i>BTM</i>	-0.219***	-0.014	-0.063**	-0.401***	0.301***	1.000		
<i>Size</i>	0.041***	0.081***	-0.180***	-0.066**	-0.527***	-0.307***	1.000	
<i>FE</i>	0.132***	-0.056*	0.060**	0.020***	0.002	-0.001	-0.073***	1.000
<i>Age</i>	0.172***	0.071**	0.212***	-0.188***	-0.029***	0.205***	0.158***	0.208***
<i>GeoSeg</i>	-0.129***	0.006*	-0.179***	-0.064**	-0.069**	-0.014	0.490***	-0.002
<i>BusSeg</i>	-0.311***	0.003	0.133***	-0.034	0.310***	0.478***	0.626***	0.032
<i>Alpha</i>	0.022	0.023	-0.066**	-0.105***	0.412***	0.054*	0.038	-0.010
<i>Beta</i>	0.055***	-0.044	0.033	-0.068**	0.541***	-0.080***	-0.343***	0.130***
σ_{ROA}	-0.241***	-0.033	0.326***	-0.355***	0.341***	0.294***	-0.426***	0.008
<i>Returns</i>	0.058***	0.051*	-0.042	0.159***	-0.540***	-0.425***	0.412***	0.067**
<i>DA</i>	0.031***	0.136***	0.046	0.071**	-0.162***	-0.141***	0.118***	-0.076**
	<i>Age</i>	<i>GeoSeg</i>	<i>BusSeg</i>	<i>Alpha</i>	<i>Beta</i>	σ_{ROA}	<i>Returns</i>	<i>DA</i>
<i>Age</i>	1.000							
<i>GeoSeg</i>	0.115***	1.000						
<i>BusSeg</i>	0.124***	-0.343***	1.000					
<i>Alpha</i>	-0.036	0.027	-0.072***	1.000				
<i>Beta</i>	-0.037***	-0.045***	0.272***	0.102***	1.000			
σ_{ROA}	0.001	-0.160***	0.268***	-0.080***	0.264***	1.000		
<i>Returns</i>	0.065**	0.095***	-0.087***	-0.116***	-0.006	-0.333***	1.000	
<i>DA</i>	0.113***	0.089**	-0.001	-0.039	0.006	0.046	-0.101***	1.000

Panel A presents the descriptive statistics for the NLRB sample on the event study analysis of labor union elections on the tone of earnings press releases. The NLRB data provide information on the election date and outcome. The variable definitions are presented in Table 1. ⁺ indicates that the variable is logarithmized in the regressions but is untransformed here for interpretation purposes. Panel B provides an analysis of tone for the firms where the union wins the election and firms where the election is lost by unions in the quarters prior to the election and post-election. A comparison is then made between the two subgroups, but also before and after the election for either subgroup. For each subgroup, the mean is reported alongside a t-test. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. Panel C presents the Pearson correlations among all relevant variables in the sample. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 4: Tone of earnings press releases and power of labor unions

	<i>Tone</i>	<i>Tone</i>	<i>PosWords</i>	<i>NegWords</i>
	Model (1)	Model (2)	Model (3)	Model (4)
(Intercept)	−0.066 (0.386)	− 0.020 * (0.011)	0.009 (0.014)	0.029 *** (0.007)
<i>UnionCoverage</i>	− 0.002 ** (0.001)	− 0.003 ** (0.001)	− 0.006 *** (0.001)	−0.003 (0.002)
<i>ROA</i>		0.094 *** (0.015)	0.079 *** (0.018)	− 0.015 * (0.009)
σ_{ROA}		− 0.047 *** (0.017)	− 0.102 *** (0.019)	− 0.055 *** (0.013)
<i>Returns</i>		0.001 ** (0.001)	−0.001 (0.001)	− 0.002 *** (0.000)
<i>Beta</i>		0.000 (0.001)	0.000 (0.001)	−0.000 (0.000)
<i>Alpha</i>		0.350 *** (0.096)	0.368 *** (0.109)	0.018 (0.064)
σ_{RET}		− 0.186 *** (0.025)	− 0.186 *** (0.028)	0.001 (0.016)
<i>BTM</i>		0.002 ** (0.001)	−0.001 (0.001)	− 0.004 *** (0.001)
<i>Size</i>		0.000 (0.000)	0.001 ** (0.000)	0.001 *** (0.000)
<i>FE</i>		0.002 *** (0.000)	0.001 ** (0.000)	−0.001 (0.002)
<i>Age</i>		0.003 *** (0.000)	0.003 *** (0.000)	−0.000 (0.000)
<i>GeoSeg</i>		0.001 *** (0.000)	0.001 *** (0.000)	−0.000 (0.000)
<i>BusSeg</i>		− 0.002 *** (0.000)	− 0.003 *** (0.000)	−0.000 (0.000)
<i>DA</i>		0.002 *** (0.000)	0.002 *** (0.000)	− 0.000 *** (0.000)
Industry Fixed Effects (Two-SIC digits)	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes
R ²	0.117	0.215	0.174	0.192
Adj. R ²	0.112	0.209	0.167	0.184
Obs.	4,504	4,504	4,504	4,504
VIF	1.019	1.521	1.521	1.521

This table reports evidence in support of Hypothesis 1 on the relationship between union power (degree of unionization) and tone. *PosWords* (*NegWords*) is defined as the number of positive (negative) words, standardized by the total number of words in the earnings press release. All models are constructed using Newey–West standard errors corrected for heteroskedasticity and autocorrelation. The robust standard errors are presented in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively, based on a two-sided t-test. VIF represents the highest variance inflation factor across variables. The definitions of the variables are presented in Table 1.

Table 5: Tone of earnings press releases, firm performance, and power of labor unions

		$FROA_{Q1}$ $\leq med$	$FROA_{Q1}$ $> med$		
	<i>Tone</i>	<i>Tone</i>	<i>Tone</i>	<i>PosWords</i>	<i>NegWords</i>
	Model (1)	Model (2)	Model (3)	Model (5)	Model (6)
(Intercept)	−0.007 (0.010)	0.010 (0.009)	0.004** (0.002)	0.011 (0.014)	0.018*** (0.006)
<i>UnionCoverage</i>	− 0.003** (0.002)	0.004 (0.003)	− 0.010*** (0.004)	− 0.006** (0.003)	−0.002 (0.002)
$FROA_{Q1}$	0.227*** (0.029)	0.092*** (0.029)	0.174*** (0.029)	0.136*** (0.031)	− 0.091*** (0.021)
$UnionCoverage \cdot FROA_{Q1}$	− 0.027** (0.011)			− 0.051*** (0.009)	−0.024 (0.039)
<i>ROA</i>	0.094*** (0.015)	0.115*** (0.018)	0.072*** (0.015)	0.079*** (0.018)	− 0.015* (0.009)
σ_{ROA}	− 0.049*** (0.017)	− 0.102*** (0.019)	−0.004 (0.017)	− 0.102*** (0.019)	− 0.053*** (0.013)
<i>Returns</i>	0.001** (0.001)	−0.000 (0.001)	0.001** (0.001)	−0.002 (0.002)	− 0.003*** (0.000)
<i>Beta</i>	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	−0.000 (0.000)
<i>Alpha</i>	0.350*** (0.096)	0.354*** (0.109)	0.345*** (0.096)	0.368*** (0.109)	0.018 (0.064)
σ_{RET}	− 0.192*** (0.025)	− 0.178*** (0.028)	− 0.205*** (0.025)	− 0.186*** (0.028)	0.006 (0.016)
<i>BTM</i>	0.002** (0.001)	−0.001 (0.001)	0.002** (0.001)	−0.001 (0.001)	− 0.003*** (0.001)
<i>Size</i>	0.000 (0.000)	0.001** (0.000)	0.000 (0.000)	0.001** (0.000)	0.001*** (0.000)
<i>FE</i>	0.001* (0.000)	0.000** (0.000)	0.000* (0.000)	0.001** (0.000)	−0.000 (0.000)
<i>Age</i>	0.003*** (0.000)	0.001*** (0.000)	0.003*** (0.000)	0.004*** (0.000)	0.000 (0.000)
<i>GeoSeg</i>	0.001*** (0.000)	0.000 (0.000)	0.001*** (0.000)	0.001*** (0.000)	−0.000 (0.000)
<i>BusSeg</i>	− 0.002*** (0.000)	−0.000 (0.000)	− 0.002*** (0.000)	− 0.002*** (0.000)	−0.000 (0.000)
<i>DA</i>	0.002*** (0.000)	0.003*** (0.000)	0.001** (0.000)	0.001** (0.000)	− 0.001*** (0.000)
Industry Fixed Effects (Two-SIC digits)	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes
R^2	0.242	0.236	0.269	0.173	0.199
Adj. R^2	0.236	0.223	0.257	0.166	0.192
Obs.	4,504	2,252	2,252	4,504	4,504
VIF	1.782	1.521	1.520	1.639	1.727

This table reports evidence in support of Hypothesis 2 on the relationship between union power and tone in light of firm performance. All models are constructed using Newey–West standard errors corrected for heteroskedasticity and autocorrelation. The robust standard errors are presented in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively, based on a two-sided t-test. VIF represents the highest variance inflation factor across variables. The definitions of the variables are presented in Table 1.

Table 6: Tone of earnings press releases, labor union power, and RTW laws

	<i>Tone</i>	<i>Tone</i>	<i>Tone</i>	<i>PosWords</i>	<i>NegWords</i>
	Model (1)	Model (2)	Model (3)	Model (5)	Model (6)
(Intercept)	0.019*** (0.000)	0.019*** (0.000)	-0.017*** (0.005)	-0.010** (0.005)	0.007 (0.006)
<i>NRTW</i>	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.000 (0.000)
<i>UnionCoverage</i>		-0.003*** (0.000)	-0.002*** (0.000)	-0.003*** (0.000)	-0.001 (0.001)
<i>UnionCoverage · NRTW</i>		-0.001** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.000 (0.000)
<i>ROA</i>			0.089*** (0.014)	0.077*** (0.018)	-0.012* (0.007)
σ_{ROA}			-0.024 (0.018)	-0.074*** (0.023)	-0.050*** (0.013)
<i>Returns</i>			0.002*** (0.001)	-0.001 (0.001)	-0.003*** (0.000)
<i>Beta</i>			0.000 (0.001)	-0.000 (0.001)	-0.001 (0.000)
<i>Alpha</i>			0.331*** (0.093)	0.364*** (0.117)	0.033 (0.068)
σ_{RET}			-0.161*** (0.026)	-0.160*** (0.032)	0.001 (0.019)
<i>BTM</i>			0.002* (0.001)	-0.001 (0.001)	-0.004*** (0.001)
<i>Size</i>			0.001 (0.002)	0.004* (0.002)	0.003** (0.001)
<i>FE</i>			0.002*** (0.000)	0.001** (0.000)	-0.000 (0.000)
<i>Age</i>			0.003*** (0.000)	0.003*** (0.000)	-0.000 (0.000)
<i>GeoSeg</i>			0.001*** (0.000)	0.001*** (0.000)	-0.000 (0.000)
<i>BusSeg</i>			-0.002*** (0.000)	-0.003*** (0.000)	-0.000 (0.000)
<i>DA</i>			0.002*** (0.000)	0.002*** (0.000)	-0.001*** (0.000)
Industry Fixed Effects (Two-SIC digits)	No	No	Yes	Yes	Yes
Year Fixed Effects	No	No	Yes	Yes	Yes
Quarter Fixed Effects	No	No	Yes	Yes	Yes
R ²	0.006	0.031	0.229	0.187	0.195
Adj. R ²	0.004	0.027	0.222	0.179	0.186
Obs.	4,504	4,504	4,504	4,504	4,504
VIF	—	1.379	1.667	1.634	1.634

This table reports evidence in support of Hypothesis 3 on the relationship between union power and tone in light of RTW laws. All models are constructed using Newey–West standard errors corrected for heteroskedasticity and autocorrelation. The robust standard errors are presented in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively, based on a two-sided t-test. VIF represents the highest variance inflation factor across variables. The definitions of the variables are presented in Table 1.

Table 7: Tone of earnings press releases and labor unions' election outcomes

				Election Won By Union	Election Lost By Union
	<i>Tone</i> Model (1)	<i>PosWords</i> Model (2)	<i>NegWords</i> Model (3)	<i>Tone</i> Model (4)	<i>Tone</i> Model (5)
(Intercept)	−0.055** (0.023)	−0.015 (0.027)	0.040*** (0.014)	−0.096*** (0.019)	0.095* (0.056)
<i>UnionPeriod</i>	−0.000 (0.001)	0.001 (0.001)	−0.001 (0.001)	−0.002*** (0.000)	0.000 (0.001)
<i>UnionOutcome</i>	0.006*** (0.001)	0.007*** (0.001)	0.002*** (0.000)		
<i>UnionPeriod · UnionOutcome</i>	−0.002* (0.001)	−0.005*** (0.001)	−0.003 (0.003)		
<i>ROA</i>	0.319*** (0.117)	0.564*** (0.118)	0.246*** (0.081)	0.469*** (0.151)	0.205 (0.146)
σ_{ROA}	−0.157* (0.089)	−0.067 (0.107)	0.090*** (0.032)	−0.046 (0.105)	1.492*** (0.337)
<i>Returns</i>	−0.002 (0.006)	−0.005 (0.007)	−0.003** (0.002)	−0.019*** (0.006)	0.011** (0.006)
<i>Beta</i>	0.004* (0.003)	0.003 (0.004)	−0.002*** (0.001)	0.006** (0.003)	−0.006 (0.004)
<i>Alpha</i>	0.062 (0.461)	0.340 (0.489)	0.278*** (0.100)	0.084 (0.523)	0.209 (0.670)
σ_{RET}	−0.420** (0.210)	−0.125 (0.271)	0.294*** (0.085)	−0.120 (0.223)	−1.220*** (0.216)
<i>BTM</i>	−0.033** (0.013)	−0.039*** (0.014)	−0.006*** (0.002)	−0.030** (0.014)	0.208*** (0.044)
<i>Size</i>	0.055* (0.031)	0.047 (0.040)	−0.007*** (0.001)	0.057 (0.083)	0.399*** (0.081)
<i>FE</i>	0.006* (0.003)	0.004 (0.003)	−0.001*** (0.000)	0.014** (0.006)	0.001 (0.004)
<i>AGE</i>	0.002 (0.005)	−0.001 (0.005)	−0.003*** (0.001)	−0.010 (0.008)	−0.070*** (0.015)
<i>GeoSeg</i>	−0.006*** (0.002)	−0.009*** (0.002)	−0.003*** (0.001)	−0.004 (0.004)	−0.009** (0.004)
<i>BusSeg</i>	0.001 (0.002)	0.004* (0.002)	0.004*** (0.001)	0.002 (0.003)	0.035*** (0.008)
<i>DA</i>	0.004*** (0.000)	−0.001*** (0.000)	−0.004*** (0.000)	0.002*** (0.001)	0.007*** (0.000)
Industry Fixed Effects (Two-SIC digits)	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes
R ²	0.797	0.805	0.694	0.876	0.839
Adj. R ²	0.789	0.798	0.682	0.867	0.828
Obs.	1,357	1,357	1,357	608	749
VIF	1.808	1.798	1.813	1.681	2.304

This table reports the results of Hypothesis 4, which tests the relationship between union election outcomes and tone deflation. All models are constructed using Newey–West standard errors corrected for heteroskedasticity and autocorrelation. The robust standard errors are presented in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively, based on a two-sided t-test. VIF represents the highest variance inflation factor across variables. The definitions of the variables are presented in Table 1.

Table 8: Labor union power, change in RTW laws, and tone deflation

	Panel A: Full sample				Panel B: Surrounding states			
	<i>Tone</i>	<i>Tone</i>	<i>PosWords</i>	<i>NegWords</i>	<i>Tone</i>	<i>Tone</i>	<i>PosWords</i>	<i>NegWords</i>
	Model (1)	Model (2)	Model (3)	Model (4)	Model (1)	Model (2)	Model (3)	Model (4)
(Intercept)	-0.030*** (0.011)	-0.019* (0.011)	-0.006 (0.014)	0.024*** (0.006)	-0.082*** (0.015)	-0.107*** (0.017)	-0.137*** (0.024)	-0.055*** (0.014)
<i>ChangeRTW</i>	0.000 (0.001)	0.000 (0.001)	-0.000 (0.001)	-0.001 (0.001)	0.000 (0.001)	-0.001 (0.001)	0.000 (0.001)	0.001 (0.001)
<i>Post</i>	-0.004 (0.003)	-0.003 (0.003)	-0.002 (0.003)	0.003* (0.002)	-0.005 (0.005)	-0.005 (0.004)	0.000 (0.005)	0.006** (0.003)
<i>ChangeRTW · Post</i>	0.006*** (0.002)	0.013*** (0.003)	0.010*** (0.004)	0.004 (0.002)	0.007*** (0.002)	0.002** (0.001)	0.004*** (0.001)	-0.002 (0.002)
<i>UnionCoverage</i>		-0.003** (0.001)				0.002 (0.003)		
<i>ChangeRTW · UnionCoverage</i>		-0.013** (0.005)				-0.021*** (0.006)		
<i>Post · UnionCoverage</i>		0.001 (0.003)				0.006 (0.006)		
<i>ChangeRTW · Post · UnionCoverage</i>		0.070*** (0.016)				0.010* (0.006)		
<i>ROA</i>	0.094*** (0.015)	0.092*** (0.015)	0.067*** (0.018)	-0.027*** (0.010)	0.193*** (0.035)	0.110*** (0.029)	0.089** (0.037)	-0.104*** (0.018)
σ_{ROA}	-0.046*** (0.017)	-0.046*** (0.017)	-0.107*** (0.019)	-0.060*** (0.013)	0.009 (0.046)	0.021 (0.045)	-0.025 (0.056)	-0.034*** (0.012)
<i>Returns</i>	0.002** (0.001)	0.001** (0.001)	-0.001 (0.001)	-0.003*** (0.000)	0.009*** (0.002)	0.004** (0.002)	0.006 (0.005)	-0.003*** (0.001)
<i>Beta</i>	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	-0.000 (0.000)	0.003*** (0.001)	0.002** (0.001)	0.004*** (0.001)	0.002** (0.001)
<i>Alpha</i>	0.348*** (0.096)	0.340*** (0.096)	0.374*** (0.110)	0.027 (0.065)	0.124 (0.208)	0.146 (0.164)	0.331 (0.217)	0.207 (0.194)
σ_{RET}	-0.186*** (0.025)	-0.189*** (0.025)	-0.183*** (0.028)	0.003 (0.016)	-0.254*** (0.056)	-0.251*** (0.041)	-0.252*** (0.064)	0.002 (0.032)
<i>BTM</i>	0.002* (0.001)	0.002** (0.001)	-0.001 (0.001)	-0.004** (0.001)	0.013*** (0.003)	0.008*** (0.002)	0.010*** (0.003)	-0.003 (0.002)
<i>Size</i>	0.000 (0.000)	0.000 (0.000)	0.001** (0.000)	0.001*** (0.000)	0.002** (0.001)	0.000 (0.000)	0.001** (0.001)	-0.001*** (0.000)
<i>FE</i>	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	-0.000 (0.000)	0.003*** (0.001)	0.003*** (0.000)	0.002*** (0.001)	0.000 (0.000)
<i>Age</i>	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	-0.000 (0.000)	0.008*** (0.001)	0.005*** (0.001)	0.005*** (0.001)	-0.002*** (0.000)
<i>GeoSeg</i>	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	-0.000* (0.000)	0.003*** (0.001)	0.002*** (0.001)	0.003*** (0.001)	0.001 (0.001)
<i>BusSeg</i>	-0.002*** (0.000)	-0.002*** (0.000)	-0.003*** (0.000)	-0.000 (0.000)	-0.004*** (0.001)	-0.004*** (0.000)	-0.005*** (0.001)	-0.001** (0.000)
<i>DA</i>	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	-0.001*** (0.000)	0.003*** (0.001)	0.002*** (0.000)	0.003*** (0.001)	-0.000 (0.000)
Industry Fixed Effects (Two-SIC digits)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.215	0.219	0.189	0.119	0.341	0.352	0.268	0.214
Adj. R ²	0.208	0.211	0.182	0.112	0.321	0.331	0.247	0.191
Obs.	4,504	4,504	4,504	4,504	1,395	1,395	1,395	1,395
VIF	2.143	2.111	2.143	2.143	2.143	2.159	2.165	2.165

This table shows the results of a robustness test that exploits the impact of a change in RTW laws on tone deflation. All models are constructed using Newey–West standard errors corrected for heteroskedasticity and autocorrelation. The robust standard errors are presented in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively, based on a two-sided t-test. VIF represents the highest variance inflation factor across variables. The definitions of the variables are presented in Table 1.

Table 9: Robustness tests

Panel A: Alternative definitions of tone				
	$Tone^{LM}$ Model (1)	$Tone^{DIC}$ Model (2)	$Tone_{HEN}^{HEN}$ Model (3)	$AbTone$ Model (4)
<i>UnionCoverage</i>	−0.001** (0.001)	−0.004*** (0.001)	−0.022*** (0.005)	−0.001** (0.000)
Control Variables	Yes	Yes	Yes	Yes
Industry Fixed Effects (Two-SIC digits)	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes
R ²	0.162	0.212	0.255	0.197
Adj. R ²	0.156	0.205	0.242	0.202
Obs.	4,504	4,504	4,504	4,504
VIF	1.411	1.413	1.495	1.415
Panel B: Bag-of-words				
	$Tone^{LM,BOW}$ Model (1)	$Tone^{DIC,BOW}$ Model (2)	$Tone_{HEN}^{HEN,BOW}$ Model (3)	$Tone^{BOW}$ Model (4)
<i>UnionCoverage</i>	−0.002* (0.001)	−0.005*** (0.001)	−0.051** (0.022)	−0.007*** (0.002)
Control Variables	Yes	Yes	Yes	Yes
Industry Fixed Effects (Two-SIC digits)	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes
R ²	0.157	0.204	0.266	0.222
Adj. R ²	0.151	0.198	0.260	0.216
Obs.	4,504	4,504	4,504	4,504
VIF	1.467	1.468	1.518	1.521
Panel C: CEO fixed effects				
	<i>Tone</i> Model (1)	<i>Tone</i> Model (2)	<i>PosWords</i> Model (3)	<i>NegWords</i> Model (4)
<i>UnionCoverage</i>	−0.000** (0.000)	−0.001* (0.000)	−0.000** (0.000)	0.000 (0.001)
CEO Fixed Effects	Yes	Yes	Yes	Yes
Control Variables	No	Yes	Yes	Yes
Industry Fixed Effects (Two-SIC digits)	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes
R ²	0.562	0.564	0.601	0.582
Adj. R ²	0.541	0.556	0.582	0.562
Obs.	4,504	4,504	4,504	4,504
VIF	1.732	1.662	1.515	1.547

This table reports the robustness tests on the relationship between union power and tone. Panel A provides the results of Hypothesis 1 using alternative measures of tone. We construct tone using the dictionary of [Loughran & McDonald \[2011\]](#), DICTION 7.0 software, an alternative construction based on [Henry \[2008\]](#) (where the difference between positive and negative words, is divided by the sum of the positive and negative words), and the abnormal tone based on the library of [Henry \[2008\]](#). Panel B reports the results of the bag-of-words approach comprising the entire document and Panel C introduces CEO fixed effects. The control variables are similar to those used in Table 4 but are suppressed here for brevity. All models are constructed using Newey–West standard errors corrected for heteroskedasticity and autocorrelation. The robust standard errors are presented in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively, based on a two-sided t-test. VIF represents the highest variance inflation factor across variables. The definitions of the variables are presented in Table 1.

Table 10: Tone of earnings press releases, union coverage, and corporate social responsibility

	<i>Tone</i> Model (1)	<i>PosWords</i> Model (2)	<i>NegWords</i> Model (3)
(Intercept)	−0.034*** (0.012)	0.043*** (0.011)	0.077*** (0.020)
<i>UnionCoverage</i>	−0.002** (0.001)	−0.006*** (0.001)	−0.004 (0.002)
<i>CSR_EMP</i>	0.003*** (0.001)	0.008*** (0.001)	0.004 (0.003)
<i>UnionCoverage · CSR_EMP</i>	0.001*** (0.000)	0.002*** (0.000)	0.001 (0.001)
<i>ROA</i>	0.093*** (0.015)	0.076*** (0.018)	−0.017* (0.010)
σ_{ROA}	−0.040** (0.017)	−0.099*** (0.019)	−0.059*** (0.013)
<i>Returns</i>	0.001** (0.001)	−0.001* (0.001)	−0.003*** (0.000)
<i>Beta</i>	0.000 (0.001)	0.000 (0.001)	−0.000 (0.000)
<i>Alpha</i>	0.357*** (0.097)	0.368*** (0.111)	0.012 (0.065)
σ_{RET}	−0.169*** (0.025)	−0.188*** (0.028)	−0.019 (0.016)
<i>BTM</i>	0.002** (0.001)	−0.002 (0.002)	−0.004*** (0.001)
<i>Size</i>	0.000 (0.000)	0.001** (0.000)	0.001*** (0.000)
<i>FE</i>	0.002*** (0.000)	0.002*** (0.000)	0.000 (0.000)
<i>Age</i>	0.003*** (0.000)	0.003*** (0.001)	−0.000 (0.000)
<i>GeoSeg</i>	0.001*** (0.000)	0.001*** (0.000)	−0.000 (0.000)
<i>BusSeg</i>	−0.002*** (0.000)	−0.003*** (0.000)	−0.000 (0.000)
<i>DA</i>	0.002*** (0.000)	0.002*** (0.000)	−0.000*** (0.000)
Industry Fixed Effects (Two-SIC digits)	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes
R ²	0.234	0.180	0.194
Adj. R ²	0.227	0.173	0.187
Obs.	4,504	4,504	4,504
VIF	1.524	1.524	1.524

This table reports the results of Hypothesis 4, which tests the relationship between union election outcomes and tone deflation. All models are constructed using Newey–West standard errors corrected for heteroskedasticity and autocorrelation. The robust standard errors are presented in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively, based on a two-sided t-test. VIF represents the highest variance inflation factor across variables. The definitions of the variables are presented in Table 1.

Table 11: Sensitivity test: Future performance, financial flexibility, union power, and tone deflation

Panel A: State-level electoral outcome and labor union strength

	<i>Tone</i> Model (1)	<i>Tone</i> Model (2)	<i>Tone</i> Model (3)	<i>PosWords</i> Model (4)	<i>NegWords</i> Model (5)
<i>Democrat</i>	-0.003*** (0.001)	-0.002*** (0.001)	-0.002** (0.001)	-0.001* (0.001)	0.000 (0.000)
<i>UnionCoverage</i>		-0.004 (0.003)	-0.006* (0.003)	-0.008* (0.004)	-0.001 (0.002)
<i>Democrat · UnionCoverage</i>		-0.017*** (0.004)	-0.010*** (0.004)	-0.012** (0.005)	0.002 (0.002)
Control Variables	No	No	Yes	Yes	Yes
Industry Fixed Effects (Two-SIC digits)	No	No	Yes	Yes	Yes
Year Fixed Effects	No	No	Yes	Yes	Yes
Quarter Fixed Effects	No	No	Yes	Yes	Yes
R ²	0.006	0.027	0.242	0.225	0.116
Adj. R ²	0.005	0.026	0.235	0.217	0.107
Obs.	4,504	4,504	4,504	4,504	4,504
VIF	—	1.253	1.259	1.259	1.254

Panel B: Financial flexibility and union power

	Leverage		Cash		Leverage & Cash	
	$\leq med$	$> med$	$> med$	$\leq med$	$\leq med_{Lev}$ $> med_{CASH}$	$\leq med_{Lev}$ $\leq med_{CASH}$
<i>Fin. Flexibility</i> <i>Tone</i>	High Model (1)	Low Model (2)	High Model (3)	Low Model (4)	High Model (5)	Low Model (6)
<i>UnionCoverage</i>	-0.008** (0.003)	-0.006 (0.004)	-0.009** (0.004)	0.003 (0.003)	-0.011** (0.005)	0.007 (0.004)
Industry Fixed Effects (Two-SIC digits)	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.395	0.172	0.225	0.363	0.357	0.282
Adj. R ²	0.386	0.116	0.195	0.312	0.295	0.202
Obs.	2,251	2,251	2,251	2,251	892	892
VIF	1.514	1.508	1.454	1.567	1.548	1.612

This table reports the sensitivity tests for Hypothesis 1. Panel A tests the relationship between the degree of unionization, tone deflation, and future firm performance. $FROA_{Q1}$ is measured as next quarter's return on assets. Panel B reports the impact of financial flexibility on tone deflation in the presence of labor unions. The control variables are similar to those in Table 4 but are suppressed here for brevity. All models are constructed using Newey–West standard errors corrected for heteroskedasticity and autocorrelation. The robust standard errors are presented in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively, based on a two-sided t-test. VIF represents the highest variance inflation factor across variables. The definitions of the variables are presented in Table 1.

Table 12: **Additional tests: Political affiliation, information value, and earnings management**
Panel A: Earnings management

<i>Tone</i>	$DA \leq Q1$	$DA > Q1$ $DA \leq Q2$	$DA > Q2$ $DA \leq Q3$	$DA > Q3$
	Model (1)	Model (2)	Model (3)	Model (4)
<i>UnionCoverage</i>	-0.008*** (0.002)	-0.001 (0.002)	-0.001** (0.000)	-0.005** (0.002)
Control Variables	Yes	Yes	Yes	Yes
Industry Fixed Effects (Two-SIC digits)	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes
R ²	0.327	0.225	0.291	0.436
Adj. R ²	0.304	0.201	0.268	0.417
Obs.	1,127	1,252	1,181	1,116
VIF	1.694	1.531	1.505	1.583

Panel B: Informational value of tone

Future Performance	$FROA_{Q1}$		$FROA_{Q1-Q4}$	
	Model (1)	Model (2)	Model (1)	Model (2)
<i>Tone</i>	0.012** (0.005)	0.043* (0.024)	0.045*** (0.006)	0.114*** (0.019)
<i>UnionCoverage</i>		-0.001 (0.002)		-0.001 (0.001)
<i>Tone · UnionCoverage</i>		-0.048* (0.027)		-0.035*** (0.013)
Control Variables	Yes	Yes	Yes	Yes
Industry Fixed Effects (Two-SIC digits)	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes
R ²	0.248	0.246	0.419	0.415
Adj. R ²	0.236	0.237	0.414	0.415
Obs.	4,504	4,504	4,504	4,504
VIF	1.531	2.582	1.632	2.472

Panel A reports the relationship between the information value of tone, given the different quartiles of accruals. Panel B tests the information value of tone in the presence of labor unions. In Models (1) and (2), the future operational performance is measured as the next quarters' return on assets ($FROA_{Q1}$), while Models (3) and (4) rely on future performance as the average return on assets over the following four quarters ($FROA_{Q1-Q4}$). The control variables are similar to those used in Table 4 but are suppressed here for brevity. All models are constructed using Newey–West standard errors corrected for heteroskedasticity and autocorrelation. The robust standard errors are presented in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively, based on a two-sided t-test. VIF represents the highest variance inflation factor across variables. The definitions of the variables are presented in Table 1.

Table 13: Labor unions, tone, and the temporal focus of earnings press releases

	Backward-looking			Contemporaneous			Forward-looking		
	$FE < 0$		$FE \geq 0$	$FE < 0$		$FE \geq 0$	$FE < 0$		$FE \geq 0$
	$Tone^{BS}$ Model (1)	$Tone^{BS}$ Model (2)	$Tone^{BS}$ Model (3)	$Tone^{CS}$ Model (4)	$Tone^{CS}$ Model (5)	$Tone^{CS}$ Model (6)	$Tone^{FS}$ Model (7)	$Tone^{FS}$ Model (8)	$Tone^{FS}$ Model (9)
(Intercept)	0.033*** (0.011)	−0.000 (0.015)	0.069*** (0.018)	0.020 (0.014)	−0.015 (0.018)	0.036 (0.024)	−0.009 (0.013)	−0.018 (0.018)	−0.009 (0.021)
<i>UnionCoverage</i>	−0.003* (0.002)	−0.003 (0.003)	−0.003** (0.001)	−0.005** (0.002)	−0.004 (0.004)	−0.005* (0.003)	−0.007*** (0.002)	−0.008** (0.004)	−0.006*** (0.002)
<i>ROA</i>	0.183*** (0.022)	0.146*** (0.038)	0.188*** (0.028)	0.212*** (0.028)	0.198*** (0.046)	0.210*** (0.036)	0.098*** (0.025)	0.020 (0.045)	0.123*** (0.031)
σ_{ROA}	−0.003 (0.029)	−0.133*** (0.049)	−0.079** (0.036)	−0.126*** (0.037)	−0.136** (0.060)	−0.106** (0.047)	−0.067** (0.033)	−0.041 (0.058)	−0.081** (0.040)
<i>Returns</i>	0.001 (0.001)	−0.002 (0.002)	0.003*** (0.002)	0.001 (0.001)	0.001 (0.002)	0.002 (0.002)	0.001 (0.001)	−0.002 (0.002)	0.004** (0.002)
<i>Beta</i>	0.001 (0.001)	0.001 (0.002)	0.000 (0.001)	0.002 (0.001)	0.003 (0.002)	0.001 (0.002)	−0.001 (0.001)	−0.002 (0.002)	−0.001 (0.001)
<i>Alpha</i>	0.353** (0.149)	0.271 (0.232)	0.123 (0.200)	0.280 (0.190)	0.119 (0.284)	0.289 (0.261)	0.594*** (0.170)	0.400 (0.276)	0.678*** (0.224)
σ_{RET}	−0.129*** (0.042)	0.073 (0.073)	−0.196*** (0.054)	−0.143*** (0.053)	0.026 (0.090)	−0.216*** (0.070)	−0.154*** (0.048)	−0.123 (0.087)	−0.191*** (0.060)
<i>BTM</i>	0.005*** (0.002)	0.004 (0.003)	0.003 (0.002)	0.005** (0.002)	0.002 (0.003)	0.005* (0.003)	0.001 (0.002)	0.008** (0.003)	−0.004 (0.002)
<i>Size</i>	−0.028*** (0.006)	−0.001 (0.010)	−0.052*** (0.008)	−0.047*** (0.008)	−0.024* (0.013)	−0.058*** (0.011)	0.029*** (0.007)	0.040*** (0.012)	0.020** (0.009)
<i>FE</i>	0.000 (0.000)	−0.000 (0.000)	−0.001 (0.001)	−0.001*** (0.000)	−0.002*** (0.001)	−0.002 (0.001)	−0.000 (0.000)	−0.001** (0.001)	0.000 (0.001)
<i>Age</i>	0.004*** (0.001)	0.005*** (0.001)	0.004*** (0.001)	0.005*** (0.001)	0.008*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.004*** (0.001)	0.003*** (0.001)
<i>GeoSeg</i>	0.002*** (0.000)	0.001 (0.001)	0.002*** (0.001)	0.002*** (0.001)	−0.001 (0.001)	0.003*** (0.001)	0.002*** (0.001)	0.001 (0.001)	0.003*** (0.001)
<i>BusSeg</i>	−0.002*** (0.000)	−0.002** (0.001)	−0.003*** (0.000)	−0.004*** (0.001)	−0.001 (0.001)	−0.005*** (0.001)	−0.003*** (0.000)	−0.002** (0.001)	−0.003*** (0.000)
<i>DA</i>	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001** (0.000)	0.000 (0.000)	0.001* (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
Industry Fixed Effects (Two-SIC dig.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.122	0.162	0.139	0.083	0.137	0.086	0.168	0.176	0.190
Adj. R ²	0.114	0.137	0.129	0.075	0.111	0.075	0.161	0.151	0.180
Obs.	4,504	1,306	3,198	4,504	1,306	3,198	4,504	1,306	3,198
VIF	1.508	1.519	1.519	1.523	1.531	1.531	1.512	1.528	1.528

This table reports additional evidence on the relationship between temporal tone and union power (degree of unionization). Specifically, we segment the tone into a backward-looking ($Tone^{BS}$), a contemporaneous ($Tone^{CS}$), and a forward-looking part ($Tone^{FS}$). All models are constructed using Newey–West standard errors corrected for heteroskedasticity and autocorrelation. The robust standard errors are presented in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively, based on a two-sided t-test. VIF represents the highest variance inflation factor across variables. The definitions of the variables are presented in Table 1.