# Return-to-Office Mandates and Brain Drain

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Current Version: November 2024

## Abstract

By tracking over 3 million tech and finance workers' employment histories reported on LinkedIn, we analyze the effect of S&P 500 firms' return-to-office (RTO) mandates on employee turnover and hiring. We find that these firms experience abnormally high employee turnover following RTO mandates. The increase in turnover rates is more pronounced for female employees, more senior employees, and more skilled employees. Further, it takes significantly longer time for these firms to fill their job vacancies after the mandates, and their overall hire rates also significantly decrease. These results are consistent with firms losing their best talent, particularly among female employees, and facing greater difficulties attracting talent after RTO mandates. Our study highlights brain drain as a significant cost of RTO mandates, even for the largest firms in the world.

Keywords: Return-to-office Mandate, Employee Turnover, Employee Hiring, Human Capital

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## 1. Introduction

Return-to-office (RTO) mandates have attracted massive, global public attention since the threat of the COVID-19 pandemic receded. Many executives suggest that their RTO decisions were made based on their intuition rather than data (e.g., Fortune 2023). Meanwhile, news reports suggest that employees are frustrated with these mandates and are applying for jobs with greater flexibility elsewhere, and experts have expressed concerns that RTO firms may lose their best talent following RTO mandates (Eaton 2024; Pringle 2024; Royle 2024; Elliott 2024). However, some employees may not be able to easily find such new jobs, and some job seekers may not have better options or even prefer to work in the office.[1] Even after three years, we still do not fully understand the benefits and costs of these mandates, making it vital to evaluate them empirically.

In particular, it is unclear whether these mandates significantly affect employee turnover and hiring. To the best of our knowledge, Van Dijcke et al. (2024) is the only recent study with useful data on the effect of RTO mandates on employee turnover: they find that senior Microsoft employees left for other companies after Microsoft's RTO mandate. However, management from Microsoft suggests that their internal data do not support these findings (Harding 2024). This debate further provides additional motivations to understand this important issue. Therefore, in this study, we attempt to further investigate this issue by systematically examining the impact of RTO mandates on employee turnover and hiring among S&P 500 firms.

Understanding whether RTO mandates affect employee turnover and hiring is important for firms because maintaining a stable workforce has many benefits. Voluntary turnover disrupts operations (Staw 1980; Watrous et al. 2006), reduces output productivity and quality of service (Hausknecht et al. 2009; Shaw et al. 2005), and negatively affects financial performance (Heavey

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[1] Please see Section 2 for theoretical analyses of how RTO mandates may affect employee turnover.

et al. 2013; Park et al. 2013; Hausknecht and Trevor 2011). Reducing voluntary turnover is thus one of the top priorities for corporate executives and is often linked with CEO compensation. Investors interpret high turnover as a negative signal for future financial performance and firm value (Li et al. 2022). In the context of RTO mandates, understanding employee turnover is especially important, because employees affected by these mandates are knowledge workers who can work remotely. These employees create significant value for their companies but respond negatively to monitoring (Zhou 2003; Anderson et al. 2014). Therefore, RTO mandates could cost firms their best employees, which are difficult to replace (Elliott 2024). These mandates could also make it more difficult for firms to attract new talent, further worsening the brain drain.

We collect information on RTO announcements for high-tech and financial firms included in the S&P 500 index by utilizing a news search method following Ding and Ma (2023). We focus on these firms for three reasons. First, announcements of RTO mandates from these big firms are likely to be covered by the media. Second, employees from the tech and financial industries are mostly knowledge workers who can work from home. Third, LinkedIn profiles, the source of our data, are most widely used among tech and financial workers (e.g., LinkedIn 2024). We first identify 57 high-tech and financial firms with RTO mandate announcements (i.e., RTO firms).[2] To ensure that each firm has data for at least two quarters before and after its RTO mandates, we exclude 3 firms that made the RTO announcements after June 2023. Our final sample for empirical analyses consists of 54 RTO firms. To collect employee turnover data, we follow prior literature (Li et al. 2022) and obtain the employment history information of over 3 million employees of the 54 RTO firms from Revelio Labs, a leading data provider that extracts information from employee

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[2] The vast majority of these firms do not have full 5-day RTO mandates. Also, many firms do not often provide details about their RTO policy in their first RTO announcements. Therefore, we do not further consider the number of days required in office for these firms. As of November 2024, 10 out of the 54 firms in our sample have changed their policies to 5 days in-office.

LinkedIn profiles. We manually identify employees who left a firm during each period, then calculate the firm's turnover rate by dividing the number of departing employees by the total employee headcount at the beginning of the period. We also obtain information about employees' gender, seniority, and the number of skills listed on their individual LinkedIn profiles, which serves as a proxy for employees' skill level.

Our first set of tests examines the change in RTO firms' employee turnover rates after their first RTO announcements, using a generalized difference-in-differences (DiD) regression. To control for the general time trend in turnover rates and the effects of the macro-economic environment and macro-events, such as the Great Resignation, we adjust firms' turnover rates by the national average turnover rate during the same period. Consistent with our expectation, we find significant evidence that employee turnover rates abnormally increased following RTO mandates. Specifically, the average turnover rate for RTO firms increased by 14 percent after RTO mandates. It is well-documented in the literature that bigger firms' turnover rates are usually lower because they offer employees more financial benefits and career opportunities (e.g., Even and Macpherson 1996). Therefore, using our sample of large tech and financial firms biases against finding a significant effect. We expect the effect of RTO mandates on employee turnover to be even higher for other firms.

We conduct additional tests to validate that our results are driven by RTO mandates rather than time trends. First, in our parallel trend assumption analysis, we find that there were no significant increases in turnover rates during any of the five quarters prior to the RTO announcement quarter. Second, we conduct a pseudo-test where we assign the same quarter of the prior year as the pseudo-RTO quarter. We do not observe any significant change in turnover rates using the pseudo-RTO quarter.

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We then conduct cross-sectional analysis based on employee gender, seniority, and skill. This analysis demonstrates that the effect of RTO mandates on employee turnover is stronger for female employees, consistent with females reacting more strongly to RTO mandates— potentially due to additional family responsibilities. Similarly, the effect is concentrated in the subsamples with mid- and top-level management teams rather than among rank-and-file employees, consistent with employees with higher seniority having more connections and finding other opportunities more easily following RTO mandates. This finding is consistent with Van Dijcke et al. (2024). Next, we divide our sample into subsamples based on the number of skills listed by employees on their LinkedIn profiles. We find that the impact of RTO mandates on turnover is concentrated among employees with the most skills listed on their profiles, suggesting that more skilled employees are more likely to leave their firms following the RTO mandates.

Finally, we analyze the effect of RTO mandates on employee hiring. We further obtain data on job vacancy duration for RTO firms from LinkUp, as well as data on the number of new employees hired by the RTO firms. Using data from more than 2 million job postings, we find that RTO firms take a significantly longer time to fill their job vacancies after RTO mandates. In addition, RTO firms hire fewer new employees compared to before their RTO mandates. On average, the time it takes for an RTO firm to fill its job vacancies increases by approximately 23 percent, and the hire rate decreases by 17 percent after RTO mandates. These results are consistent with significantly higher hiring costs induced by RTO mandates. Taken together, our findings suggest that firms lose their best talent after RTO mandates and face significant difficulties replacing them.

Our study makes several important contributions to the economics and management literature. First, while plentiful research has investigated why and how employees leave their

current firms (Allen et al. 2010; Heavey et al. 2013; Hom et al. 2017; Lee et al. 2017), to the best of our knowledge, workplace flexibility has not been considered in these prior studies. Also, research before the pandemic has limited implications for understanding the effect of RTO mandates on employee turnover after the pandemic. Remote work was available to a very limited number of employees prior to COVID but became available for significantly more people during and after COVID. Studies estimate that between 35% and 50% of jobs were converted to remote during COVID (Brynjolfsson 2020; Dingel and Brent 2020), and in 2021, 91% of surveyed employees reported that they expect and prefer to continue working remotely to some extent (Saad and Wigert 2021). Many employees enjoyed the benefits of remote work during the COVID pandemic and realized that their work could be done from home without spending time and resources on long daily commutes. As a result, even though employees may not have traditionally changed jobs due to onsite work requirements prior to COVID, they may be more likely to change jobs to avoid returning to the office after the pandemic. Our study thus contributes to the employee turnover literature and the debate over the effect of RTO mandates on employee turnover (e.g., Van Dijcke et al. 2024) by highlighting RTO mandates, or more broadly workplace flexibility, as an important factor that has affected turnover after the pandemic.

In addition to documenting the overall effect of RTO mandates on employee turnover, we also document the cross-sectional variation based on employee attributes. Notably, we find that female employees are more likely to leave after RTO mandates. This finding contributes to the literature by showing more precisely how workplace flexibility affects employee retention. Third, we add to the literature on the effect of workplace flexibility in employee hiring. Surveys show the ability to work remotely was among the top priorities for recent job seekers. Ham et al. (2024) shows that firms that allow employees to work from home have higher hire rates, using data

collected mostly before the pandemic (2017 to 2021). We further show that RTO mandates affect both hire rates and hiring speed. Finally, we add to the debate over the effect of RTO mandates on employee turnover (e.g., Van Dijcke et al. 2024) by providing supporting empirical evidence that employee turnover rates spiked after RTO mandates.

## 2. Background and Predictions

### 2.1 Effect of RTO Mandates on Employee Turnover

The COVID-19 pandemic has significantly changed how people work. During the initial stage of the pandemic, studies estimate that between 37% and 50% of all jobs were performed remotely (Brynjolfsson et al., 2020; U.S. Bureau of Labor Statistics, 2022).[3] Even after the threat of the pandemic receded, most companies continued to offer at least some workplace flexibility, recognizing that many job seekers prioritize the ability to work remotely.[4] In a recent survey, 91% of surveyed employees expect their ability to work from home to continue, with 37% indicating they want a fully remote work mode and 54% indicating hybrid as their preferred work mode.[5] However, contrary to employees' preferences and hopes, many companies have started requiring employees to return to the office and work onsite. These RTO mandates have attracted much public attention and stirred both debates and conflicts between employees and companies.

For example, on September 16, 2024, Amazon announced that all employees must work in the office 5 days a week, starting January 2, 2025. This announcement received ongoing media coverage in the following months as Amazon employees responded to the mandate with rage, with many simply applying to other jobs. Employees in these situations often cite concerns about the

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[3] https://www.bls.gov/opub/mlr/2022/article/telework-during-the-covid-19-pandemic.htm#_edn7
https://www.nber.org/system/files/working_papers/w27344/w27344.pdf
[4] https://jasonhanold.medium.com/6-of-the-highest-priorities-for-job-seekers-in-2024-5cb9255beff2
[5] https://news.gallup.com/poll/355907/remote-work-persisting-trending-permanent.aspx

added hours of daily commutes to and from the office, which for some represent more than four hours of travel each day. Also, for the many employees who were hired during the pandemic and promised they could work remotely, RTO mandates represent a broken promise. Besides lowering employee satisfaction, these overly negative responses from employees to RTO mandates (Ding and Ma 2023) raises concern that RTO mandates may induce employee turnover.

Human capital has become increasingly important in today's knowledge economy and matters to a company's long-term well-being. Maintaining a stable and high-quality workforce is crucial to a firm's operations, productivity, innovation ability, and financial performance. But employee turnover disrupts operations (Staw 1980; Watrous et al. 2006), thereby negatively affecting both performance and productivity (Shaw et al. 2005) and reducing the quality of service (Hausknecht et al. 2009). These negative impacts extend to financial performance (Heavey et al. 2013; Cascio et al. 1997; Park et al. 2013). For example, Li et al. (2022) find that employee turnover provides information to investors about firms' future performance and investors incorporate turnover information into future stock returns. Finally, turnover among R&D personnel can negatively affect innovation (Faems and Subramanian 2013; Fonseca et al. 2019). Because of the costs associated with turnover, it is important to understand the specific effects of RTO mandates on the workforce.

The employee retention and turnover literature offers several main theories on why and how employees quit. The review papers by Hom et al. (2017) and Lee et al. (2017) outline the development in turnover theories. Under the theory first proposed by March and Simon (1958), job satisfaction and job alternatives are the two most important factors in why employees change jobs (Lee et al. 2017; Mitchell et al. 2001). Employees who are less satisfied with their pay, evaluation process, overall work environment, and growth opportunities are more likely to think

about quitting. Applying this theory in the RTO setting, Ding and Ma (2023) find that RTO mandates reduce employee satisfaction, so dissatisfied employees after RTO mandates are likely to think about changing jobs.

Mobley et al. (1979) further break down the process of how employees make the decision to quit, arguing that it depends on the outcome of a "subjective expected utility (SEU) analysis." In other words, employees evaluate the costs and benefits of looking for another job and the prospect of alternative jobs, then decide on whether to quit after the job search and evaluation process. Applying this theory in the RTO context, RTO mandates change the labor-leisure tradeoff and the net benefit of the current job. The most direct cost that RTO mandates impose on employees is the added hours of commute, which is entirely borne by employees. Therefore, when employees compare the costs and benefits of their current job to similar jobs at other non-RTO companies, switching jobs to non-RTO companies allows them to maintain comparable benefits but avoid the cost of RTO mandates.

Another very important cost of RTO mandates is the change in work–life balance for many employees. Work–life balance has become an important factor for employment decisions (Shockley et al. 2017). Many employees who started their jobs fully remote have settled in neighborhoods that are further from the office but more affordable. One Amazon employee, for instance, reported that she could not find any Amazon office within 2 hours of where she lives. These employees have structured their personal lives around distant communities, such as their children's schools, so RTO mandates limit their ability to "fulfill their responsibilities both inside and outside paid work"—a standard both Visser and Williams (2006) and Wilkinson et al. (2018) set for work–life balance. RTO mandates may cost employees their local support systems and social connections, and in some cases may mean uprooting an entire family (Wilkinson et al. 2017).

Research has also shown that organizational culture (Sheridan 1992) and an employee's organizational commitment (Bentein et al. 2005; Steer and Mowday 1981) affect the employee's decision to leave or stay. In particular, RTO mandates can also reduce employees' organizational commitment in three ways. First, they communicate a culture of distrust that encourages management through monitoring, which Elliott (2024) calls out as the worst type of management. In this culture, management does not believe that employees work hard when they are not being monitored onsite. As a result, employees may feel that their performance and efforts are not being recognized, appreciated, and understood. Second, RTO mandates can reduce employees' confidence in leadership and create doubts about management's decision-making in other areas. Third, employees may feel less fit with the organization, because RTO mandates seem to communicate that what they value is different from what the organization values. Allen et al. (2010) shows that these three aspects are important considerations to the leave or stay question.

Another important turnover theory is expectancy theory, pioneered by Porter and Steers (1973), which explains an employee's decision to leave based on "how closely a job fulfills employees' initial job expectations (Hom et al. 2017, 534), and posits that employees quit their jobs when they are not given what they have been initially promised (Earnest et al. 2011). This theory is relevant in the RTO setting because many employees were promised the ability to work remotely before but must now return to the office. Finally, under the "unfolding model," one path to turnover is "abhorrent workplace events," which can prompt immediate quitting (Lee et al. 2017, 203). An RTO announcement can be a big and sudden event that is distasteful to most employees, especially when the decision has not been well communicated, potentially triggering an immediate response of employees searching for and switching to new jobs.

On the other hand, it is also possible that, ex ante, employees may not leave their jobs following RTO mandates, for several reasons. First, external factors such as the competitiveness of the job market and overall trends in the industry affect an employee's ability to change jobs (Price 2001). Employees who are unwilling to relocate would either have to find onsite jobs within their geographic area or find another job that offers remote work options. Therefore, they may face limited opportunities or increased competition for flexible jobs. Second, employees may not leave their jobs due to the personal costs associated with changing jobs, as it can take up to a year to adjust to the environment and expectations of a new job and the associated changes to other aspects of life (Mitchell et al. 2001). Third, employees may not want to leave their current company due to their identity with and loyalty to their organization (Rothausen et al. 2015), a sense of community (Feldman et al. 2012), social ties with other employees (Felps et al. 2009; Ng and Feldman 2012), and other forms of attachment that embed them into the organization (Mitchell and Lee 2001; Kiazad et al. 2015). Finally, RTO mandates create more in-person time that employees can spend on collaboration and relationship-building, and employees who desire more social connection may stay after RTO mandates. Thus, employees who prefer to work in person may be less likely to quit after RTO mandates, neutralizing the negative effect of RTO mandates on employee turnover. Therefore, whether or not RTO mandates lead to higher employee turnover remains an empirical question.

## 2.2 Who are More Likely to Leave after RTO Mandates?

In addition to the main effect of RTO mandates on employee turnover, we also want to understand how this effect differs across employees. We first consider the differential effect by gender. On one hand, RTO mandates may lead more female employees to change jobs because of their family responsibilities. Female employees have also been shown to have a higher turnover

rate and lower attachment to the workforce (e.g., Light and Ureta 1992; Royalty 1998). On the other hand, female employees may face more difficulty changing jobs than male employees due to gender biases in the job market and limited opportunities. Thus, it is also possible that fewer female employees may leave after RTO mandates.

The second aspect we explore is how the main effect varies with employee seniority and skill level, in order to clarify the firm-level costs associated with RTO-induced turnover. We expect employees with higher seniority and skill levels to leave more often after RTO mandates, for several reasons. First, senior employees often have more connections with other companies that still offer workplace flexibility. Second, top executives often blame remote work as a cause for low productivity. More skilled employees who often perform well are likely more dissatisfied with such blame from management. Third, the general unemployment trend has little impact on high-skilled employees (Trevor 2001), and recruiting efforts are always competitive for high value-adding and experienced employees (Allen et al. 2010). Therefore, employees with more experience or skills are more competitive in the job market and have better and more outside options, enabling them to find jobs at non-RTO firms.

## 2.3 Effect of RTO Mandates on Employee Hiring

After examining the impact of RTO mandates on employee turnover, we further examine the hiring costs associated with RTO mandates. If companies are losing their best talent after RTO mandates and face difficulties when hiring new employees, then the employee turnover associated with RTO mandates would be really costly to these firms. But if companies are losing less qualified employees or if the cost of finding replacement employees is low, then the turnover associated with RTO mandates would not be as costly (Allen et al. 2010). We expect RTO mandates to affect hiring in two ways, given the strong preference for workplace flexibility expressed by many

knowledge workers. First, we expect RTO firms to take longer to fill positions after RTO mandates. Second, we expect RTO firms to hire fewer people after RTO mandates.

Understanding the effect of RTO mandates on hiring costs is important because hiring a new employee can be costly. Hiring costs include not only the costs associated with searching, recruiting, and selecting, but also the costs of training new employees. Firms lose productivity while new employees take the time to adapt to their new environments and processes. Research reports that these costs can exceed 100% of the annual salary of the position being filled (Allen et al. 2010; Cascio 2003), while more conservative estimates indicate that the hiring costs can range from 17 to 24 weeks of salary for the position (Blatter et al. 2012). In addition, the hiring costs increase with the level of skill and experience needed for the position being filled. How quickly firms fill their positions can also indicate future profitability. Chen and Li (2023) find that firms that are quicker at filling low-skill jobs show higher future profitability, along with firms that take longer to fill high-skill jobs.

**3. Research Design**

3.1 Data, Sample, and Variable Construction

Following Ding and Ma (2023), we collect information about RTO policies for S&P 500 firms from news articles. Among the S&P 500 firms, we locate news articles about RTO mandates (through the end of 2023) for 145 firms. We further narrow down our sample to S&P 500 high-tech and financial firms, because employees in these firms often work on tasks that can be done effectively from any location with the right tools and setups. Restricting the sample to high-tech and financial firms results in a total of 57 S&P 500 firms in our sample. For each RTO firm, we identify the RTO announcement date by either the company's first public announcement of its RTO mandate or, if the announcement date is unclear, the date of the first news report about the

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announcement. Further, we exclude 3 firms that made their announcements after June 2023, to ensure at least 2 quarters of post-announcement observations. Thus, our final sample consists of 54 RTO firms. Figure 1 shows the distribution of these RTO firms in a timeline.

For each RTO firm, we consider the quarters before its RTO announcement the pre-RTO quarters, and the quarters during and after its RTO announcement the post-RTO quarters. We measure employee turnover from the first quarter of 2020 to the last quarter of 2023, a total of 16 quarters. However, because firms have different RTO announcement dates, they may have different numbers of pre-RTO and post-RTO quarters. For example, a firm that announces in Q3 of 2020 would have 2 pre-RTO quarters and 14 post-RTO quarters, whereas a firm that announces in Q3 of 2023 would have 14 pre-RTO quarters and 2 post-RTO quarters.

We collect employee turnover data using Revelio Labs, a leading data provider that extracts information from employees' online profiles on LinkedIn. According to LinkedIn (2024), LinkedIn is most widely used among tech and financial workers. The online profiles contain information about an employee's employment history, including the start and end dates of each job,[6] the employer's name, the job title, and the location. Employees can also self-disclose their skills on their profiles, such as proficiency in certain programming languages, software, or processes.

Using employment histories from LinkedIn profiles, we first measure a firm's monthly turnover rate by dividing the number of employees who left the firm during the month by the employee headcount at the end of the prior month. Next, we adjust the monthly turnover rate by the national average turnover rate, using data from the Bureau of Labor Statistics. Finally, we

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[6] If information on the specific date is not available, we assume the start or end date to be the first date of the month. If information on the specific month is not available, we assume the start or end time to be the first month of the year.

calculate a firm's quarterly abnormal turnover rate (*Abnormal Total Turnover*) as the average of the monthly adjusted employee turnover rates for each quarter.

We then categorize employees based on gender, seniority, and skills. We take the gender classification directly from Revelio Labs. The classification comes from Revelio Labs' proprietary classification system. Revelio Labs trains its algorithm on U.S. Social Security Administration data to predict an employee's gender based on their first name. As to seniority, we classify employees into three categories based on their job titles: rank-and-file employees include those in entry and junior positions, mid-level managers include those who hold manager and director positions, and top managers consist of those who hold executive and senior executive roles. We further classify employees into two skill categories: less skilled and more skilled, based on the top quartile of the number of skills disclosed on their profiles. Those above the top quartile are classified as more skilled, while those below are classified as less skilled. For each group, we compute the turnover rate by dividing the number of employees in that group who left the firm during the month by the total number of employees in that group at the end of the prior month. We then adjust these rates by the national average turnover rate and aggregate them to the quarterly level.

Next, we construct two measures of hiring outcomes. First, we measure the average length of time that a job opening remains unfilled, i.e., the job vacancy duration. To do so, we manually collect data on the opening and closing dates of job postings made by RTO firms between January 2020 and December 2023. To reduce potential noise, we exclude job postings that were created prior to a firm's RTO announcement date and remained unfilled at the time of the RTO announcement, as RTO firms may extend the posting duration for these positions. Our sample includes a total of 2,096,005 job postings across all RTO firms, for which we calculate the average

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duration of job postings created during each firm-quarter (*Time_to_Hire*). Our second measure examines the firm's hire rate. To compute the abnormal hire rate (*Abnormal Hire Rate*), we divide the number of new hires by the headcount of employees with LinkedIn profiles at the end of the prior month. We then adjust the new hire rate by subtracting the national average monthly new hire rate of the U.S. Finally, we aggregate the variable to the quarterly level.

3.2 Empirical Design

Our main research design involves a generalized difference-in-differences analysis, where we compare the abnormal turnover rates of RTO firms in the post-period versus the pre-period. We estimate the DiD comparison using the following empirical equation (1):

$$Abnormal\ Turnover\ Rate$$
$$= \beta_0 + \beta_1 RTO + \beta_2 Size\_lag + \beta_3 Sales\_Growth\_lag + \beta_4 KZ\_lag + FirmFE$$
$$+ QuarterFE \qquad (1)$$

The dependent variable, *Abnormal Turnover Rate,* refers to one of the following variables: the abnormal turnover rate of all employees (*Abnormal Total_Turnover*), the abnormal turnover rate of female employees (*Abnormal Female_Turnover*), the abnormal turnover rate of male employees *(Abnormal Male_Turnover*), the abnormal turnover rate of rank-and-file employees *(Abnormal Rank_and_File Turnover*), the abnormal turnover rate of middle-level managers *(Abnormal Mid-level Manager Turnover*), the abnormal turnover rate of top-level managers *(Abnormal Top-Level Manager Turnover*), the abnormal turnover rate of less skilled employees *(Abnormal Less Skilled Turnover*), and the abnormal turnover rate of more skilled employees *(Abnormal More Skilled Turnover*). These variables are measured quarterly for each firm.

The effect of RTO mandates on employee turnover is captured by *RTO*, which takes the value of 1 for observations after (or during) the quarter when the firm made its RTO mandate

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announcement, and 0 otherwise. We expect its coefficient to be significant and positive if RTO mandates increase employee turnover rates.

We control for firm size ($Size\_lag$) and growth ($Sales\_Growth\_lag$) of the previous quarter, following prior literature (Chen and Li 2023; Davis et al. 2013; Li et al. 2022). We control for size because smaller firms may have less ability to meet employee needs and may be affected more by employee turnovers (Even and Macpherson 1996; Li et al. 2022). We control for sales growth because employees may be more willing to stay if there is current or future opportunities for career advancements. Finally, we control for financial constraints in the previous quarter ($KZ\_lag$) using the Kaplan and Zingales (1997) measure, because employees are more likely to leave the firm during financial distress (Baghai et al. 2021). We include firm fixed effects and quarter fixed effects following a generalized DiD design, to control for firm characteristics and time trend effects that may explain the variation in turnover before and after a firm's RTO mandate. Appendix I details all the variable definitions.

After we establish the effect of RTO mandates on employee turnover, we seek to further understand the implications of employee turnover for the hiring process of new employees. We empirically estimate the following regression DiD model with two-way fixed effects (TWFE).

$Hiring\ Outcome$

$$= \beta_0 + \beta_1 RTO + \beta_2 Size\_lag + \beta_3 Sales\_Growth\_lag + \beta_4 KZ\_lag + FirmFE$$
$$+ QuarterFE \qquad (2)$$

The dependent variable $Hiring\ Outcome$ is one of two hiring-related variables: the natural logarithm of the average number of days for a firm to fill its job postings created during the quarter (*Time_to_Hire*) or the firm's abnormal hire rate in the quarter (*Abnormal Hire Rate*). Again, the main independent variable of interest is *RTO*, which takes the value of 1 for observations in or after the quarter when the firm made its RTO mandate announcement, and 0 otherwise. When

*Time_to_Hire* is used as the dependent variable, we expect the coefficient to be significant and positive if RTO mandates increase job vacancy duration. When *Abnormal Hire Rate* is used as the dependent variable, we expect the coefficient to be significant and negative if RTO mandates decrease the hire rate of new employees. We include the same control variables that appear in Equation (1) and include firm- and quarter-fixed effects.

## 4. Empirical Results

4.1 Descriptive Statistics

We present the descriptive statistics in Table 1. Our sample period spans from January 2020 to December 2023, covering a total of 16 quarters. Our sample includes 828 firm-quarter observations, covering 54 high-tech and financial firms from the S&P 500 list that have implemented RTO mandates between Q2 2022 and Q2 2023 in our main analysis. On average, each firm has 78,483 employees with LinkedIn profiles, which adds up to more than 3 million employees across all 54 firms. The majority of employees are male (50,270 out of 78,483) and rank-and-file (36,953). The average quarterly turnover rate among RTO firms is 0.63%, meaning that 2.5% of total employees leave the firm every year. Further, the average abnormal turnover rate is -1.85%, consistent with our expectation that large firms on average have lower turnover rates than other firms. On average, it takes a firm in our sample 51 days to fill a job vacancy. The average hire rate is 0.18%, which is lower than the average turnover rate (0.63%). Thus, on average, our sample firms have more employees leaving than new hires.

4.2 Effect on Employee Turnover

We present our main results in Table 2. The coefficient on *RTO* measures the effect of RTO mandates on total employee turnover. Column (1) presents the results without the three

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control variables and Column (2) presents the results after including the control variables. We find that the coefficient on *RTO* is positive and statistically significant with or without the control variables (coefficient = 0.088, t-statistics = 2.54 with control variables). These results suggest that RTO mandates increase employee turnover, which has a negative effect on employee retention. An average firm's turnover rate increases by 13% (=0.088%/0.63%) following its RTO mandate. Overall, our results indicate that the concerns expressed by various groups about talent loss following RTO mandates are valid and justified.

We present our subsample analysis by gender, seniority, and skill level in Table 3. In Panel A, Columns (1) and (2) report the results for the turnover of female and male employees. We observe that the coefficient on *RTO* is significantly positive in Column (1) (coefficient = 0.127, t-statistic = 2.71), and the magnitude is larger than the values reported in Table 2. In contrast, the coefficient on *RTO* is not statistically different from zero in Column (2) (coefficient = 0.044, t-statistic = 1.01), suggesting that the effect of RTO on male employee turnover is not significant. Importantly, the effect on female employee turnover is almost three times as high as that on male employees (=0.127/0.044). One possible reason for these results is that female employees are more affected by RTO mandates due to their greater family responsibilities, which increases their demand for workplace flexibility and work-life balance. Figure 2 illustrates the effects based on employee gender.

We present the results of the effect of RTO mandates on employee turnover by seniority in Panel B. Column (1) presents the results for turnover among rank-and-file employees, while Columns (2) and (3) present the results for turnover among mid-level and top-level managers. Consistent with our expectations, we find that the coefficients on *RTO* are positive and significant, but only for the mid- and top-level manager subsamples (coefficients = 0.093 and 0.099, with t-

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statistics of 2.40 and 2.10). On the other hand, the coefficient on *RTO* is not statistically significant for rank-and-file employees. These results suggest that more senior employees are more likely to leave the firm following the announcements of RTO mandates.

We present the results of the effect of RTO mandates on employee turnover by skill level in Panel C of Table 3. Column (1) reports the results for turnover among less skilled employees, while Column (2) reports the results for turnover among more skilled employees. Consistent with our expectations, we find that the coefficient on *RTO* is positive and significant only in the more skilled employee subsample (coefficient = 0.110, t-statistic = 2.21), whereas the coefficient on *RTO* is not statistically significant for less skilled employees (coefficient = 0.062, t-statistic = 1.52). These results suggest that more skilled employees are more likely to leave the firm following RTO mandates. Figure 3 further illustrates the effects based on seniority and skill levels.

In untabulated tables, we validate the parallel trend assumption underlying the DiD design. We conduct the parallel trend analysis by including four variables, each indicating whether the observation is from one, two, three, or five or more quarters prior to the RTO announcement quarter (Pre1, Pre2, Pre3, and PreN, where N ≥ 5), in the regression model. The baseline period is set to quarter q-4, which corresponds to the quarter of the RTO announcement from the previous year. The coefficients on these indicators reflect changes in abnormal employee turnover for RTO firms in the periods leading up to the RTO announcement. We find that the coefficients on these four indicators are generally insignificant, supporting the parallel trend assumption and alleviating concerns that our findings are driven by pre-existing trends.

To provide further assurance that our results are not driven by a general time trend in employee turnover, we conduct a pseudo test to examine whether the positive association between RTO announcements and employee turnover persists using pseudo RTO announcement quarters.

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We define pseudo-RTO announcement dates as the same dates as the actual RTO announcements, but from the prior year. We then repeat the DiD design to compare the turnover rates before and after the pseudo announcement quarters. The results suggest that the effect of pseudo-RTO events on employee turnover rates is statistically indifferent from zero, consistent with our expectation and that the results reported in Table 2 and Table 3 are not attributable to a general trend.

Together, these results suggest that firms are more likely to lose female employees, employees in managerial positions, and employees with higher skill levels. These results are consistent with the concern that RTO mandates can cost firms their most valuable talent (Elliott 2024). They also support the notion that more valuable employees have better outside options and can more readily secure alternative positions at peer firms offering flexible work arrangements.

4.5 Effect on Employee Hiring

We present additional analysis on the effect of RTO mandates on job vacancy duration and hire rates in Table 4. Column (1) reports the results using the average time to fill job postings as the dependent variable. Consistent with our expectations, the coefficient on *RTO* is positive and significant (coefficients = 0.239, t-statistics = 3.82), suggesting that it takes firms 23 percent longer to fill job positions following RTO mandates. In terms of days, an average RTO firm takes 12 additional days to fill a position following its RTO mandate. The increased hiring time is a significant cost associated with talent loss due to RTO mandates. Column (2) reports the results using the abnormal hire rate as the dependent variable. Consistent with our expectations, the coefficient on *RTO* is negative and significant (coefficient= -0.032, t-statistic = -1.84), suggesting that firms hire fewer new employees following RTO mandates. The decrease in new hires indicates that RTO firms have greater difficulty filling vacancies and recruiting qualified new employees after RTO mandates. Of course, an alternative explanation for the lower hire rate is that these firms

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are intentionally hiring less to cut headcounts. However, this alternative explanation cannot explain the longer time to hire after RTO mandates. Therefore, the two sets of results complement each other, suggesting that RTO mandates increase difficulties for firms in attracting new employees.

In untabulated tests, we also provide tests of time trends and pseudo-events. We do not find upward time trends in either time to hire or hire rates before RTO mandates. Also, we do not find statistically significant effects of pseudo-RTO events, set to one year before the actual RTO announcements. Therefore, our results are not due to general time trends in employee hiring at these firms.

## 5. Conclusion

In this paper, we empirically examine the effect of return-to-office mandates on employee turnover and hiring, using a sample of 54 high-tech and financial firms in the S&P 500 index. We find that these RTO firms experience higher employee turnover rates after announcing RTO mandates. Our findings validate the concern that RTO mandates may induce employees to leave for other firms and are consistent with the overwhelmingly negative employee response. We further find that female employees, more senior employees, and employees with higher skill levels are more likely to leave RTO firms, consistent with RTO firms losing highly valuable employees. Finally, we find that it takes longer for RTO firms to fill new job positions. These firms also hire fewer employees following the RTO mandates. Together, our evidence suggests that RTO mandates are costly to firms and have serious negative effects on the workforce. These turnovers could potentially have short-term and long-term effects on operation, innovation, employee morale, and organizational culture.

Our study has several limitations. First, we cannot draw causal inferences based on our setting. Second, our sample uses the largest firms in the US market. Effects may differ for smaller firms, though we expect the use of large firms to bias against finding significant results. Third, we use firms from high-tech and financial industries. It is unclear whether firms in other industries would exhibit different results, as their job markets may not be the same as these two industries. Fourth, it is unclear how our results would change if the macroeconomic environment changes and the job market becomes more competitive for job seekers. We encourage future research to further investigate these issues.

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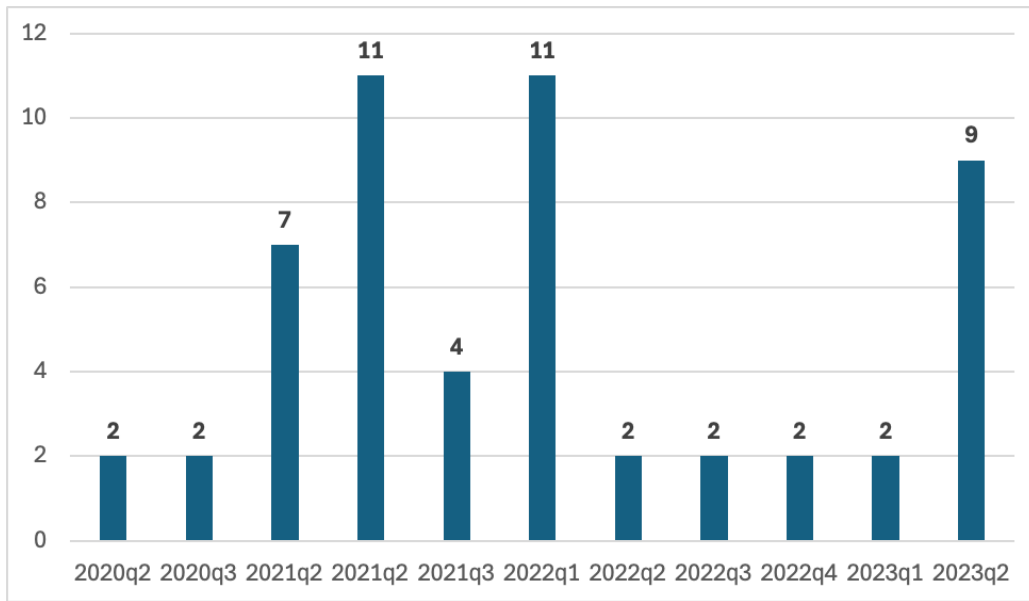
**Figure 1. Distribution of high-tech and financial firms' RTO mandates over our sample period.** This figure shows the distribution of RTO announcements at the firm level across different quarters from April 2020 to June 2023. A total of 54 S&P 500 high-tech and financial firms publicly announced their RTO plans. We summarize the frequency of RTO announcements on a quarterly basis. Our sample period includes 16 quarters in total.
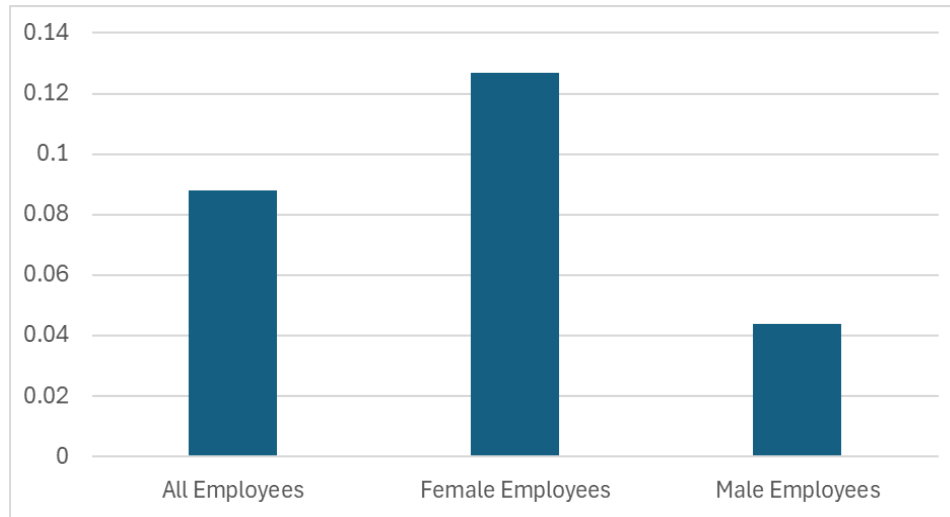
**Figure 2. Increase in Employee Turnover Rates (Total, Female, Male) for High-Tech and Financial Firms Following RTO Mandates.** This figure depicts the average increase in turnover rates among all employees, female employees, and male employees following the announcement of RTO mandates, as shown by the coefficients on *RTO* in Table 2 and Table 3, Panel A.
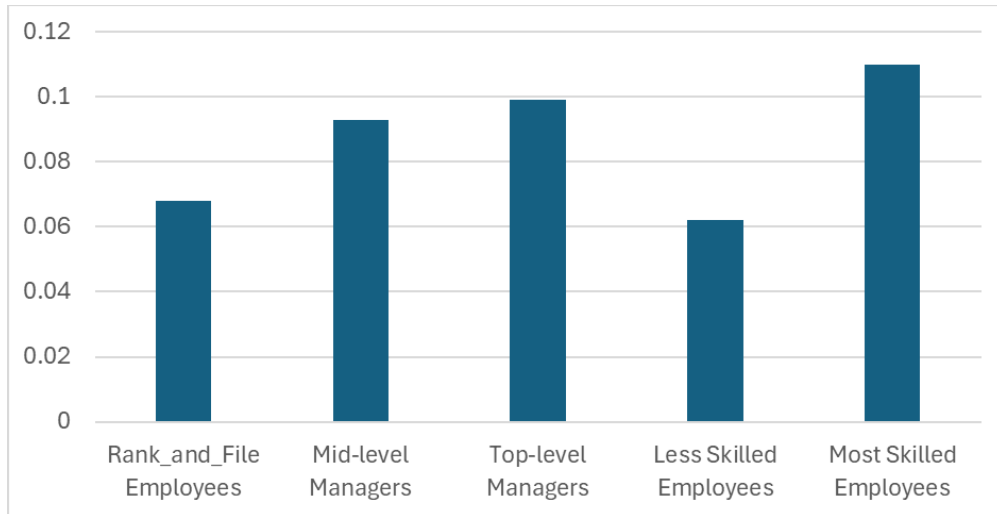
**Figure 3. Increase in Employee Turnover Rates for High-Tech and Financial Firms by Employee Seniority and Skill Levels Following RTO Mandates.** This figure shows the average increase in turnover rates among employees of varying seniority levels and skill levels following the announcement of RTO mandates, based on the coefficient estimates on *RTO* in Table 3, Panels B and C.

**Table 1 Descriptive Statistics**
**Panel A: Headcount Descriptions**

| | N | Mean | P25 | Median | P75 | SD |
|---|---|---|---|---|---|---|
| *Headcount* | 828 | 78,483 | 18,290 | 42,785 | 109,418 | 90,293 |
| *Female_Headcount* | 828 | 28,212 | 8,035 | 18,338 | 40,036 | 28,217 |
| *Male_Headcount* | 828 | 50,270 | 9,420 | 21,979 | 64,081 | 63,221 |
| *Rank_and_File_Headcount* | 828 | 36,953 | 7,747 | 22,088 | 51,025 | 41,824 |
| *Mid_Level_Manager_Headcount* | 828 | 28,316 | 5,925 | 13,312 | 39,782 | 37,944 |
| *Top_Level_Manager_Headcount* | 828 | 3,011 | 635 | 1,360 | 3,543 | 4,160 |
| *Less_Skilled_Headcount* | 828 | 61,837 | 14,149 | 34,674 | 89,163 | 70,620 |
| *Most_Skilled_Headcount* | 828 | 16,645 | 3,736 | 8,731 | 18,770 | 20,779 |

**Panel B: Turnover Descriptions**

| | N | Mean | P25 | Median | P75 | SD |
|---|---|---|---|---|---|---|
| *Total Turnover (%)* | 828 | 0.63 | 0.38 | 0.56 | 0.76 | 0.41 |
| *Female Turnover (%)* | 828 | 0.60 | 0.35 | 0.54 | 0.74 | 0.39 |
| *Male Turnover (%)* | 828 | 0.62 | 0.38 | 0.57 | 0.78 | 0.39 |
| *Rank_and_File Turnover (%)* | 828 | 0.68 | 0.40 | 0.61 | 0.87 | 0.43 |
| *Mid_Level Manager Turnover (%)* | 828 | 0.51 | 0.30 | 0.44 | 0.62 | 0.36 |
| *Top_Level Manager Turnover (%)* | 826 | 0.46 | 0.22 | 0.39 | 0.60 | 0.42 |
| *Less Skilled Turnover (%)* | 828 | 0.61 | 0.36 | 0.54 | 0.76 | 0.41 |
| *More Skilled Turnover (%)* | 828 | 0.59 | 0.34 | 0.55 | 0.77 | 0.39 |
| *US Turnover (%)* | 828 | 2.48 | 2.30 | 2.53 | 2.80 | 0.32 |
| *Abnormal Total Turnover (%)* | 828 | -1.85 | -2.14 | -1.97 | -1.65 | 0.45 |
| *Abnormal Female Turnover (%)* | 828 | -1.88 | -2.18 | -1.99 | -1.67 | 0.46 |
| *Abnormal Male Turnover (%)* | 828 | -1.86 | -2.13 | -1.97 | -1.65 | 0.43 |
| *Abnormal Rank_and_File Turnover (%)* | 828 | -1.81 | -2.13 | -1.91 | -1.56 | 0.47 |
| *Abnormal Mid_Level Manager Turnover (%)* | 828 | -1.97 | -2.24 | -2.06 | -1.81 | 0.43 |
| *Abnormal Top_Level Manager Turnover (%)* | 826 | -2.02 | -2.33 | -2.10 | -1.82 | 0.49 |
| *Abnormal Less Skilled Turnover (%)* | 828 | -1.87 | -2.16 | -1.99 | -1.66 | 0.46 |
| *Abnormal More Skilled Turnover (%)* | 828 | -1.89 | -2.16 | -1.99 | -1.70 | 0.44 |

**Panel C: New Hire Descriptions**

| | N | Mean | P25 | Median | P75 | SD |
|---|---|---|---|---|---|---|
| *Time_to_Hire (Days)* | 762 | 51 | 36.42 | 47.10 | 61.53 | 22.77 |
| *Time_to_Hire (Natural logarithm)* | 762 | 3.85 | 3.60 | 3.85 | 4.12 | 0.41 |
| *Hire Rate (%)* | 765 | 0.18 | 0.04 | 0.13 | 0.23 | 0.23 |
| *U.S. Hire Rate (%)* | 765 | 4.18 | 4.00 | 4.13 | 4.40 | 0.32 |
| *Abnormal Hire Rate (%)* | 765 | -4.01 | -4.20 | -4.00 | -3.86 | 0.31 |

This table provides the summary statistics for our empirical analyses, including the number of observations (N), mean, the bottom quartile (P25), the median (Median), the top quartile (P75), and standard deviation (SD). Panel A reports the summary statistics for employee headcounts. Panel B reports the summary statistics for employee turnover rates. Panel C reports the summary statistics for employee hiring-related variables. Variables are defined in the Appendix.

**Table 2 Turnover Rate Change After RTO Announcements**

| Dependent Variable = | (1)<br>*Abnormal Total Turnover* | (2)<br>*Abnormal Total Turnover* |
|---|---|---|
| *RTO* | 0.087** | 0.088** |
| | (2.56) | (2.54) |
| *Size_lag* | | 0.060 |
| | | (1.03) |
| *Sales_Growth_lag* | | 0.021 |
| | | (0.47) |
| *KZ_lag* | | -0.003*** |
| | | (-3.08) |
| Firm FE | YES | YES |
| Quarter FE | YES | YES |
| Observations | 828 | 828 |
| R-squared | 0.845 | 0.846 |

This table presents the results of abnormal total employee turnover. The dependent variables are firm-quarter total employee turnover rates, adjusted by the average employee turnover rates in the US (*Abnormal Total Turnover*). *RTO* is an indicator for observations of RTO firms in the post-RTO period, including the RTO announcement quarter. Variable definitions are provided in the Appendix. Firm and quarter fixed effects are included but not tabulated. Robust t-statistics, based on standard errors and clustered by firm, are in parentheses. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels (two-tailed).

**Table 3 Turnover Rate Change After RTO Announcements – By Gender, Seniority, and Skill**

**Panel A: By Gender**

| Dependent Variable = | (1) Abnormal Female Turnover | (2) Abnormal Male Turnover |
|---|---|---|
| *RTO* | 0.127*** | 0.044 |
| | (2.71) | (1.01) |
| *Size_lag* | 0.052 | 0.079 |
| | (0.73) | (0.80) |
| *Sales_Growth_lag* | 0.080 | -0.047 |
| | (0.85) | (-0.61) |
| *KZ_lag* | -0.002** | -0.002* |
| | (-2.39) | (-1.74) |
| Firm FE | YES | YES |
| Quarter FE | YES | YES |
| Observations | 828 | 828 |
| R-squared | 0.663 | 0.638 |

**Panel B: By Seniority**

| Dependent Variable = | (1) Abnormal Rank_and_File Turnover | (2) Abnormal Mid-level Manager Turnover | (3) Abnormal Top-level Manager Turnover |
|---|---|---|---|
| *RTO* | 0.068 | 0.093** | 0.099** |
| | (1.67) | (2.40) | (2.10) |
| *Size_lag* | 0.020 | 0.139 | 0.414 |
| | (0.20) | (1.11) | (1.30) |
| *Sales_Growth_lag* | -0.150 | -0.106 | -0.009 |
| | (-0.88) | (-0.92) | (-0.08) |
| *KZ_lag* | -0.002*** | -0.003* | -0.004* |
| | (-3.09) | (-1.77) | (-1.73) |
| Firm FE | YES | YES | YES |
| Quarter FE | YES | YES | YES |
| Observations | 828 | 828 | 826 |
| R-squared | 0.705 | 0.612 | 0.417 |

**Table 3 (Continued)**
**Panel C: By Skill**

| Dependent Variable = | (1) Abnormal Less Skilled Turnover | (2) Abnormal Most Skilled Turnover |
|---|---|---|
| *RTO* | 0.062 | 0.110** |
| | (1.52) | (2.21) |
| *Size_lag* | 0.071 | 0.112 |
| | (1.18) | (1.30) |
| *Sales_Growth_lag* | 0.035 | -0.077 |
| | (0.73) | (-1.35) |
| *KZ_lag* | -0.002** | -0.004*** |
| | (-2.66) | (-4.01) |
| Firm FE | YES | YES |
| Quarter FE | YES | YES |
| Observations | 828 | 828 |
| R-squared | 0.785 | 0.582 |

This table reports the results of abnormal employee turnover rates by gender, seniority, and skill level. Panel A presents the regression results for firm-quarter abnormal employee turnover rates by gender with two-way fixed effects, where the dependent variables are the turnover rates of female employees, adjusted by the average U.S. turnover rate (*Abnormal Female Turnover*), and the turnover rate of male employees, adjusted by the average U.S. turnover rates (*Abnormal Male Turnover*). Panel B reports the regression results for firm-quarter abnormal employee turnover rates by employee seniority with two-way fixed effects, where the dependent variables are the turnover rate of rank-and-file employees in entry-level and junior-level positions, adjusted by the average U.S. turnover rates (*Abnormal Rank-and-File Turnover*), the turnover rate of middle-level managers in manager-level and director-level positions, adjusted by the average U.S. turnover rates (*Abnormal Mid-Level Manager Turnover*), and the turnover rate of top-level managers in executive-level and senior-executive-level positions, adjusted by the average U.S. turnover rates (*Abnormal Top-Level Manager Turnover*). Panel C provides the regression results for firm-quarter abnormal employee turnover rates by employee skill level with two-way fixed effects, where the dependent variables are the turnover rate of less-skilled employees whose skill levels rank below the top quartile, adjusted by the average U.S. turnover rates (*Abnormal Less-Skilled Turnover*), and the turnover rate of more-skilled employees whose skill levels rank within the top quartile, adjusted by the average U.S. turnover rates (*Abnormal More-Skilled Turnover*). *RTO* is an indicator for observations of RTO firms in the post-RTO period, including the RTO announcement quarter. Variable definitions are provided in the Appendix. Firm and quarter fixed effects are included but not tabulated. Robust t-statistics based on standard errors clustered by firm are in parentheses. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels (two-tailed).

**Table 4 Change in Time to Hire and Hire Rate After RTO Announcements**

| Dependent Variable = | (1) Time_to_Hire | (2) Abnormal Hire Rate |
|---|---|---|
| RTO | 0.239*** | -0.032* |
| | (3.82) | (-1.84) |
| Size_lag | 0.119 | -0.064 |
| | (0.73) | (-1.15) |
| Sales_Growth_lag | 0.133* | 0.019 |
| | (1.93) | (0.39) |
| KZ_lag | -0.003 | 0.001** |
| | (-0.85) | (2.19) |
| Firm FE | YES | YES |
| Quarter FE | YES | YES |
| Observations | 762 | 765 |
| R-squared | 0.421 | 0.840 |

This table presents the results of employee hiring analyses. The dependent variables are the natural logarithm of days to fill job openings (*Time_to_Hire*) and the firm-quarter hire rates, adjusted by the average U.S. hire rate (*Abnormal Hire Rate*). *RTO* is an indicator for observations of RTO firms in the post-RTO period, including the RTO announcement quarter. Variable definitions are provided in the Appendix. Firm and quarter fixed effects are included but not tabulated. Robust t-statistics based on standard errors clustered by firm are in parentheses. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels (two-tailed).

**Appendix. Variable Definitions**

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| *Headcount* | The average number of employees with LinkedIn profiles in the prior quarter, calculated by averaging the firm's monthly headcounts on LinkedIn. Source: LinkedIn. |
| *Female_Headcount* | The average number of female employees with LinkedIn profiles in the prior quarter, calculated by averaging the firm's monthly female headcounts on LinkedIn. Source: LinkedIn. |
| *Male_Headcount* | The average number of male employees with LinkedIn profiles in the prior quarter, calculated by averaging the firm's monthly male headcounts on LinkedIn. Source: LinkedIn. |
| *Rank_and_File_Headcount* | The average number of rank-and-file employees with LinkedIn profiles in the prior quarter, calculated by averaging the firm's monthly rank-and-file employee headcounts on LinkedIn. Rank-and-file employees are defined as those in entry-level and junior-level positions. Source: LinkedIn. |
| *Mid_Level_Manager_Headcount* | The average number of midlevel managers with LinkedIn profiles in the prior quarter, calculated by averaging the firm's monthly midlevel manager headcounts on LinkedIn. Midlevel managers are defined as those in manager-level and director-level positions. Source: LinkedIn. |
| *Top_Level_Manager_Headcount* | The average number of top managers with LinkedIn profiles in the prior quarter, calculated by averaging the firm's monthly top manager headcounts on LinkedIn. Top managers are defined as those in executive-level and senior-executive-level positions. Source: LinkedIn. |
| *Less_Skilled_Headcount* | The average number of less skilled employees with LinkedIn profiles in the prior quarter, calculated by averaging the firm's monthly less skilled employee headcounts on LinkedIn. Less skilled employees are defined as those whose skill level ranks below the top quartile of all employee skills on LinkedIn. Source: LinkedIn. |
| *More_Skilled_Headcount* | The average number of most skilled employees with LinkedIn profiles in the prior quarter, calculated by averaging the firm's monthly most skilled employee headcounts on LinkedIn. Most skilled employees are defined as those whose skill level ranks at or above the top quartile of all employee skills on LinkedIn. Source: LinkedIn. |
| *Size_lag* | Firm size at the end of the prior quarter, calculated as the natural logarithm of total asset (asset). Source: Compustat. |
| *Sales_Growth_lag* | Sales growth over the prior quarter, calculated as $revtq_{q-1}/revtq_{q-2} - 1$. Source: Compustat. |
| *KZ_lag* | Financial constraints at the end of the prior quarter, calculated using quarterly data following Kaplan & Zingales (1997). Source: Compustat. |
| *Total Turnover* | The firm-quarter employee turnover rate, calculated by averaging the monthly turnover rates. The monthly employee turnover rate is computed by dividing the number |

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| | of employees who left the firm during the month by the employee headcount at the end of the prior month. Source: Manual Collection. |
| *Female Turnover* | The firm-quarter female employee turnover rate, calculated by averaging the monthly female turnover rates. The monthly female employee turnover rate is computed by dividing the number of female employees who left the firm during the month by the female employee headcount at the end of the prior month. Source: Manual Collection. |
| *Male Turnover* | The firm-quarter male employee turnover rate, calculated by averaging the monthly male turnover rates. The monthly male employee turnover rate is computed by dividing the number of male employees who left the firm during the month by the male employee headcount at the end of the prior month. Source: Manual Collection. |
| *Rank_and_File Turnover* | The firm-quarter rank-and-file employee turnover rate, calculated by averaging the monthly rank-and-file employee turnover rates. The monthly rank-and-file employee turnover rate is computed by dividing the number of rank-and-file employees who left the firm during the month by the rank-and-file employee headcount at the end of the prior month. Source: Manual Collection. |
| *Mid_Level Manager Turnover* | The firm-quarter midlevel manager turnover rate, calculated by averaging the monthly midlevel manager turnover rates. The monthly midlevel manager turnover rate is computed by dividing the number of midlevel managers who left the firm during the month by the midlevel manager headcount at the end of the prior month. Source: Manual Collection. |
| *Top_Level Manager Turnover* | The firm-quarter top manager turnover rate, calculated by averaging the monthly top manager turnover rates. The monthly top manager turnover rate is computed by dividing the number of top managers who left the firm during the month by the top manager headcount at the end of the prior month. Source: Manual Collection. |
| *Less Skilled Turnover* | The firm-quarter less-skilled employee turnover rate, calculated by averaging the monthly less-skilled employee turnover rates. The monthly less-skilled employee turnover rate is computed by dividing the number of less-skilled employees who left the firm during the month by the less-skilled employee headcount at the end of the prior month. Source: Manual Collection. |
| *More Skilled Turnover* | The firm-quarter most skilled employee turnover rate, calculated by averaging the monthly most skilled employee turnover rates. The monthly most skilled employee turnover rate is computed by dividing the number of most skilled employees who left the firm during the month by the most skilled employee headcount at the end of the prior month. Source: Manual Collection. |
| *US_Turnover* | The month-average employee turnover rates in the U.S. Source: FRED. |

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| *Abnormal Total Turnover* | The firm-quarter abnormal employee turnover rate, calculated by averaging the monthly abnormal employee turnover rates. The monthly abnormal employee turnover rate is computed by dividing the number of employees who left the firm during the month by the employee headcount at the end of the prior month, adjusted by subtracting the average monthly employee turnover rate in the U.S. Source: Manual Collection. |
| *Abnormal Female Turnover* | The firm-quarter abnormal female employee turnover rate, calculated by averaging the monthly abnormal female employee turnover rates. The monthly abnormal female employee turnover rate is computed by dividing the number of female employees who left the firm during the month by the female employee headcount at the end of the prior month, adjusted by subtracting the average monthly employee turnover rate in the U.S. Source: Manual Collection. |
| *Abnormal Male Turnover* | The firm-quarter abnormal male employee turnover rate, calculated by averaging the monthly abnormal male employee turnover rates. The monthly abnormal male employee turnover rate is computed by dividing the number of male employees who left the firm during the month by the male employee headcount at the end of the prior month, adjusted by subtracting the average monthly employee turnover rate in the U.S. Source: Manual Collection. |
| *Abnormal Rank_and_File Turnover* | The firm-quarter abnormal rank-and-file employee turnover rate, calculated by averaging the monthly abnormal rank-and-file employee turnover rates. The monthly abnormal rank-and-file employee turnover rate is computed by dividing the number of rank-and-file employee who left the firm during the month by the rank-and-file employee headcount at the end of the prior month, adjusted by subtracting the average monthly employee turnover rate in the U.S. Source: Manual Collection. |
| *Abnormal Mid_Level Manager Turnover* | The firm-quarter abnormal midlevel manager turnover rate, calculated by averaging the monthly abnormal midlevel manager turnover rates. The monthly abnormal midlevel manager turnover rate is computed by dividing the number of midlevel managers who left the firm during the month by the midlevel manager headcount at the end of the prior month, adjusted by subtracting the average monthly employee turnover rate in the U.S. Source: Manual Collection. |
| *Abnormal Top_Level Manager Turnover* | The firm-quarter abnormal top manager turnover rate, calculated by averaging the monthly abnormal top manager turnover rates. The monthly abnormal top manager turnover rate is computed by dividing the number of top managers who left the firm during the month by the top manager headcount at the end of the prior month, adjusted by |

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| | subtracting the average monthly employee turnover rate in the U.S. Source: Manual Collection. |
| *Abnormal Less Skilled Turnover* | The firm-quarter abnormal less-skilled employee turnover rate, calculated by averaging the monthly abnormal less-skilled employee turnover rates. The monthly abnormal less-skilled employee turnover rate is computed by dividing the number of less-skilled employees who left the firm during the month by the less-skilled employee headcount at the end of the prior month, adjusted by subtracting the average monthly employee turnover rate in the U.S. Source: Manual Collection. |
| *Abnormal More Skilled Turnover* | The firm-quarter abnormal most skilled employee turnover rate, calculated by averaging the monthly abnormal most skilled employee turnover rates. The monthly abnormal most skilled employee turnover rate is computed by dividing the number of most skilled employees who left the firm during the month by the most skilled employee headcount at the end of the prior month, adjusted by subtracting the average monthly employee turnover rate in the U.S. Source: Manual Collection. |
| *Time_to_Hire* | The natural logarithm of the average duration (in days) of job posts created within each firm quarter. Source: LinkUp |
| *Hire Rate* | The firm-quarter employee new hire rate, calculated by averaging the monthly employee new hire rates. The monthly employee new hire rate is computed by dividing the number of employees who entered the firm during the month by the employee headcount at the end of the prior month. Source: Manual Collection. |
| *U.S. Hire Rate* | The monthly-average new hire rates in the U.S. Source: U.S. Bureau of Labor Statistics. |
| *Abnormal Hire Rate* | The firm-quarter abnormal employee new hire rate, calculated by averaging the monthly abnormal employee new hire rates. The monthly abnormal employee new hire rate is computed by dividing the number of employees who entered the firm during the month by the employee headcount at the end of the prior month, adjusted by subtracting the average monthly new hire rate in the U.S. Source: Manual Collection. |
| *High_Tech* | Indicator variable that equals 1 if the firm is categorized as a high-tech company (SIC first 3 digits being 283, 357, 366, 367, 382, 384, 481, 482, 489, 737, and 837). Source: Compustat. |
| *Finance* | Indicator variable that equals 1 if the firm is categorized as a finance, insurance, or real estate company (SIC first 2 digits between 60-67). Source: Compustat. |
| *RTO* | Indicator variable for observations in the post-RTO period, which equals 1 if an observation of an RTO firm is after (including) the RTO announcement quarter. Source: Manual collection. |