Digital Picket Lines: Strategic Employee Disclosure

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Abstract

Using survey and archival data, we examine how employees strategically disclose information. We find that when unions renegotiate collective bargaining agreements (CBAs), employees write more Glassdoor reviews and leave lower ratings. Our survey responses from over 300 union representatives indicate encouraging strategic disclosure by employees on online platforms is a common union strategy. Building on survey responses, we demonstrate that strategic disclosure during CBA renegotiation intensifies when the union is less exposed to right to work laws and when the union is less exposed to unfair labor practices. We then document that strategic reviews are associated with improved workplace conditions, time to fill new jobs, and better contract wage outcomes. We conclude that employees strategically disclose information about their employers online, and that their disclosure has economic consequences for employing firms.

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1. Introduction

Firm managers have long used their discretion over the timing or content of firm disclosures to strategically influence stakeholders (Core, 2001; Healy and Palepu, 2001). One of the settings where strategic disclosure is especially salient is during labor negotiations when firms try to strengthen their bargaining power against their employees. A number of studies document that firms employ disclosure strategies in an effort to strengthen their bargaining power against their employees. [1] However, it is not well understood how employees, in turn, leverage disclosure to enhance their own bargaining power. Similar to firm managers, rank-and-file employees possess internal firm information that is not generally observable by external stakeholders (Huddart and Lang, 2003). We examine if employees disclose this internal information strategically against their employer to enhance their bargaining power.

Employee disclosure of firm information on online platforms, including social media and job review websites, has become a valuable source of information for stakeholders seeking to understand firm intangibles (Kolanovic and Smith, 2019). Employee information provides insight into firm dynamics such as culture, efficiency, leadership, etc. The emerging use of employee generated information mirrors a growing understanding of how intangible assets, such as human capital and employee engagement, can contribute to an organization's overall performance (Edmans, 2011). Since external stakeholders value information generated by employees, employees are in a position to use the disclosure of such information strategically. To examine if employees use this information strategically, we use the renegotiation of Collective Bargaining Agreements (CBA) as a setting.

[1] Firms use many disclosure strategies; see the following papers for examples: Aobdia & Cheng (2018); Arslan-Ayaydin et al. (2021); Bova (2013); Bova et al. (2015); Chalos et al. (1991); Chung et al. (2016); DeAngelo and DeAngelo (1991); D'Souza et al. (2000); Klasa et al. (2009); Liberty & Zimmerman (1986); Waterhouse et al. (1993).

The CBA is the contract that binds labor union employees and their employers to wages, work conditions, and benefits for a predefined period, usually three years. CBA renegotiations provide a setting where we can identify shifts in the incentive of employees to disclose strategically because it captures a brief window when their actions can have a direct effect on the contract being negotiated. Further, the timing of CBA renegotiations (hereafter, "renegotiations") is determined by the expiration of the existing CBA contract and the contract term. The predictable scheduling of renegotiations creates a plausibly exogenous increase in employees' incentives to act strategically.

Another benefit of using CBA renegotiations as a setting is it provides the opportunity to survey union representatives about strategies they use in renegotiations, which can complement our empirical tests (Armstrong et al., 2022; Glaeser and Guay, 2017). The survey is a valuable component of our study as it reveals various inner workings of renegotiations (i.e., union strategies and changes in the workplace environment) that would otherwise be unobservable in archival data. To our knowledge, we provide the first academic study to survey union representatives about the renegotiation process.

During renegotiations, employees can leverage their bargaining power to improve wages and working conditions in their labor contract. To enhance the bargaining power, employees may sometimes engage external stakeholders to exert pressure on the firm. For example, traditional union tactics, including public information campaigns and picketing, have typically taken place during periods of contract renegotiations. (Erickson et al., 2002; Gregory, 1949; Kullgren, 2023). Similarly, we posit that employees can strategically disclose information on online platforms around renegotiations. Using reviews from Glassdoor.com (hereafter, Glassdoor) as a proxy for employee-disclosed information, we predict an increase in the number of reviews and a decrease in the rating of reviews during renegotiations.

Using Glassdoor can be less costly to employees than other union strategies like picketing, however, it comes with its own set of frictions that can diminish its appeal. Economically, if the firm is affected negatively then the employees would also be negatively affected in the long run. Further, strategic employee disclosure can strain employer-employee relations, leading to negative workplace conditions. Employees also face legal frictions. Whereas the National Labor Relations Act protects employees' rights to collectively address work conditions via platforms like social media, it poses certain restrictions that, if violated, can lead to legal risks for union employees and unions themselves (National Labor Relations Board, 2011-2012).[2] One potential violation is employees intentionally attacking or trying to hurt their employer. Anecdotally, one of the union representatives we interviewed said that encouraging targeting of companies on social media is risky because "It's like walking on eggshells… if companies found out, they can interpret it as an attack and file for a ULP (unfair labor practice)." Moreover, legal frictions are broadly reflected in our survey with approximately 55% of surveyed union representatives believing that the risk of legal consequences at least sometimes keep employees from speaking openly about the firm.[3]

We begin our analysis by examining our survey consisting of 306 labor union representative responses. Survey results show that union representatives consider influencing firm public image an important strategy when negotiating and often encourage employees to make their grievances public. For example, we find that it is not unusual for union representatives to explicitly encourage employees to use online reviews and social media as a strategy to influence negotiation.[4] Building on the survey findings, our main archival tests also

[2] Some employees' use of social media is categorized as "protected concerted activity" under NLRB memos, while others are deemed unprotected due to factors like coercive conduct and overly broad provisions in employers' social media policies. For cases that define boundaries of protected activity on social media see Labor Board v. Washington Aluminum Co. (370 U.S. 9, 1962), Smithfield Packing Co. v. N.L.R.B. (510 F.3d 507, 4th Cir. 2007), and MikLin Enterprises, Inc. v. NLRB (No. 14-3099, 8th Cir. 2017).
[3] See Figure 2 (#9) for related survey responses.
[4] See Figure 3 for related survey responses.

confirm our predictions. Using event study methodology, we find that firms experience statistically significant increases in Glassdoor employee reviews around renegotiations, and that these reviews are significantly more negative.

The change in Glassdoor activity during renegotiations is suggestive of strategic behavior but does not entirely rule out alternative explanations. Our survey results indicate that the strategic use of online platforms, such as Glassdoor, plays a significant role in renegotiation tactics. To empirically substantiate strategy as a primary motive of employee disclosure, we examine two specific frictions that make it more difficult for unions to use employee disclosure as a strategy.

First, we examine union level exposure to right to work (RTW) laws. Unions exposed to RTW laws are required to represent all employees in a workplace; however, unlike unions who are not exposed to RTW laws, they cannot require union fees for these services. Consistent with responses in our survey, unions with a greater exposure to RTW laws are likely to have less resources to organize employees during union renegotiations than unions that are not legally constrained by RTW laws.[5] We document that strategic employee disclosure is less pronounced for firms covered by unions with fewer resources due to exposure to RTW laws. This finding provides evidence that strategic employee disclosure can be at least partly attributed to the labor union that covers the employees.

Next, we examine union-level legal exposure using Unfair Labor Practice (ULP) charges. ULPs are violations of the National Labor Relation Act (NLRA), and unions that received ULPs are more likely to limit future organizing activity because ULPs can lead to costly fines and penalties. Moreover, being responsible for receiving ULPs can result in the termination of the responsible union representative. Using data on ULPs, acquired through a Freedom of Information Act (FOIA) request to the NLRB, we examine the effects of legal

[5] See Figure 2 (#1) and (#2)

exposure on strategic employee disclosure.[6] We find that employees that are covered by unions that are more exposed to ULPs are less likely to engage in strategic employee disclosure during renegotiations. Taken together, the correlations between Glassdoor activity and frictions at the union level provide corroborating evidence to our survey results that the activity is strategic and can be tied to the capacity of labor unions. In other words, when the union faces more friction in organizing employees, the review activity is similar to periods when there are no renegotiations taking place.

We next examine outcomes of strategic reviews.[7] If strategic reviews are effective, we expect them to have consequences for the employer and for the success of the negotiations. Moreover, employees would have to believe their disclosures can be effective as a prerequisite to disclosing. The inability to disentangle strategic reviews from other negotiation strategies means we cannot identify a causal relation, however, examining outcomes further provides evidence of strategic behavior and provides evidence of the effectiveness of strategic reviews. We first examine workplace conditions using Occupational Safety and Health Administration (OSHA) incidents. We find that firms that are targeted by strategic reviews during renegotiations experience a decrease in OSHA incidents in the following two quarters, consistent with workplace conditions improving in response to employee strategic employee disclosure.

Next, we examine the time it takes for firms to fill job postings using workflow data from Revelio Labs. Longer fill times would suggest that prospective employees have become more difficult to hire. We document that there is an increase in the time it takes to fill jobs in the following six months after firms are targeted by strategic reviews during renegotiations.

[6] Unions that received above-median unfair labor practice complaints within the past three years are classified as high legal risk. Unfair labor practices are violations of the National Labor Relations Act. See Section 7 for more details.

[7] See Section 8 for more details how reviews are classified as strategic.

This finding is consistent with strategic employee disclosure by current employees imposing costs on employers.

Lastly, we document that the presence of strategic reviews during renegotiations is associated with better contract wage outcomes. The fact that the wage increases in the new CBA contracts is higher in the presence of strategic employee disclosure, suggests that disclosure strengthens employee bargaining power. Overall, our results suggest that strategic employee disclosure impose costs on employers (e.g., difficulty in attracting new employees) and results in better outcomes for existing employees with improved working conditions and higher pay.

We make four primary contributions. First, we provide evidence that employees can use strategic disclosure on social media as one of their renegotiation tactics. Existing literature on union negotiations predominantly takes the perspective of the employers and shows that employers exploit financial reporting and assorted disclosure strategies as bargaining tactics (Aobdia and Cheng, 2018; Aobdia et al., 2023; Bova et al., 2015; Cheng, 2017; D'Souza et al., 2000; Gore et al., 2023; Hilary, 2006; Klasa et al., 2009; Matsa, 2010). Our paper takes the perspective of employees and provides novel evidence that their strategic disclosure can be used during labor union negotiations.

Second, our research brings a novel perspective to the literature examining employees' use of online platforms including social media (e.g., Carter et al., 2023; Chen et al., 2014; Green et al., 2019). Studies in this area show that employee-generated information via online platforms can predict future stock returns and operating performance (Green et al., 2019; Huang et al., 2020), reflects employee feelings about firm activities (Campbell and Shang, 2022; Gadgil and Sockin, 2023; LaViers et al., 2022; Lee et al., 2021), and that firms respond to such information (Dube and Zhu, 2021). We add to this literature by showing that strategy is one of the determinants for employee disclosure.

Third, we show that employees can strategically disclose to harm employers. This finding complements recent papers that examine corporate disclosure aimed at disadvantaging competitors (Bloomfield et al., 2023; Cao et al., 2021; Glaeser and Landsman, 2021). We add a new perspective, where current employees can function similarly to competitors, specifically because incentives between the management and employees diverge, and use disclosure to harm their employer to increase their labor power. Such behavior, while potentially advantageous for the current employees, at least in the short run, can inflict economic damage through the public image of their employer (e.g., Edmans, 2011; Green and Jame, 2013).

Lastly, we contribute to the voluntary disclosure literature by demonstrating that stakeholders, such as employees, engage in disclosure practices consistent with those of firm managers. Previous research in this literature has explored how firm managers strategically disclose information to achieve personal goals (Aboody and Kasznik, 2000; Aghamolla and Smith, 2023; Brockman et al., 2008; Cheng and Lo, 2006; Edmans et al., 2018; Gu and Li, 2007). Similarly, we illustrate that employees also strategically disclose information, aiming to fulfill personal objectives. Moreover, an expanding body of research suggests that non-traditional data can supplement, or even replace, traditional accounting information (Kang, 2024; Miller and Skinner, 2015; Minnis et al., 2024). As technology continues to change firm's information environment, it becomes increasingly important to understand how various parties disclose information. Thus, our study extends the voluntary disclosure literature by broadening its focus from disclosures by firms to those made by stakeholders.

2. Conceptual Framework

2.1 Voluntary discloser and employee disclosure

The traditional voluntary disclosure literature provides insights that help us construct a framework to examine employee disclosure. To start, management has the discretion to disclose firm information that stakeholders or market participants cannot obtain except through its disclosure (Guay et al., 2016).[8] Because firm managers have discretion over the disclosure of the information, they can strategically choose the timing or content of disclosure if they anticipate some firm or personal benefit (Healey and Palepu, 2001). Examples of specific settings where firm managers use strategic disclosures include merger and acquisitions, management stock option expirations, and labor union negotiations (Aboody and Kasznik, 2000; Aobdia and Cheng, 2018; Bova, 2013; Cheng and Lo, 2006; Chung et al., 2016; deHaan et al., 2015; Doyle and Magilke, 2009; Gu and Li, 2007; Kimbrough and Louis, 2011; Lang and Lundholm, 2000; Waterhouse et al., 1993). Similar to firm managers, employees also have information unobservable to stakeholders (Huddart and Lang, 2003).

Whereas firm managers mostly use designated disclosure channels, employees are empowered to disclose through the reach and accessibility of online platforms.Whereas firm managers mostly use designated disclosure channels, employees are empowered to disclose through the reach and accessibility of online platforms.[9] When it comes to labor union negotiations, employees can benefit from such disclosures as they can put pressure on firm managers through external stakeholders, or, alternatively, prompt organizational changes to management. Therefore, disclosure can be used as a strategy for employees to enhance bargaining power during labor negotiations.

Whereas disclosure could potentially help achieve some desired outcomes for both firm managers and employees, there are also frictions in the use of disclosure. Existing literature documents that firm managers face frictions including reduced incentives, litigation costs, and proprietary costs (Core, 2001). Similar to firm managers, employees also face frictions that

[8] Voluntary disclosure is characterized as any disclosure above the mandated requirement (Core, 2001).
[9] A key difference between management and employees is that employee disclosure is not the focus of any regulatory body governing disclosure, which allows for greater freedom in disclosing information that may not be credible.

impose costs of engaging in the strategic behavior. Employees face economic and legal frictions in strategically disclosing information. Economic frictions include strained relationships between employees and management, and potential negative spillover effects (i.e., long-run negative effects of disclosure on the firm could also negatively affect the employees). Legal frictions include potential violations of the NLRA. Violations of the NLRA could impose penalties, fines, reputational damage, and a potential loss of jobs.

Taken together, the insights from voluntary disclosure build out a framework we use to identify how employees disclose information strategically. We first focus on the incentive to disclose by identifying labor union renegotiations as a plausibly exogenous change in employee incentives. We then examine legal frictions that reduce the feasibility of disclosure and related effects of disclosure.

2.2 Defining strategic disclosure

We define "strategic" disclosure as information disclosed by employees that is motivated to influence CBA contract negotiations. Under this definition, bias can be introduced in three ways. First, employees can selectively disclose firm information. Selective disclosure occurs when employees disclose, or refrain from disclosing, information that is true, but is not representative of the information set. Labor unions can initiate selective disclosure by selectively informing employees of certain information. Second, employees could disclose information that does not accurately reflect the employee's genuine experiences. If employees disclose information to influence negotiations, they can provide information that are created, or tailored to influence negotiations. Third, employees can disclose information earlier or later than they would have otherwise.

To external stakeholders, who cannot fully assign an underlying motive to the disclosure, any source of bias would function similarly. This holds especially true if the aim of employee disclosure during renegotiations is to strategically influence outcomes, thereby introducing bias. Thus, we posit that such strategic behavior implicitly indicates the presence of bias. Due to the difficulty of identifying bias empirically, we focus our discussion on strategic behavior alone, but consider bias to be implied.

3. Background on Glassdoor and Labor Contract Renegotiations

3.1 Online reviews

Glassdoor has emerged as the largest firm review and job search website in the United States. The website averages over 50 million monthly visitors and has reviews for over a million businesses worldwide. Launched in 2008, Glassdoor offers employees the opportunity to share reviews publicly about their firms across a variety of topics. Glassdoor reviews consist of three parts – an overall rating, open response, and sub-ratings by category.

Although employees can use any online platform, we focus on employee reviews on Glassdoor.com because it provides our study four main advantages over other online platforms. First, all Glassdoor reviews for a specific firm are posted to the same page, which eliminates potential Type 1 and Type 2 errors that would likely arise when assigning activity from individual online accounts to specific firms. Second, each Glassdoor review represents one employee and is not over/under weighted by platform specific features like profile followings, privacy settings, etc. Third, Glassdoor is consitent across time because it requires standardized ratings ranging from 1 to 5 . Lastly, Glassdoor monitors new reviews manually and with algorithms to detect and remove fraudulent or invalid reviews.

3.2 Contract renegotiations

CBA renegotiation refers to the process of modifying or renewing the terms of a CBA between union employees and their employer. The negotiation process can be complex and contentious because both parties have conflicting incentives. Renegotiations begin when the current contract is approaching expiration (i.e., usually within six months). The entire process, from preparations to conclusion, normally takes four to six months. Unions may aim to negotiate for higher wages, improved benefits, and better working conditions; whereas firms may seek to reduce labor costs, increase productivity, and maintain/increase profitability. The bargaining process involves negotiating teams from both sides, with each side advocating for the interests of their constituents.

The collective bargaining negotiation process is governed by labor laws and regulations. The National Labor Relations Act (NLRA) is federal law that establishes the legal framework for collective bargaining and governs labor-management relations. A violation of the NLRA constitutes a ULP that can result in costly penalties and fines for either the union or the employer. The negotiation process usually begins with a formal exchange of proposals, followed by a series of meetings and discussions aimed at reaching a mutually acceptable agreement. During this process, both parties may use various negotiation tactics and strategies, including strike threats, work slowdowns, and lockouts to gain leverage (Erickson et al., 2002; Gregory, 1949; Kullgren, 2023).

3.3 Employee negotiation tactics and disclosure

The heterogeneity of rank-and-file employee's motivations, coupled with the sparsity of data, has made documenting determinants of employee disclosure difficult. When it comes to unions, the existing interdisciplinary literature on negotiation strategies during union negotiations has focused primarily on employee actions and much less on union strategies (Kallas et al., 2023). Strategies including mailing letters, bargaining committees, contract surveys, solidarity days, and house calls explain more variance in union certification election outcomes than any other group of variables (Bronfenbrenner, 1997). Recent research suggests that, in addition to traditional tactics like highly visible protests and picketing, unions can employ innovative strategies such as filing shareholder proposals to influence negotiation outcomes, though these strategies are limited to the union level (Fisk, 2018; Hitt, 2023;

Matsusaka et al., 2018). Other effective strategies include person-to-person contact, union democracy, the use of pressure tactics, and an emphasis on fairness (Bronfenbrenner and Hickery, 2003).

When it comes to technology, social media and new digital tools are being used to organize and mobilize employees effectively (Flanagan and Walker, 2021; Maffie, 2020). The literature on technology and unions focuses mainly on how unions could engage employees within the union with digital tools, but does not discuss how unions could utilize the technology to strategically disclose information about the employer (Geelan, 2021). Our study provides a new perspective by directly examining the use of technology as a disclosure mechanism against employers in negotiations.

4. Research Design

We use an integrated approach that combines both survey and archival methods to provide a more holistic understanding of how employees strategically disclose on Glassdoor.

4.1 Survey methodology

We began by contacting union representatives in our professional network and conducting a series of information-gathering interviews. Using feedback from these interviews, we developed our initial survey and asked several union representatives who we had interviewed to beta test the survey and provide feedback. We then received IRB approval for our survey through our institution. Potential respondents were found by acquiring contact information for union representatives from The Federal Mediation and Conciliation Service, which requires the Union Chief Negotiator for each CBA to be reported on SEC Form F7. Our survey was distributed electronically, and respondents were notified that their answers were confidential beforehand.[10] We gathered a total of 424 labor union representative responses, a response rate of approximately six percent. After removing incomplete responses and those that incorrectly answer our attention-check question, we are left with 306 usable responses. We summarize survey responses and incorporate them when we subsequently discuss the related archival designs and findings.

4.2 Archival research design

The crux of our archival research design uses the expiration date of CBA contracts to identify periods of time when union employees have greater incentive to act strategically. We specify two quarters before the expiration as the renegotiation period in our study as a new contract is usually agreed upon by the time the old contract expires. The timing of the union renegotiations is consistent with our survey evidence of how long renegotiations typically last. In our sample, the number of renegotiations is distributed evenly by quarter with no period experiencing significant bunching, providing evidence that the renegotiation periods are exogenous. Figure 1 displays the number of renegotiations across time.

We employ an event study approach by restricting our sample to four quarters before, two quarters during, and two quarters after the CBA negotiation period. The unit of analysis in our model is firm-quarter level. For our main analysis, we use the following model:

$$Review\ Activity_{it} = \beta_0 + \beta_1 Negotiation\ Period_{it} + \beta_i X_{it} + \gamma_i + \mu_t + \varepsilon_{it}, \quad (1)$$

Review Activity represents either *Number of Reviews* or *Rating* of the Glassdoor reviews for firm *i* in quarter *t*. *Negotiation Period* is the CBA renegotiation period and is an indicator variable that equals one two quarters before a contract expires and zero otherwise. Following prior studies (e.g., Lee et al., 2021) that use Glassdoor reviews as a dependent variable, we include firm-specific characteristics as controls: return on assets, market-to-book ratio,

[10] Eligible participants were offered the opportunity to enter a drawing for a $1,000 incentive upon survey completion. The incentive details were communicated in the recruitment email, adhering to IRB requirements.

leverage, size.[13] We include earnings surprise, analyst earnings forecast revision around earnings announcements to control for the effects of earnings announcements on Glassdoor reviews (deHaan et al., 2022). To control for the effect of employee jobsearch on Glassdoor reviews, we include employee outflows. We include firm (γ_i) and year-quarter (μ_t) fixed effects. We also report our main results with industry fixed effects using Fama-French 48 industries. The key coefficient β_1 indicates the change in our measures of Glassdoor activity during the negotiation period. We include both firm fixed effects and time fixed effects in our model to capture inherent characteristics that are unique to each firm and specific to each time period. We cluster standard errors at the firm level to account for serial dependence within firms over time, and at the year-quarter level to account for serial dependence across firms due to shared economic or seasonal factors.

5. Data and Sample

5.1 Sample construction

We use the Bloomberg Labor Plus database to identify CBA negotiation periods and variables associated with renegotiations including the representing union and details on employees in the workplace. When CBAs expire, firms must file notices with the Federal Mediation and Conciliation Service. Bloomberg collects these notices, which include the expiration date, and provides them through Labor Plus.

We begin constructing our sample by identifying firms that are in the full Compustat universe, from 2008 up to 2023, and in the Labor Plus dataset.[11] Because Bloomberg Labor Plus is only identified by company name, we fuzzy merge Labor Plus to Compustat by firm name and manually verify the matches. We hand collect URLs for Glassdoor based on our Compustat/Labor Plus merged data and scrape all available reviews from Glassdoor for these

[11] The last quarter in our sample is the Q3 of 2022.

companies. We then merge employee outflows data from Revelio Labs, and analyst forecast data from IBES. After matching data from Compustat, CRSP, Bloomberg Labor Plus, Glassdoor, Revelio Labs, and IBES, we exclude data not in the event study window of eight quarters, leaving the sample with 442 unique firms with 2,348 renegotiations comprising 7,363 firm-quarter observations.

Table 1 provides descriptive statistics for variables related to the union renegotiations.[12] Most quarters have somewhere between 32 and 46 renegotiations with the average being approximately 38. For the full sample, firms are in renegotiations on average 27% of the time, consistent with the average CBA lasting three years in our survey of union representatives.[13] Table 1 also presents the average number of total employees in a workplace and average number of employees covered by each renegotiation. There is an average of 1,419 employees in each workplace and 407 covered union employees for each CBA negotiation.[14] Lastly, *Exposure to RTW* represents how exposed a firm's workforce is to RTW laws. We calculate exposure at the union level as the percentage of a union's CBA contracts that are in states with RTW laws, relative to all the union's CBA contracts.

5.2 Sample summary statistics

Table 2 provides the remaining descriptive statistics for our data sample. *Number of Reviews* is the total number of Glassdoor reviews in a quarter scaled by the firm's average number of quarterly reviews. The mean *Number of Reviews* for firms in our sample is 0.996. *Rating* represents the overall review score with a sample average of 3.216 out of 5.00.[15] If a firm has no reviews for a given period, we set the number of reviews to zero for the quarter to

[12] Table 2 provides descriptive statistics for variables other than the union negotiations.
[13] Some firms have more than one union covering workplaces. We are examining firm level effects, so we treat each negotiation independently. However, when restricted to firms with only one union our tests remain consistent in magnitude and significance.
[14] Number of employees in workplace and number of employees covered by the CBA are from Bloomberg Labor Plus.
[15] A higher score reflects a better opinion of the firm.

avoid bias caused by omitted observations (Schafer and Graham, 2002). However, because missing reviews have no review score associated with them, we leave them as missing to not introduce downward bias, resulting in a fewer number of observations for *Rating* compared to *Number of Reviews*.

6. Renegotiations and Firm Reviews

6.1 Union representatives' perspectives on impacting the public image of firms

We start this section by examining survey responses from union representatives to questions about how they view the public image of firms as part of renegotiations and how employees are instructed to engage with their firms during renegotiations. Figure 2 (#3) shows that about 53% of union representatives always or often encourage union employees to bring public awareness to how their labor conditions or contract can be improved, with another 29% of union representatives sometimes encouraging union employees. Further, Figure 2 (#4) reveals that about 53% of union employees state that the public image of the firm is always or often a factor when negotiating and 30% say it is sometimes a factor.

Consistent with the survey questions suggesting that union representatives push for union employees to engage with platforms that would influence their firm's public image, Figure 3 reports that 81% of union representatives encourage union members to use online reviews or social media, more than the traditional strategies of boycotts and picketing (74.1%) and striking (57.6%). Word of mouth is the most common strategy employed, with 92.1% of union representatives using word of mouth. Intuitively, Figure 3 suggests that union representatives implement lower-effort strategies, such as social media, before higher-effort strategies, such as strikes.

Supporting our choice to use Glassdoor to capture strategic reviews on social media, Figure 2 (#6) shows that about 44% of union representatives believe that firms always or often care about their online reviews like Glassdoor.com, 34% believe that firms sometimes care, with only about 21% rarely or never caring. Figure 2 (#6) provides evidence that if employees are strategically using online platforms, then Glassdoor is a platform that many union representatives believe firms would care about.

6.2 The relation between contract renegotiations and the number of firm reviews

Table 3 reports the results of estimating Equation (1) with *Number of Reviews* as the dependent variable. We separately include firm or industry fixed effects as indicated. Across all specifications *Negotiation Period* is positive and statistically significant. In Column (2), the coefficient on *Negotiation Period* suggests that employees provide 6.7 percentage point more reviews during renegotiations. The coefficient represents a quarterly effect, so the increased reviews of 6.7 percentage points occur on average in each quarter during renegotiations. Using the within fixed effects standard deviation of *Number of Reviews* of 0.878 as a benchmark, the economic magnitude of the coefficient indicates an increase of about 7.3% of the standard deviation during the negotiation period.[16]

Column 4 reports that the coefficient on *Negotiation Period* is consistent when using firm fixed effects and controls (Coef = 0.060, *t*-statistic = 2.575). These results demonstrate that during the CBA renegotiation period, there is more engagement on Glassdoor with an increase in the number of reviews that are posted.

6.3 The relation between contract renegotiations and the average rating of firm reviews

Next, we estimate Equation (1) with *Rating* as the *Review Activity* to examine the sentiment of the increased Glassdoor activity. Table 4 presents the results. Column (2) shows the coefficient on *Negotiation Period* is negative and statistically significant when estimated

[16] Instead of the raw variation, we use the within-FE variation for cleaner interpretation (deHaan and Bruer, 2024). We divide the coefficient value of 0.067 by the standard deviation of 0.878 to calculate the economic magnitude.

with industry fixed effects and including controls (Coef = -0.037, *t*-statistic = -2.073).[17] Using the within fixed effects standard deviation of *Rating* of 0.710 as a benchmark, the economic magnitude of the coefficient indicates a decrease of about 5.32% of the standard deviation during the negotiation period. Like *Number of Reviews*, each negotiation would have two quarters of reviews with lower ratings. Column (4) shows the coefficient on *Negotiation Period* is negative and statistically significant when estimated with industry fixed effects and including controls (Coef = -0.037, t-statistic = -2.082). These results document that the sentiment of reviews during CBA renegotiation periods is more negative. Coupled with our results on the number of reviews increasing from Section 6.2, Glassdoor activity increases and is more critical of the firm during CBA negotiation periods.

6.4 Robustness

To show that our results are robust to alternative specifications, we re-estimate our models two different ways. First, we re-estimate the main effects using a stacked difference-in-difference design. The stacked difference-in-difference approach enables us to assess the impact of renegotiations on Glassdoor activity by comparing it with similar firms during the same time period. We follow the methodology of several recent studies that either encourage the use of, or use, a stacked difference-in-difference design (Baker et al., 2022; Balakrishnan et al., 2014; Barrios, 2021; Gormley and Matsa, 2011).

From our sample of firms, we define a firm in renegotiation as treated for the event window we use for our main analysis (four quarters before, two quarters during, two quarters after). For each unit within our treatment group, we identified three control units using propensity score matching on our vector of controls. Control units are selected from firms that belong to our sample of union firms but who are not in renegotiations over the same period.

[17] The coefficient size is similar to that in studies examining significant external corporate events (e.g., Lee et al., 2021)

Table 5 reports results from our stacked difference-in-difference analysis. Column (1) shows that *Number of Reviews* is significantly positive (Coef = 0.073, t-statistic =1.965), and *Rating* is significantly negative (Coef = -0.072, t-statistic =-2.701). These results give further confidence that main finding is robust.

Second, in Table 6 we re-estimate Equation (1) with an alternative fixed effect's structure. First, to control for industry-specific trends over time we include industry-by-year-quarter fixed effects in addition to firm fixed effects. Second, to control for local labor conditions we include state-by-quarter fixed effects in addition to firm fixed effects. Panel A of Table 6 presents the results for *Number of Reviews*. Column (1) shows that the effects are robust to inclusion industry-time fixed effects (Coef = 0.051, t-statistic = 2.255) and Column (2) shows that the effects are robust to inclusion of state-time fixed effects (Coef = 0.042, t-statistic = 1.690). Panel B of Table 6 presents the results for *Rating*. Column (1) shows that the effects are robust to inclusion industry-time fixed effects (Coef = -0.033, t-statistic = -1.807) and Column (2) reports that the effects are robust to inclusion of state-time fixed effects (Coef= -0.036, t-statistic = -1.778). These tests provide additional confidence that our main inferences are not driven by industry-specific trends over time or state-specific trends over time.

The additional tests in this section, stacked difference-in-difference design and results using industry-by-quarter and state-by-quarter fixed effects, add additional robustness to our main results. The results also provide further evidence that number of reviews and ratings are consistently associated with the incentives of employees over time, helping to validate our setting.

6.5 Review text

The previous sections document that there is an increase in Glassdoor activity during renegotiations, and that ratings become more negative. To further understand the content of the reviews, we descriptively examine patterns in the text using generative AI. To examine patterns in the text, we create four topic dictionaries with words and phrases related to negotiations. The dictionaries are created by providing examples of Glassdoor reviews to GPT-4 and then prompting GPT-4 to identify topics. After identifying four topics, GPT-4 created dictionaries that contain words and phrases to identify these topics in the reviews.

Details on our classification can be found in Appendix B, including the four topics, an explanation of the topics, and the dictionary used to identify each topic. The four topics capture various aspects of employee reviews. First, *Employee Compensation and Benefits* captures employees reporting on the benefits and compensation of the firm, which is one of the main areas of discussion during renegotiations. Second, *Workplace Conditions* captures deficiencies in working conditions, which is another important topic during renegotiations. Third, *Employment Red Flags* captures review comments that are targeted at making employment less attractive to prospective employees, which can strengthen existing employees' bargaining power. Lastly, *Leadership and Management Advice* are critiques of company leadership, pointing out where there may be potential weakness.[18]

Figure 5 reports the frequency of the four topics in the reviews, broken out by time periods relative to negotiations, consistent with our event study design. *Before* is the four quarters before renegotiations. *During* is the two quarters during renegotiations. *After* is the two quarters after negotiations. The frequency of keyword mentions is standardized by quarter, and made relative to the *During* period, to avoid mechanical inflation because of an increased number of reviews in the *During* quarter. Across all four topics, we find that the *During* period has a larger proportion of its textual content that reflects the four categories. It is also interesting to note that the frequency is higher *Before* than *After* for the Topic 1, Topic 2, and Topic 3. The

[18] Examples of words included in each dictionary are as follows: 1) Employee compensation and benefits: "lacking benefits", "noncompetitive pay", and "limited time off"; 2) Workplace conditions: "unsafe working conditions", "chronic understaffing", and "excessive overtime demands"; 3) Employment red flags: "better opportunities elsewhere", "misleading job descriptions", and "career dead-end"; 4) Leadership and management advice: "out of touch with reality", "ignores employee concerns", and "stop micromanaging"

patterns in the text used by employees suggests that they use language that is consistent with what might be expected from employees who are trying to increase their bargaining power through pointing out weaknesses in their contracts and discouraging prospective employees.

7. Glassdoor Reviews as a Strategic Behavior

Our primary empirical findings indicate that Glassdoor activity changes during renegotiations, supporting the notion that employees act in line with their incentives. Additionally, our survey evidence suggests that strategic disclosure plays a significant role. Nonetheless, to further substantiate that the disclosure is strategic, we expand our analysis to encompass not only employee incentives but also survey questions about the workplace environment and empirical analyses of frictions within labor unions.

7.1 Survey evidence on strategic behavior

It could be the case that the change in Glassdoor activity from employees during renegotiations is not strategic, but due to various other reasons. One reason may be an increase in friction between union and non-union employees during renegotiations. Figure 2 (#5) reports that only about 19% of union representatives believe that non-union employees are unsupportive, whereas about 42% believe that non-union employees are always or often supportive and about 38% believe non-union employees are sometimes supportive. Furthermore, Figure 2 (#10) reports that about 46% of union representatives state that union renegotiations rarely or never strain relationships between union and non-union employees, with another 40% believing that renegotiations sometimes strain relationships and only 15% believing that relationships are always or often strained. In both Figure 2 (#5) and Figure 2 (#10), union representatives offer evidence that the most common experience during renegotiations is for non-union employees to be supportive of renegotiations and that the relations between union and non-union employees remain unstrained.

Although relationships between union employees and non-union employees do not appear to be frequently damaged because of renegotiations, the renegotiation process is not without tense feelings. Figure 2 (#7) reports levels of negative feelings between union representatives and firm representatives with about 28% always or often having negative feelings, 56% sometimes having negative feelings, and only 16% rarely or never having negative feelings. Figure 2 (#7) provides evidence that the union survey-responding representatives are not simply painting a rosy picture of the relationship between union and non-union employees in (#5) and (#10) of Figure 2, but that such tensions are typically between the employer and union representatives not the employees themselves.

Lastly, we explicitly ask if frustration or strategy is the driving force of employees expressing negative opinions of their firm. Figure 2 (#8) reports that about 30% of union representatives believe that negative opinions from firms are always or often expressed to strategically help with renegotiations, with 42% believing that negative opinions are sometimes written to help with renegotiations, and 29% believing that the negative opinions are rarely or never to help with renegotiations. These responses give us insight into the strategic motivation of employees with more than 70% of union representatives believing that employees are sharing negative opinions to help with negotiations, at least sometimes.

7.2 Cross-sectional tests on right to work laws

Our first archival test of strategic disclosure as a potential explanation of the increased Glassdoor activity during renegotiations uses variation in union exposure to RTW laws. After the Taft-Hatley Act of 1947, workers cannot be required to join a union. However, once formed, unions are required to represent all employees in a workplace regardless of their union status, including representing non-union workers who may be in dispute with management (Traub, 2017). In states that do not have RTW laws, unions can charge fees to non-union members to compensate unions for providing the legally required representation, however unions in states with RTW laws cannot charge such fees but are still required to represent non-union employees.[19]

Consistent with RTW laws constraining unions, our survey responses reveal a strongly-held belief among union representatives that RTW laws either do, or would, hurt a union's ability to organize its members. As illustrated in Figure 2 (#1), a substantial majority of union representatives, about 70%, believe that these laws often or always hurt contract renegotiations for union members with another 15% indicating that RTW laws would hurt contract renegotiations sometimes. This negative perception towards RTW is further reflected in Figure 2 (#2) where about 60% of representatives believe that RTW laws always or often undermine the union's ability to engage members during renegotiations and another 20% of representatives believe that union ability to negotiate would be undermined. (#1) and (#2) of Figure 2 reflect a common belief among union leaders about the weakening effect of RTW laws on their bargaining power.

In the next test we empirically examine how RTW laws affect Glassdoor activity. We measure the exposure to RTW laws on the union level as the percentage of CBA contracts a union has in states with RTW laws to total CBA contracts. We then apply the union level RTW exposure to firms based on which union represents their CBA contract under renegotiations. To create the subsample test, we split the sample on the median exposure to RTW laws by union and estimate Equation (1) with the median split. We report the results in Table 7.

Table 7 reports that the coefficient for *Negotiation Period* is significantly positive for *Number of Reviews* in Column (1) (Coef = 0.075, *t*-statistic = 2.007) and significantly negative for *Rating* in Column (3) (Coef = -0.07, *t*-statistic = -1.957) for firms whose unions have low-

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[19] As of 2023, 26 states have enacted right-to-work-laws. The 26 states include Alabama, Arizona, Arkansas, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Nebraska, Nevada, North Carolina, North Dakota, Oklahoma, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Wisconsin, West Virginia, and Wyoming.

RTW law exposure. The coefficient on *Number of Reviews (Rating)* for firms with high-RTW exposed unions is statistically insignificant in Column (2) and Column (4), and also significantly lower (higher) from the coefficient on their counterparts in low-RTW exposed unions.[20] These tests document that companies whose unions are less exposed to constraining RTW laws garner a greater number of reviews and have reviews that are more negative during renegotiations, providing further evidence that the ability of the union to engage employees is an important factor for Glassdoor activity.

7.3 Cross-sectional tests on union-level legal risk

Our next tests examine union-level legal exposure due to unfair labor practices (ULP). ULPs are violations of the NLRA, federal law governing union-employee relations. Employers, unions, and individuals can all receive ULP's, which come with various fines and penalties. Because of the costs, union-level legal exposure can prevent unions from engaging or organizing members for strategic employee disclosure. Anecdotally, one of the union representatives we interviewed reported that if a union representative was responsible for the union receiving more than two ULPs they were automatically fired from the Union. If unions are responsible for coordinating the reviews, we would expect the Glassdoor activity during negotiations to be less strategic when they are exposed to more ULPs. We acquire data through a Freedom of Information Act (FOIA) request for detailed information on ULP charges filed from FY 2003 to 2023. We divide our sample into low and high legal exposure unions based on the median number of unions receiving ULP in the prior year, after assigning all unions with no ULPs as low legal exposure and compare the Glassdoor activities between the two groups in subsample tests.

[20] The p-value of the statistical difference between the two coefficients is less than 10%. We perform the test of significant difference by fitting two separate regressions, each for a different subsample, and then used a Wald test to compare the coefficient on *Negotiation Period* between the two subsamples. The same method is applied throughout the paper, unless otherwise specified.

Table 8 reports the coefficient for *Negotiation Period* is significantly positive for *Number of Reviews* in Column (1) (Coef = 0.080, t-statistic = 2.650) and significantly negative for *Rating* in Column (3) (Coef = -0.064, t-statistic = -1.957) for firms whose unions have low legal exposure. The coefficient on *Number of Reviews (Rating)* for firms with high-RTW exposed unions is statistically insignificant in Column (2) and Column (4). *Rating* for firms with low legal exposure is significantly lower for firms with high legal exposure. While the test of difference is not significant for *Number of Reviews*, the results are only significant for low legal exposure firm. This correlation between legal exposure at the union level and Glassdoor usage provides evidence for the strategic use of the platform, suggesting that employees are affected by the legal considerations of their union in their disclosure behavior.

The results of testing RTW laws and ULP exposure, collectively, provide circumstantial evidence of strategic behavior being an important determinant of the Glassdoor activity observed during negotiations, corroborating the survey responses from union representatives.

8. Strategic Reviews and Outcomes

We next examine outcomes of strategic reviews. For union employees to disclose strategic reviews, it must be that they believe the reviews can either affect the firm or have some benefit to themselves. As such, examining potential outcomes that may motivate union employees can help provide evidence, and explanation, for employee's strategic disclosure. We examine three outcomes, which are OSHA incidents, the time it takes to fill jobs, and contract outcomes.

To examine the three outcomes of strategic reviews, we use the following regression model:

$$Outcome_{it} = \beta_0 + \beta_1 Normal\ Negative\ Reviews_{it} + \beta_2 Strategic\ Negative\ Reviews_{it} + \beta X_{it} + \gamma_i + \mu_t + \varepsilon_{it}, \quad (2)$$

We classify reviews as *Strategic Negative Reviews* if they occur during the CBA negotiation period or *Normal Negative Reviews* if they occur outside of the CBA negotiation period. Including *Normal Negative Reviews* provides a benchmark for the reviews that are not strategic.[21] *Strategic Negative Reviews* (*Normal Negative Reviews)* is an indicator variable that equals one if the company's reviews during the CBA negotiation period (non-negotiation period) are below the cumulative average of the company's overall rating in the previous quarter, and represents the effect the reviews would have on the overall company statistic.[22] We include firm (γ_i) and year-quarter (μ_t) fixed effects as in Equation (1). The key coefficients β_1 and β_2 indicate if each outcome variable is associated with *Normal Negative Reviews* and *Strategic Negative Reviews*, respectively. The unit of analysis in Equation (2) is firm-quarter level. We retain the same control variables used in our main analysis.

The variable *Outcome* represents firm-quarter level variables for the dependent variable for each of three tests, which are 1) the number of OSHA violations for two subsequent quarters; 2) average time to fill jobs for two subsequent quarters; and 3) the percentage wage increase of the CBA contract.

Any analysis examining the effectiveness of a negotiation strategy would need to fully disentangle other strategies that occur simultaneously to claim identification of a causal relation. Many of these strategies are unobservable. For example, we are unable to observe discussions at the bargaining table between union representatives and company representatives. Because

[21] We re-emphasize that it is likely not all reviews in negotiation periods are strategic and that reviews during non-negotiation periods can be strategic. We assert based on our previous tests that the aggregate composition of the reviews during the CBA negotiation period are more strategic than those in non-negotiation periods.

[22] Our classification of negative reviews follows the method that Glassdoor offers as summary statistics on company profiles, including trend analysis. By comparing the current quarter to the cumulative average, we capture the changes that would be visible in time trends that are displayed on the Glassdoor platform.

we cannot fully disentangle the effect of various strategies, we do not claim a causal relation in our analysis of outcomes. Instead, we provide analysis that strategic disclosure is predictive of favorable outcomes for employees, and to substantiate that employee belief in disclosure as a strategic tool is warranted.

8.1 OSHA incidents

We examine if strategic reviews help CBA negotiations improve workplace conditions. Because workplace conditions are largely unobservable to us, we follow Caskey and Ozel (2017) and Cohn et al. (2021), and examine OSHA incidents as a measure of workplace safety. A reduction in the number of OSHA incidents post-disclosure would suggest that strategic reviews have a positive influence on workplace conditions, potentially due to changes in the CBA contract or management awareness. This test provides empirical evidence supporting the notion that strategic disclosures can lead to improvements in workplace conditions.

We collect data on OSHA incidents from the OSHA website and link it to our sample using data from Caskey and Ozel (2017). We calculate the dependent variable *OSHA Incidents* by scaling the number of OSHA incidents by the average quarterly number of OSHA incidents, consistent with our scaling of *Number of Reviews* in our main specifications.

Column (1) of Table 9 presents the results of estimating Equation (2) on *OSHA Incidents* for the subsequent two quarters post CBA negotiation. The table reports a negative and significant coefficient on *Strategic Negative Reviews* (Coef = -0.01, t-statistic = -1.728). The coefficient on *Normal Negative Reviews* is not significant (Coef = -0.002, t-statistic = -0.407). The coefficient of -0.01 on *Strategic Negative Reviews* means that there is one percentage point less OSHA incidents following negotiation when employees strategically disclose information. The evidence suggests that workplace conditions improve in periods following strategic reviews, which indicates either the contract improved, or perhaps management pay attention to the disclosure. Interestingly, the effects are not found during periods that are not during CBA renegotiations. We interpret this finding as evidence that strategic disclosure is correlated with improvement in workplace conditions, a first order goal of the CBA negotiations for employees.

8.2 Time to fill jobs

We examine the time it takes for firms to fill jobs using workflow data obtained from Revelio Labs. Prospective employees are the stakeholder group that Glassdoor explicitly targets. Further, labor union employees can increase their bargaining power if it is more difficult for their employer to find new employees. Strategic disclosure could inflict potential damage on the firm's reputation and the perceived quality of the work environment, which in turn could deter prospective employees from applying for jobs at the affected company. If firms have difficulty hiring new employees, existing employees gain leverage, strengthening their position to negotiate improved compensation and working conditions. We use the time it takes to fill new jobs as a measure of hiring frictions (Chen and Li, 2023) that a firm faces to examine if strategic disclosure affects future employment.

We create the variable *Time to Fill Job* by computing the average time to fill a job posting and scale it by the quarterly average time to fill a job posting. The data we obtained from Revelio Labs on job postings starts in 2019, so we drop observations before the job posting data is populated.

Column (2) of Table 9 presents the results of estimating Equation (2) on *Time to Fill Job* for the subsequent two quarters post CBA negotiation. The table reports a positive and significant coefficient on *Strategic Negative Reviews* (Coef = 0.234, t-statistic = 2.809). The coefficient on *Normal Negative Reviews* is also significant (Coef = 0.155, t-statistic = 1.794). Following negotiations that have strategic negative reviews, firms take longer to fill new positions by about 23.4 percentage point, and about 15.5 percentage points longer for normal reviews. The similar increases in the time it takes to fill jobs is suggestive of prospective employees not discounting reviews generated during negotiations and using them to update their own priors.

8.3 Contract outcomes

Lastly, we examine whether unions that use strategic reviews during renegotiations achieve better contract outcomes. Specifically, we test whether there is a higher average annual percentage increase in wages in the new CBAs when strategic disclosures are used. A significant increase in wage rates in contracts would provide further evidence of how disclosures can enhance bargaining positions of employees. This outcome test provides evidence that employee reviews are not just mere grievances but could be a useful tool in improving economic terms of employees.

We search the Bloomberg Labor Plus Settlement Summaries database for the finalized contracts of the CBA renegotiations in our sample. The Settlement Summaries database is compiled from Bloomberg Law researchers who identify and record contracts from both internal and external sources, including news reports. Because of heterogeneity in the contract outcomes, we focus on wage increase and we standardize wage adjustments into annual percentage increase over the life of the contract, named *Wage Percent Increase*. After hand matching contracts and retaining only contracts where we can calculate percentage increase, we are left with 177 contracts.

Table 10 presents the results of estimating Equation (2) with *Strategic Negative Reviews* and control variables on annual *Wage Percent Increase*. Since there is only one contract outcome per CBA negotiation, each negotiation period has one observation. After requiring non-missing control variables and including firm fixed effects, we lose a portion of our sample, so we report results with both firm/industry fixed effects and with/without control variables for descriptive completeness. Table 10 reports a positive and significant coefficient across all specifications. Focusing on Column (2) of the table, where we report results with industry and time fixed effects, the coefficient on *Strategic Negative Reviews* (Coef = 1.204, t-statistic = 2.206) indicates that CBA negotiations where employees use strategic disclosure have a 1.204 percent higher increase in annual wage percent increase. While the smaller number of observations makes it difficult to claim causality between the reviews and the contract outcomes, it is suggestive evidence in that it shows where strategic behavior can be documented we also find better contract outcomes.

Examining outcomes helps strengthen the case for strategic employee disclosure. Employees must ex-ante believe that their use of Glassdoor can influence ex-post outcomes for them to engage in strategic behavior. Results from testing OSHA incidents and contract outcomes show that the Glassdoor activity during CBA negotiations is correlated with better outcomes for employees. Additionally, testing how strategic reviews affect the filling time for job posting provides evidence that the activity can directly affect their firms through the labor market. These tests collectively provide evidence that employee disclosure can influence ex-post outcomes for employees in a positive manner, consistent with our voluntary disclosure framework.

9. Alternative Explanations

In this section, we examine three potential alternative explanations for the change in Glassdoor behavior during renegotiations.

9.1 Worker outflows

First, we examine whether changes in employee disclosure are the result of employees leaving the company as the result of CBA renegotiations. A unique feature of Glassdoor is that without an existing account, employees must leave a review before they can view other reviews. Prior research uses Glassdoor to document job search through review numbers and finds that employees are more likely to seek new jobs when they obtain new information through major corporate events such as earnings announcements (Choi et al., 2023; deHaan et al., 2023). This alternative explanation is particularly salient when considered in conjunction to our main results because leaving employees may be more likely to leave negative reviews. Further, like prior research, employees during contract renegotiations could also obtain new information, which could then influence them to look for new jobs. To examine this alternative explanation, we test whether the employee outflows during the negotiation period increase.

Column (1) of Table 11 estimates the effect of *Negotiation Period* on employee outflows. The *Negotiation Period* coefficient is statistically insignificant (Coef = -0.243, t-statistic = -1.330). This result shows that there are no significant employee outflows during the period of CBA negotiations, providing evidence that our main result is not driven by employees changing jobs. These results are also consistent with anecdotal evidence from the union representatives we interviewed, one of whom said, "There aren't enough leaves or hires during that time [renegotiations] to say there are patterns of employees leaving during negotiations. It would be more likely that less employees are leaving because of potential retroactive benefits."

9.2 Cosine similarity

Second, we examine whether changes in employee disclosure are the result of a small number of union representatives writing many reviews during CBA renegotiations. Whereas this explanation is not completely different from our main explanation of strategic reviews, these results would not support the inference that it is the employees who strategically disclose information and may weaken the generalizability of our study. To examine this alternative explanation, we assume that if a small group of individuals are responsible for the reviews, the text of the reviews would become more similar. Under this assumption we examine if the reviews become more similar by using the cosine similarity of the text of the reviews each quarter.

Column (2) of Table 11 estimates the effect of *Negotiation Period* on *Cosine Similarity*. The *Negotiation Period* coefficient is statistically insignificant (Coef = 0.000, t-statistic = 0.093). The *Cosine Similarity* among employee reviews during CBA negotiation is not statistically different from non-negotiation periods. This result provides evidence that employee disclosure during CBA negotiations is more likely the result of individual employees writing reviews rather than a small number of individuals manipulating employee reviews during the negotiation period.

9.3 Business outlook

Lastly, we examine whether employees mindlessly sabotage their employers instead of strategically disclosing information. If employees are mindlessly sabotaging, we would expect all aspects of the reviews to be negative. However, if employees are strategically disclosing, they would want to increase their own bargaining power, but also not hurt the employer in the long run. To examine this explanation, we test whether the business outlook rating on Glassdoor is negatively affected during the negotiation period. The business outlook rating is considered the most "forward" looking aspect of Glassdoor reviews (Hales et al., 2018), and we expect that if employees who plan on staying at the firm are being strategic, they would avoid indicating negative sentiments about the long-term prospect of their employer. The business outlook section of the Glassdoor review has three options, positive, negative, or neutral. We construct the variable *Business Outlook* as the ratio of reviews that selected "negative outlook" to the total number of reviews.

Column (3) of Table 13 estimates the effect of *Negotiation Period* on *Business Outlook*. The *Negotiation Period* coefficient is statistically insignificant (Coef = 0.001, t-statistic = 0.330). This result shows that while overall ratings decrease, the business outlook rating during CBA negotiation does not. While employees are systematically lowering the ratings of their firms, they appear to be tactfully avoiding harming the long-term reputation of their employer.

10. Conclusion

Taken together, our findings suggest that employees strategically disclose information when they have negotiation incentives that may not be fully aligned with their firm, and that their disclosure can bring about economic consequences. While our study provides valuable insights into the strategic disclosure of employees on online platforms, we acknowledge some inherent limitations. Firstly, our focus on public companies may restrict the generalizability of our findings to private firms and public sector entities. Examining strategic employee disclosure in diverse organizations can offer a broader understanding of its prevalence and implications for both employees and employers. Secondly, while our study examines the impact of strategic employee disclosure on Glassdoor, it is possible that employees engage in similar practices on other social media platforms, such as Twitter, Facebook, or LinkedIn. Investigating strategic employee disclosure on a broader range of social media platforms could provide a more comprehensive understanding of employees' communication strategies. Lastly, we only examine one of many possible strategies used by employees. It is likely that other strategies are being used concurrently. The interaction between these strategies and employee disclosure is an area for further research.

Acknowledging these limitations, our study provides insights into how employees can strategically disclose against their firms using online platforms with survey and archival analysis. Our survey of labor union representatives provides evidence that labor unions strategically target their firms. Archivally, we analyze the number of reviews and overall ratings on Glassdoor, the largest website for employees to anonymously review companies, around the CBA renegotiations. We find that the number of reviews is higher, and the overall ratings are more negative during the labor contract negotiation.

To identify the underlying mechanism for these employee disclosure, we extend the voluntary disclosure literature and examine the frictions that may keep union employees from engaging in strategic behavior, and the outcomes of their strategic disclosure. Consistent with our survey responses that suggest the reviews are strategic, we document that Glassdoor activity is correlated with exposure to RTW laws that weaken union power and union legal exposure using ULPs. Next, we examine outcomes of strategic reviews, and show that workplaces improve using OSHA data, and that firms take longer to fill jobs after experiencing strategic reviews. Lastly, we show that the annual wage increase is higher when unions use strategic disclosure.

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Figure 1. Number of union renegotiations by quarter

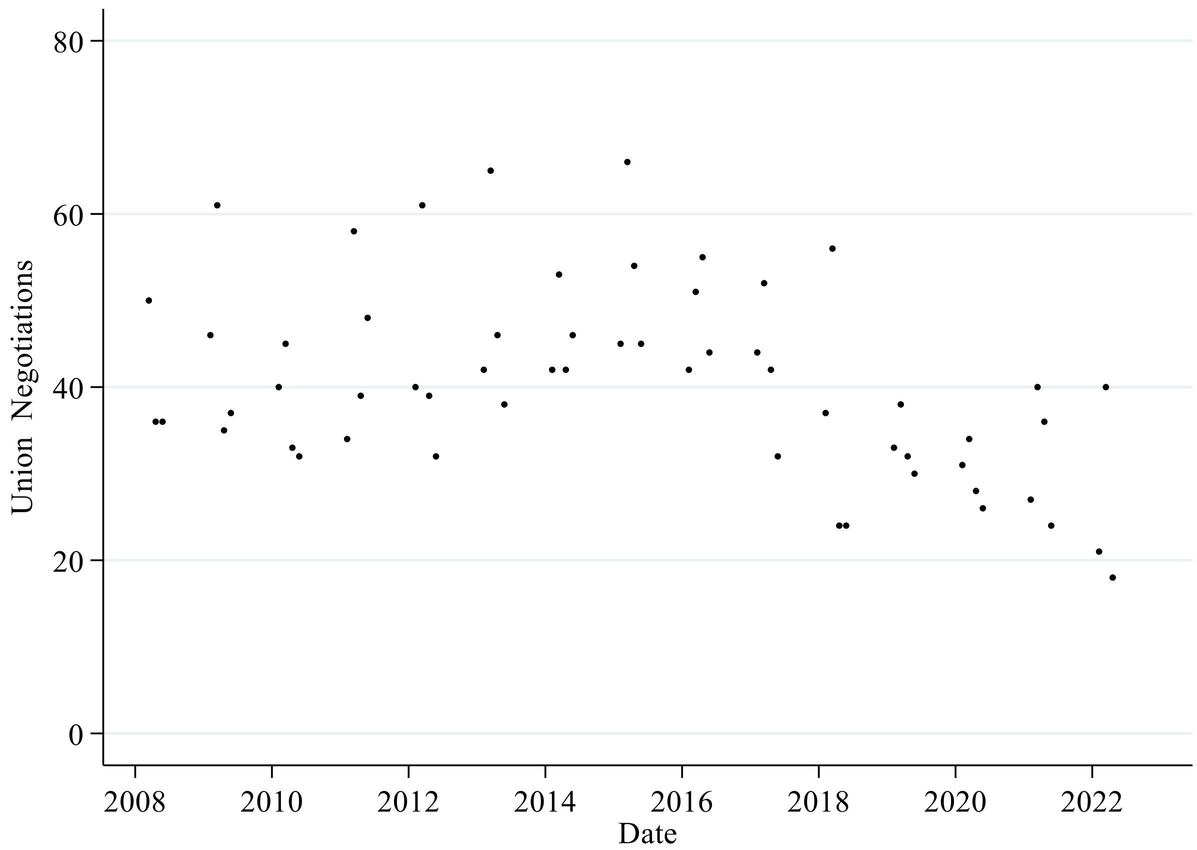


Figure 2. Survey responses about renegotiations

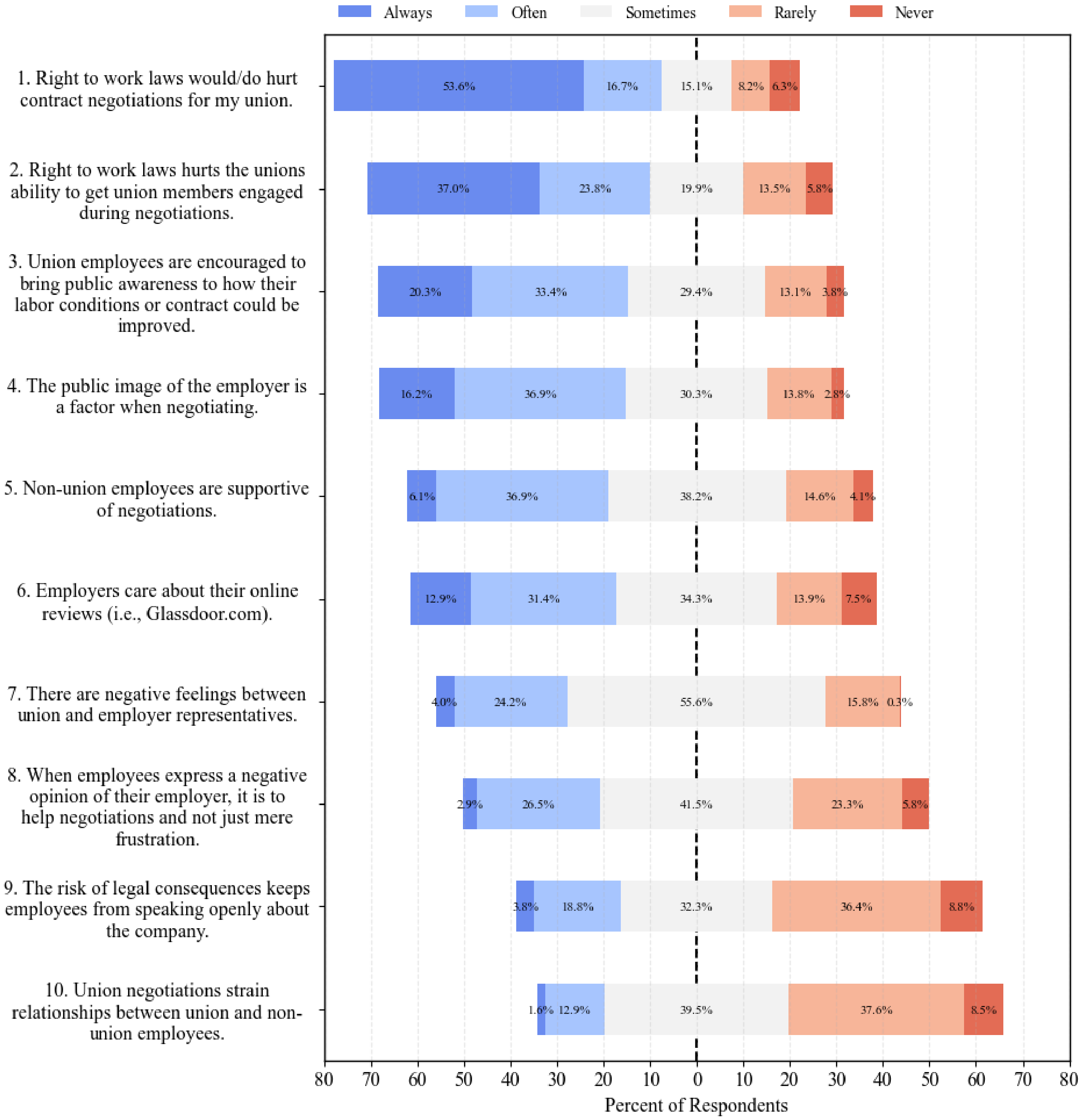


Figure 3. Survey response about tactics

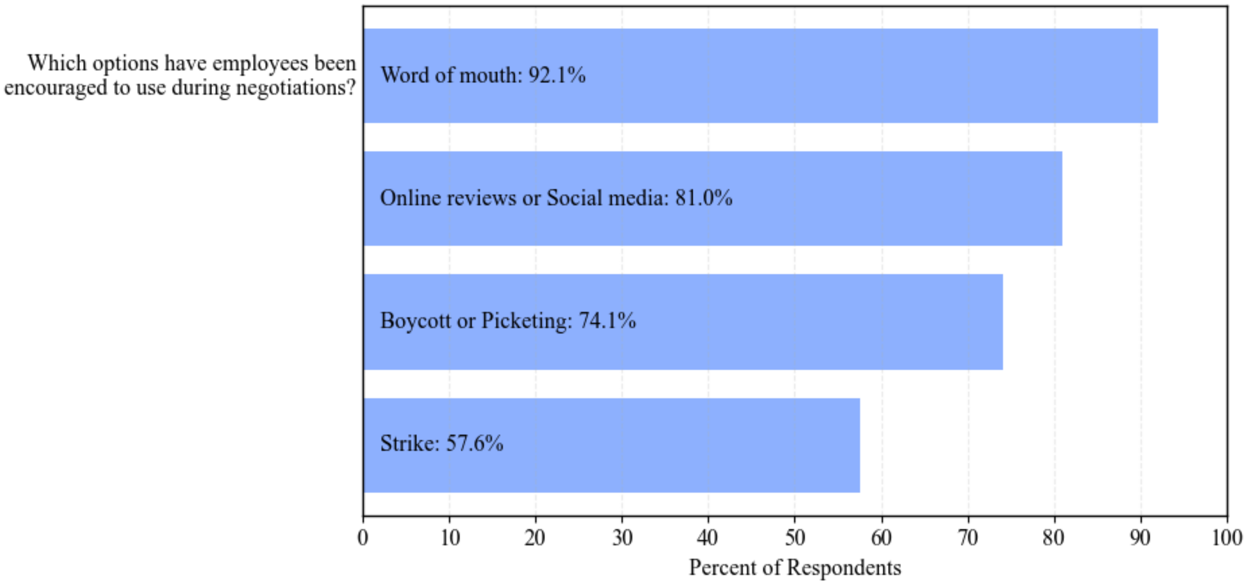
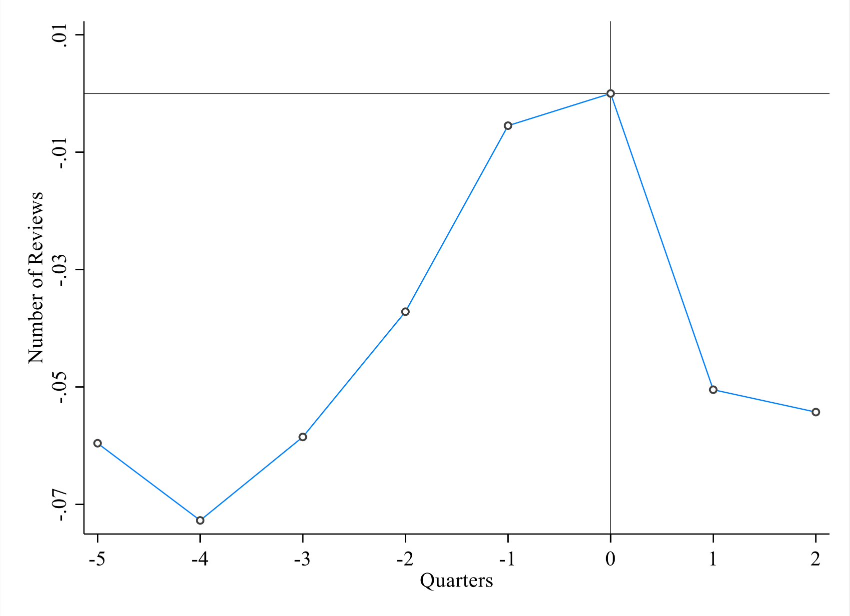


Figure 4. Glassdoor activity around renegotiations

Panel A: *Number of Reviews* around renegotiations. This figure plots the number of reviews relative to the last month of CBA contract renegotiations. Number of reviews is orthogonalized against firm-year fixed effects.



Panel B: *Rating* around renegotiations. This figure plots rating of reviews relative to the last month of CBA contract renegotiations. Rating is orthogonalized against firm-year fixed effects.

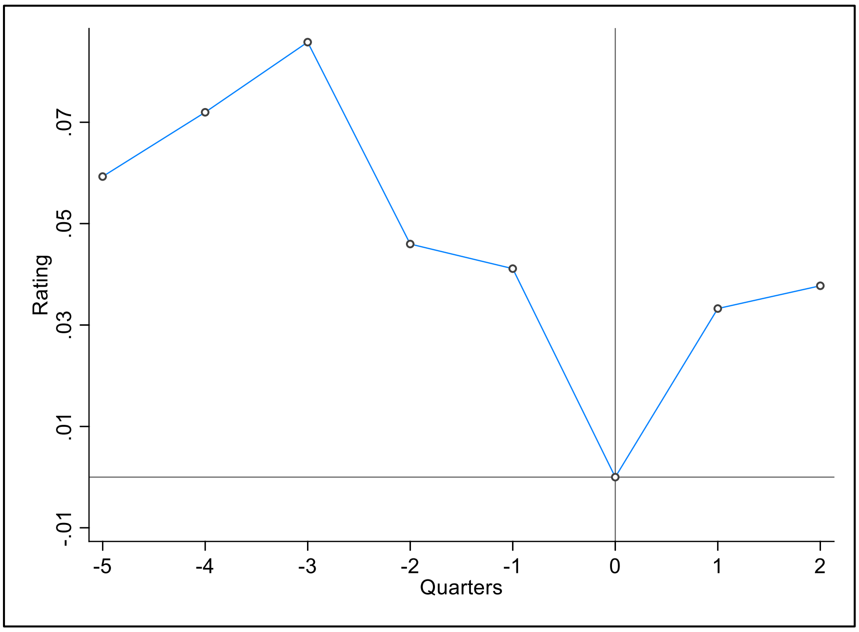
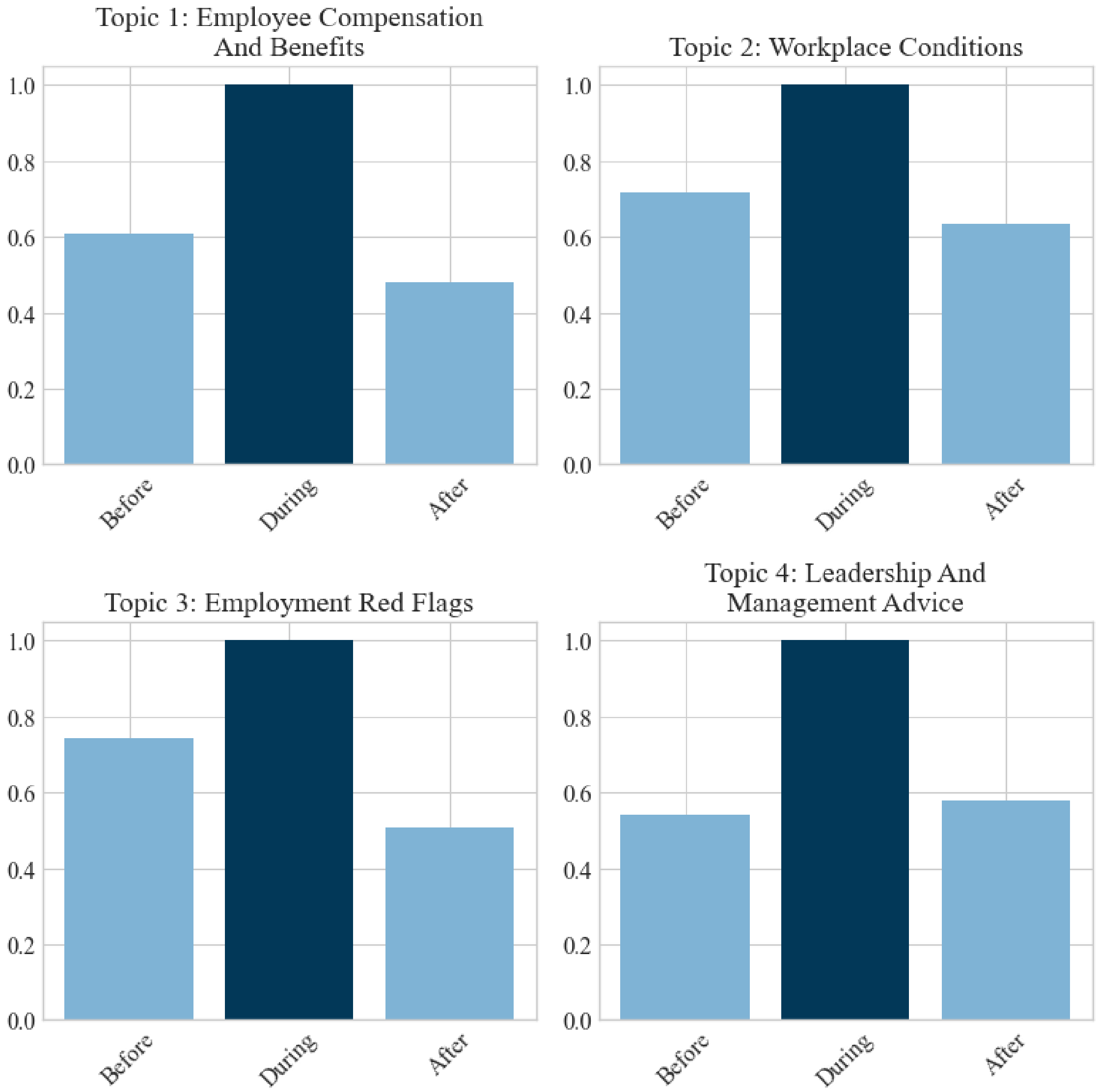


Figure 5. Textual topics in Glassdoor reviews



This figure shows the frequency of four topics contained in Glassdoor review text in the time period *Before* (four quarters before), *During* (two quarters during), and *After* (two quarters after) renegotiations. The topics were determined using generative AI (GPT-4). The frequency of the topic is calculated and scaled by total reviews each quarter, and made relative to the period with the highest frequency, which happens to be the *During* period in all cases. The dictionary associated with the topics can be found in Appendix B.

Table 1. Descriptive statistics for CBA contract expirations

Variables	Mean	Std Dev	p25	p50	p75
Number of Negotiations per Quarter	37.87	14.53	32.00	39.00	46.00
Negotiation Period	0.27	0.444	0.00	0.00	1.00
Employees in Workplace	1419.31	7031.86	175.00	300.00	600.00
Number of Employees Covered by CBA	407.04	2122.18	35.00	125.00	262.00
Exposure to RTW	29.77	11.19	22.86	28.42	39.23
Legal Exposure	52.21	120.60	0.00	0.00	68.00

This table provides descriptive statistics related to union collective bargaining agreement (CBA) renegotiations in our sample comprised of 442 unique firms engaged in 2,348 renegotiations, representing 7,363 firm-quarter observations. The data span 2008 to 2023, obtained from Compustat and Bloomberg Labor Plus datasets and merged with reviews scraped from Glassdoor. The variables are defined in the Appendix A and include the *Number of renegotiations per quarter*, *Negotiation Period* indicator variable, the total number of *Employees in workplace* collected from BNL Labor Plus database, the *Number of employees covered by each Collective Bargaining Agreement (CBA*), *Exposure to Right to Work (RTW) laws*, and *Legal Exposure*. Standard Deviation (Std Dev) and quartile values (p25, p50, p75) are provided for all measures.

Table 2. Sample summary statistics

Variables	Mean	Std Dev	p25	p50	p75	N
Number of Reviews	0.996	1.436	0.000	0.629	1.402	7,363
Rating	3.216	0.748	2.824	3.250	3.698	5,383
OSHA Incidents	1.141	2.650	0.000	0.000	0.694	4,070
Time to Fill Job	1.007	1.007	0.420	0.981	1.481	1,099
Wage Percent Increase	3.663	2.500	0.550	2.500	3.000	177
Employee Outflow	1.096	0.277	0.935	1.101	1.259	7,363
Cosine Similarity	0.276	0.146	0.204	0.328	0.383	5,383
Business Outlook	0.338	0.404	0.000	0.133	1.000	5,383
Strategic Negative Reviews	0.016	0.127	0.000	0.000	0.000	5,383
Normal Negative Reviews	0.268	0.443	0.000	0.000	1.000	5,383
ln(Total Assets)	8.347	1.926	7.200	8.400	9.673	7,363
Return on Assets	0.007	0.027	0.002	0.009	0.018	7,363
Leverage	0.306	0.207	0.165	0.282	0.401	7,363
MTB Ratio	2.065	6.037	1.284	2.065	3.423	7,363
Earnings Revision	-0.038	0.156	-0.050	-0.010	0.003	7,363
Earnings Surprise	0.024	0.309	-0.020	0.016	0.070	7,363

This table presents descriptive statistics for variables used in our main analysis and Glassdoor ratings. Our data sample includes a total of 7,363 firm-quarter observations. *Number of Reviews* is the total number of Glassdoor reviews in a quarter scaled by the average number of quarterly reviews by firm. *Rating* is the average overall rating per quarter on Glassdoor. *OSHA Incidents* is the total number of OSHA incidents in a quarter scaled by the average number of quarterly OSHA incidents by firm. *Time to Fill Job* is the average number of days it takes to fill a job in a quarter scaled by the average number of days it takes to fill a job quarterly by firm. *Employee Outflow* is the total number of employees outflow in a quarter scaled by the average number of quarterly outflow by firm. *Cosine Similarity* is textual similarity among reviews. *Business Outlook* is the number of reviews that indicate a positive outlook divided by the total number of reviews by firm each quarter. Control variables include natural log of *Total Assets*, *Return on Assets*, leverage ratio (*Leverage*), Market-to-Book ratio (*MTB Ratio*), earnings revision (*Earnings Revision*) and earnings surprise (*Earnings Surprise*). *Normal Negative Reviews* is an indicator variable that equals one if the company's reviews during a non-negotiation quarter are below the cumulative average of the company's overall rating. *Strategic Negative Reviews* is an indicator variable that equals one if the company's reviews during a negotiation period are below the cumulative average of the company's overall rating. Standard Deviation (Std Dev) and quartile values (p25, p50, p75) are provided for all variables.

Table 3. Union negotiation and number of Glassdoor reviews

	(1)	(2)	(3)	(4)
Dependent Variable:	*Number of Reviews*			
Negotiation Period	0.065***	0.067***	0.057**	0.060**
	(2.824)	(2.833)	(2.464)	(2.575)
ln(Total Assets)		0.028**		0.108
		(2.007)		(1.422)
Return on Assets		-1.418*		-1.177**
		(-1.947)		(-2.486)
Leverage		0.012		-0.102
		(0.158)		(-0.922)
MTB Ratio		-0.002		-0.001
		(-1.441)		(-0.306)
Earnings Revision		-0.178*		-0.199**
		(-1.933)		(-2.229)
Earnings Surprise		-0.031		-0.003
		(-0.757)		(-0.077)
Employee Outflow		-0.000		0.000
		(-0.994)		(0.729)
Fixed effects				
Firm	No	No	Yes	Yes
Industry	Yes	Yes	No	No
Time	Yes	Yes	Yes	Yes
Adjusted R-Squared	0.431	0.433	0.524	0.526
No. of Observations	7,363	7,363	7,363	7,363

This table presents the results of estimating Equation (1) with the number of Glassdoor reviews (*Number of Reviews)* as the dependent variable. Each column reports estimates using OLS regression. Control variables are: *ln(Total Assets)*, *Return on Assets*, *Leverage*, *MTB Ratio*, *Earnings Revision*, *Earnings Surprise*, and *Employee Outflow*. The constant is not displayed for presentation. The unit of observation is a firm-quarter. All regressions include year-quarter fixed effects. Columns (1a) and (1b) include industry fixed effects, while Columns (2a) and (2b) include firm fixed effects. T-statistics are in parentheses beneath coefficient estimates. Standard errors are clustered at the firm level. Significance levels are indicated: * = 10%, ** = 5%, *** = 1%.

Table 4. Union renegotiations and rating of Glassdoor reviews

	(1)	(2)	(3)	(4)
Dependent Variable:		*Rating*		
Negotiation Period	-0.036**	-0.037**	-0.039**	-0.037**
	(-2.143)	(-2.073)	(-2.024)	(-2.082)
ln(Total Assets)		0.074***		0.115**
		(4.578)		(2.343)
Return on Assets		1.625**		0.754
		(2.654)		(1.178)
Leverage		-0.323***		-0.073
		(-3.731)		(-0.705)
MTB Ratio		0.003**		0.002**
		(2.424)		(2.168)
Earnings Revision		-0.048		-0.092
		(-0.807)		(-1.520)
Earnings Surprise		0.012		-0.011
		(0.310)		(-0.351)
Employee Outflow		0.000		-0.000
		(0.188)		(-0.806)
Firm	No	No	Yes	Yes
Industry	Yes	Yes	No	No
Time	Yes	Yes	Yes	Yes
Adjusted R-Squared	0.113	0.145	0.321	0.322
No. of Observations	5,383	5,383	5,383	5,383

This table presents the results of estimating Equation (1) with the overall Glassdoor rating (*Rating)* as the dependent variable. Each column reports estimates using OLS regression. Control variables are: *ln(Total Assets)*, *Return on Assets*, *Leverage*, *MTB Ratio*, *Earnings Revision*, *Earnings Surprise*, and *Employee Outflow*. The constant is not displayed for presentation. The unit of observation is a firm-quarter. All regressions include year-quarter fixed effects. Columns (1a) and (1b) include industry fixed effects, while Columns (2a) and (2b) include firm fixed effects. t-statistics are in parentheses beneath coefficient estimates. Standard errors are clustered at the firm level. Significance levels are indicated: * = 10%, ** = 5%, *** = 1%.

Table 5. Stacked difference-in-difference

	(1)	(2)
Dependent Variable:	*Number of Reviews*	*Rating*
*Negotiation Period * Treat*	0.073**	-0.072***
	(1.965)	(-2.701)
Controls	Yes	Yes
Fixed effects		
Cohort	Yes	Yes
Firm	Yes	Yes
Time	Yes	Yes
Adjusted R-Squared	0.411	0.351
No. of Observations	14,825	9,883

This table presents the results of a stacked difference-in-differences analysis examining the impact of contract negotiation periods on two key outcomes: the number of reviews and ratings. The analysis employs linear regression models, with coefficients and t-statistics presented for each outcome variable across two different specifications: Columns (1) and (2) correspond to the effects on the number of reviews and ratings, respectively. Control variables are included as indicated but not displayed for presentation and are: *ln(Total Assets)*, *Return on Assets*, *Leverage*, *MTB Ratio*, *Earnings Revision*, *Earnings Surprise*, and *Employee Outflow*. Standard errors are clustered at the firm level. The coefficient is reported with the t-statistic in parentheses below. Significance levels are indicated: * = 10%, ** = 5%, *** = 1%.

Table 6. Alternative fixed effect structure

	(1)	(2)	(3)	(4)
Dependent Variable:	*Number of Reviews*		*Rating*	
Negotiation Period	0.051**	0.042*	-0.033*	-0.036*
	(2.255)	(1.690)	(-1.807)	(-1.778)
Controls	Yes	Yes	Yes	Yes
Fixed effects				
Firm	Yes	Yes	Yes	Yes
Industry-Time	Yes	No	Yes	No
State-Time	No	Yes	No	Yes
Adjusted R-Squared	0.544	0.561	0.345	0.385
No. of Observations	7,363	7,255	5,383	5,281

This table presents results of estimating Equation (1) with number of Glassdoor reviews (Number of Reviews) and overall Glassdoor rating (Rating) as dependent variables. Control variables are included as indicated but not displayed for presentation and are: *ln(Total Assets)*, *Return on Assets*, *Leverage*, *MTB Ratio*, *Earnings Revision*, *Earnings Surprise*, and *Employee Outflow*. The constant is also not displayed for presentation. The unit of observation is a firm-quarter. All OLS regressions include firm fixed effects. All specifications are estimated with firm fixed effects and either with industry-time or state-time fixed effects. t-statistics are in parentheses beneath coefficient estimates. Standard errors are clustered at the firm level. Significance levels are indicated: * = 10%, ** = 5%, *** = 1%.

Table 7. Right to work (RTW) laws and Glassdoor activity

	(1)	(2)	(3)	(4)
Dependent Variable:	*Number of Reviews*		*Rating*	
	RTW - Low	*RTW - High*	*RTW - Low*	*RTW - High*
Negotiation Period	0.075*	0.014	-0.070*	0.001
	(2.007)	(0.459)	(-1.957)	(0.026)
Test of significant difference	p-value < 10%		p-value < 10%	
Controls	Yes	Yes	Yes	Yes
Fixed effects				
Firm	Yes	Yes	Yes	Yes
Time	Yes	Yes	Yes	Yes
Adjusted R-Squared	0.489	0.447	0.326	0.304
No. of Observations	2,701	1,922	1,874	1,246

This table presents cross-sectional results of estimating Equation (1) with number of Glassdoor reviews (Number of Reviews) and overall Glassdoor rating (Rating) as dependent variables. Sub-samples are made by splitting our full sample on the median of Exposure to RTW. *RTW-Low* represents low exposure to RTW laws and are less legally constrained, while *RTW-High* represents high exposure to RTW laws and are more legally constrained. Control variables are included as indicated but not displayed for presentation and are: *ln(Total Assets)*, *Return on Assets*, *Leverage*, *MTB Ratio*, *Earnings Revision*, *Earnings Surprise*, and *Employee Outflow*. The constant is also not displayed for presentation. The unit of observation is a firm-quarter. We perform the test of significant difference by fitting regressions for each subsample and then used a Wald test to compare the coefficient on *Negotiation Period* between the two subsamples. All OLS regressions include year-quarter fixed effects. All specifications are estimated with firm and year-quarter fixed effects. t-statistics are in parentheses beneath coefficient estimates. Standard errors are clustered at the firm level. Significance levels are indicated: * = 10%, ** = 5%, *** = 1%.

Table 8. Legal exposure and Glassdoor activity

Dependent Variable:	(1)	(2)	(3)	(4)
	Number of Reviews		*Rating*	
	Legal Exposure - Low	Legal Exposure - High	Legal Exposure - Low	Legal Exposure - High
Negotiation Period	0.080***	0.049	-0.064**	0.001
	(2.650)	(1.165)	(-1.975)	(0.019)
Test of significant difference	p-value > 10%		p-value < 10%	
Controls	Yes	Yes	Yes	Yes
Fixed effects				
Firm	Yes	Yes	Yes	Yes
Time	Yes	Yes	Yes	Yes
Adjusted R-Squared	0.487	0.510	0.344	0.373
No. of Observations	3,979	1,645	2,668	1,224

This table presents cross-sectional results of estimating Equation (1) with number of Glassdoor reviews (Number of Reviews) and overall Glassdoor rating (Rating) as dependent variables. Sub-samples are made by splitting our full sample on the median of exposure to legal risks. *Legal Exposure-Low* represents low exposure to legal risks and are less legally constrained, while *Legal Exposure-High* represents high exposure to legal risks and are more legally constrained. Control variables are included as indicated but not displayed for presentation and are: *ln(Total Assets), Return on Assets*, *Leverage*, *MTB Ratio*, *Earnings Revision*, *Earnings Surprise*, and *Employee Outflow*. The constant is also not displayed for presentation. The unit of observation is a firm-quarter. We perform the test of significant difference by fitting regressions for each subsample and then used a Wald test to compare the coefficient on *Negotiation Period* between the two subsamples. All OLS regressions include year-quarter fixed effects. All specifications are estimated with firm and year-quarter fixed effects. t-statistics are in parentheses beneath coefficient estimates. Standard errors are clustered at the firm level. Significance levels are indicated: * = 10%, ** = 5%, *** = 1%.

Table 9. Strategic reviews and workplace outcomes

	(1)	(2)
Dependent Variable:	*OSHA Incidents*	*Time to Fill Job*
Strategic Negative Reviews	-0.010*	0.234***
	(-1.728)	(2.809)
Normal Negative Reviews	-0.002	0.155*
	(-0.407)	(1.794)
Controls	Yes	Yes
Fixed effects		
Firm	Yes	Yes
Time	Yes	Yes
Adjusted R-Squared	0.262	0.998
No. of Observations	4,070	1,099

This table presents the results of estimating Equation (2) with *OSHA Incidents* and *Time to Fill Job* as the dependent variable. Each column reports estimates using OLS regression. Control variables are: *ln(Total Assets)*, *Return on Assets*, *Leverage*, *MTB Ratio*, *Earnings Revision*, *Earnings Surprise*, and *Employee Outflow*. The constant is not displayed for presentation. The unit of observation is a firm-quarter. All regressions include firm-fixed effects and year-quarter fixed effects. t-statistics are in parentheses beneath coefficient estimates. Standard errors are clustered at the firm level. Significance levels are indicated: * = 10%, ** = 5%, *** = 1%.

Table 10. Strategic reviews and contract outcomes

Dependent Variable:	(1) *Wage Percent Increase*	(2) *Wage Percent Increase*	(3) *Wage Percent Increase*	(4) *Wage Percent Increase*
Strategic Negative Reviews	3.015***	1.204**	*4.383***	3.387**
	(3.496)	(2.206)	*(2.694)*	(2.311)
Controls	No	Yes	No	Yes
Fixed effects				
Industry	Yes	Yes	No	No
Firm	No	No	Yes	Yes
Time	Yes	Yes	Yes	Yes
Adjusted R-Squared	0.389	0.893	0.553	0.912
No. of Observations	177	138	111	78

This table presents the results of estimating Equation (2) with *Wage Percent Increase* as the dependent variable. Each column reports estimates using OLS linear regression. Control variables are: *ln(Total Assets)*, *Return on Assets*, *Leverage*, *MTB Ratio*, *Earnings Revision*, *Earnings Surprise*, and *Employee Outflow*. The constant is not displayed for presentation. The unit of observation is a firm-quarter. All OLS regressions include industry -fixed effects or firm-fixed effects, and year-quarter fixed effects. t-statistics are in parentheses beneath coefficient estimates. Standard errors are clustered at the firm level. Significance levels are indicated: * = 10%, ** = 5%, *** = 1%.

Table 11. Alternative explanations

Dependent Variable:	(1) *Employee Outflow*	(2) *Cosine Similarity*	(3) *Business Outlook*
Negotiation Period	-0.243	0.000	0.001
	(-1.330)	(0.093)	(0.330)
Controls	Yes	Yes	Yes
Fixed effects			
Firm	Yes	Yes	Yes
Time	Yes	Yes	Yes
Adjusted R-Squared	0.944	0.563	0.164
No. of Observations	7,363	5,383	5,383

This table presents the results of estimating Equation (1) with *Employee Outflow*, *Cosine Similarity*, and *Business Outlook* as the dependent variable. Each column reports estimates using OLS regression. Control variables are: *ln(Total Assets)*, *Return on Assets*, *Leverage*, *MTB Ratio*, *Earnings Revision*, *Earnings Surprise*, and *Employee Outflow*. The constant is not displayed for presentation. The unit of observation is a firm-quarter. All regressions include firm-fixed effects and year-quarter fixed effects. t-statistics are in parentheses beneath coefficient estimates. Standard errors are clustered at the firm level. Significance levels are indicated: * = 10%, ** = 5%, *** = 1%.

Appendix A: Variable Description

This appendix provides variable definitions for variables used in this study.

Business Outlook	The number of reviews that indicate a positive outlook divided by the total number of reviews by firm each quarter.
Cosine Similarity	The firm level average cosine similarity of the text of Glassdoor reviews each quarter.
Earnings Revision	The revision of consensus analyst forecast for the following quarter around the earnings announcement of quarter q, divided by the firm's market capitalization at the end of quarter.
Earnings Surprise	Quarterly earnings minus the consensus analyst forecast, divided by the firm's market capitalization at the end of quarter.
Employee Outflow	The total number of employees outflow in a quarter scaled by the average number of quarterly outflow by firm.
Exposure to RTW	The number of CBA contracts in states with RTW laws divided by total number of CBA contracts by union, then applied to firm based on union who negotiates the CBA.
Legal Exposure	The number of ULPs that unions receive in the prior year.
Leverage	The ratio of book value of total debt to book value of total assets.
ln(Total Assets)	The natural log of the total assets.
MTB Ratio	The ratio of equity market value to equity book value.
Negotiation Period	An indicator variable that equals one for the two quarters before the CBA expiration.
Normal Negative Reviews	Indicator variable that equals one if the company's reviews during a non-negotiation period are below the cumulative average of the company's overall rating, and zero otherwise.
Number of Reviews	Total number of Glassdoor reviews in a quarter scaled by the average number of quarterly reviews.
OSHA Incidents	The total number of OSHA incidents in a quarter scaled by the average number of quarterly OSHA incidents by firm.
Rating	Average Glassdoor rating for firm-quarter.
Return on Assets	Net income divided by total assets.
Strategic Negative Reviews	Indicator variable that equals one if the company's reviews during a negotiation period are below the cumulative average of the company's overall rating, and zero otherwise.
Time to Fill Job	The average number of days it takes to fill a job in a quarter scaled by the average number of days it takes to fill a job quarterly by firm.
Wage Percent Increase	The average annual wage increase per CBA contract renegotiation.

Appendix B: Topics and Classification

This appendix provides topics generated by GPT-4 that are used in Figure 5. The *Explanation* column contains the explanation of the topic by GPT-4, and the *Dictionary* column contains the keywords used to identify topics.

Topic	Explanation	Dictionary
Employee Compensation and Benefits	Discussing compensation and benefits in reviews, potentially to put pressure on employers during renegotiations.	lacking benefits, minimal perks, inadequate compensation, no bonuses, insufficient health coverage, poor retirement plans, limited time off, scarce employee benefits, low salaries, rigid schedules, noncompetitive pay, no growth opportunities, absence of rewards, cut benefits, dwindling perks, underpaid positions, meager pension contributions, expensive health plans, no equity or stock options, unpaid overtime, lack of professional development support, no childcare assistance, inflexible work hours, insubstantial bonus structure, limited or no parental leave
Workplace Conditions	Reviews that target workplace conditions are used to spotlight deficiencies, potentially to mobilize external pressure for improvements.	high stress levels, toxic culture, lack of work-life balance, overwhelming workloads, unapproachable management, unsafe working conditions, minimal support for employees, lack of transparency, poor communication, neglected employee feedback, unrealistic expectations, no recognition for hard work, discriminatory practices, favoritism, lack of team spirit, excessive overtime demands, chronic understaffing, lack of necessary resources, unfair performance evaluations, isolation from decision-making, mismanagement of talent, lack of career advancement paths, exclusionary practices, unethical behavior, resistance to change
Employment Red Flags	The reviewer points out red flags to deter potential hires, potentially pressuring employers to resolve these issues quickly or increasing their labor power by making hiring more difficult.	think twice before applying, better opportunities elsewhere, regret joining, high turnover rates, stagnant career growth, misleading job descriptions, promise more than they deliver, lack of job security, toxic work environment, unfulfilled promises, underappreciated talent, exploitative practices, no work-life balance, all work no play, career dead-end, persistent organizational issues, lack of strategic direction, continuous restructuring, poor industry reputation, unstable market position, ineffective leadership, lack of innovation, culture of overwork, disregard for employee feedback, failure to adapt to market changes
Leadership and Management Advice	Public critiques of leadership and management in reviews serve as a challenge to the company's executives, demanding immediate action. This tactic exposes leadership flaws, using the threat of public embarrassment to coerce improvements in management practices and workplace culture.	listen to your employees, out of touch with reality, need for better leadership, ignores employee concerns, lack of empathy, improve communication, value your workforce, stop micromanaging, invest in employee development, address morale issues, prioritize employee well-being, transparent decision-making, reconsider your priorities, foster inclusivity, embrace feedback, enhance team collaboration, strengthen conflict resolution, build a positive work culture, demonstrate visionary leadership, commit to employee satisfaction, address burnout proactively, facilitate career progression, encourage work-life balance, acknowledge and reward contributions, ensure equitable treatment

Appendix C: Tests of Proportions for Survey Questions

Questions	(1) Always/Often - Rarely/Never	(2) Always - Never
Right to work laws would/do hurt contract negotiations for my union.	0.829***	0.895***
Right to work laws hurts the unions ability to get union members engaged during negotiations.	0.759***	0.865***
Union employees are encouraged to bring public awareness to how their labor conditions or contract could be improved.	0.761***	0.844***
The public image of the employer is a factor when negotiating.	0.762***	0.852***
Non-union employees are supportive of negotiations.	0.696***	0.594
Employers care about their online reviews (i.e., Glassdoor.com).	0.674***	0.632**
There are negative feelings between union and employer representatives.	0.636***	0.929**
When employees express a negative opinion of their employer, it is to help negotiations and not just mere frustration.	0.503	0.333
The risk of legal consequences keeps employees from speaking openly about the company.	0.333***	0.300***
Union negotiations strain relationships between union and non-union employees.	0.238***	0.156***

This table presents the results of testing the differences in proportions of survey responses between combined categories of "Always/Often" and "Rarely/Never" (Column 1), and between "Always" and "Never" specifically (Column 2). The proportions are displayed as percentages, representing the fraction of respondents selecting the respective categories out of the total responses for the tested categories. The test evaluates whether these proportions significantly differ from the hypothesized proportion of 50%, indicating an equal distribution of responses. Statistical significance is assessed using a two-proportion z-test, with significance levels denoted as: $p < 0.1$ (*), $p < 0.05$ (**), $p < 0.01$ (**). A significance star (*) next to a percentage indicates that the proportion of responses for that category significantly differs from 50%, based on the standard error of the difference in proportions and the z-test statistic calculated for each comparison.

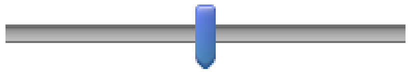
Appendix D: Survey Instrument

Section 1)

Which best describes you? Select all that apply:

- ☐ Union member working for employer
- ☐ Union member working for union
- ☐ Non-union member
- ☐ Outside contractor hired by union

Please slide the bar to the number of contracts applicable.

	0 4 8 12 16 20 24 28 32 36 40
About how many labor union contracts have you helped negotiate? ()	

What is the average duration of your collective bargaining agreements (how many years are covered before it expires)?

- ○ 1 year
- ○ 2 years
- ○ 3 years
- ○ 4 years
- ○ 5+ years

How long do contract negotiations typically last?

- ○ Less than 2 weeks
- ○ 2-4 weeks
- ○ 1-4 months
- ○ 3-6 months
- ○ 6-9 months
- ○ 9-12 months
- ○ 1 year or longer

How long before the formal negotiations does your union start preparing to negotiate?

- ○ Less than 2 weeks
- ○ 2-4 weeks
- ○ 1-3 months
- ○ 3-6 months
- ○ 6-9 months
- ○ 1 year or longer

Section 2)

Please select how often each statement is true:

	Always (1)	Often (2)	Sometimes (3)	Rarely (4)	Never (5)
There are negative feelings between union and employer representatives.	○	○	○	○	○
Union negotiations strain relationships between union and non-union employees.	○	○	○	○	○
Non-union employees are supportive of negotiations.	○	○	○	○	○
The public image of the employer is a factor when negotiating.	○	○	○	○	○
Employees are more likely to express their negative feelings about employers through word-of-mouth during negotiations.	○	○	○	○	○
Union employees are encouraged to bring public awareness to how their labor conditions or contract could be improved.	○	○	○	○	○
When employees express a negative opinion of their employer, it is to help negotiations and not just mere frustration.	○	○	○	○	○

Employees take action to support workplaces within the same union during their contract negotiations.	○	○	○	○	○
This statement is to check attention. Please select "Rarely" for this statement.	○	○	○	○	○
The employer engaged in unfair labor practices (ULP) during negotiations.	○	○	○	○	○
The gap between executive compensation and employee compensation is considered during negotiations.	○	○	○	○	○
Union representatives look at the employers accounting information to help with their negotiations.	○	○	○	○	○
Employers use accounting numbers strategically during negotiations.	○	○	○	○	○
Negotiation outcomes depend on the skill of the representatives.	○	○	○	○	○

The employer hires outside parties to weaken union power.	◯	◯	◯	◯	◯
Right to work laws would/do hurt contract negotiations for my union.	◯	◯	◯	◯	◯
Right to work laws hurts the unions ability to get union members engaged during negotiations.	◯	◯	◯	◯	◯
The risk of legal consequences keeps employees from speaking openly about the company.	◯	◯	◯	◯	◯
Employers care about their online reviews (i.e., Glassdoor.com).	◯	◯	◯	◯	◯

Select all options which employees have been encouraged to use during negotiations.

- ☐ Online reviews
- ☐ Social media
- ☐ Word of mouth
- ☐ Strike
- ☐ Boycott
- ☐ Picketing

If you would like to be entered into the drawing for $1,000, please put an email to contact you if you win (this email will only be used for the drawing and will be deleted immediately after).

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