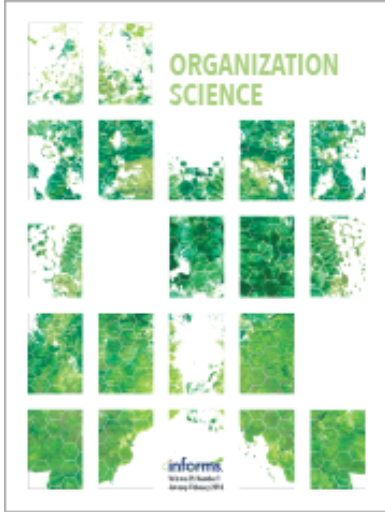




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Temporal Availability and Women Career Progression: Evidence from Cross-Time-Zone Acquisitions

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Abstract. This study investigates whether an increase in the demand for nonconventional work schedules helps explain the gender gap in career advancement. We look at employees of U.S. firms acquired between 2010 and 2014 and distinguish between same and different time-zone acquisitions. The idea is that time-zone differences between the headquarters and the newly acquired firm increase the demand for and value of working outside the standard working schedule. This, combined with social norms about women's role as caregivers, puts female employees at a disadvantage relative to men. Based on Zephyr-LinkedIn matched data, our results show that women are about 9.5% less likely than men to be promoted in cross-time-zone acquisitions than in same-time-zone acquisitions. The gap rises to 10.6% for managerial occupations, and it is higher for time-zone differences of two and three hours. We discuss the implications of our results for the management, evaluation, and retention of human capital in organizations and, more generally, for gender equality in the workplace.

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Supplemental Material: The online appendices are available at <https://doi.org/10.1287/orsc.2023.17685>.

Keywords: temporal availability • women career progression • time zone differences • acquisitions

1. Introduction

Women's participation in the labor market has increased over time and then plateaued in the United States, even for college graduates, since around the 1990s (Goldin 2014). Similarly, the gender gap in pay has remained stable throughout the 2000s after decades of decline (Blau and Kahn 2006, Blau 2012). Meanwhile, another trend in the organization of work has emerged: employers' demand for working according to nonstandard schedules and overwork (more than 50 hours per week) has become pervasive (Presser 2003). This practice, besides addressing the genuine employers' need for employees to be available during unconventional hours, has evolved into a signal of dedication and commitment (Blair-Loy 2003, Jacobs

and Gerson 2004, Sharone 2004, Roth 2006, Cha and Weeden 2014), and it is highly rewarded in terms of wage and career progression (Kalleberg 2011, Gicheva 2013, Goldin 2014). This is especially true for highly paid occupations, such as business jobs in finance, law, or consulting (Cha and Weeden 2014). Combined with women's real or perceived constraints to provide such temporal availability, this increased demand may contribute to explaining the persistent gender gap in the labor market.

This is the focus of our study. We investigate the effect of an increase in the employers' demand for temporal availability on female versus male employees' career progression. A higher demand for temporal availability implies rising expectations about prioritizing work over

personal and family needs. These expectations conflict with the belief of women's role as caregivers (Fernandez-Mateo and King 2011, Bianchi et al. 2012, Lerchenmueller and Sorenson 2018). These constraints, in turn, reflect in objective outcomes, such as career advancements and earnings (Kelly et al. 2010, Glass and Noonan 2016).

Our empirical setting is that of employees working at firms acquired by multinational companies. We collect data on 564 U.S. firms acquired in the period 2010–2014 and match them with employees' public records from LinkedIn. We distinguish between two types of deals: acquisitions where the target and acquirer firms are located in a different time zone and acquisitions where they are located in the same time zone. Our logic builds on recent research on the effect of time-zone differences on inter- and intraorganization communication patterns (Bøler et al. 2018, Bahar 2020, Chauvin et al. 2024). The idea is that, on average, cross-time-zone acquisitions involve interactions between target company employees and new headquarters employees whose standard work schedules overlap only partially. This mismatch increases the employer's demand for employees' temporal availability, that is, working earlier in the morning or later in the evening, compared with acquisitions taking place in the same time zone. Thus, if women are (or are perceived as) more constrained than men in providing temporal availability, the probability of being promoted at the target firm after the completion of the deal is lower than for men if the acquisition takes place across time zones instead of in the same time zone.

Our findings reveal that women are about 9.5% less likely than men to make career progressions when the acquisition takes place in a different time zone. This gap increases for women in managerial occupations (10.6%), whereas it disappears for clerical and support/back-office jobs where the share of employees working in non-conventional hours is lower (Cortés and Pan 2016). Moreover, the magnitude of the effect varies across time-zone differences. It is larger when the target firm is located two or three hours away from the acquiring firm (e.g., a New York target firm acquired by a multinational firm headquartered in California). In this case, women are up to about 50% less likely to make career progression than men, relative to same-time-zone acquisitions.

We address concerns related to employees' and firms' heterogeneity by controlling for employees' occupation, age, experience, education, and past promotions and by including firm-industry dummies. For subsets of firms, we also control for acquirer and target dummies. Finally, we account for differences in the probability of men and women leaving the target firm when the acquisition is announced and after the completion of the acquisition. This would be the case, for example, if women anticipate or react to an increase in the demand for temporal availability in cross-time-zone deals and respond by moving out from their job, or if they are laid off by the new

employer when the acquisition comes with higher requirements in terms of temporal availability.

Our work contributes to understanding the sources of gender imbalances in labor market outcomes, which is central to the design of organizational strategies to motivating and retaining employees. We also speak to the following strands of literature. The first comprises contributions focusing on the impact of firms' multinational operations on the gender gap in the workplace. Bøler et al. (2018), for example, examine the gender wage gap effects of doing business with partners in distant countries. We extend this study by showing that the challenges women face to work during nonconventional hours persist within the same organization, with differences across occupations. In particular, because managerial jobs require more temporal availability, an increase in the demand along this dimension may imply that women do not compete for these jobs and adapt, at least in the short run, to a career path on a lower growth trajectory. Second, our research contributes to the literature on workers' preferences for different working arrangements (Mas and Pallais 2017). We build on the evidence that women dislike schedules that require working in nonstandard hours and delve into the career implications of their higher constraints in providing on the job temporal availability.

We discuss the implications of our findings for organizations and individuals, and we highlight possible strategies for employers and regulators to limit the negative effects of this organization of work. A necessary starting point to promote change is to make managers aware of women's disadvantage in these situations and the associated potential costs for the organization in terms of female human capital motivation, attraction, and retention. Rising awareness could limit the use of gender-biased organizational reward systems, especially to extract signals of devotion and commitment that go beyond the real value created by employees. Companies may, instead, use different scheduling arrangements to attract and match employees who are equally talented but have different preferences for time. Current organizational changes such as reducing the working week and allowing for working from anywhere (Choudhury 2020) go in this direction and may help alleviate gender differences in the labor market. At a societal level, policies that target culturally rooted gendered beliefs about the role of women as caregivers could level the playing field and alleviate, especially in the longer run, the gendered consequences of firms' demand for temporal availability. Finally, although we develop a specific study on the promotion effects of employers' demand for temporal availability, we highlight, more broadly, the potential drawbacks of practices that conflict with real or perceived constraints on groups of individuals in organizations.

2. Background Literature and Theoretical Framework

2.1. Value of Temporal Availability

Our arguments build on the observation that the proportion of employees experiencing long working hours and nonstandard schedules has increased in recent decades, particularly for highly educated and highly paid men (Jacobs and Gerson 2004, Kuhn and Lozano 2008). Moreover, employers disproportionately reward employees who work particular hours because of the discomfort that nonstandard schedules can create, which narrows the pool of people willing to provide temporal availability (Goldin 2014, Weeden et al. 2016). This is the case, for example, of jobs in sectors going increasingly global in their operations and thus requiring employees' availability to work in non-conventional hours to satisfy the demand for managing operations across time zones (Bøler et al. 2018, Miller 2019).

In addition, temporal availability on the job is often interpreted as a signal of commitment and devotion to the organization (Presser 2003, Cha and Weeden 2014, Bourdeau et al. 2019), particularly in distributed work settings where employees interact across temporally distant locations (Cristea and Leonardi 2019). In these contexts, where advanced technologies facilitate face-to-face interactions among individuals who are geographically and temporally distant, companies increasingly value workers' availability who can engage in synchronous communication, even during their leisure time (Bonet and Salvador 2017, Chauvin et al. 2024).

Responding to this demand by extending the boundaries of the standard workday aligns with the "ideal worker" norm (Cuddy et al. 2004, Kelly et al. 2010) according to which employees should prioritize work over private life and arrange their outside responsibilities around their paid work (Kelly et al. 2010, Reid 2015). For instance, there is evidence that the duration of parental leave affects subsequent labor market outcomes and that firms use signals inferred from workers' choices on this matter to evaluate their contribution and devotion to the organization (Tô 2018). As a result, even when organizational policies allow for such family-friendly working practices, the ideal worker rarely takes advantage of these opportunities (Gonsalves 2020).

The value of signaling to infer the worker's contribution to the organization is higher in occupations where individual productivity is hard to measure and employees are more likely to be evaluated relative to one another (Jacobs and Gerson 2004, Cha 2010, Cha and Weeden 2014). In these professions, the returns from temporal availability are therefore especially large and consist of immediate monetary compensation and long-term benefits, such as tenured contracts and promotions (Epstein et al. 1999).

2.2. Gender Gap in Temporal Availability and the Implications for Female Career Progression

We argue that an increase in the demand for time availability creates unequal treatment between employees

who can or are willing to work particular hours and those who do not. In itself, it would not translate into gender imbalances if men and women had the same, real or perceived, constraints to work with non standard schedules. However, this is not the case.

Not too long ago, a set of protective labor laws, which include the landmark U.S. Supreme Court decision *Muller v. Oregon*, confirmed the constitutionality of a law preventing women in many occupations from working overtime because of the priority of women's role in the family (Baron 1981). Still today, childcare and elder care remain mainly a women's job, even in egalitarian societies (Cotter et al. 2011, Bianchi et al. 2012, Cha 2013). A study by the Pew Research Center (Geiger et al. 2019) shows that, over the past 20 years, motherhood has become more demanding. Mothers have increased their time in the labor force, they are breadwinners in 40% of U.S. families, and 24% are single moms. At the same time, they spend more time than fathers on childcare, especially when they come from middle-class families and highly educated backgrounds (Cha and Weeden 2014). Among highly educated couples, the typical higher work seniority of husbands makes an uneven division of housework and family tasks economically justified (Cha 2010, Bertrand et al. 2015, Fortin 2015, Sorenson and Dahl 2016). Thus, despite women being currently about half the total workforce, and even if men have increased their child care and housework time (Raley et al. 2012, Cha and Weeden 2014), women still face much more pressure as parents than men.

The tension between organizational practices that reward temporal availability and greater constraints (real or perceived) on work in nonconventional hours drives women into tasks and occupations that offer more predictable schedules (Barbulescu and Bidwell 2013, Cha 2013, Cortés and Pan 2017). Moreover, conditional on being in an occupation, these uneven constraints place women at a disadvantage in terms of earning potential and career progression. For example, Bøler et al. (2018) show that because of a higher demand to work across time zones, the gender wage gap is higher for exporter firms than for nonexporter firms, particularly for workers who are more likely in charge of communicating and coordinating with customers in foreign countries. Mas and Pallais (2017) use a field experiment in a call center to elicit preferences about work arrangements and find that employees have a strong aversion to jobs that permit employers scheduling discretion and that women more than men are willing to take substantial wage cuts to avoid working evenings and weekends, especially if they have young children. For physicians, Wasserman (2022) demonstrates that jobs' time requirements during early career reduce women's entry. The study exploits the timing of a reform that reduced hospitals' residency hours and that was differently binding across medical specialties.

As a result, women are more likely to enter a medical specialty when there are less-binding time schedules.

Women's disadvantage when the demand for temporal availability on the job increases can stem either from the employers' perception of their higher constraints or it may originate from female employees being less likely to aspire to higher-level positions, such as managerial roles, due to the perception that these roles demand greater temporal availability. For example, Fleche et al. (2018) argue that women's lower life satisfaction with longer working hours compared with their husbands is primarily due to the perceived unfairness in the division of household labor. Haegele (2024) shows that when asked to identify changes that accompany career promotions, employees often point at longer and more unpredictable working hours, and that women are generally less likely to apply for promotions, particularly those involving team leadership. Azmat and Ferrer's (2017) study, which uncovers significant gender gaps in performance leading to disparities in earnings and promotions in the legal profession, attributes a substantial portion of these gaps to differences in aspirations to become a partner in the companies, which likely reflect broader concerns about career and traditional gender roles. Thus, women may apply less for promotions either because of genuine constraints or because they anticipate employer perceptions that may favor their male counterparts. In general, as noted by Fernandez-Mateo and Kaplan (2018) and Fernandez-Mateo et al. (2023), the interplay of supply and demand factors contributes to women's lower progression rates to higher and better paid roles. The supply side effect can also arise from organizations discouraging women by making themselves inaccessible or unattractive in terms of work-life balance or by displaying records of bias in promotions, which discourage women from seeking higher-level positions (Fernandez-Mateo and Fernandez 2016, Coffman et al. 2024).

Based on these arguments we test the following expectation: an increase in the employer's demand for temporal availability hampers the career progression of women more than men. In addition, women's disadvantage concerns business jobs such as professional and managerial occupations, in which temporal availability is more common and highly rewarded, more than jobs in secretarial and support occupations.

3. Empirical Approach

3.1. Estimation Strategy

We compare the career progression of male and female employees after their employer firm (i.e., target firm) is acquired by a multinational company. We differentiate between target firms acquired by companies in the same and those in different time zones. The idea is that, on average, time-zone differences between the target and the acquirer increase the employer's demand for

employees' temporal availability. This is because when time zones differ, standard work schedules overlap only partially. Therefore, joint activities, synchronous interactions, and meetings with employees in different time zones require flexibility in adjusting work schedules, which may imply working in uncomfortable hours, later in the evening or earlier in the morning (Goldin and Katz 2011, Bøler et al. 2018). Recent research supports the idea that differences between time zones reduce significantly the opportunity for synchronous communication (Bahar 2020) and that they increase the cost of coordination and communication between employees working at temporally distant locations within the same firm (Chauvin et al. 2024). This often translates into an increase in the demand for employees' temporal availability on the job, particularly in communication-intensive roles like managerial business positions that involve handling complex information, building consensus, and managing negotiations (Dennis et al. 2008). In these roles, face-to-face interactions remain crucial, even if facilitated by technologies supporting long-distance connections. Nachum and Buckley (2023), for example, contend that in organizations requiring coordination of complex tasks across time zones, the cost associated with temporal distance is substantial. Real-time connectivity remains essential for these tasks and requires adjustments to synchronize employees' working schedules.

If cross-time-zone acquisitions increase the employers' demand for temporal availability, and women are less flexible in their work schedules or are perceived as such by their employers, their opportunities for career progression should be lower than men's, and relative to same-time-zone acquisitions. To test this prediction, we estimate the following equation:

$$\begin{aligned} Promotion_{if} = & \beta_0 + \beta_1 Female_i + \beta_2 DifferentTZ_f \\ & + \beta_3 Female_i \times DifferentTZ_f + \beta X_{if} + \epsilon_{if}. \end{aligned}$$

The dependent variable $Promotion_{if}$ takes the value of one if employee i experiences a job title change while working at target firm f in the year of the completion of the acquisition or the year after. Thus, the time dimension is built in the definition of the dependent variable, and employees are either part of the treatment group (i.e., target firms eventually acquired across time zones) or of the control group (i.e., target firms that always retain their headquarters in the same time zone). $Female_i$ is a dummy variable that takes the value of one for female employees, and $DifferentTZ_f$ is a dummy variable that takes the value of one if the acquirer is in a different time zone than the target firm f . The coefficient β_3 of interaction between the $Female_i$ dummy variable and the acquirers being in a different time-zone indicator (i.e., $DifferentTZ_f$) captures the probability of promotion of a female employee (compared with a male employee) working at a target firm that is acquired by a firm

headquartered in a different time zone compared with the same time zone. This is our coefficient of interest, which we expect to be negative if the rising demand for temporal availability negatively affects female employees’ career progression compared with men.

We control for employee characteristics, including type of occupation, age, education, work experience, and previous promotions at the focal firm. We also include target-firm industrial sector at the Nomenclature statistique des Activités économiques dans la Communauté Européenne (NACE) two-digit level to control for industry-specific characteristics and date-of-acquisition dummies (month and year), to account for temporal trends. Finally, we include a variable for the geographical distance between the target and the acquirer firms (in kilometers) as well as target-acquirer-country-pair dummies. These two control variables limit concerns about alternative explanations that could potentially drive our results. Target-acquirer-country-pair dummies factor out potential cultural and institutional differences between countries that may correlate with cross-versus same-time-zone acquisitions (Weber et al. 1996, Delis et al. 2017); the measure of geographical distance between the acquirer and the target firm captures the benefits and the costs associated with physical separation between the target and the acquirer (Giroud 2013). However, for these forces to explain our results, they should correlate with employees’ gender differences at the target firm that translate into different career paths.

3.2. Data

We combine information drawn from different sources and summarize the main steps to build our data set in this section. The Online Appendix contains a detailed description of the procedures adopted.

3.2.1. Acquisitions Data. We extracted from the Zephyr (Bureau Van Dijk) database information on acquisitions of U.S. target firms by multinational enterprises (MNEs). We focused on firms that were acquired between 2010 and 2014 and that, before the acquisition, were already part of a multinational company with headquarters in the same time zone as the target firm itself.[†] By using target firms that are in the same time zone as their vendor company, we reduce concerns that

employees had previous experience in working with geographically distant headquarters. Moreover, by considering target firms that were already part of a multinational company, we avoid having a time-zone change coinciding with a shift in the target firm’s ownership status from domestic to multinational. Our working sample comprises 564 target firms subject to a completed majority acquisition (see Online Appendix A for details on the procedure used to collect and organize the data).

To distinguish between firms acquired by companies headquartered in the same time zone as the target firm and those acquired by companies located in different time zones, we classified each acquisition according to the location of the global ultimate owner (GUO) headquarters and calculated the difference in time zones, or the number of hours, between the acquirer and the target firm.² Table 1 shows the distribution of target firms by time-zone difference with acquirers’ headquarters. It also displays the corresponding number of acquirer firms. About 45% of the target firms are acquired by companies in their same time zone. The remaining 55% are spread across time zones, with negative time-zone differences (e.g., East Coast target firms acquired by West Coast companies) being slightly more frequent than positive time-zone differences. The large majority of acquisitions involves U.S. target and acquirer firms (about 78%; 43,960 employees). Of these, about 18.2% (6,294 employees) take place within the same U.S. state.

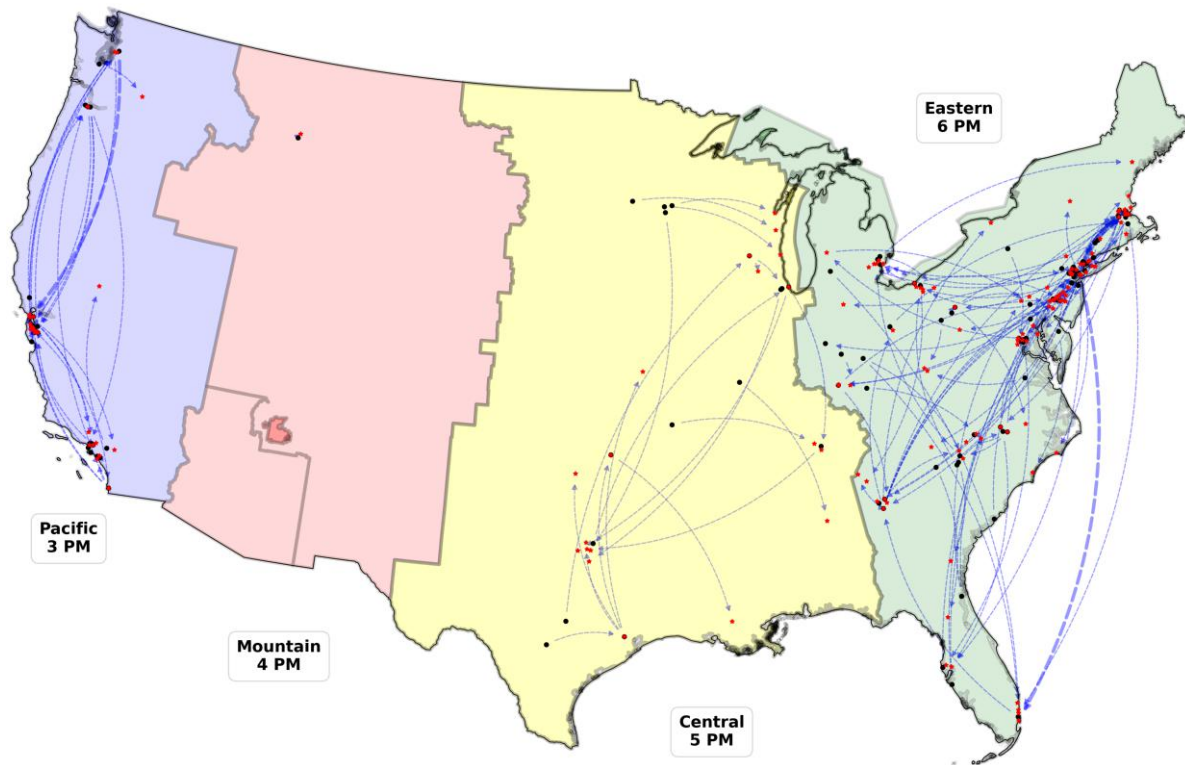
Figures 1–3 map the geography of the acquisitions. Each colored area in the map identifies regions within the same time zone. Figure 1 shows same time zones acquisitions of U.S. targets. About 67% of these deals involve firms located in the east coast, with an important cluster in the area between New York and Washington. Additional hot spots coincide with large urban areas such as Detroit and Cleveland, and Miami and Tampa. On the west coast, San Francisco, Los Angeles, and Seattle host most of the acquiring and target firms. Figure 2 shows cross time acquisitions within the United States. Most of them are between the West and the East Coast, with target and acquiring firms being mostly located in areas such as San Francisco, New York, and Washington. These deals entail a time zone difference between the target and the acquirer firms of about three hours. Finally, Figure 3 shows the

Table 1. Distribution of Target and Acquirer Firms by Time-Zone Difference (Hours)

Target and acquirer firms	Time-zone difference between target and acquirer									Total
	≤ −4	−3	−2	−1	0	+1	+2	+3	≥ +4	
Number of target firms	81	58	24	45	252	30	11	44	19	564
Percentage	14.3	10.3	4.3	8	44.7	5.3	1.9	7.8	3.4	100
Number of acquirer firms	73	50	21	41	216	27	10	34	18	490
Percentage	14.9	10.2	4.3	8.4	44.1	5.5	2	6.9	3.7	100

Note. Acquirer firms with multiple acquisitions in different time zones are double-counted; thus, the total number of acquirer firms reported in this table is higher (= 490) than the actual number of acquirer firms in the sample (= 448).

Figure 1. (Color online) Within U.S. Acquisitions: Sample of Target and Acquirer Firms Located in the Same Time Zone



Notes. Dots indicate acquirers; stars are for target firms. Line width proportional to the number of deals.

geography of acquisitions that involve U.S. targets acquired by acquirers located outside the United States. Most of them are made by European and, to a lesser extent, Asian acquirers, particularly from Japan.

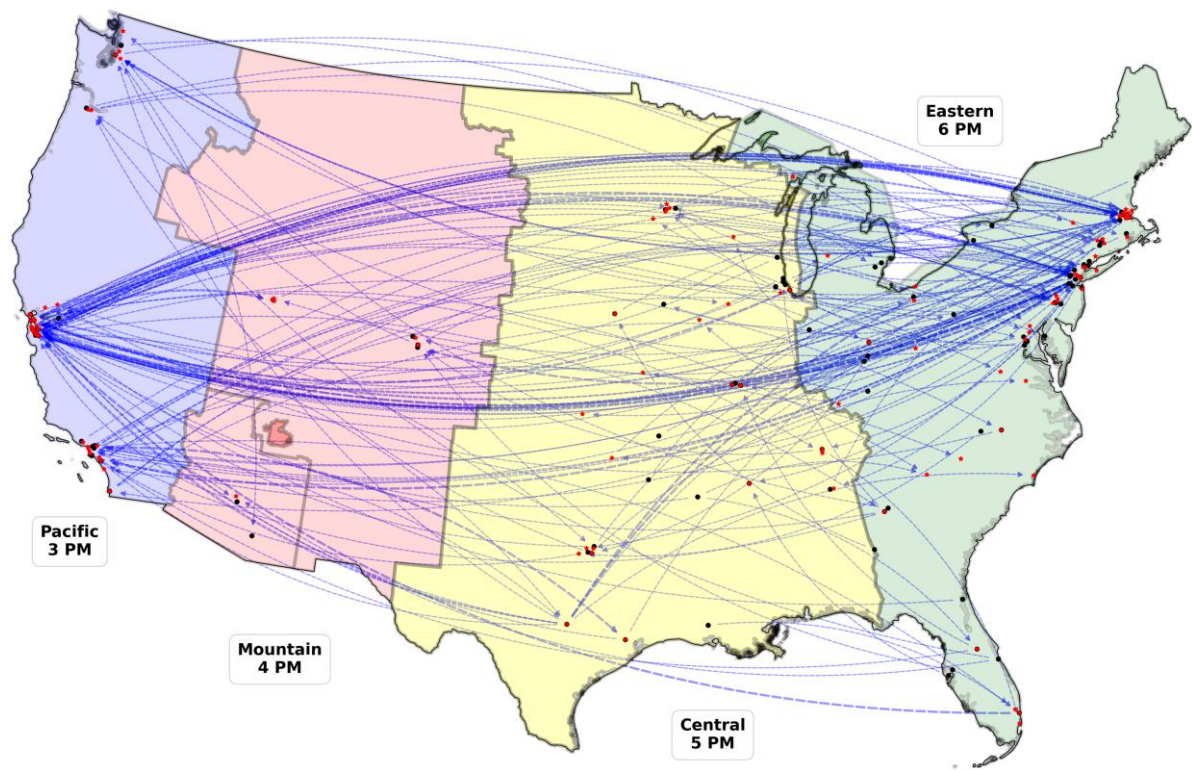
We used information on the geo-location of target and acquirer firms (i.e., defined by latitude and longitude coordinates) also to measure the geographical distance (in kilometers) between them (*Geographical distance*). Finally, we recovered from Zephyr information on the industry of the target firm at the two-digit NACE Rev. 2 level (*Industry*). Online Appendix A shows the distribution of target firms across industries and number of employees in our sample.

3.2.2. Employment Data. We used employees' public profiles published in LinkedIn to collect the resumes of the employees of the 564 target firms in our sample (see Online Appendix B for details). To construct our dependent variable, we tracked the employment history of each employee and use job-title changes reported in the LinkedIn profile to identify promotions, thus assuming that the destination job "wins" over the origin job (Ng and Stuart 2022). Our dependent variable *Promotion* takes the value of one if an employee reports a job-title change within the target firm in the completion year of the acquisition or in the year after and zero otherwise. For robustness checks, we defined an alternative dependent variable (*Promotion 2y*) taking the value of one if an

employee reported a job-title change within the target firm in the year of completion of the acquisition or in the two years after and zero otherwise.

We label as *Promotion* all job-title changes. To assess the proportion of changes corresponding to actual upward moves, rather than horizontal moves or changes that do not lead to higher roles in the occupational hierarchy, we manually inspected the job titles of a random sample of 10,000 employees from our data set (Online Appendix E.1). Of all job title changes, 61% are unequivocal promotions, whereas in 31% of the cases, it is challenging to determine whether the change represents a promotion or a lateral move. Only 8% involve job title changes that may not lead to higher level roles. Table E.1 in the Online Appendix presents consistent results from sensitivity tests using different definitions of the dependent variable. As an additional check, we explored if job title changes in our data align with salary increases, which would suggest promotions. To this end, we matched job titles with U.S. salaries from the [indeed.com](https://www.indeed.com) platform (Online Appendix E.2) and found that 89% of job changes correspond to higher salaries. Recent research also indicates that lateral moves often result in significantly increased responsibilities and resources and are precursors to vertical promotions (Benson and Rissing 2020, Bidwell and Keller 2024). For these reasons and for consistency with previous work using similar data and methodology (Ge et al. 2016, Ng and Stuart

Figure 2. (Color online) Within U.S. Acquisitions: Sample of Target Firms Acquired by Companies from Different Time Zones



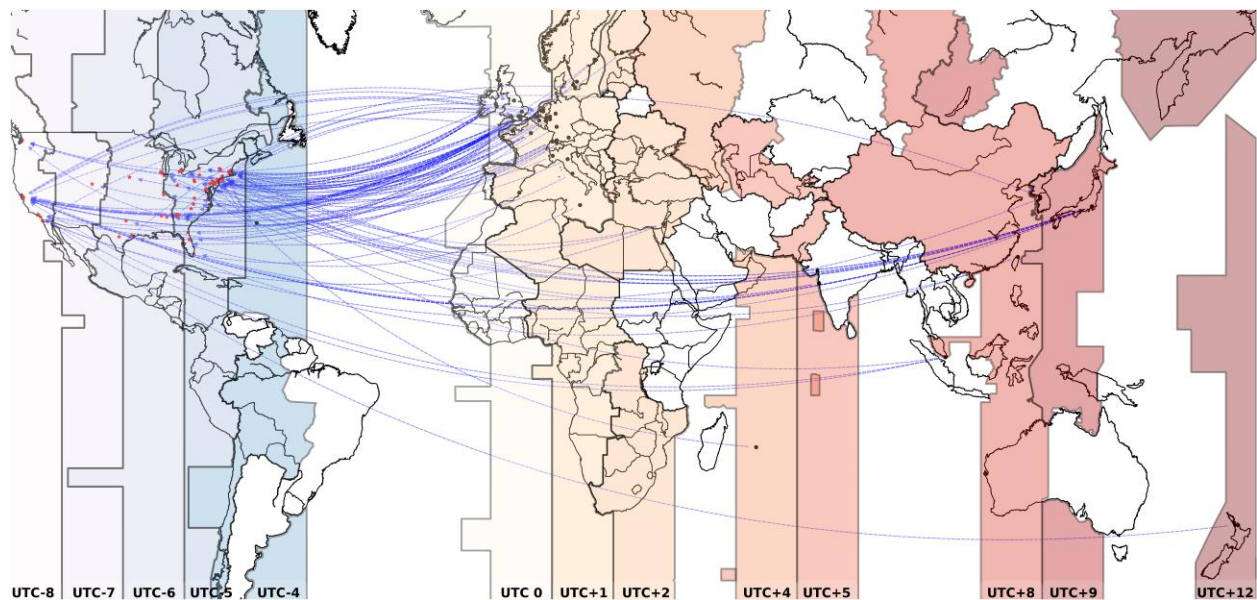
Notes. Dots indicate acquirers; stars are for target firms. Line width proportional to the number of deals.

2022), we adopt the label *Promotion*, acknowledging that it may include also a portion of lateral moves.

We leveraged information from LinkedIn to construct variables concerning employees' gender, education, age, and work experience. The variable *Female* takes the value of one for female employees and zero

for male employees. To build this variable, we used the given name of the employee as reported in the resume and assigned the most likely gender using various sources. Online Appendix B.2 describes the methodology we used. We also defined a dummy variable that takes the value of one if the employee attained a BSc

Figure 3. (Color online) Acquisitions of U.S. Target Firms by Companies Outside the United States



Notes. Dots indicate acquirers; stars are for target firms. Line width proportional to the number of deals.

degree or higher and zero otherwise (*BSc degree or higher*). As far as age is concerned, we assigned employees to four decadal age bands (*Age band*): this ordinal variable takes values from one for employees younger than 30 to four for employees older than 50. Similarly, we built a variable capturing experience in the labor market (*Experience band*). We assigned each employee to one of five quinquennial experience bands: This ordinal variable takes values ranging from one for employees who are in the labor market for 5 years or less (according to the date of their first job as reported in LinkedIn) to five for employees with more than 20 years of experience. We also coded whether an employee experienced one or more job promotions at the focal firm in the two years before the acquisition (*Promoted before*).

We then classified employees' occupations according to whether they are in *Business*, *Health*, or *Science and Technology*. We focus on employees in these occupations because, based on previous research, we can make predictions about the value of temporal availability for the firms. Goldin (2014), for instance, suggests that occupations in *Business*, *Health*, *Science and Technology*, and *Law* differ with respect to characteristics related to workers' time pressures, requirements to be available at particular times, scheduling flexibility, and substitutability by other workers. We used information on employees' skills as reported in the LinkedIn resumes and developed an algorithm to associate each skill with a *Business*, *Health*, or *Technology and Science* occupation (see Online Appendix C for details). We could not use job titles to classify employees' field of occupation because those supplied by LinkedIn subscribers do not follow a standard classification and are based on people's highly personalized and idiosyncratic job description.

We distinguish between managerial (*Managerial*) and support (*Support*) occupations because of the different value of temporal availability in these jobs. To classify employees in managerial and administrative/support occupations, we used a word-search algorithm that looks for titles that are more likely to appear in managerial job names (e.g., chief, director, executive, general manager) versus support job names (e.g., secretary, assistant, desk, reception, clerk). To reduce the noise associated with the large variation in job names in LinkedIn, we complement this method with information about employees' educational attainment and perform this classification for employees in *Business* occupations only (see Online Appendix D for details).

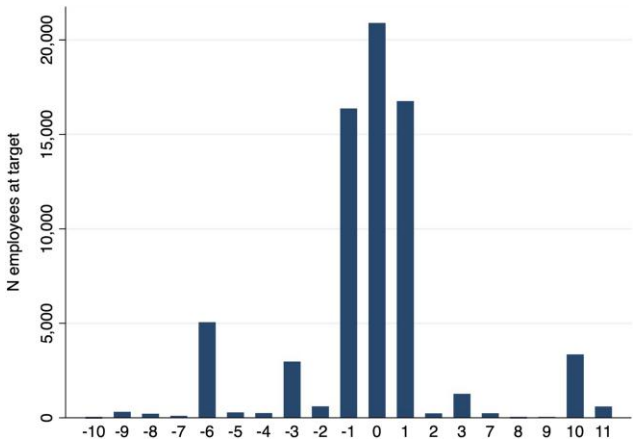
We obtained information on the gender of the chief executive officer (CEO) of the acquiring firm by fuzzy matching the names of our acquirer companies with those in the Execucomp database. This process resulted in matches for 90 acquirer firms involved in 107 acquisitions (29,438 employees). We created a variable labeled *Female CEO* that takes a value of one if the acquiring firm is headed by a female CEO, and zero otherwise.

Finally, we used information on tenure and work experience to distinguish non-entry-level employees, namely those with more than two years of tenure at the target firm and at least five years of experience in the labor market from entry-level employees. We perform our main analysis on non-entry-level employees for two reasons. First, entry-level employees are less experienced and have more limited responsibilities within the firm. They are more likely to have specific contractual agreements, such as temporary contracts or internship positions, and therefore their career path during the transition to the new acquirer may follow a different logic (i.e., layouts). Second, and most importantly, entry-level employees are young (86% of these employees in our sample are under 30), making women and men similar in terms of constraints on working with nonstandard schedules and on their capacity to meet the demand for working according to nonstandard schedules. Thus, for them, we do not expect gender differences in promotion rates.

Our final sample of employees working at the 564 target firms during the time window around the acquisition comprises 69,574 individuals, of whom 30,421 are women and 39,153 are men. Their distribution by time-zone difference is shown in Figure 4. The majority of employees are employed in target firms located either in the same time zone of the acquirer firm (i.e., zero category) or at ± 1 hours of difference from the acquirer company. Moreover, similar to the distribution of target firms, more employees are in firms with a negative rather than positive time-zone difference.

Table 2 defines the variables used in the empirical analysis. Table 3 reports descriptive statistics separately for women and men, and for acquisitions in the same and in different time zones. The share of promotions within one year after the acquisition is 5% for both women and men when the acquisition takes place in

Figure 4. (Color online) Distribution of Employees by Time-Zone Difference Between Target and Acquirer Firms



Note. Overall, there are 69,574 employees in the sample.

Table 2. Description of Variables

Variable	Description
Promotion	1 if employee <i>i</i> reports a change in job title at the target firm <i>f</i> in the year of completion of the acquisition or in the year after its completion, 0 otherwise
Promotion 2y	1 if employee <i>i</i> reports a change in job title at the target firm <i>f</i> in the year of completion of the acquisition or in the two years after its completion, 0 otherwise
Female	1 if employee <i>i</i> is female, 0 if male
Different TZ	1 if target firm <i>f</i> and acquirer are located in different time zones, 0 otherwise
Geographical distance	Distance in kilometers between the target firm <i>f</i> and the headquarters of the acquirer
Industry	Dummy variables for the 2-digit NACE Rev. 2 industry of the target firm <i>f</i>
BSc degree or higher	1 if employee <i>i</i> has a BSc degree or higher, 0 otherwise
Age band	1 if age < 30; 2 if age 30–39; 3 if age 40–49; 4 if age ≥50
Experience band	Experience in labor market: 1 if ≤5 years; 2 if 6–10 years; 3 if 11–15 years; 4 if 16–20 years; 5 if ≥21 years
Promoted before	1 if employee <i>i</i> experienced a change in job title at the target firm <i>f</i> in the 2 years2 years before the acquisition, 0 otherwise
Business	1 if employee <i>i</i> has a business occupation at the target firm <i>f</i> , 0 otherwise
Health	1 if employee <i>i</i> has a health occupation at the target firm <i>f</i> , 0 otherwise
Technology and Science	1 if employee <i>i</i> has a technology and science occupation at the target firm <i>f</i> , 0 otherwise
Managerial	1 if employee <i>i</i> has a managerial role at the target firm <i>f</i> , 0 otherwise
Support	1 if employee <i>i</i> has a support or administrative role at the target firm <i>f</i> , 0 otherwise
Mobility between announcement and completion date	1 if employee <i>i</i> left the target firm <i>f</i> in the period between the announcement of the acquisition and its completion, 0 otherwise
Mobility	1 if employee <i>i</i> left the target firm <i>f</i> in the year of completion of the acquisition or in the year after its completion, 0 otherwise
Female CEO	1 if employee <i>i</i> works at a target firm <i>f</i> that is acquired by a company led by a female CEO, 0 otherwise

the same time zone; women are instead promoted less than men in different-time-zone acquisitions (9% versus 10% for men). The employees’ profiles in terms of education, age, and experience differ between women and men but are fairly similar across target firms acquired in same and different time zones. *Geographical distance* is larger for cross-time-zone acquisitions, and the distribution by field of occupation differs depending on whether the acquisitions are in the same or in a different time zone, with more employees in *Business* occupations in same-time-zone acquisitions, and more employees in *Health* and *Technology and Science* occupations in cross-time-zone acquisitions. Indicators such as promotion rates are higher for employees, both men and women, at target firms involved in cross-time-zone acquisitions with respect to same-time-zone acquisitions, with women being promoted relatively less than men only in cross-time-zone deals. This evidence aligns with our expectation.

A specific note concerns the representativeness of LinkedIn employees with respect to the overall population of employees in the target firms. Individuals decide whether to sign up for LinkedIn, and the likelihood to do so may change across, for instance, gender or occupations. The fact that social networks became pervasive in recent years and that LinkedIn, in particular, is a worldwide leading platform for labor-market-related content, should limit this concern. To check the representativeness of our LinkedIn sample of employees, we

compared its composition with the general population of workers in the U.S. Community Population Survey (CPS), the primary source of labor-force statistics for the U.S. population. We constructed figures for the gender and occupational structure of the CPS labor force for the same 2010–2014 period of our analysis and compared them with those from our data set. The share of women in our sample is similar to that in the U.S. CPS (43% in CPS data, 44% in our sample). Also, the distribution of employees across the three fields of occupation in our sample is not far from that in CPS data: CPS data report 72% of employees in *Business* occupations, 15% in *Technology and Science*, and 19% in *Health* occupations. In our sample, these shares amount to 68%, 20%, and 12%, respectively (see Table H.1 in Online Appendix H).

We also reviewed recent literature that has examined the use of LinkedIn for research purposes, and we analyzed data from the Pew Research Center to investigate differences between women and men in the use of this professional social network. In a nutshell, the literature review and the data analysis suggest that, in line with the business model of the platform to be used for job-related purposes, subscribers are more frequent among young, high-income, and highly educated professionals but that there is no gender-specific selection on top of these characteristics. Online Appendix F summarizes the findings from this investigation.

Table 3. Descriptive Statistics by Gender and Type of Acquisition (Same vs. Different Time Zones)

Panel A: Acquisitions in the same time zone				
Variable	Men (N = 12,310)		Women (N = 8,583)	
	Mean	Standard deviation	Mean	Standard deviation
Promotion	0.05	0.22	0.05	0.22
Promotion 2y	0.06	0.23	0.06	0.23
BSc degree or higher	0.51	0.50	0.44	0.50
Age band	2.63	0.79	2.53	0.73
Experience band	3.42	1.20	3.26	1.16
Promotion before	0.07	0.25	0.07	0.25
Geographical distance	226.99	344.94	245.43	335.50
Business	0.77	0.42	0.83	0.37
Health	0.04	0.19	0.10	0.30
Technology and Science	0.19	0.40	0.07	0.25
Managerial	0.43	0.49	0.31	0.46
Support	0.55	0.50	0.66	0.47
Mobility btw announc. and completion date	0.22	0.41	0.19	0.39
Mobility	0.17	0.38	0.18	0.38
Female CEO	0.01	0.10	0.01	0.11

Panel B: Acquisitions in different time zones				
Variable	Men (N = 26,843)		Women (N = 21,838)	
	Mean	Standard deviation	Mean	Standard deviation
Promotion	0.10	0.30	0.09	0.29
Promotion 2y	0.12	0.33	0.11	0.32
BSc degree or higher	0.53	0.50	0.48	0.50
Age band	2.68	0.78	2.55	0.72
Experience band	3.40	1.20	3.21	1.17
Promotion before	0.11	0.31	0.11	0.31
Geographical distance	3,752.3	3,464.18	2,386.19	2,520.98
Business	0.56	0.50	0.70	0.46
Health	0.11	0.31	0.20	0.40
Technology and Science	0.33	0.47	0.09	0.29
Managerial	0.44	0.50	0.33	0.47
Support	0.53	0.50	0.64	0.48
Mobility btw announc. and completion date	0.16	0.37	0.14	0.34
Mobility	0.12	0.33	0.11	0.31
Female CEO	0.001	0.04	0.001	0.03

Notes. Men, N = 39,153; women, N = 30,421. Descriptive statistics on *Managerial* and *Support* refer to the subsample of *Business* occupations (N = 45,660). Descriptive statistics on mobility between announcement and completion date refer to the sample of employees at the target firm since the announcement date (N = 83,690). Data on female CEOs are available for the sample of acquirer firms matched with firms in the Execucomp database (N = 29,438 employees).

4. Baseline Estimates

Table 4 shows the estimated results from regressions that use *Promotion* as the dependent variable. Column (1) includes the baseline specification with *Female* and *Different TZ* dummy variables, in addition to controls for country pairs, industry, occupation, and time. On average, women are promoted 0.5 percentage points (that is, 6%, relative to a baseline promotion rate of 8.4%) less than men ($p = 0.069$), consistent with extant research on the gender gap in labor-market outcomes. The estimated coefficient for acquisitions taking place in a different time zone is negative, although with $p = 0.383$.³ Column (2) adds the interaction term between *Female* and *Different TZ* to the baseline specification. The coefficient of this interaction term (i.e., β_3 in the

estimated equation) is negative and statistically significant below the 5% level ($p = 0.028$). Compared with male employees, female employees are 0.8 percentage points less likely to be promoted when working for a target firm acquired in a different time zone than when the acquisition takes place in the same time zone, which corresponds to a decrease of 9.5% relative to the baseline. In column (3), we add control variables for individual characteristics such as education, age, experience, whether employees have been promoted already before the acquisition, and controls for target-acquirer geographical distance.⁴ The coefficient β_3 remains of the same order of magnitude (−0.9 percentage points, or 10.7%, $p = 0.009$) as in column (2). These results are consistent with the expectation regarding the impact of

Table 4. Employees’ Promotion: Gender and Time Zone Effects

Dependent variable: <i>Promotion</i>	(1)	(2)	(3)
<i>Female</i>	−0.005* (0.003)	0.000 (0.003)	0.002 (0.003)
<i>Different TZ</i>	−0.008 (0.009)	−0.004 (0.009)	0.007 (0.010)
<i>Female × Different TZ</i>		−0.008** (0.004)	−0.009*** (0.003)
<i>BSc degree or higher</i>			0.036*** (0.007)
<i>Promoted before</i>			0.190*** (0.012)
<i>Geographical distance</i>			−0.004* (0.002)
Constant	−0.042 (0.051)	−0.046 (0.051)	−0.118** (0.059)
Observations	69,574	69,574	69,574
R ²	0.046	0.046	0.099
Age band dummies	No	No	Yes
Experience band dummies	No	No	Yes
Country pairs dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes

Notes. Robust standard errors clustered at the target-firm level in parentheses. Estimates based on linear probability models (LPM). Sample includes non-entry-level employees (i.e., 2+ years of tenure at the target firm and more than 5 years of work experience) at the target firm at the time of the acquisition. The dependent variable takes the value of one if an employee is promoted at the target firm within one year after the acquisition is completed. Target-firm-industry dummies defined at the two-digit NACE Rev. 2 level. Employees’ occupation dummies included (*Business, Technology and Science, Health*). Age band dummies take values from one (youngest cohort) to four (elder cohort), and experience band dummies from one (least experienced) to five (most experienced).

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

increasing demand for temporal availability on the career progression of female compared with male employees.

5. Estimation Challenges and Robustness Checks

5.1. Firm Heterogeneity

A potential challenge to our estimation strategy is that acquisitions from different time zones differ from those in the same time zone due to unobserved characteristics that are correlated with the role that an employee’s gender plays in the probability of being promoted.

We begin by noting that in the descriptive statistics in Table 3, same- versus cross-time-zone target firms do not differ in the extent to which, *before* the acquisition, they promote employees of different genders. A gender difference in promotion rates between target firms only takes place after acquisition. Preacquisition promotion rates are lower at target firms eventually acquired in the same time zone than in different time zones, but

they do not differ between men and women. Specifically, in the two years prior to an acquisition, 7% of both men and women are promoted at target firms acquired in the same time zone; 11% of both women and men are promoted at target firms acquired in different time zones.

In addition to this, our regressions include variables that control for employees’ occupation and target-firm industry to reflect gender differences in composition and promotion rates across jobs and sectors. They also include dummy variables for the timing of the acquisition (month and year), with each dummy identifying a small number of acquirer–target matches in the sample and therefore accounting for some heterogeneity at this level, besides controlling for the possibility that firms’ policies for women’s inclusion in the labor market can change over time.

To address residual concerns that our results are explained by unobserved differences other than time-zone differences between firms, we estimated a model with acquirer dummies to account for time-invariant heterogeneity across them. We gathered data on all the acquisitions that the acquirers in our sample made since 2004 and retained acquirers that made two or more deals by 2014. We identified 29 such acquirers with 71 acquisitions (11,250 employees, 43.3% of whom are women) over the period 2004–2014. Then, we estimated our full specification model (as in column (3) of Table 4) on this sample, and we augmented it with acquirer dummies. Column (1) of Table 5 shows the estimated results. The coefficient of the interaction term indicates that, after accounting for heterogeneity across acquirers, women are 2.2 percentage points ($p = 0.066$) less likely to be promoted than men when the acquisition takes place in a different time zone compared with same-time-zone deals relative to an overall promotion rate of 4.6% for this sample.

Regarding the heterogeneity across target firms, we exploit information on the location reported in the headline of the LinkedIn profile of each employee working at the target firms. This information refers to the place where the person claims to be located at the time of data collection (June 2016). We restrict the analysis to target firms with at least one employee reporting a residential address different from the one of the target firm. This within-firm variability across individual employees’ locations allows us to add target firm dummies to the regression to account for target firm specific differences. Results reported in column (2) of Table 5 are similar to those in our main specification: women are about 1 percentage point less likely to be promoted (baseline is 9%) than men when the acquisition is across time zones relative to the same time zones.

We then perform a placebo test that employs *Promoted before* as the dependent variable in a full specification model. The goal is to test whether the probability of female employees being promoted at the target firm

Table 5. Employees’ Promotion: Acquirer and Target Dummies, Promotion Before Acquisition, and Random Acquisition Year

	(1)	(2)	(3)	(4)
Dependent variable:	Sample of acquirers with	Target firm dummies	Full sample. Dependent	Random acquisition year
Promotion	multiple acquisitions		variable: Promoted before	
<i>Female</i>	0.005* (0.003)	0.004 (0.004)	−0.002 (0.005)	−0.002 (0.004)
<i>Different TZ</i>	−0.194*** (0.014)	−0.008** (0.004)	0.021** (0.009)	0.021*** (0.0063)
<i>Female × Different TZ</i>	−0.022* (0.012)	−0.009** (0.004)	0.004 (0.006)	−0.003 (0.005)
<i>BSc degree or higher</i>	0.023** (0.010)	0.041*** (0.009)	0.054*** (0.011)	0.040*** (0.008)
<i>Promoted before</i>	0.192*** (0.028)	0.194*** (0.014)		0.226*** (0.008)
<i>Geographical distance</i>	0.062*** (0.004)		−0.008*** (0.002)	−0.005*** (0.001)
Constant	−0.575*** (0.039)	0.013 (0.022)	0.390*** (0.041)	−0.102*** (0.024)
Observations	11,250	52,367	69,574	47,102
R ²	0.096	0.115	0.055	0.089
Acquirer dummies	Yes	No	No	No
Age band dummies	Yes	Yes	Yes	Yes
Experience band dummies	Yes	Yes	Yes	Yes
Country pair dummies	Yes	No	Yes	Yes
Industry dummies	Yes	No	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes
Time dummies	Yes	No	Yes	Yes
Target dummies	No	Yes	No	No

Notes. Robust standard errors clustered at the acquirer-firm and target-firm level in column (1), at the target-firm level in columns (2), (3), and (4). Country pairs, Industry, Time dummies, and geographical distance are not included in column (2) because they are collinear with Target dummies. Time dummies in column (4) are defined at the year level rather than the date of acquisition. Estimates based on linear probability models (LPMs). The sample includes non-entry-level employees. Column (1) focuses on acquirers with multiple acquisitions over the period 2004–2014. Column (2) focuses on target firms with at least one employee reporting a residential location different from the location of the target firm. Column (3) uses the full sample and Promoted before as the dependent variable. Column (4) constructs the dependent variable based on a fake acquisition year randomly distributed between 2000 and 2014.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

before the acquisition differs between firms that are eventually acquired in a different time zone with respect to those acquired in the same time zone. The results shown in column (3) of Table 5 provide further support that target firms in the same versus different time zones do not systematically differ in their probability of promoting women and men in the preacquisition period and that these gender differences only emerge after an acquisition takes place. We replicated this analysis using bootstrap standard errors to account for the potential noise introduced by observing promotion events for only a limited number of years. Results reported in Table H.2, column (2), in Online Appendix H confirm our main findings.⁵

Finally, we replaced the true acquisition date with a random date taking values between 2000 and 2014. If our core finding reflects firm specific promotion trends for women in firms eventually acquired across time zones compared with those in firms eventually acquired in the same time zone (regardless of the actual acquisition event), this pattern should also manifest when we

manipulate the acquisition date backward or forward artificially (i.e., when the demand for temporal availability does not change). However, the results in column (4) of Table 5 indicate that the interaction term between *Female* and *Different TZ* is not statistically significant below standard levels. This implies that the effect only becomes apparent after the true acquisition occurs.

5.2. Employees’ Mobility

Employee mobility, and in particular the possibility that women and men have a different propensity to leave the target firm depending on cross- versus same-time-zone acquisitions, challenges our estimation strategy. For example, female employees might anticipate an increase in the demand for temporal availability in cross-time-zone acquisitions and leave the firm before the deal takes place more than men. To account for this potential selection mechanism, we exploit information on the date of announcement, which corresponds to the moment when news of the acquisition becomes publicly available, typically one to two years before the actual completion date.

We constructed a measure of outward mobility that takes the value of one if the employee left the target firm during the time interval between announcement and completion dates and zero otherwise (*Mobility btw announc. and completion date*). If we find no effect on this variable for the interaction term between the female dummy (*Female*) and the acquisition taking place across different time zones (*Different TZ*), this would suggest that a systematic selection in the mobility of women before the completion of cross-time-zone acquisitions is unlikely. Column (1) of Table 6 shows that the coefficient of this interaction term is zero (and also imprecisely estimated). This result suggests that women do not respond beforehand to potential adjustment costs associated with cross-time-zone acquisitions.

Mobility might also happen in the postacquisition period. Recent research suggests that turnover is higher among employees at newly acquired firms (Kim 2024), especially among more qualified and highly ranked employees who have greater outside options (Ng and

Stuart 2022). In our setting, postacquisition turnover matters if it differs between women and men and between same and different time zones. Suppose, for example, that women are more constrained than men in meeting the demand for temporal availability, and for this reason, they are more likely than men to be laid off from or to voluntarily leave target firms acquired in different time zones. In this case, our result that women are promoted less than men in cross-time-zone deals could depend on a selection process of women out of firms acquired in different time zones. To check whether this is a plausible explanation for our results, we constructed a mobility indicator that takes the value of one if an employee leaves the firm in the year of the acquisition or in the year after, the same time window we used to construct the promotion variable and zero otherwise (*Mobility*). We used this indicator as the dependent variable in column (2) of Table 6. The result on the interaction term suggests that women are not laid off or do not voluntarily leave the firm more often than men after an acquisition that takes place in a different time zone relative to the same time zone. This could be because mobility decisions require seeking suitable outside options (Ng and Stuart 2022, Benson et al. 2024), which might happen after employees assess the worsening of their career prospects. In the short time window observed with our data, women might not be fully aware of their promotion penalty or could lower their career expectations temporarily while searching for better alternatives.⁶

Table 6. Employees' Mobility Before and After an Acquisition

Dependent variable:	(1) Mobility between announcement and completion date	(2) Mobility
<i>Female</i>	−0.011** (0.036)	−0.000 (0.005)
<i>Different TZ</i>	−0.045 (0.146)	−0.030 (0.023)
<i>Female × Different TZ</i>	0.000 (0.953)	−0.007 (0.007)
<i>BSc Degree or higher</i>	0.043*** (0.000)	0.041*** (0.006)
<i>Geographical distance</i>	0.002 (0.730)	−0.004 (0.005)
<i>Lag announcement-completion</i>	−0.113*** (0.010)	
<i>Promoted before</i>		0.031** (0.014)
Constant	−0.162 (1.000)	0.452** (0.179)
Observations	83,690	69,574
<i>R</i> ²	0.110	0.080
Age band dummies	Yes	Yes
Experience band dummies	Yes	Yes
Country pair dummies	Yes	Yes
Industry dummies	Yes	Yes
Occupation dummies	Yes	Yes
Time dummies	Yes	Yes

Notes. Robust standard errors clustered at the target-firm level in parentheses. Estimates based on linear probability models (LPMs). The sample includes non-entry-level employees. The dependent variable in column (1) is a dummy taking value of one if the employee left the target firm between the announcement and the completion of the acquisition. The dependent variable in column (2) is a dummy taking value of one if the employee left the target firm in the acquisition year or the year after.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

6. Demand for Temporal Availability as the Driving Mechanism: Evidence from Employees' Roles, Time Lags, and CEO Gender

The mechanism we theorize—an increasing demand for temporal availability in cross time zones acquisitions—captures the impact of work schedules that overlap only partially on the fulfillment of daily work activities. Time lags increase the burden of synchronous communication, as workers need to accommodate differences in work schedules outside their standard work hours.

We enquire into the plausibility of this mechanism in four ways. First, we focus on business occupations (*Business*) and distinguish between managerial and support roles that likely differ in the employers' value of and demand for temporal availability. Goldin (2014) explains how time pressure, scheduling flexibility, the need to be available in particular times, and substitutability by other workers differ across occupations and finds that jobs in business are especially demanding compared with technology, science, and health occupations. Cortés and Pan (2016) explore this further and document a large variation in the prevalence of temporal availability also within occupation fields, with 30% of managers and health and legal professionals

reporting working overtime compared with 10% of administrative/support and office clerks over the period 1995–2010.

We test the prediction that employees in business occupations and, among them, employees performing managerial tasks suffer more from a gender gap in career progression than employees in administrative and support roles.⁷ We leverage information on job titles and educational attainments reported at LinkedIn to assign employees to two occupational tracks at the time of acquisition, namely managerial (*Managerial*) and administrative, support, and clerical tracks (*Support*). Looking at employees in business occupations

only, we can also unequivocally classify their roles as either managerial or support, based on the information available at LinkedIn.

Our sample contains 17,467 employees in *Managerial* occupations (40% are women) and 27,044 in *Support* occupations (51% are women). Table 7 shows estimates of our full specification model (as in column (3) of Table 4) for all employees in *Business* occupations (column (1)) and, separately, for the groups of employees with *Managerial* roles (column (2)) and *Support* roles (column (3)). The estimated coefficient of the interaction term in column (1) suggests that women are 1% less likely than men to be promoted when the acquisition takes place in a different

Table 7. Business, Managerial, and Support Occupations, Employees 25–45 Years Old, Entry-Level Employees, and Female CEO

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Business	Managerial	Support	Employees	Entry-level	Female CEO
Promotion	occupations	occupations	occupations	between 25 and	employees	
				45 years old		
<i>Female</i>	0.004 (0.003)	0.004 (0.007)	0.003 (0.004)	0.004 (0.004)	0.008 (0.005)	0.005 (0.003)
<i>Different TZ</i>	0.011 (0.012)	0.043** (0.020)	−0.011 (0.012)	0.012 (0.015)	−0.023 (0.018)	−0.068 (0.044)
<i>Female × Different TZ</i>	−0.010** (0.004)	−0.014** (0.007)	0.000 (0.005)	−0.013** (0.005)	0.009 (0.008)	−0.012*** (0.004)
<i>BSc degree or higher</i>	0.037*** (0.009)	0.033*** (0.009)	0.024*** (0.005)	0.044*** (0.009)	0.034*** (0.007)	0.040*** (0.012)
<i>Promoted before</i>	0.194*** (0.012)	0.165*** (0.008)	0.198*** (0.021)	0.200*** (0.017)	0.261*** (0.048)	0.191*** (0.018)
<i>Geographical distance</i>	−0.003 (0.003)	−0.008* (0.004)	0.000 (0.003)	−0.003 (0.003)	0.004 (0.003)	0.011 (0.016)
<i>Female CEO</i>						−0.153 (0.130)
<i>Female × Female CEO</i>						0.077*** (0.027)
<i>Different TZ × Female CEO</i>						0.006 (0.137)
<i>Female × Different TZ × Female CEO</i>						0.086*** (0.028)
Constant	0.026 (0.074)	0.118 (0.102)	0.036 (0.066)	0.704 (0.075)	−0.118** (0.055)	0.569* (0.329)
Observations	47,039	17,467	27,044	38,302	19,235	29,438
R ²	0.112	0.130	0.083	0.119	0.051	0.127
Age band dummies	Yes	Yes	Yes	Yes	Yes	Yes
Experience band dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country pair dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes

Notes. Robust standard errors clustered at the target-firm level in parentheses. Estimates based on linear probability models (LPMs). The sample includes non-entry-level employees in Business (column (1)), Managerial (column (2)), and Support (column (3)) occupations; employees in the 25–45 age range (column (4)), entry-level employees (column (5)), and the non-entry-level employees taking the subsample of acquirers available in Execucomp (90 acquirers, corresponding to 107 target firms employing 29,438 employees) (column (6)). *Managerial* occupations are attributed to job titles of vice president, chief, director, executive, general manager, project manager, head, COO, CTO, CIO, CFO, branch manager, leader, champion, manager, and to individuals with an MBA, MSC, JD, or PhD. *Support* occupations are attributed to job titles of secretary, assistant, desk, reception, clerk, office administrator, cashier, bill collector, customer service, billing, operator, aide, and to individuals with a BSc degree or lower qualification. Wald test for difference in β_3 between specifications (2) and (3), $\chi^2 = 2.27$ ($p = 0.131$).

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

time zone ($p = 0.011$), which, relative to a promotion rate of 8.5%, corresponds to a decrease of 11.8%.⁸ The interaction term for the subset of *Managerial* occupations (column (2)) is still negative and statistically significant: Women are 1.4 percentage points less (or 10.6% less relative to a promotion rate of 13.2% for this sample) likely to be promoted than men in cross-time-zone acquisitions compared with acquisitions occurring in the same time zone ($p = 0.047$).⁹ The estimated coefficient of the interaction term is zero for employees in *Support* occupations (column (3)), suggesting that there is no career penalty for women in these jobs if the acquisition takes place in a different time zone.¹⁰

Second, we re-estimated our equation for the sample of employees between the ages of 25 and 45. This age group is more likely to have family responsibilities related to child rearing, which could result in greater time constraints eventually unbalanced between women and men. In column (4) of Table 7, we find that women are 1.3 percentage points (or 13.1%) less likely to be promoted in target firms acquired across time zones. As expected, the promotion penalty for women is higher than in the full sample, despite the latter still including older employees who may experience time constraints due to caring for elderly family members instead of children.

Third, we examined the sample of entry-level employees, a group characterized by significantly younger age (86% below 30 years old compared with 0.3% in the non-entry-level sample) than non-entry-level employees. Therefore, we anticipate fewer gender-based differences in their ability to work during nonconventional hours: Younger individuals entering the job market are likely to share similar constraints on overtime and unpredictable scheduling, with family duties exerting less influence on this cohort. The results reported in column (5) of Table 7 confirm this expectation.

Fourth, in column (6), we estimate the coefficient of the triple interaction between *Female*, *Different TZ*, and *Female CEO*. Our findings indicate that in the infrequent instances of acquiring firms led by female CEOs, there is no observable female promotion penalty linked to cross-time zone acquisitions. This evidence aligns with the idea that female CEOs are more inclined to foster an organizational culture that does not penalize women's promotion potential, even when new roles demand increased time availability, or they do not tie job rewards to temporal availability. It may also reflect the fact that female CEOs could be more prone to promote diversity mandates that foster women's promotions.¹¹

Finally, we looked at differences in the estimated gender promotion gap across time lags. If the mechanism that drives our results is the higher demand for temporal availability when acquisitions take place across time zones, then the impact of this rising demand on employees' daily schedule should vary with the size of the time lag between the target and

acquirer firms. For example, we expect a one-hour time-zone difference at the beginning or at the end of the workday to produce an increase in the demand for temporal availability, although smaller than a two- or three-hour difference, which requires an even more significant coordination effort to make the work schedules at the target and acquirer compatible. For larger time-zone differences, however, because the overlap between the target and the acquirer's work schedules shrinks to a narrow window of time, the demand for temporal availability might fall as well, as employees at the two businesses are several hours apart, making synchronous communication difficult and providing incentives to switch to asynchronous modes (Cumings et al. 2009, Chauvin et al. 2024). Thus, as long as time-zone differences reduce the overlap between business hours but are compatible with synchronous communication, we expect women to be penalized by an increasing demand for temporal availability. However, when the time-zone difference becomes large enough, synchronous communication is likely to be replaced by asynchronous modes of interaction, which do not require working in nonconventional hours and this should not make women experience a time-zone penalty compared with men.

To test this conjecture, we grouped acquisitions by meaningful time lags between the target and the acquirer and estimated our full specification model separately for each group. The baseline for comparison is always the case of acquisitions in the same time zone as the target firm. Table 8 shows the estimated results. Column (1) refers to acquisitions where there is a time difference of one hour between the target and the acquirer; column (2) and column (3) refer to acquisitions where the time difference is 2 and 3 hours respectively. In all these instances, the time lag between the acquirer and the target is close enough for firms to require their employees to work in nonconventional hours (e.g., waking up earlier in the morning or working later in the evening) but, at the same time, large enough to conflict with family commitments. However, we expect the effect on the gender gap in career progression to be more pronounced at two- and three-hour differences, which characterize West Coast (East Coast) target firms acquired by East Coast (West Coast) multinational companies, as this time lag is more difficult to accommodate. The estimated coefficient β_3 of the interaction provides support for our expectation. In column (1), waking up one hour earlier or working one hour later in the evening generates some discomfort. The negative effect on female career progression is -0.8 percentage points (or 10%, $p = 0.003$). For acquisitions with a two-hour lag, the estimated effect raises to -2.7 percentage points (or 50.9%, $p = 0.016$). It is -2.4 percentage points (or 39.3%, $p = 0.009$) for acquisitions with a

Table 8. Acquisitions with Different Time-Zone Lags

Dependent variable: Promotion	(1) +1/−1	(2) +2/−2	(3) +3/−3	(4) Europe	(5) Asia
<i>Female</i>	0.000 (0.003)	0.002 (0.003)	0.003 (0.003)	0.004 (0.003)	0.002 (0.003)
<i>Different TZ</i>	0.020 (0.016)	−0.033 (0.020)	0.014 (0.014)	0.071 (0.051)	−0.231*** (0.085)
<i>Female × Different TZ</i>	−0.008** (0.003)	−0.027* (0.016)	−0.024*** (0.009)	−0.010 (0.007)	0.002 (0.007)
<i>BSc degree or higher</i>	0.033*** (0.008)	0.020*** (0.006)	0.025*** (0.006)	0.034*** (0.012)	0.023*** (0.006)
<i>Promoted before</i>	0.183*** (0.015)	0.143*** (0.012)	0.145*** (0.012)	0.171*** (0.028)	0.157*** (0.015)
<i>Geographical distance</i>	−0.004* (0.002)	−0.004* (0.003)	−0.004 (0.003)	−0.005* (0.002)	−0.004 (0.003)
Constant	0.191** (0.085)	0.047 (0.087)	−0.174*** (0.059)	0.039 (0.062)	0.291*** (0.110)
Observations	54,029	21,727	25,139	26,721	25,064
R ²	0.103	0.072	0.073	0.088	0.072
Age band dummies	Yes	Yes	Yes	Yes	Yes
Experience band dummies	Yes	Yes	Yes	Yes	Yes
Country pair dummies	Yes	Yes	Yes	Yes	No
Industry dummies	Yes	Yes	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes

Notes. Robust standard errors clustered at the target-firm level in parentheses. Estimates based on linear probability models (LPMs). Sample includes non-entry-level employees. Column (1) focuses on acquisitions where the acquirer is at a +1/−1 hour difference from the target, column (2) at a +2/−2 hours difference, column (3) at +3/−3, column (4) focuses on acquisitions from Europe (e.g., Germany, Spain, France, Italy) and column (5) on deals involving Asian acquirers (e.g., Japan, Singapore, Hong Kong). In all columns, the baseline category is always same-time-zone acquisitions.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

three-hour lag. Hence, in the case of acquisitions occurring in a time zone that is two to three hours behind or ahead, such as target firms located in Los Angeles acquired by a MNE with headquarters in Chicago or New York, or vice versa, the probability of a woman to be promoted is about half that of a man compared with the case in which the acquisition takes place in the same time zone. The fact that even small differences of one or two hours matter are indicative of the role of women as caregivers, who are responsible, for example, of school drop-offs and pickups. In these situations, even moderate requests for time availability on the job may disrupt family equilibria and put women under pressure.

Columns (4) and (5) focus on the sample of acquisitions made by multinationals located in Europe, with a time-zone difference between 4 and 9 hours, and a bulk of deals involving a difference of 6 hours, or in Asia, implying a time zone lag between 7 and 11 hours, with most of the acquisitions at 10-hour difference.¹² The estimated coefficient of the interaction term is 0.010 for European acquisitions (that is, 15.1% relative to a baseline promotion rate of 6.6%, $p = 0.155$). For Asian acquisitions, it is 0.002 (that is, 3.5% relative to a baseline promotion rate of 5.7%, $p = 0.718$). These results suggest that, especially in non-European acquisitions, the substantial time zone difference between the target and acquirer makes temporal availability from employees

impractical. Asynchronous communication modes may then become the preferred option, therefore reducing women's penalization. However, as we lack direct information on the demand for interactions between the target and acquirer firms, it is difficult to assess how much of this result can be ascribed to a potential low demand for interactions in these particular deals.¹³

7. Discussion and Conclusions

This research advances the literature on an important determinant of the gender gap in organizations. We show that when employers need employees to be available beyond standard work schedules, women are less likely to progress in their careers than men. We operationalize the demand for temporal availability with cross-time-zone acquisitions and show that women's disadvantage is concentrated in managerial occupations in business, where the demand for working in hours outside the standard work schedule is more frequent and highly rewarded and that it increases when the time lag between target and acquirer firms is narrow enough to expect temporal availability on the job but wide enough to conflict with family commitments.

Our results have important implications for organizations and regulators. As Fernandez-Mateo and Kaplan (2018) suggest, given the intertwined nature of demand and supply decisions in driving these lower women

outcomes, effective interventions should operate on both the demand side (e.g., organizations) and the supply side (e.g., encouraging or making it easier for women to take on higher level roles). At the organizational level, a direct consequence of our findings is that top managerial occupations and prestigious jobs accessed through internal promotions are more often taken by men. Thus, to the mechanisms that explain the “leaking pipeline” that leads to women’s under-representation in higher-ranked jobs, we add employers’ rising demand for temporal availability. Moreover, the evidence that, despite being penalized, women do not change employer in the short run suggests a lock-in effect, which comes at the cost of frustrating women’s human capital and their contribution to the organization.

How to avoid these negative implications that affect employees in the first place, and then employers themselves, is a scorching question. Scheduling strategies are firms’ deliberate decisions. Thus, the “last mile” to gender equality in labor market opportunities passes via a change in the attitude of firms to overvalue temporal availability on the job. For example, in 2014 Starbucks revised internal policies to promote “stability and consistency” in scheduling, in response to single mothers struggling to keep up with erratic hours set by automated software (Kantor 2014). In 2016, Walmart announced a reduction in managerial discretion on shift scheduling to help employees to fit in other priorities such as childcare (DePillis 2016).

Changing firms’ attitude, however, requires making them aware of the long-term effects of these practices, especially when temporal availability is used as a sign of commitment and devotion to the firm and does not correspond to any real value added by employees who are available at inconvenient hours. Employees are normally responsible for a portfolio of activities, some of which benefit from being performed during specific hours (and a subset during unconventional hours), and others that do not. Attaching a disproportionate value to the former does not necessarily mirror employees’ contribution to the organization. Thus, employers should first question whether and when temporal availability really contributes to explaining employees’ performance. Second, they should not assume that women have necessarily higher constraints on work during unconventional hours than men. Making employers aware of their gendered organizational cultures is the premise to turn workplaces into fairer environments (Mennino et al. 2005, Kelly et al. 2010).

Besides the classic idea of creating “institutions” (e.g., company nursery, paternity leaves) that could relax unequal time constraints, companies might want to promote a culture of “opportunity creation” for employees with different constraints. Recent changes toward offering more flexibility in choosing scheduling arrangements as a matching mechanism to attract and

retain human capital with different constraints and preferences go in this direction. These could include flexible arrangements, such as remote working (Mas and Pallais 2017, Choudhury 2020), or arrangements that trade the number of hours worked for the availability to work according to nonstandard schedules.

The second area of intervention concerns *ruling out that women are born with a comparative advantage in loading the dishwasher, changing diapers, or driving kids to soccer games* (Bertrand 2018). Because these cultural beliefs are hard and slow to change, higher-level, institutional policies are needed to help promoting the norm of the “ideal parent” rather than mother. Finally, public policies can contribute to alleviate the culture that temporal availability is an acceptable firm policy and a way to induce self-selection of the most committed employees. The solution cannot be a limitation of women’s work schedules only. This is what maternal laws did in the United States in the last century, which exacerbated gender differences in the workplace. Policies should ubiquitously alleviate the temporal-availability culture or should work to make it easier for people to cope with unconventional schedules.

In addressing these important issues, we tried to address the challenges posed by our empirical investigation. For example, LinkedIn data provide valuable information about publicly available employees’ profiles, but may not fully represent the employees’ general population. This would be a concern for our study if the sources of sample bias correlate with employees’ gender, which does not seem to be the case. We also limit concerns about potential sources of heterogeneity between same- and cross-time-zone acquisitions, which, again, would be an issue only in the (unlikely) case that such heterogeneity correlates with employees’ gender. We interpret our results as being driven by a higher demand for temporal availability when firms are acquired in different time zones, and the higher constraints on women compared with men to supply work with unpredictable schedules. We provide evidence that support our interpretation, and rule out alternative explanations. Because of the nature of our data, however, we cannot offer more direct evidence about changes in employees’ work schedules or communication patterns with the headquarters. We can track individual promotions up to two years after the acquisition occurs. Although this limits our possibility to explore the long-term effects of an increasing demand for temporal availability on women’s career advancement, it also reduces the noise surrounding the factors influencing promotions. In the short term observed in our data, differences in promotion rates between women and men are more likely to be the result of a sudden increase in temporal availability following cross-time-zones acquisitions. Finally, we use a research design related to acquisitions by multinational companies because it is

a neat setting to test our prediction, but the results from this specific exercise is intended to update our general prior about women's penalty in the labor market each time working conditions are not designed in a gender neutral manner.

Endnotes

¹ To identify the multinational status of both the vendor and the acquirer company, we relied on the Zephyr listing of global ultimate owners (GUOs), defined as the ultimate shareholder of a corporate tree globally. We focus on acquisitions since 2010 to avoid the economic events of 2008–2009 and to use relatively recent (and presumably more accurate) information in LinkedIn public profiles. The last acquisition year in our sample is 2014 because we measure the dependent variable in the two years after the acquisition and we have LinkedIn information on employees' career paths only until 2016.

² We assume that employees at the target firm interact, at least to some extent, with those at the GUO. Research suggests that the GUO is a major reference point within a multinational group and that subsidiaries interact with it directly (Chauvin et al. 2024), even if the group has a more complex structure that includes the presence of regional headquarters. An analysis that we perform in Online Appendix G using information from Glassdoor reviews supports this idea. Finally, because in our study all vendors and the large majority of acquirers are from the United States, the distinction between GUO and regional headquarters is less relevant. Our results hold when we focus on this group of acquisitions.

³ The coefficient of *Different TZ* is negative and statistically not significant below standard cutoff levels, despite the raw promotion rate in Table 3 being higher in cross-time-zone than in same-time-zone acquisitions. The inclusion of the date of acquisition (month and year) and, to a smaller extent, target-industry dummies, factors out variation in the likelihood of promotion across types of deals. This is because these two variables together identify small clusters of acquirer–target matches, therefore absorbing heterogeneity in promotion rates across time zones.

⁴ We provide additional evidence that the effect of temporal distance holds on top of geographical distance between the target and the acquirer firm. We built two binned scatterplots that relate our dependent variable (i.e., probability of promotion) on the y axes and geographical distance measured in kilometers on the x axes, for men and women separately. Figure H.1(a) in Online Appendix H is for target employees involved in acquisitions that take place in the same time zone. It shows that, irrespective of geographical distance, women are promoted slightly more than men when the acquisition takes place in the same time zone. This evidence is consistent with the regression results in Table 4, where the baseline coefficient for female is positive and statistically not significant. In addition, the negative slope reported in panel (a), which includes the bulk of our deals, aligns with the negative coefficient of geographical distance in Table 4. Figure H.1(b) focuses on employees involved in acquisitions across time zones. It shows that women are always promoted less than men, across all geographical distances. Taken together these two graphs suggest that cross time zone acquisitions are systematically associated with a career penalty for women compared with men and that this effect is robust to variation in the geographical distance between the acquirer and the target firm.

⁵ The estimation with bootstrap standard errors is reported also for the main specification that uses promotion after the acquisition as a dependent variable (Table H.2, column (1)). Results remain unchanged with respect to those in Table 4, column (3).

⁶ These results do not contradict earlier research showing higher turnover rates after an acquisition or between target and acquirer companies (Ng and Stuart 2022, Kim 2024), as the focus of our work is on gender-heterogeneous turnover effects between same and different time zones acquisitions.

⁷ If women in managerial occupations are positively selected with respect to their temporal availability, this should work against finding a penalty for this group of employees. If we still find a female disadvantage, this is likely a lower bound estimate of the effect that we would find in a nonselected population.

⁸ Results for *Technology and Science* and *Health* occupations are in Table H.3 in Online Appendix H.

⁹ We performed the regression accounting for employees' tenure at the target firm to test the expectation that female managers with longer tenure are those experiencing the highest penalty. This is because they may have more responsibilities, and therefore be asked to coordinate activities that require more interactions with the acquirer. The results reported in Table H.4 in Online Appendix H confirm that the negative coefficient of the interaction term holds and is larger for managers with longer tenure at the firm.

¹⁰ We compared β_3 between specifications (2) and (3). The Wald test produced a χ^2 equal to 2.27 ($p = 0.131$).

¹¹ We explored additional dimensions according to which the female career penalty associated with the demand for temporal availability might vary. For example, we estimated our baseline specification from column (3) of Table 4 for the sample of acquirer firms headquartered in fiscal paradises, acquisitions involving targets in the same NACE one-digit industry of the acquirer firms versus those in different industries and autonomous target firms versus nonautonomous target firms. The results are detailed in Table H.6 in Online Appendix H.

¹² This sample involves only U.S. targets and non-U.S. acquirers. Thus, we cannot include country pairs in the regression because of collinearity with the *Different TZ* variable. Hence, for these acquisitions, we perform two additional analyses shown in Table H.5 in Online Appendix H. First, we control that our core results are not driven by these high-distance deals and that they hold for deals at less than four-hour time-zone differences (column (1)). Second, we merged our full sample with data from the CEPII Gravity Database (Head and Mayer 2014) that provides gravity-like measures between country pairs constructed over the interval 1948–2014. We add two variables to our full sample regression and to the regression on the sample of deals at four hours or more: a dummy variable that indicates target-acquirer countries with common legal systems, which proxies for institutional proximity, and a variable that indicates countries' common religion, measured as a share of the population having the same religious background, as a proxy for cultural proximity (Bloom et al. 2012) (columns (2) and (3)). The inclusion of these variables does not change the size and statistical significance of the coefficient for the interaction term *Female* $\times$ *Different TZ* compared with our baseline regressions.

¹³ We performed the Wald test to compare β_3 estimated in columns (2) and (3) with those in columns (4) and (5). The test produces χ^2 values of 1.76 ($p = 0.184$) for European acquisitions and 7.01 ($p = 0.008$) for deals carried out by Asian acquirers, respectively. In addition, to explore whether a higher independence could account for the findings in column (5), we use the variable indicating whether the target firms are intended to be autonomous in the acquisition deal (see column (5) in Table H.6 in Online Appendix H). We regress this variable against an indicator that takes the following three values: zero for target and acquirer from the same time zone and the same country (baseline), one for different time zones and the same country, and two for different time zones and different

countries. The results, available upon request from the authors, reveal no difference in the likelihood of observing an autonomous target firm across these three acquisition types. Hence, if target autonomy reflects the demand for interactions between the target and the acquirer, this outcome suggests that it does not systematically vary among these three acquisition types.

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