Beyond Wages and Employment:
Do Minimum Wages Affect Management Practices?

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ABSTRACT

Extensive research has examined the impact of minimum wages on employment. Yet less explored is whether and how these mandatory wage increases affect the broader spectrum of management practices and job quality. Compensating differentials theory posits that low-wage employers will diminish non-wage amenities to counteract the added labor costs. Conversely, the high-road strategy literature anticipates firms to enhance crucial aspects of job quality to optimize worker productivity. To assess these contrasting hypotheses, I used matched U.S. employee-employer job reviews and ratings to measure management quality in both general terms and across three specific dimensions: schedule quality, investment in employees (training, career opportunity, and relational investment), and employee input (autonomy and voice). I conducted difference-in-differences analyses based on multiple state-mandated mini- mum wage hikes spanning 2015-2021. The analyses show that as firms comply with mandates to raise wages, they, on average, neither compromise job quality in non-wage aspects nor undergo a thorough management system upgrade in the high-road direction. These findings align with organizational inertia theories and provide evidence of the barriers to high-road diffusion. Specifically, economic and policy pressure can be insufficient to cause strategic adoption of high-road employment systems. This study carries significant policy implications as the first comprehensive evaluation of minimum wage mandates on low-wage job quality. On one hand, it alleviates concerns regarding a negative spillover effect of mandatory wage increases on overall job quality. On the other hand, it highlights the limitations of minimum wage mandates in fostering systematic enhancements in working conditions beyond mere wage adjustments.

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1 Introduction

Over the past 50 years, as the New Deal national labor law and collective bargaining regime have weakened, there has been a proliferation of state-level employment laws (Galvin, 2019, 2021; Piore & Safford, 2006). This shift in workplace governance authority has sparked academic and practitioner interest in the capacity of local employment laws to improve job quality (Fine et al., 2021). State minimum wage mandates target the most important aspect of job quality: wages. Prior research has focused on compliance with these mandates and mandates' effect on employment and income for low-wage workers (Cengiz et al., 2019; Fine & Bartley, 2019; Stansbury, 2021; Weil, 2010). However, as the mandates increase labor costs for firms, firms may adjust a broader set of management practices to offset the added costs. These understudied practices hold considerable significance for job quality and worker well-being — they should be incorporated into the evaluation of minimum wages' overall impact on low-wage jobs and workers (Clemens, 2021; Kalleberg, 2016; Maestas et al., 2023).

In this study, I ask whether state-mandated minimum wage increases affect a wide range of management practices across different low-wage sectors. These practices encompass scheduling, employer investment in employees (training, career opportunities, relational investment), as well as employee input (autonomy and voice). A primary factor that limits the study of this question is the scarcity of data to measure these practices across firms and over time. Using job reviews and ratings data collected by online platform Glassdoor, I make the first attempt to systematically and longitudinally measure the quality of these key management practices applied to low-wage jobs across firms and regions. These measurements allow for identifying workplace management quality change brought by state-level minimum wage hikes.

Existing theoretical and empirical works provides three divergent predictions regarding the effect of minimum wages on the management quality of low-wage jobs. First, compensating differentials theory, a labor economics perspective that considers wage and non-wage job amenities as substitutes, foresees firms reducing non-wage amenities when compelled to raise wages (Clemens, 2021; Sorkin, 2018).

A second opposing argument stems from the documented emergence of high-road / high-involvement management strategies in the industrial relations (IR) and human resource management (HRM) literature (Appelbaum, 2000; Osterman, 2018; Slichter et al., 1960). Mandatory wage increases can incentivize firms to offset the additional costs with productivity gains elicited by implementing the "high-road" strategies: improving schedules, increasing investment in employees, and promoting greater autonomy and voice (Hirsch et al., 2015; Kochan & Kimball, 2019).

Finally, theories of organizational inertia, characterizing organizations' reluctance to implement substantive practice changes in response to environmental changes, anticipate firms' tendency to avoid strategic alterations to the labor management system (Gresov et al., 1993; Hannan et al., 1996; Stinchcombe, 2013). Such avoidance could come at the expenses of absorbing the rising costs imposed by minimum wage mandates (Draca et al., 2011; Luca & Luca, 2019). It may also be complemented by smaller, more easily-implementable changes in certain operational practices other than the management of incumbent workers, such as raising price for customers, reducing new hires, and increasing reliance on technology to generate profit (Aaronson & Phelan, 2019; Gopalan et al., 2021; Renkin et al., 2022).

To empirically test these contrasting hypotheses, I constructed stacked event-by-event samples based on multiple state-mandated minimum wage increase events spanning 2015-2021 (Cengiz et al., 2019). Based on difference-in-differences analyses, I rule out a compensating differentials reaction. As firms raise wages for low-wage jobs in compliance with the mandates, on average they do not degrade job quality in other non-wage aspects. Moreover, there is weak evidence that firms adopt some productivity-boosting strategies. However, such evidence also rules out a consistent and large positive effect of minimum wages on the quality of all management practices. These results are most consistent with the organizational inertia, which confirms the insufficiency of economic pressure to induce systematic strategy change in labor management. They may also indicate significant variability in how firms respond to minimum wage mandates, prompting further investigations into the underlying conditions for diverse managerial outcomes.

To my knowledge, this is the first study to comprehensively evaluate the impact of state-

mandated minimum wage increases on key management practices that determine low-wage job quality. The findings refute the concern raised in the economics literature about an overall negative minimum wage effect on job quality (Clemens, 2021). Additionally, this study contributes to the high-road literature by addressing the puzzle of when and how firms move to the high-road strategy (Osterman, 2018; Rahmandad & Ton, 2020). A number of prior works underscore the role of productivity gain needs, partially (if not fully) caused by high operational costs, in incentivizing the adoption of high-road strategy bundle (Appelbaum, 2000; Kochan & Kimball, 2019; Slichter et al., 1960). This study suggests scope conditions to this mechanism by showing that rising labor costs imposed by minimum wage mandates are not sufficient to lead to a full-fledged management system upgrade. The diffusion of high-road systems crucially depends on the influence of pro-worker social values and comprehensive supporting policies to encourage the adoption (Osterman, 2018; Ton, 2014); and the availability of enduring worker power and voice structure to sustain the enforcement (Osterman, 2018; Slichter et al., 1960).

2 Mandatory Minimum Wage Increases and Management Practices

2.1 Minimum Wage Effect on Non-wage Amenities

The study of minimum wage effects on employment has generated contentious debates in economics for decades. These debates arise from the struggle to reconcile the recurringly observed null effect with neoclassical price theory (Leonard, 2000). Clemens (2021) dispels this incompatibility concern by drawing attention to the non-wage/employment margins. While these margins are often overlooked and held as constant in prior research, they are likely to be strategically adjusted to offset rising costs imposed by minimum wage increases (Clemens, 2021). Among all non-wage/employment margins, I focus on scheduling, training, career development, relational investment, autonomy, and voice provision.

While the empirical research on minimum wage effect on non-wage job attributes is sparse, Clemens (2021) represents a widespread theoretical view: firms would counteract additional labor costs by reducing the provision of non-wage amenities. This hypothesis is based on the compensating differentials theory, which considers wage and non-wage job amenities as substitutes. Recent studies provide empirical groundings for this theory in the realm of worker demands of working conditions (Maestas et al., 2023; Sorkin, 2018).

However, this theory remains questionable when it comes to employer supply of job quality. The scant minimum wage studies with non-wage amenity outcomes center around fringe benefits, like employer-provided health insurance and training. The results are mixed or at most provide only weak support for a negative minimum wage effect (Acemoglu & Pischke, 1999; Clemens et al., 2018; Simon & Kaestner, 2004). The most recent works that provide comprehensive measures of non-wage amenities find significant complementarities in employer supply of wages and non-wage amenities. Sockin (2022) demonstrates that across different industries and occupations, higher-paying firms also offer better overall non-wage amenities. Dube et al. (2022) examine cross-state variation in the bite of Walmart's 2014 corporate minimum wage and find no decline of non-wage amenities in response to a higher minimum wage. The non-wage amenities studied by Dube et al. (2022) include dignity, supervisor respect and fairness, hours adequacy, schedule control, self-expression and skill acquisition opportunity. These job attributes are closely connected to the focal outcomes I examine.

The above empirical results underscore the need to reassess the assumed cost-minimization logic of firm response to labor cost increases. As I explain in the next section, firms could alternatively be prompted to adopt productivity-maximizing labor strategies that feature better schedule quality, more investment in employees, and greater employee involvement.

2.2 Imperative for Productivity Enhancement and High-road Strategy

In the past decades, one key research stream in IR and HRM explores management strategy bundle aimed to generate both business efficiencies and decent working conditions (Doellgast et al., 2021).

This bundle has been labeled as high-performance work system (HPWS) (Appelbaum, 2000), high-involvement/commitment strategy (Ton, 2014), human resources investment (Lakhani & Ouyang, 2022), and high-road model (Osterman, 2018), etc. It generally combines three features: (1) good schedule quality; (2) investment in employee skills, career, and relational contracts; and (3) high-level work discretion, participation, and voice expression. In some versions, good pay is also an important element (Osterman, 2018). These complementary management practices aspire to boost productivity by retaining skilled and experienced workers; motivating increased work efforts; and enabling workers to perform more effectively, undertake more complex tasks, and contribute to the enhancement of work processes (Appelbaum, 2000; Batt et al., 2002; Distelhorst & McGahan, 2022; Gibbons & Henderson, 2012; Ton, 2014). Despite the high-road model's promise of mutual gains, the low-wage industry is dominated by the opposite "low-road" model that minimizes labor costs, task complexity, and worker input.

Therefore, the diffusion of the high-road strategy becomes an important puzzle. Several works characterize the impediments for the high-road diffusion among profit-seeking organizations. According to Osterman (2018), it remains empirically inconclusive to assert that the high-road strategy is always as profitable as the low-road strategy, as the high-road increases both productivity and costs. If profit-seeking purpose largely determines the management practices, firms would not move to the high-road. Rahmandad and Ton (2020) show that even when the two models have equal profitability, it is still more challenging for mass service firms to voluntarily adopt and sustain the high-road strategy. They identify three challenges. First, the high-road strategy requires significant work on customization for each context. Second, the strategy relies on long-term and synergistic investment, yet it usually generates transient misleading negative feedback before the slowly-emerging positive feedback. Third, firms are more prone to provide poor, unstable schedule because of the highly variable customer demands and the lack of inventory buffer.

Given the small likelihood for an average firm to perceive high-road as optimal for profits, other works have called attention to the role of economic and institutional shocks. Such shocks could partially close off the low-road option and drive firms to set productivity and output quality

as primary optimization goal. Appelbaum (2000) portray the historical emergence of HPWS in the U.S. manufacturing sector as closely tied to the imperative for productivity and product quality enhancement under fierce global competition. The literature on union shock to management documents how the rising labor costs imposed by union contracts push firms to seek productivity gains through adjusting management practices (Freeman & Medoff, 1984; Slichter et al., 1960). IR scholars have extended this argument to a more general form: when firms are compelled to improve compensation, they are likely to respond more broadly with a management system upgrade (Osterman, 2018). For instance, Kochan and Kimball (2019) hypothesize that minimum wage mandates may incentivize firms to enlist productivity-enhancing high-road practices.

Do minimum wage mandates lead to broader high-road strategy adoption? There are some empirical observations of heightened firm demands for productivity following minimum wage hikes, although they do not necessarily imply that firms on average respond to minimum wage increases with high-road adoption. Hirsch et al. (2015) interview managers that have adopted or planned to adopt human resource and operational changes to offset 2009 minimum wage labor cost increases. They find that these reformers highly value productivity-enhancing strategies. These strategies involve increasing performance standards; providing more cross-training for multitasking; discouraging overtime; boosting morale and team spirit; and treating employees in a respectful, supportive, and fair manner. However, these organizations with the desire and ability to change might not represent the majority of low-wage firms. Clemens et al. (2021) find that state minimum wage hikes in 2014-2015 led to increases in the average age and education of low-wage workers, as well as growing low-wage employer demands for workers with high-school diploma. With more skilled workers in the low-wage jobs, firms may upgrade management in the high-road direction. This is either because they consider an upgrade to be more effective to manage the new work force, or because they respond to the potential demands from the more-skilled workers who could feel more entitled to better overall job quality. Nevertheless, this observation could alternatively indicate that low-wage firms can attain productivity gains solely through skill upgrade, without a management system upgrade.

As I elaborate in the next section, forces of organizational inertia could hinder firms from implementing substantial changes to the organization of work. That is why firms may resist changes that can potentially address productivity-enhancing or cost-saving needs. The need to counteract additional labor costs is not sufficient to cause comprehensive management system changes. Whether such economic pressure leads to management changes depends on the agency of stakeholders and their power relations.

2.3 The Insufficiency of Economic Pressure to Induce Management Change

Substantial literature has theorized and studied the sources of organizational inertia: the tendency for organizational practices to resist changes prompted by economic, normative, and coercive pressures (Hannan et al., 1996; Stinchcombe, 2013). One type of explanation focuses on the structural constraints rooted in the size and complexity of organizational structures. Complex and hierarchical communication and decision-making procedures can produce a lengthy process to design and implement changes (Greve, 2011). Highly-specialized division of organizational functions require massive coordination efforts between different departments to modify the management system (Rahmandad & Ton, 2020). This account could not explain why small firms with simple structures may also find it difficult to change their operations. Another important explanation that addresses small firm inertia focuses on the path dependency of organizational learning processes. The history of success and established routines shape the cognition and incentives of organizational actors (Kaplan & Henderson, 2005; Tripsas & Gavetti, 2000), and build up stock of resources and capabilities (Greve, 2011; Leonard-Barton, 1992). Therefore, organizations tend to over-invest in replicating prior success and reinforcing existing practices (Levinthal & March, 1993). Yet this perspective could not account for inertia in new firms (Zuzul & Tripsas, 2020).

A more comprehensive theoretical ground for organizational inertia lies in Hannan and Freeman (1984)'s classical premise that firms resist changes to preserve the accountability and reliability of organizational performance and practices. These characteristics are crucial to organizations' survival, because they determine the organization's legitimacy in the eyes of both internal

actors and external audiences (Tripsas, 2009). These stakeholders negotiate with each other to collectively construct the legitimate order and structure of organizations (Barley, 1986). Under this model, economic pressure can create an opportunity for restructuring. Yet re-negotiations between the stakeholders are needed to overcome organizational inertia and realize any organizational change. The interests, identities, and power of different actors heavily shape this process. Economic pressure only leads to changes when actors with power seize on the opportunity to advocate for changes and overcome potential resistance from other stakeholders (Edelman, 2020; Kelly, 2003).

A good example for this process is how unionization affects management practices. In the last section, I discuss the "shock effect" mechanism: the labor cost increases brought by unionization creates the imperative for enhancing productivity and therefore incentivizes the adoption of high-road practices. However, this is not the only mechanism underlying why unions may lead to high road adoption. IR scholars also theorize on the "voice effect", which characterizes union's role as a powerful collective actor in workplace promoting pro-worker management practices (Verma, 2017). A "shock effect" without union's intention and power to advance worker interests is not sufficient for a full-fledged management change in the high-road direction. This argument is consistent with the mixed empirical evidence regarding union effect on management (Harley, 2020). Usually under hostile labor-management relationship, unions may not advocate for high-road management practices or might even resist them, because unions perceive these practices as threats. Specifically, these practices could substitute the union's role to fulfill workers' need for better job quality and voice channels (Liu et al., 2009). This observation suggests that with the same pressure of rising labor costs associated with unions, what eventually determines the persistence or change of management practices lies in the agency of the union and other actors, as well as the relationships between them.

While it is difficult to empirically disentangle "shock effect" and "voice effect" in the study of union effect on management (Verma, 2017), mandatory minimum wage increases provide an opportunity to single out the "shock effect" channel. Minimum wage mandates not only are seldom

accompanied by union presence in low-wage sectors, but could also discourage unionization efforts as workers become satisfied with getting raises without paying dues (Clemens & Strain, 2023). The examination of minimum wage effect on management practices is set to test whether the economic pressure from rising labor costs is sufficient to overcome organizational inertia and lead to management changes. It is possible that some firms have actors other than unions with the intention and power to change, who problematize the labor cost increases to promote remedial changes. Even in those cases, it is likely to see the realization of easier alternative changes, such as price increases, than a systematic shift in the management of workers. As the majority of the low-wage firms lack strong enough counter-forces for organizational inertia, on average, firms would not undertake a management system upgrade in either the high-road or the low-road direction.

Consistent with this hypothesis, firms have been observed to absorb the additional costs of mandatory wage increases: losing profits and exiting the market (Draca et al., 2011; Dustmann et al., 2022; Luca & Luca, 2019). Even when firms attempt to make some changes to transfer the wage increase costs, they tend to modify operational practices that can be changed more easily than the management system for incumbent workers. These adjustments include price increases, hiring decreases, skill-demand upgrades in hiring, more reliance on technology, outsourcing, or importing goods from areas not subject to compulsory wage increases (Aaronson & Phelan, 2019; Clemens, 2021; Clemens et al., 2021; Gopalan et al., 2021; Renkin et al., 2022). Note that it is possible to see changes in the composition of management practices across the whole economy, as firms with low productivity may not survive minimum wage increases. But this paper focuses on organizational dynamics and does not expect to see systematic management changes at workplace level.

3 Data and Methods

3.1 Measuring Management Practices

The lack of panel data on management practices across US firms creates an obstacle to assessing minimum wage effects on management practices. The Management and Organizational Practices Survey (MOPS)—a high-quality panel data across US establishments—only focuses on the manufacturing industry and do not include the bulk of low-wage workers that are exposed to minimum wage effect (Bloom et al., 2019). Surveys on multiple management practices for typical low-wage workers in the service sector are mostly cross-sectional (Lakhani, 2022; Lakhani & Ouyang, 2022). In the recent years, a unique data opportunity emerges from the widespread use of online platforms among workers to review their jobs and employers. I used such online data to systematically measure variation in management practices and their changes over time. Particularly, I relied on data collected from Glassdoor, a popular online platform for job seekers to obtain labor market information from the reviews, ratings, and pay reports provided by the current and former employees of different employers (Corritore et al., 2020; Marinescu et al., 2021; Sockin & Sojourner, 2023). Glassdoor attracts an enormous number of reviewers through a give-to-get policy. That is, users can only get and maintain access to Glassdoor by providing a verifiable email address or social media account and filling out a survey about their employers every year (Sockin, 2022).

These survey responses generate two large-scale datasets. The first dataset features free-response style text reviews on pros, cons, and feedback for the employers, as well as numerical ratings on various aspects of the employers. The second dataset reports detailed information on pay. Both datasets encompass meta information of the reviews, such as occupation, location, employment type, and tenure. With these datasets, I constructed various measures for five groups of dependent variables on management practices: *pay, general management quality, schedule quality, investment in employees, and employee input*.

Pay was drawn from the Glassdoor pay data, where reviewers reported their base pay and several types of supplementary compensation that are usually uncovered in standard labor market

surveys. The supplementary compensation comprises cash bonuses, stock bonuses, shared profits, sales commissions, and tips. As workers who are subject to minimum wage effects are mostly paid hourly, my analyses only examined observations with base pay entered on an hourly basis. To incorporate the supplementary compensation reported on annual basis, I converted these items to an hourly basis, assuming full-time equivalent hours and full year employment. Then I summed hourly base pay and hourly versions of the supplementary compensation, and converted the amount to real wage of 2022. Because the pay data and text review data have different sets of review identifiers, they cannot be matched on individual review level. Therefore, I calculated the average hourly pay for each unique combination of state, firm, occupation, and year; and matched the average hourly pay to individual review data. Occupation is coded by Glassdoor and has 1285 categories. Lastly, I took the natural log of the average hourly pay in the model estimation.

For the other four groups of management practices, I used the text review data to build dictionary-based measurements with the following procedure. I first specified the conceptual dimensions for each group based on what is identified as important in prior literature and what is commonly discussed by workers given my qualitative reading of 350 randomly-selected text reviews posted by low-wage job workers. *Schedule quality* contains five dimensions: (1) worker's ability to control schedule; (2) whether the number of hours is adequate but not too long; (3) whether the timing of work is standard (i.e. performed on daytime during non-holiday weekdays); (4) general quality and other aspects of schedule (e.g., schedule predictability, consistency, and other general discussion); and (5) work-life balance (Lambert & Fugiel, 2023). *Investment in employees* consists of (1) training; (2) career opportunity; and (3) relational investment (i.e. worker perceived care, respect, appreciation, recognition, and support from employer) (Osterman, 2018; Wilmers et al., 2023). *Employee input* entails two inter-related dimensions: (1) worker autonomy and discretion; and (2) worker voice. The quality of worker voice is partially reflected by the presence and efficacy of communication channel/structure and speak-up behavior; it is also defined by the level of employee involvement in workplace decision-making (Turco, 2016; Wilkinson et al., 2020). Lastly, I operationalized *General management quality* as a uni-dimensional concept: the tone of review

when it discusses the management or manager at the given workplace.

Based on these definitions, I constructed dictionaries to identify the discussions of each specific management practice and general management quality. The dictionaries comprise key phrases mostly selected from the top 1000 unigrams and top 500 bigrams that appear the most frequently in the pros and cons section of low-wage job reviews, respectively. For some categories, their dictionaries include a few phrases that appear relatively less frequently but serve as important indicators of the presence/absence of certain practices. Aside from the key phrases, I also identified exclusion phrases for some of the key phrases to remove common false classifications based on the key phrases. For instance, the key word "hour" is mostly used to describe schedule, but "happy hour" is irrelevant to schedule quality and therefore becomes an exclusion phrase for "hour." The key phrases and exclusion phrases used to measure each category of management practice are listed in the appendix section A. Whereas the specific management practices all have separate dictionaries for the pros and cons section, *general management quality* has only one dictionary that tracks the mention of manager or management.

Following Sharkey et al. (2022), I leveraged the data feature of separate pros and cons review sections to determine whether mentions of a management practice indicate a positive or negative evaluation of the practice. Compared with the alternative measure of a management practice's presence, this approach allows for a more fine-grained measure of its quality. When a specific practice or the general management is mentioned in the pros section of a review, I consider the mention as signifying good quality of this aspect at the reviewer's workplace. Conversely, the mention of a management category in the cons section reflects poor quality of the given aspect. Specifically, I created a set of dummy variables for each review, which code whether the given review discusses certain management practice positively (in the pros section) or/and negatively (in the cons section). For instance, if a review mentions any specific dimension of *schedule quality* in the pros section, this review is classified as 1 for schedule quality positive discussion. If this review also mentions one or more specific dimension(s) of *employee input* in the cons section, it is classified as 1 for employee input negative discussion. As the management practice categories all

have multiple dimensions, it is possible for a review to contain both positive and negative discussion of the same management practice. Imagine a job with a predictable schedule but inadequate hours — a job review on such experience would therefore be coded as 1 for both schedule quality positive and negative discussion.

To determine the quality of a management practice when it is mentioned in both pros and cons sections, I created a summary measure with a pros-cons text difference approach (Sockin, 2022). For each management practice, I subtracted the number of mentioned sub-dimensions in the cons section from that in the pros section. If a review discusses more dimensions positively (in pros) than negatively (in cons), the quality of the concerned management practice is coded as 1 for this review. The opposite situation produces a -1 code: a review mentions more dimensions of a management practice negatively than positively. If the number of positively-mentioned dimensions is the same as the number of dimensions mentioned in cons, this management practice quality is coded as 0. For example, a review is coded as 1 for investment in employees if it mentions good relational investment and training in the pros section, and limited career opportunity in the cons section. I consider this case to reflect better quality than a 0-coded review that mentions relational investment in pros and career opportunities in cons. And this 0-coded review represents more investment in employees than a review coded as -1 for its mentions of relational investment in pros, and training and career opportunities in cons.

In the analysis, I supplemented this text-based summary metric with the dual dummies of positive and negative mentions discussed previously. To some extent, the separate positive and negative mentions dummies can qualitatively decompose the trends embodied in the summary metric. They can answer questions like: when the summary metric suggests an improvement in schedule quality in a workplace, does it mean less negative quality (less mentions in cons), or more positive quality (more mentions in pros), or both? In sum, each review is coded into 3 metrics of text-based outcome variables for each of the four management practice groups: *general management quality, schedule quality, investment in employees, and employee input*.

In addition to text-based measurements, I also operationalized some of these concepts with

structural information and numerical ratings. Specifically, schedule quality includes a measurement of 5-point Likert scale work-life balance rating. Investment in employees have structural measures of tenure (coded in 6 levels ranging from shorter than 1 year to more than 10 years)[1] and dummy regular employment status. It also involves a measure of 5-point Likert scale career opportunity rating. General quality of management practices entails several rating measurements: senior leadership (5-point Likert scale), culture & value (5-point Likert scale), and CEO approval (-1 for disapproval, 0 for no opinion, and 1 for approval). Table 1 shows descriptive statistics of all the dependent variables based on the text, ratings, and structural information measures.

[Table 1 about here.]

3.2 State-level Minimum Wage Increases

I examined 10 state-level minimum wage increase events from 2015 to 2021 that (1) involve at least 5% real minimum wage raise, and (2) represent the first year of increase if there are consecutive increases in multiple years following the initial one (the same state is not treated in the past 2 years). Table 2 lists the events. Exploiting the state-level variation in minimum wages, I built 10 event-specific samples to conduct a stacked event-by-event difference-in-differences (DID) analysis (Cengiz et al., 2019). Each event sample covers 4-year observation period around the treatment time, with 2 years prior to and 1 year after the treatment year. An event sample consists of observations from one treated state and all"clean" control states with no real minimum wage increases within the 4-year event window. To track workplace changes brought by the treatment, each sample only includes review observations about State-Firm-Occupation units that are observed at least once pre- and post- treatment year.

[Table 2 about here.]

This design allows for precisely examining low-wage sample that is subject to wage increase pressures for different events with varying levels of minimum wages. For each event, low-wage

[1]Tenure is classified into 6 levels: shorter than 1 year as level 1, 1-2 years as level 2, 3-4 years as level 3, 5-7 years as level 4, 8-10 years as level 5, more than 10 years as level 6

State-Firm-Occupation units are identified as those with an average hourly pay, calculated at the third year prior to the treatment, that is equal to or falls below the newly established minimum wage in the treated state plus one dollar. For example, Massachusetts raised real minimum wage (2022) to 11.11 dollars in 2015: the sample for this event only includes review observations about State-Firm-Occupation units with $\leq$ 12.11 dollars average real pay in 2012. The one extra dollar accounts for the spillover effect of minimum wage increases on jobs previously paid at or slightly above the new minimum wage (Cengiz et al., 2019). Figure 1 demonstrates that most of the observations are in retail and wholesale as well as restaurant and food service industries. The largest employers in the sample are McDonald's, Walmart, Kroger, Chick-fil-A, and Dollar General. The most common jobs are cashier, sales associate, team member, customer service representative, and food service worker.

[Figure 1 about here.]

3.3 Model

I stacked the 10 event-specific samples to estimate a weighted average effect across all events in equation 1. This design aligns events by event-time (year from treatment in a given event) instead of calendar time, creating a non-staggered DID setting where all the events happen simultaneously. By aligning events and matching all treated states to clean control states, this stacked event-by-event DID design avoids the problem of two-way fixed effect DID estimator to incorporate "forbidden" comparisons between units who are both already-treated when treatment timing varies (Goodman-Bacon, 2021). The full sample include 193, 079 review (encoded with *i*) by event (encoded with *e*) observations. Some control reviews are reused for multiple event samples.

$$y_{i,e} = \beta I_{s,e} \times Post_t + \alpha_{f,t,e} + \alpha_{s,f,o,e} + \epsilon_{i,e} \quad (1)$$

The outcome variable, $y_{i,e}$, has 21 different versions (structural, text-based, and numeric ratings) of measurements for *pay, general management quality, schedule quality, investment in em-*

ployees, and employee input, as described in section 3.1. The treated state by event dummy $I_{s,e}$ equals 1 when the state s of observation i is the treated state of the given event e. The post-treatment dummy $Post_t$ equals 1 when i is observed in or after the treatment year of the event (event time $t = 0, 1$). The standard errors are clustered at state level.

Compared with a common DID equation that only uses time fixed effect and state fixed effect, I built in finer controls in the fixed effect terms. First, the event index is embedded in all fixed effect terms and the treatment dummy, ensuring the estimation to be based on comparisons between treated and control cases within the same event. $\alpha_{f,t,e}$ refers to firm by event time by event fixed effect. It controls for both common and firm-specific time trends within each event. $\alpha_{s,f,o,e}$ is state by firm by occupation by event fixed effect. It allows for identifying within state-firm-occupation management practices change, which approximates workplace changes and distinguishes them from changes in the composition of firms or jobs supplying different practices. β therefore represents a weighted average of each event's effect on workplace management practice change. The weights are determined by the number of treated units and variance of treatment within each event (Roth et al., 2023).

4 Results

4.1 Main Results

The results for the stacked DID analysis are shown in Figure 2. The figure presents the estimated minimum wage effect coefficients β and 95% confidence interval from equation 1 with the 21 outcomes that measure pay, general management quality, schedule quality, investment in employees, and employee input.

The top left panel focuses on pay and general management quality outcomes. Across the 10 events, state minimum wage increases on average lead to a within state-firm-occupation 4.2% increase in hourly pay for low-wage jobs. There are also multiple signs of general management quality improvement following minimum wage hikes. The general management quality summary

variable observes a slight increase mainly due to the decrease in negative mention. The ratings for senior leadership, culture and values, as well as CEO approval also become higher. While general management quality is a holistic index, pay practice constitutes a part of it and may drive the better overall assessment of management.

What about the specific categories of management practices that shape key aspects of job quality? The bottom left panel of figure 2 suggests some evidence of increasing investment in employees after minimum wage increases. The positive mention of investment in employees sees a small increase. The average ratings of career opportunity and average level of tenure also increase. However, as is shown in the top and bottom right panels, minimum wage hikes do not have a statistically significant impact on schedule quality or employee input.

[Figure 2 about here.]

To assess whether any time-varying unsobervable (such as labor demand) confounds minimum wage effect on management practices, I examine whether minimum wage increases appear to have an effect on management practices before they actually occur. The presence or absence of such pre-event trends are evaluated by adding lead terms to equation 1. I also add lag terms to examine how the treatment effect unfolds in the two years since treatment. Equation 2 presents this event study. The treatment dummy $I_{l,s,t,e}$ equals 1 if the minimum wage was raised l years from the event time t of the observation in state s. Everything else is the same as equation 1. The original sample used for the main analysis discussed above includes state-firm-occupation units that do not have observations over all four years around treatment. These units would complicate the interpretation of the lead and lag terms estimated with state-firm-occupation-event fixed effects. Therefore, I only retain units with all four-year event window observations for the event study. This filters a smaller sample size of 140,782 observations from 9 events.

$$y_{i,e} = \sum_{-2}^{1} \beta_l I_{l,s,t,e} + \alpha_{f,t,e} + \alpha_{s,f,o,e} + \epsilon_{i,e} \qquad (2)$$

Figure 3 presents the event plots for the different groups of dependent variables. The plots

demonstrate the four estimated β_l with standard errors (2 lead terms, the treatment, and 1 lag term) for each of the focal outcome measures. All the estimates are expressed as changes from the year prior to treatment ($l = -1$), and the estimates for β_{-1} are normalized to 0. The top left panel examines pay and general management quality. Because the events all happen at different months of a year, the treatment effects do not always emerge during the treatment year. For hourly pay, it only has a statistically significant increase of 5.4% in the next year of treatment. There is no pre-event trend for the pay increase, confirming the strict exogeneity of minimum wage effect on pay. As the panel sample is much smaller than the main analysis sample and has less statistical power, some of the small changes observed in the larger sample are no longer statistically significant, such as all the text-based measurements for general management quality. The ratings of senior leadership, culture and values, and CEO approval still see increases in the year after the treatment, although the culture and values rating has pre-event trend and therefore might be caused by some time-varying forces other than minimum wage increases. In the bottom left panel, the signs of increasing investment in employees vanish in the small sample. The event study on schedule quality and employee input is consistent with the main results. While there is a small rise in the negative mention of employee input in the treatment year, it immediately goes back down in the next year.

[Figure 3 about here.]

In sum, these results show that employers on average do raise wages and experience additional labor costs due to the state minimum wage mandates. However, the results rule out the hypothesis of negative minimum wage effect on non-wage amenities based on the compensating differentials theory. While there are some weak signs of general or specific management quality improvement following minimum wage increases, they rule out a systematic and substantial management up-grade towards the high-road either.

4.2 Robustness Checks and Additional Analyses

4.2.1 Gap Measure of Treatment Magnitude

The dummy treatment variable in the main analyses assume different minimum wage hike events impose the same level of economic pressure across all low-wage firms and occupations. However, some minimum wage mandates require larger wage increases than other events. Some firms also pay lower than other firms for certain jobs before the minimum wage hikes, and might need to increase their labor costs more than others. To more precisely assess the impact of labor cost increases on management practices, I constructed a continuous "gap measure" for treatment magnitude with Card and Krueger (1994)'s approach.

The gap measure captures the proportional wage increase at a given firm and occupation necessary to meet the new minimum wage in the treated state. As is expressed in equation 3, for each minimum wage increase event, observations in the control states are considered to have no pressure to increase wages ($Gap = 0$). So are the treated-state firm-occupation units that are paid at or above the new minimum wage before the mandate. For the other firm-occupation units in the treated state, the gap measure is the percentage increase from the pre-treatment average state-firm-occupation wage to the new minimum wage. The average wage before treatment is calculated either with data in the year before treatment, or two years before treatment if the given state-firm-occupation unit is missing in the year before treatment. The average of gap measure among treated observations is 0.04. Note that firms that pay certain occupations at or above the new minimum wage before the treatment may still choose to increase wages even when their old wage levels already comply with the new mandate (Forsythe, 2023). Therefore, the gap measure could underestimate the actual increase of labor costs at workplaces. However, it can largely differentiate the level of economic pressure experienced by different firms, occupations, and states at different events.

$$Gap_{s,f,o,e} = \begin{cases} 0 & for\ control\ group \\ max\{0, MW_{post,e} - W_{pre,s,f,o,e}\} / W_{pre,s,f,o,e} & for\ treated\ group \end{cases} \quad (3)$$

$$y_{i,e} = \beta Gap_{s,f,o,e} \times Post_t + \alpha_{t,e} + \alpha_{s,o,e} + \epsilon_{i,e} \quad (4)$$

In equation 4, I replace the dummy treatment variable in equation 1 with the gap measure. The other parts are all the same with the main stacked event-by-event DID specification, except that the standard error is clustered at state by firm by occupation level here. β reflects the within state-firm-occupation management practice change brought by 100% of necessary wage increase to comply with the new minimum wage. Figure 4 shows the estimated βs with 95% confidence interval based on different groups of management practice dependent variables. In the top left panel, the effect on pay corresponds to the gap measure: 100% of necessary wage increase to comply leads to 97% actual wage increase. For all the other non-wage management practices, the results are of the same direction with the main results, yet the standard errors increase likely due to the finer level of standard error clustering. Except for the slight increase in the general management quality summary variable, the gap from minimum wage does not have statistically significant effect on other non-wage management practice measures. In sum, with the gap measure that accounts for heterogeneous economic pressure brought by minimum wage increases, I do not observe any management quality change in terms of schedule quality, investment in employees, or employee input.

[Figure 4 about here.]

4.2.2 Firm Low-Wage Job Density and Minimum Wage Effect on Management

Low-wage jobs exist in various types of firms. Yet it is possible that only firms dominated by low-wage jobs would respond to minimum wage increases with systematic management adjustment. When the labor costs at a firm mainly come from low-wage workers impacted by the mandate,

the firm is under greater economic pressure to change management. Moreover, as management practices tend to be designed for or affect a broad spectrum of workers beyond the low-wage workers, it is potentially infeasible to change management systems just to adapt to an economic shock targeting part of the workforce (Simon & Kaestner, 2004). But when most of the workforce at a firm is exposed to the shock, it might be easier for the firm to justify and implement systematic management changes. Therefore, I examined whether the impact of minimum wage increases on management vary by firm low-wage job density.

I created a dummy variable that classifies state-firm-event units into categories of high vs. low share of low-wage jobs. To construct this classification, I first calculated the proportion of low wage jobs at each firm-state unit during the 4 year window of each event. Low-wage jobs for each event include any state-firm-occupation units that enter the event sample for analyses, with detailed criteria defined in section 3.2. Then I ranked all firm-state units for each event according to their share of low-wage jobs. If the percent of low-wage jobs of a firm-state unit falls into the top 25% quantile of a given event sample, this employer-state unit is classified as a workplace with high-density low-wage jobs during the given event. These workplaces have fractions of low-wage jobs ranging from 77-100% with weighted mean of 97%. Across all event samples, 43% of observations fall into firm-state units that have high density of low-wage jobs.

In equation 5, I add in the dummy moderator, $D_{s,f,e}$, that indicates state-firm units with high-density of low-wage jobs in each event. Because this moderator varies at state-firm-event level, I can no longer incorporate the same fixed effects in the main analyses. Instead, equation 5 includes time by event fixed effect and state by occupation by event fixed effect. β denotes average minimum wage effect on management practices for workplaces that do not have a high share of low-wage jobs. θ corresponds to the average difference in minimum wage effect between workplaces with high-density of low-wage jobs and the other workplaces. If firms dominated by low-wage jobs make larger adjustments to increase the quality of a given management practice than other firms, θ should be significantly larger than zero.

$$y_{i,e} = \beta I_{s,e} \times Post_t + \gamma D_{s,f,e} + \theta I_{s,e} \times Post_t \times D_{s,f,e} + \alpha_{t,e} + \alpha_{s,o,e} + \epsilon_{i,e} \quad (5)$$

Figure 5-8 present the estimated coefficients β, γ, and θ based on the 21 outcome measures. In Figure 5, the average effects of minimum wage increases on pay and general management quality for workplaces that do not have high share of low-wage jobs are the same as the main results for the full sample. Accordingly, none of the interaction terms coefficients (θ) is statistically significantly different from zero. This suggests that there is no variation in minimum wage effect on pay and management quality between workplaces with high vs. low density of low-wage jobs.

[Figure 5 about here.]

The results of the three groups of specific management practices are predominantly consistent with the main results. The only differences are that the positive effect on work-life balance ratings become statistically significant (Figure 6), and the positive effect on tenure is no longer statistically significant (Figure 7). These standard error changes could be due to the differences in estimation samples. The baseline results estimated in this section are constrained to the workplaces with lower density of low-wage jobs, whereas the main results are estimated on all workplaces. Moreover, the fixed effects in the main analyses (equation 1) allow the estimation of within state-firm-occupation management changes. The fixed effects in equation 5 could only help track the within state-occupation changes for the two groups of workplaces, respectively. Therefore, βs estimated in this section also pick up changes in the composition of firms supplying different practices. As for the moderation of firm low-wage job density on minimum wage effect — the interaction term coefficients for most outcome measures are not statistically significant. The exceptions include larger increase in the negative mention of schedule quality at workplaces with high share of low-wage jobs (Figure 6). These workplaces also see larger decrease in regular employment (Figure 7), and slightly larger increase in the positive mention of employee input (Figure 8). Despite these sparse and weak signs of heterogeneous minimum wage effect on specific management practices, the overall results rule out the hypothesis that workplaces with high-density of low-wage jobs are

more likely to make systematic management change in response to minimum wages.

[Figure 6 about here.]

[Figure 7 about here.]

[Figure 8 about here.]

5 Discussion

This study addresses the important question of whether low-wage employers modify non-wage management practices that are central to job quality in response to state-mandated minimum wage increases. These management practices include scheduling, employer investment in employees (training, career opportunities, relational investment), as well as employee input (autonomy and voice). The labor economics and IR literature both assume that firms would strategically respond to economic pressures of rising labor costs. With this assumption, they hypothesize that low-wage employers will have broader management practice adjustments beyond wages. But these two groups of literature have opposite propositions in terms of the direction of change. Based on compensating differentials theory, the labor economics literature posits negative minimum wage effect on non-wage amenities, as firms would seek to counteract rising wage costs by reducing other labor costs related to the provision of good training and scheduling, worker autonomy, etc. The IR literature derives arguments from how economic competitions and union shocks drive the adoption of productivity-enhancing management practices. According to this perspective, firms are anticipated to provide better schedule quality, more investment in employees, and encourage higher employee input to boost worker productivity when minimum wage mandates impose additional labor costs.

Drawing on the theory of organizational inertia, I argue that firms have the tendency to resist management changes even under economic pressures that incentivize adaptations. The labor cost increases brought by minimum wage mandates do provide a justification for systematic changes in

labor management practices. However, the changes will only occur when interested actors utilize this justification to push for changes amidst inertia forces, and prevail over different directions of revisions promoted by other actors. While it's possible to see some workplaces adapt management practices in different directions following minimum wage mandates, I do not expect to see a general firm response of adjusting management systems.

I used U.S. online reviews and ratings data to build the first systematic and longitudinal measurements of general management quality and specific management practices for low-wage jobs across various firms and regions. With this dataset, I conducted stacked event-by-event DID analysis with multiple state minimum wage hikes from 2015-2021. I found that even though minimum wage increases push firms to raise wages, the rising labor costs do not lead firms, on average, to reduce non-wage amenities or significantly upgrade the full management system towards the high-road. Note that while workplaces generally do not shift their management systems, changes may occur in the composition of management practices across the economy. Low-road firms may go out of business after labor cost increases if they do not switch to management practices that raise productivity and attract workers (Dustmann et al., 2022). Therefore, minimum wage mandates may increase the proportion of high-road firms in the economy. With data that more comprehensively represent the population of firms, future work could test the economy-level compositional changes of management practices due to the selection of firms following minimum wages.

These findings contribute to the minimum wage literature by providing the first comprehensive evaluation of minimum wage mandates on key labor management practices. As minimum wage studies have predominantly focused on employment outcome, this paper provides a more complete answer on minimum wage effect on overall low-wage job quality (Clemens, 2021). It rules out a widespread hypothesis in the labor economics literature that firms will diminish non-wage aspects of job quality when they raise wages because of minimum wage mandates.

This paper also adds to the high-road literature by showing that economic shocks are insufficient to cause high-road adoption. IR scholars build on the literature of union "shock effect" on management and postulate that labor cost increases push firms to enhance productivity with

high-road management system. I add a scope condition to this thesis by drawing attention to the union "voice effect" mechanism for high-road adoption: unions actively utilize their power to voice worker concerns to management and advocate for pro-worker management practices. While it is difficult to disentangle these two effect channels in the study of union, minimum wage mandates provide an opportunity to single out the "shock effect" of labor cost increases on management practices. This paper demonstrates that "shock effect" alone is not enough to lead to the shift towards high-road practices. Economic pressures need to be complemented by "voice effect" to guide and secure high-road adoption, such as the influence of pro-worker social values and comprehensive supporting policies to push for the adoption (Osterman, 2018; Ton, 2014); and the availability of enduring worker power and voice structure to sustain the enforcement (Osterman, 2018; Slichter et al., 1960). Building on this paper, future work could find settings that can single out the "voice effect" channel and see if it is sufficient to lead to management changes without economic pressures. More broadly, future research could explore under what conditions firms do change management practices after minimum wage increases, and how different combinations of interested actors and the interactions between them affect the direction of change trajectory.

While my argument focuses on the agency of actors and their relationships, other institutional and structural conditions could also contribute to explaining the findings, which warrants further examinations in future work. For instance, an organizational learning perspective may argue that the lack of role models in low-wage industries would hinder the diffusion of high-road practices under economic pressures. Unlike U.S. manufacturers who can directly learn from their HPWS-adopting foreign competitors, there are few high-road adopters in the low-wage sectors (Osterman, 2018). Even when firms discover the high-road, they still need to design their own version, ignore the misleading signal of short-term negative feedback, and identify ways to solve the tension between schedule quality and varied customer demands (Rahmandad & Ton, 2020).

Another alternative explanation is concerned with the magnitude and breadth of economic pressure. The robustness checks show that minimum wage increases do not elicit management system changes from firm-occupation units that need larger wage increases and firms dominated by low-

wage jobs. But it is possible that even the largest "economic shock" brought by minimum wage hikes is not disruptive enough to break through the organizational inertia (Zhang, 2021). The burden of slightly raising wages once for the group of lowest-paying workers is not the same as some union-contract burden of substantively raising wages for all non-managerial workers in consecutive years. Minimum wage increases also create much less economic pressures to firms compared to the crisis of industrial survival faced by U.S. manufacturers when they operated in a much less productive yet more costly way than Japanese and German competitors in the 1980s (Appelbaum, 2000). Moreover, the level of potential gains from management adjustments also influence whether firms adjust their management practices. For instance, Simon and Kaestner (2004) argue that non-wage amenities may not constitute a meaningful portion of worker compensation. Therefore, reducing them is not that helpful to offset labor costs, yet undermines productivity. Future work could examine whether larger and more broadly-impacted mandatory wage increases lead to management changes.

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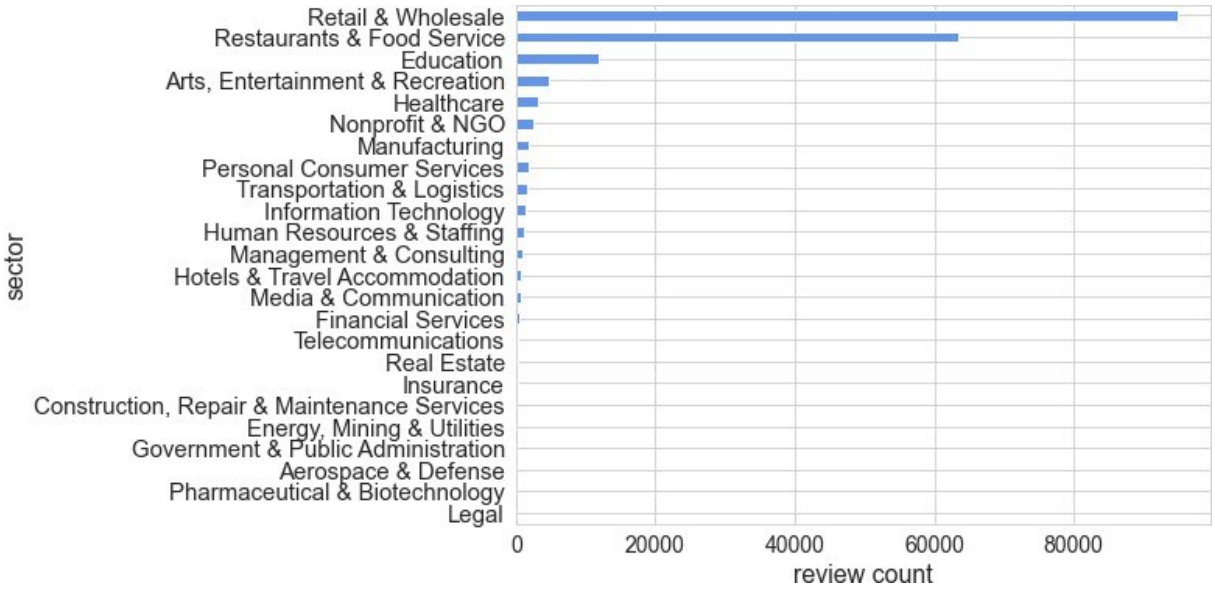
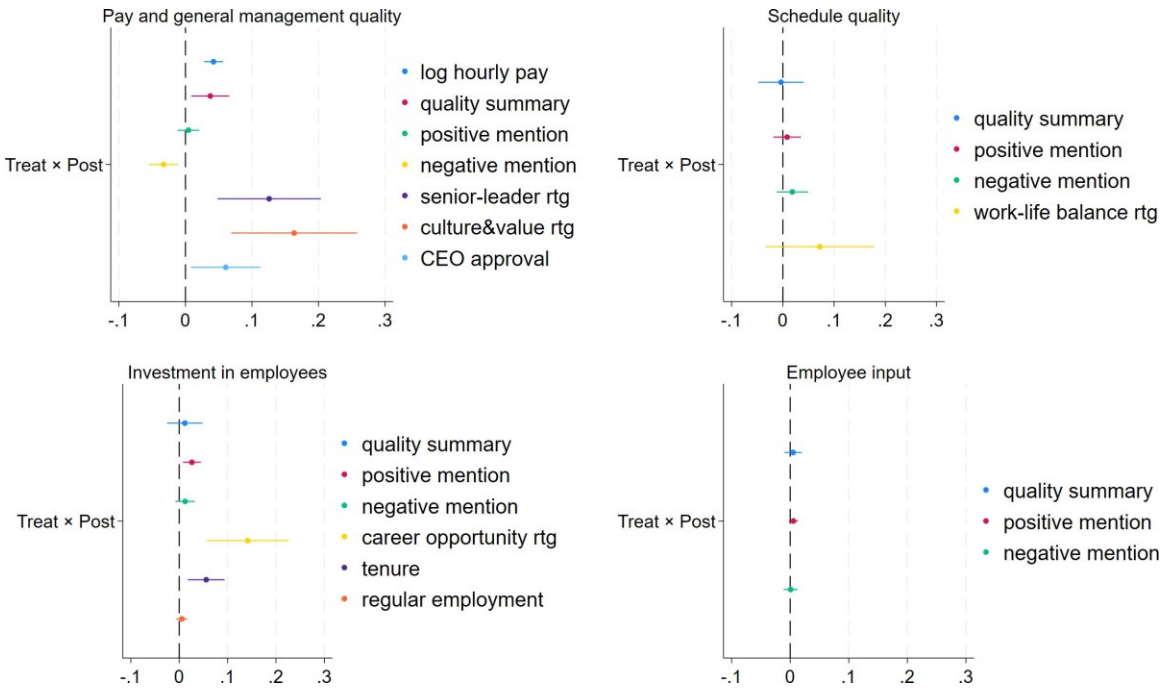
Figure 1: Sample size by sector



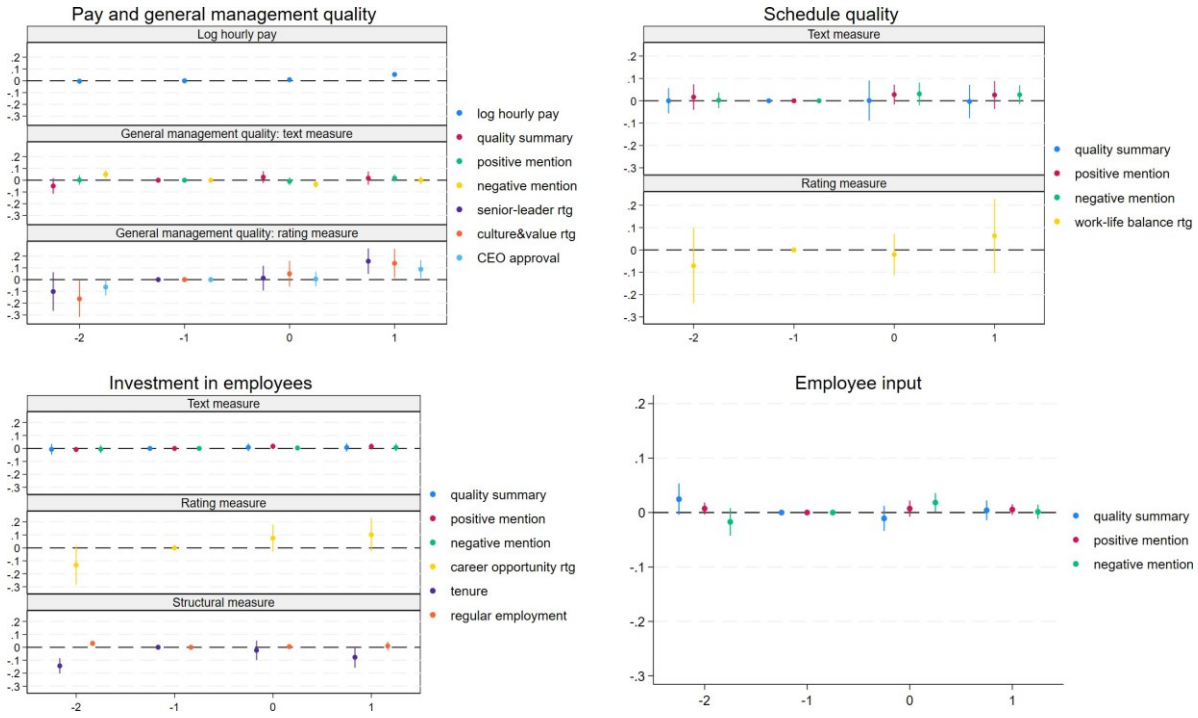
Note: Data from Glassdoor. The y axis denotes glassdoor-classified sector for individual reviews, The x axis presents the number of observations per sector in the stacked events sample.

Figure 2: Minimum wage effect on management practices



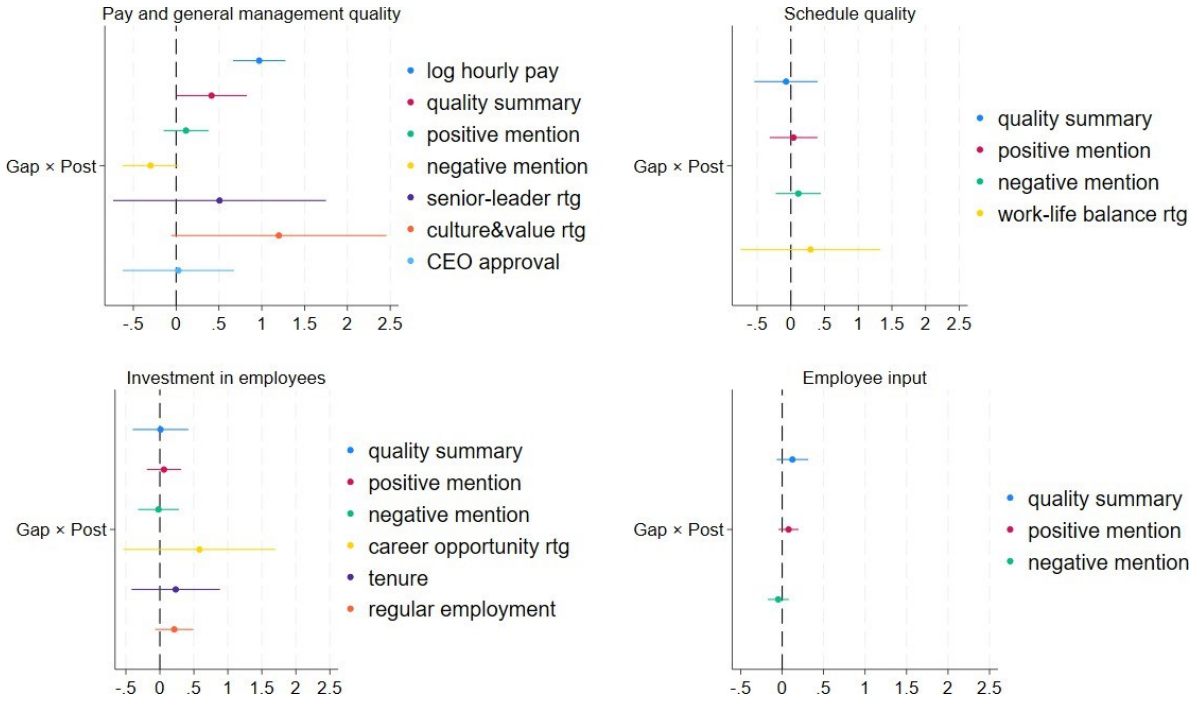
Note: Each panel presents the coefficients (dot) and 95% confidence intervals (line) of minimum wage event effect on one or two groups of management practices, estimated according to equation 1, with firm by event time by event fixed effect and state by firm by occupation by event fixed effect. Standard errors are clustered at state level.

Figure 3: Dynamic minimum wage effect on management practices



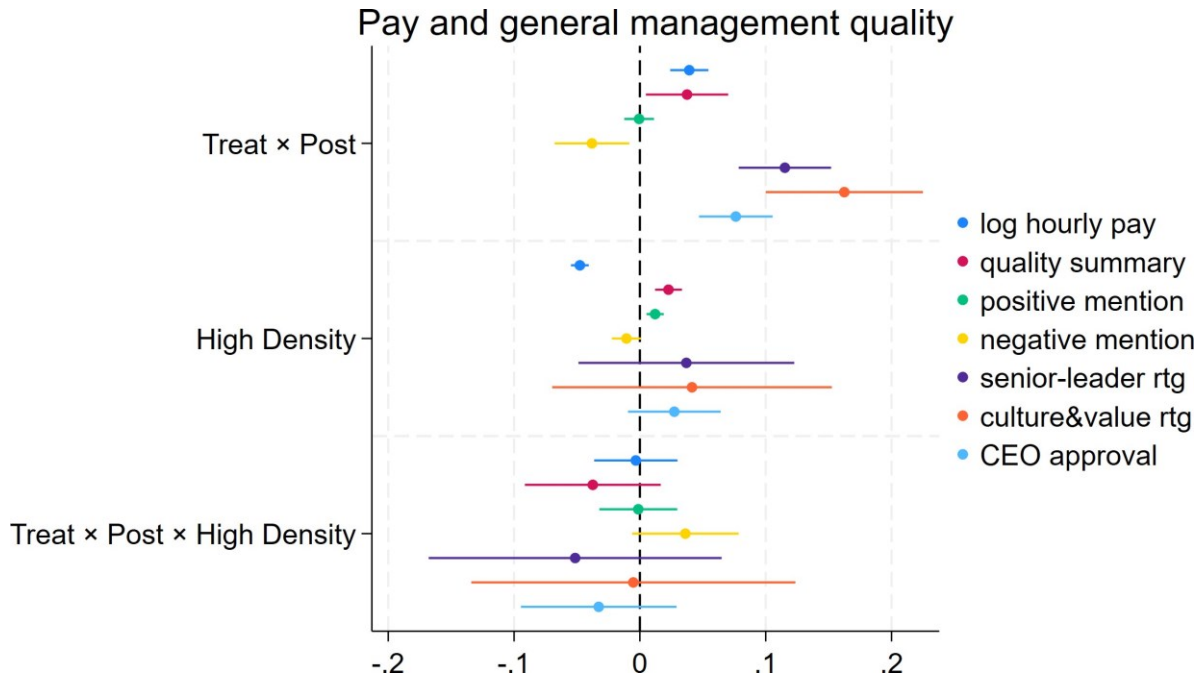
Note: Each panel present the 4-year period event plots of minimum wage effect on one or two groups of management practices, estimated according to equation 2, with firm by event time by event fixed effect and state by firm by occupation by event fixed effect. All the estimates are expressed as changes from the year prior to treatment ($l = -1$), the estimates for which are normalized to 0. The coefficients (dot) are accompanied by 95% confidence intervals (line). Standard errors are clustered at state level. The y axes denote the effect size. The x axes represent year from treatment time.

Figure 4: The effect of gap from minimum wage on management practices



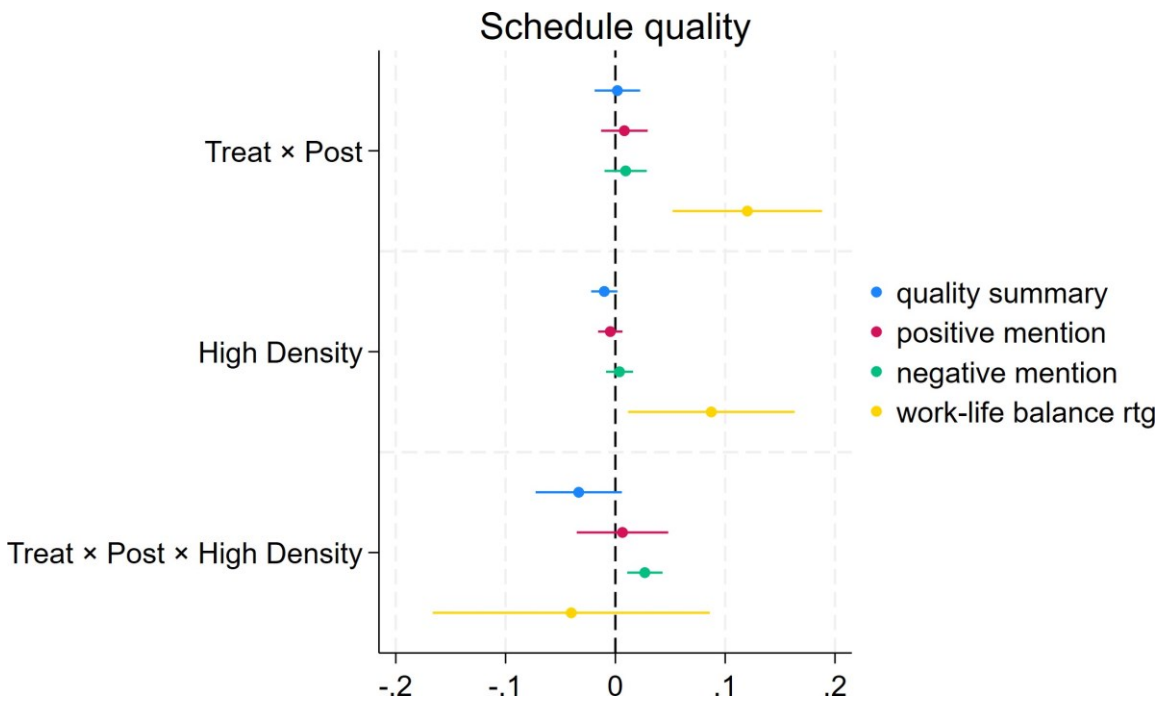
Note: Each panel presents the coefficients (dot) and 95% confidence intervals (line) of the effect of gap from minimum wage on one or two groups of management practices, estimated according to equation 4, with firm by event time by event fixed effect and state by firm by occupation by event fixed effect. Standard errors are clustered at state by firm by occupation level.

Figure 5: Firm low-wage job density and minimum wage effect on pay and general management quality



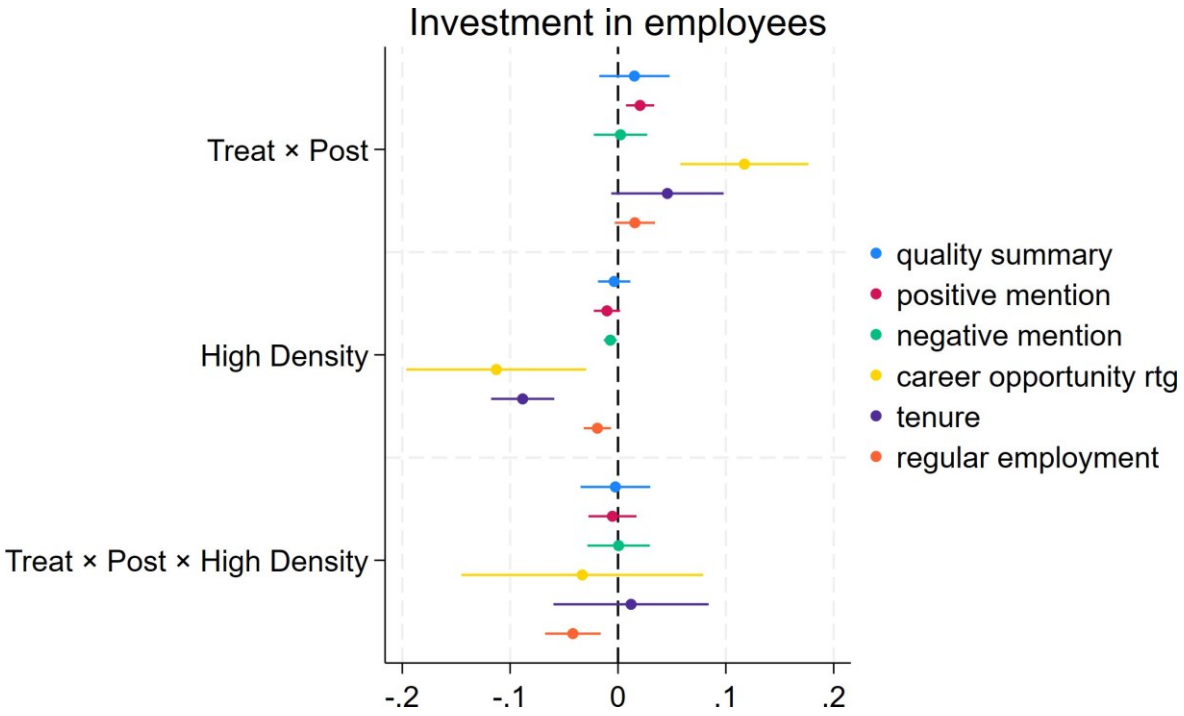
Note: This plot presents the coefficients (dot) and 95% confidence intervals (line) of minimum wage effect on pay and general management quality, moderated by firm share of low wage job. High Density is a dummy variable that indicates state-firm units with a high-share of low-wage jobs during a given event window. The coefficients are estimated according to equation 5, with event time by event fixed effect and state by occupation by event fixed effect. Standard errors are clustered at state level.

Figure 6: Firm low-wage job density and minimum wage effect on schedule quality



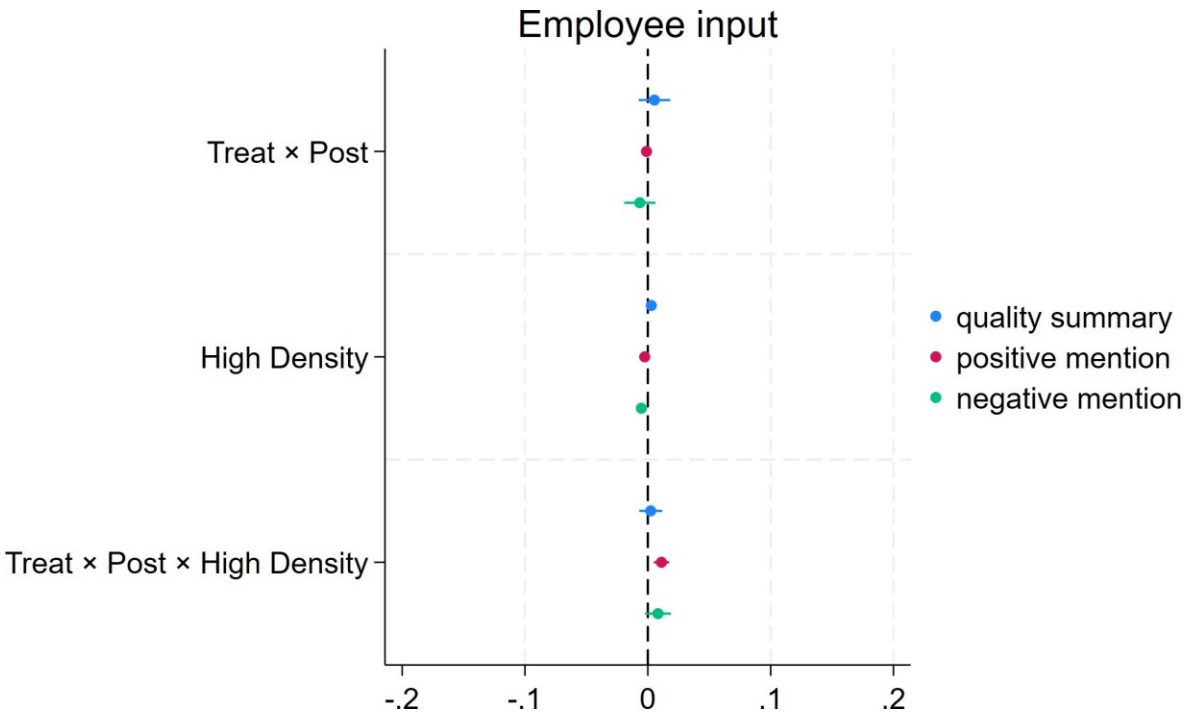
Note: This plot presents the coefficients (dot) and 95% confidence intervals (line) of minimum wage effect on schedule quality, moderated by firm share of low wage job. High Density is a dummy variable that indicates state-firm units with a high-share of low-wage jobs during a given event window. The coefficients are estimated according to equation 5, with event time by event fixed effect and state by occupation by event fixed effect. Standard errors are clustered at state level.

Figure 7: Firm low-wage job density and minimum wage effect on Investment in Employees



Note: This plot presents the coefficients (dot) and 95% confidence intervals (line) of minimum wage effect on investment in employees, moderated by firm share of low wage job. High Density is a dummy variable that indicates state-firm units with a high-share of low-wage jobs during a given event window. The coefficients are estimated according to equation 5, with event time by event fixed effect and state by occupation by event fixed effect. Standard errors are clustered at state level.

Figure 8: Firm low-wage job density and minimum wage effect on employee input



Note: This plot presents the coefficients (dot) and 95% confidence intervals (line) of minimum wage effect on employee input, moderated by firm share of low wage job. High Density is a dummy variable that indicates state-firm units with a high-share of low-wage jobs during a given event window. The coefficients are estimated according to equation 5, with event time by event fixed effect and state by occupation by event fixed effect. Standard errors are clustered at state level.

Table 1: Descriptive Statistics

	Mean	SD
Log(hourly pay)	2.42	0.20
General management quality summary (-1,0,1)	-0.14	0.58
General management quality: positive mention	0.14	0.35
General management quality: negative mention	0.28	0.45
Senior leader rating (1-5)	2.94	1.44
Culture and values rating (1-5)	3.24	1.44
CEO approval (-1,0,1)	0.19	0.70
Schedule quality summary (-1,0,1)	-0.05	0.65
Schedule quality: positive mention	0.27	0.44
Schedule quality: negative mention	0.31	0.46
Work-life balance rating (1-5)	3.23	1.38
Investment in employee quality summary (-1,0,1)	-0.02	0.55
Investment in employee: positive mention	0.18	0.38
Investment in employee: negative mention	0.20	0.40
Tenure (6 levels)	1.85	0.98
Regular employment status	0.26	0.44
Career opportunity rating (1-5)	2.97	1.37
Employee input quality summary (-1,0,1)	-0.03	0.29
Employee input: positive mention	0.03	0.16
Employee input: negative mention	0.06	0.24
Observations	193079	

Note: Data are from Glassdoor.

Table 2: Minimum wage increase events

	Event name	Percent increase	Real increase amount (2022)	Real new minimum wage (2022)
0	2015-MA	0.12	1.22	11.11
1	2015-MD	0.12	1.07	10.03
2	2015-NE	0.10	0.92	9.88
3	2015-WV	0.10	0.92	9.88
4	2017-ME	0.17	1.60	10.75
5	2019-IL	0.10	0.97	10.59
6	2019-NJ	0.26	2.57	12.59
7	2019-NM	0.18	1.56	10.30
8	2020-NV	0.08	0.73	10.18
9	2021-VA	0.25	2.06	10.26

Note: Percent increase is calculated based on real minimum wage increases from the prior year of treatment. The real increase amount and real new minimum wage is standardized in 2022 dollar value.

A Dictionary Measurement

A.1 Schedule Quality

(1) Schedule Control
Pros Key Phrases: flexibl schedul, flexibl hour, flexibl work, schedul flexibl, hour flexibl, work flexibl, flexibl time, time flexibl, control schedul, control hour, flexibl shift, pick shift
Cons Key Phrases: schedul chang, flexibl schedul, chang schedul, flexibl hour, flexibl work, schedul flexibl, hour flexibl, work flexibl, flexibl time, time flexibl, schedul not flexibl

(2) Hour
Pros Key Phrases: hour, overtim, day week, day work week
Pros Exclude Phrases: pay hour, happi hour, flexibl hour, hour flexibl, hour fun, per hour, control hour
Cons Key Phrases: hour, overtim, overwork, work long, no break, long day, long work, long shift, day week, day work week, minut break, short break
Cons Exclude Phrases: pay hour, flexibl hour, hour flexibl

(3) Standard Timing
Pros Key Phrases: weekend, monday friday
Cons Key Phrases: weekend, late, saturday, work holiday, night shift, long shift, no holiday

(4) Other General Discussions of Schedule Quality
Pros Key Phrases: schedul, shift
Pros Exclude Phrases: flexibl schedul, schedul flexibl, control schedul
Cons Key Phrases: schedul, shift
Cons Exclude Phrases: schedul chang, flexibl schedul, chang schedul, hour shift, night shift, long shift, schedul flexibl, schedul not flexibl

(5) Work-life Balance
Pros Key Phrases: work life, life balanc, famili orient, work famili
Cons Key Phrases: work life, life balanc

A.2 Investment in Employees

(1) Training
Pros Key Phrases: learn, train, educ, get experi, gain experi, develop skill
Cons Key Phrases: train, learn, trainer
Cons Exclude Phrases: learn curv

(2) Career Opportunity
Pros Key Phrases: opportun, growth, grow, career, advanc, develop, room, move, promot, upward
Pros Exclude Phrases: compani grow, grow compani, develop skill, break room, growth compani,

compani growth
Cons Key Phrases: advanc, opportun, promot, room, move, growth, fire, grow, career, develop, upward, layoff
Cons Exclude Phrases: break room, grow compani, compani grow, grow pain, growth compani, compani growth, fire drill

(3) Relational Investment
Pros Key Phrases: appreci, recognit, like famili, feel valu, manager care, care peopl, truli care, reward, famili environ, support, mentorship, help succeed, compani valu, seem care, help grow, peopl care, care staff, actual care, recogn, compani truli, famili like, respect, take care, famili atmospher, mentor, realli care, compani realli, management care, compani care, valu employe, encourag, employee well, invest employe, genuin care, treat, guidanc, taken care, manager help, care employe, management help, help employe
Pros Exclude Phrases: tech support, environ support, respect work, brand recognit, support team, support environ, team support, staff support, name recognit, support staff
Cons Key Phrases: didn care, appreci, recognit, feel valu, care peopl, doesn valu, reward, support, help, mentorship, don valu, care number, bulli, seem care, doesn care, recogn, dont care, respect, take care, mentor, care much, realli care, management care, valu employe, compani care, encourag, not valu, care less, not care, invest employe, don care, treat, guidanc, could care, care employe, disrespect
Cons Exclude Phrases: help custom, tech support, support team, support staff

A.3 Employee Input

(1) Autonomy
Pros Key Phrases: littl supervis, freedom, take respons, independ, choos, lot respons, micromanag, autonomi, no supervis, minim supervis
Cons Key Phrases: freedom, control, independ, micromanag, red tape, autonomi, strict
Cons Exclude Phrases: qualiti control, climat control

(2) Voice
Pros Key Phrases: input, feedback, response, hear, voic, listen, engag employe, communicate, opinion, discuss, employe engag, will answer, union, respond, answer question, open, particip, address, transpar, empow, heard
Pros Exclude Phrases: credit union, communicate skill, listen music
Cons Key Phrases: union, ignor, respond, opinion, discuss, input, open, hierarch, feedback, hear, response, address, listen, disconnect, communicate, transpar, heard, hierarchi
Cons Exclude Phrases: open close, email address, communicate skill, store open, credit union, open posit, con opinion

A.4 General Management Quality

Pros and Cons Key Phrases: manager, micromanager, boss, ceo, leader, director, employer, owner, foreman, management, micromanagement, leadership