Children and Careers: Effects of Motherhood on Professional Paths in a Global Organization*

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Abstract

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*The findings, interpretations, and conclusions expressed in this article are entirely those of the authors and do not necessarily represent the views of the World Bank Group, its executive directors, or the governments of the countries they represent. The authors can be contacted at

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1 Introduction

The transition to parenthood represents a major turning point in gender inequalities, generating large and persistent career costs for women. These costs include reductions in labor supply, earnings losses, and slower career progression, with effects that endure throughout women's working lives. These "child penalties" are now recognized as a central explanation for the remaining gender gaps in earnings and in representation in higher-paying and leadership positions (Kleven et al., 2019; Angelov et al., 2016; Olivetti & Petrongolo, 2017).

A large cross-country literature documents sharp and persistent declines in women's employment and earnings after childbirth (Kleven et al., 2019a; Kleven et al., 2019b; Kuziemko et al., 2018; Kleven et al., 2024; Angelov et al., 2016; Melentyeva & Riedel, 2025; Berniell et al., 2024). Part of these effects reflects reductions in hours worked, but also a shift toward more family-friendly, lower-paying jobs (Kleven et al., 2019a; Hotz et al., 2018). In contrast, men's labor market trajectories remain largely unaffected following the transition to parenthood. These patterns emerge even in contexts with generous parental leave and childcare policies, suggesting that public support, while important, has not been sufficient to offset the career costs associated with childrearing. Importantly, evidence from large organizations shows that mothers' career trajectories often diverge sharply from those of men and non-mothers through the emergence of a "mommy track," characterized by slower promotion, reduced advancement opportunities, and changes in job assignments (Lucifora, Meurs & Villar, 2021).

Most existing evidence relies on population-level or administrative data, which is well suited for capturing aggregate labor market effects but may confound them with worker–firm sorting. Because firms differ substantially in their compensation structures, promotion systems, and workplace cultures, cross-firm comparisons may blur differences in workers' responses to parenthood with differences in organizational environments. Only a few recent studies have begun to explore within-firm variation (Almond et al., 2023; Casarico & Latanzio, 2021; Lucifora et al., 2021), typically finding that penalties persist even within firms, though with magnitudes smaller than those found in population-level analyses.

Even less is known about the mechanisms operating within firms and how these penalties unfold inside organizations. Most existing work focuses on aggregate outcomes—such as earnings, employment, or hours worked—without disentangling whether penalties arise from reduced career progression, lower internal mobility, or other within-firm adjustments such as sorting across units after childbirth. Lucifora et al. (2021) provide an impor-

tant exception, documenting motherhood gaps in promotion rates within a large French company. Nevertheless, because individual productivity is unobserved in most settings, the extent to which these gaps reflect differential performance, self-selection, or biased career dynamics remains unclear.

This paper analyzes how the arrival of children affects the earnings and career trajectories of highly skilled and career-oriented employees within a single large global organization. By focusing on a homogeneous institutional context—where all employees are subject to the same pay structures, promotion systems, and family policies—we are able to isolate how parenthood reshapes careers while abstracting from cross-firm heterogeneity. We go beyond documenting average earnings penalties to explore why these penalties arise. First, we study whether parenthood affects promotion rates, providing direct evidence on career progression. Second, we examine whether parents experience changes in productivity or behavior after childbirth, using rich measures of work output such as projects managed or supervised, travel activity, consultant hiring, and the use of leave or flexible work arrangements. Third, we assess whether parents sort into units or job types that may offer greater flexibility at the expense of slower career advancement. Finally, we study how the magnitude of these penalties varies with job characteristics, unit composition, managers' attributes, and inherited gender norms, leveraging the organization's globally diverse workforce operating under a shared institutional environment.

To address these questions, we combine detailed administrative records on roughly 50,000 employees, including information on salaries, positions, project involvement, travel, leave spells, and demographic and family characteristics. We estimate child penalties by exploiting variation in the timing of first childbirth using an event-study difference-in-differences design for staggered adoption (de Chaisemartin & D'Haultfœuille, 2020). The focus on a single employer allows us to abstract from cross-firm differences in policies, practices, and cultures, thereby isolating how parenthood affects men's and women's careers within a standardized institutional setting.

Our paper makes several contributions to the literature. First, we contribute to the growing body of evidence documenting sizable and persistent child penalties across countries (Kleven et al., 2019; Angelov et al., 2016; Berniell et al., 2024; Kuziemko et al., 2018; Marchionni & Pedrazzi, 2025). While these studies consistently find that women's earnings decline by roughly 20–30 percent after childbirth, most of the evidence is based on administrative or survey data that, although rich in labor market information, provide limited visibility into within-firm processes. A few exceptions—such as Wilner (2016) and Lucifora et al. (2021) for France, or Almond, Cheng & Machado (2023) for the United States—use matched employer–employee data to isolate the effect of childbirth

from worker–firm sorting. By studying a single global organization with standardized pay systems, promotion rules, and HR policies, we provide a cleaner view of how parenthood affects careers within a uniform institutional environment.

Second, we shed light on the mechanisms behind child penalties. While the literature has firmly established the existence of motherhood penalties, much less is known about why they arise. Evidence on mechanisms remains scarce, with the partial exception of Lucifora et al. (2021), who examine promotion gaps. We use direct measures of promotion outcomes, performance (projects managed, supervision, consultant hiring), behavior (travel, leave, flexible work usage), and sorting across units or job types to assess whether penalties reflect changes in productivity, organizational constraints, or individual choices.

Third, we examine how features of the work environment shape the size of the child penalty. Prior research suggests that flexible and family-friendly workplaces may mitigate gender gaps (Goldin, 2014; Abraham, 2017; Hotz et al., 2018), but direct evidence within firms remains limited. Our data allow us to explore how the composition of colleagues in the unit, the unit's degree of flexibility, job-position demands, and managers' characteristics relate to the magnitude of the penalty.

Finally, we contribute to the literature on gender norms and their role in shaping labor market outcomes (Blau & Kahn, 2013; Olivetti & Petrongolo, 2017; Alesina et al., 2013; Fernández, 2013; Kleven et al., 2022, 2024; Åslund et al., 2025). Our setting is exceptionally diverse: employees from nearly all countries work under the same policies and organizational structure. This allows us to examine how inherited cultural norms and gender stereotypes influence the magnitude of child penalties within a shared institutional environment.

This paper also relates to the small literature analyzing gender gaps within multinational firms and career dynamics inside organizations (Bronson & Thoursie, 2020; Hotz et al., 2018; Lucifora et al., 2024; Van der Straaten, Pisani & Kolk, 2024). Prior work highlights mechanisms such as the "mommy track" (Lucifora, Meurs & Villar, 2021), showing that both extensive and intensive margins of promotions account for a substantial share of career divergence after childbirth. Research on multinational subsidiaries (Van der Straaten, Pisani & Kolk, 2024) further suggests that parental gaps may vary across organizational contexts. Relatedly, Bertrand, Goldin & Katz (2010), studying MBA cohorts, document how interruptions, hours worked, and the persistence in "greedy jobs" contribute to substantial gender gaps in high-skilled careers.

We document three main findings. First, the arrival of the first child generates a modest but persistent motherhood penalty in earnings within the firm: mothers' salaries

decline by about 5 percent over the seven years following childbirth, while fathers' earnings trajectories remain essentially unchanged. Although substantially smaller than the 20–30 percent penalties typically observed in national labor markets, this within-firm gap remains economically meaningful in a high-skill professional environment. Second, these earnings losses arise not from differences in labor-force attachment, but from adjustments in contracts, responsibilities, and advancement opportunities within the organization. Following childbirth, mothers become less likely to hold open-ended contracts, take on fewer project-leadership and consultant-hiring tasks, and sharply reduce their travel intensity—changes that coincide with a roughly 50 percent decline in promotion probabilities relative to comparable non-mothers. Fathers, in contrast, exhibit no systematic changes along any of these dimensions. Third, we show that these dynamics are reinforced by systematic re-sorting within the firm: after becoming parents, mothers gradually shift into jobs and units with lower promotion potential, greater reliance on telework, and substantially weaker travel demands, but not into areas with higher female or parental representation. Taken together, these patterns depict a clear internal "mommy track" through which motherhood reshapes career trajectories even within a standardized and highly structured organizational environment.

The remainder of the paper is organized as follows. Section 2 describes the institutional setting and the data. Section 3 outlines the empirical strategy. Section 4 presents the main results and heterogeneity analysis by work environment, manager characteristics, and gender norms. Section 6 concludes.

2 Institutional setting and data

This section describes the context of this paper, highlighting the main institutional features of the WBG, and then details the data sources and key variables used in the empirical analysis.

2.1 Institutional setting

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2.2 Data

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This paper leverages several sources of data. The core of our analysis is a uniquely detailed administrative dataset covering the labor trajectories of all World Bank Group

(WBG) employees from fiscal year (FY) 1988 to FY 2024.[1] Known as the Human Resources Longitudinal Database, it tracks each staff member through a unique personnel identifier that remains constant across employment spells.[2]

The dataset contains comprehensive sociodemographic, professional, and organizational information. Sociodemographic variables include age, gender, marital status, nationality, household composition, and highest educational degree. Household composition includes the number of household members and children; in the next subsection, we describe how we use this information to identify the timing of first births. Professional and organizational characteristics include annual salary (net of taxes, in constant 1983–1984 US dollars), professional position, contract type (term vs. open-ended), duty station (Headquarters or Country Office), and performance ratings (available from 2000 onward). Using occupational categories, we identify promotions from changes to higher positions relative to the previous year. We can also observe job positions and organizational-unit assignments, which allows us to track movements across jobs and units and to characterize each job and unit along several dimensions, such as promotion "desirability," travel intensity, gender and parent composition, prevalence of flexible work arrangements, and rates of lateral exits. For the subsample available from 2014 onward, we additionally match each employee to their direct manager, enabling us to reconstruct manager-specific characteristics such as gender and parenthood status.

To complement the HR records, we incorporate several measures of individual productivity. First, we link staff to projects using name matching and record the number of Board-approved projects designed or supervised by each staff member. Second, we measure analytical output through the number of working papers (co-)authored. Third, we add information on the number, duration, and budget of short term consultant contracts initiated by each employee per year (available from 2007 onward).

We further draw on data on staff travel patterns, available from 2010 onward, which record every mission taken by each employee, including purpose, duration, dates, and countries visited. We also observe leave usage beginning in 2010, including annual, sick, family, and parental leave.[3] Finally, we collect information on the take-up of the compressed work schedule (Alternative Work Schedule), under which employees work an additional hour per day in exchange for one day off every two weeks.

To capture cross-country differences in gender norms and cultural attitudes, we use several external data sources. Nationality information is matched to the World Values

[1] A fiscal year runs from July of year t to June of year $t+1$. For simplicity, we refer to fiscal years by the calendar year in which they end.

[2] Non-staff employees—such as Short-Term Consultants (STCs)—are not included.

[3] Emergency and compensatory leave are also recorded, though used only minimally.

Survey, from which we construct a gender-norms index following Kleven (2022), based on agreement with statements regarding job rights, the value of housework, and maternal employment. We complement this with the Global Gender Gap Index from the World Economic Forum (2023). We also use the Cultural Wizard (CW) survey, an internal WBG initiative that collects self-reported information on staff members' cultural attitudes, including work-life balance, social interactions, and time management. Although the CW sample is relatively small (about 6,000 staff), it is uniquely tailored to the population under study.

Finally, we build an annual panel containing salary, professional position, promotions, contract type, productivity measures, travel data, leave usage, and take-up of alternative work schedules. Together, these sources provide a rich and granular portrait of employees' professional trajectories and the environments in which they operate.

Identification of first child's birth and sample size

A key variable in our analysis is the birth of the first child and, in particular, the precise timing of the event. We identify births by tracking changes in the number of self-reported dependent children across two consecutive years: a first birth is recorded when the reported number of dependent children increases from zero to one (or more). Out of roughly 50,000 employees, about 10,000 individuals (5,137 women and 4,689 men) exhibit such a transition, as shown in the row "Total first births" in Table 1.

To ensure that these cases correspond as closely as possible to true first births, we apply a series of additional restrictions. First, we exclude employees with gaps in their employment records around the time of childbirth, since incomplete observation windows hinder the correct identification of the first birth. Second, we retain only parents observed for at least one year before and one year after the birth, guaranteeing sufficient information to determine the event and construct event-time trajectories. Third, we restrict the sample to employees based at Headquarters. Birth-date information in Country Offices is considerably less reliable—particularly before 2005—but, moreover, HQ staff tend to be more career-oriented and operate under a more uniform institutional environment, making them more comparable to one another. Focusing on HQ employees therefore yields a more homogeneous sample and improves the construction of appropriate control groups in our empirical strategy.

Finally, to assess how parenthood affects professional trajectories in contexts where experience and tenure are key drivers of progression, we focus on individuals who ever held professional, managerial, or executive roles (the "GE+ track" in the Table). Within

this group—whose work is more directly tied to analytical, strategic, and managerial responsibilities—experience is more strongly rewarded, and career advancement typically reflects demonstrated performance, growth in responsibility, and compensation.[4] After applying these restrictions, the resulting "Clean first births" sample comprises 2,105 mothers and 1,896 fathers.

Table 1: Sample sizes

	Female	**Male**	**Total**
Observations (UPI-year)	245089	228365	473454
Employees (UPI)	26496	26017	52513
Total first births	5137	4689	9826
Clean first births	4123	3631	7754
Clean first births HQ	2549	1969	4518
Clean first births HQ GE+	2105	1896	4001

As an additional robustness check, we take advantage of administrative records on parental leave and cross-validate our identification of first births with recorded leave spells. Because leave-taking patterns are less clear for fathers, this exercise is most informative for mothers, who are generally expected to take parental leave at the time of birth. Restricting attention to individuals observed from 2010 onward (the period for which leave data are available), we find that among the 1,999 mothers and 1,713 fathers who had their first child from 2010 onward, 87% of mothers and 78% of fathers took parental leave at the time of birth, providing strong support for the accuracy of our identification strategy.

Table 2 reports summary statistics for our sample of interest, measured the year prior to the birth of their first child. Overall, before the birth of their first child, women are on average 35.5 years old, 79% are married or partnered, and 20% have a PhD as their highest educational attainment. Men are about 1.5 years older than women, 10 percentage points more likely to be married and 7 points more likely to have a PhD.

In terms of employment and career outcomes, in the year before becoming a parent, women earn annual salaries about 5,400 USD lower than men ($40,305$ USD compared to $45,673$ USD for men). Surprisingly, mothers-to-be display a higher probability of experiencing a promotion than fathers-to-be (0.15 vs. 0.11), although we find no significant differences in the likelihood of having entered through a highly selective recruitment

[4]Within the WBG's internal grading system, this corresponds to staff who ever held GE+ positions, which include technical experts (GE–GG), mid-level managers (GH), directors (GI), and the most senior leadership roles (GJ–GK). We exclude lower grades (GA–GD), which correspond primarily to administrative and support functions.

program, or of holding a short-term contract (defined as a term contract of 3 years or less). In terms of observable productivity measures, women are just as likely as men to manage teams, whether measured by the probability of having a project approved by the Board or by the probability of hiring a short-term consultant. We also find no significant differences in the number of projects designed by women that are approved by the Board or, conditional on approval, on the budget assigned to those projects. While women tend to supervise fewer projects than men, we do not find difference in the quality of such projects.

Table 2: Summary statistics before childbirth. WBG staff in Headquarters

	(1) Fathers	Mothers	Diff	s.e.
Age	36.97	35.51	1.458	0.15
Married / partnered	0.89	0.79	0.101	0.01
Has doctoral degree	0.27	0.20	0.066	0.02
Annual salary (in USD)	45672.97	40304.97	5368.003	399.27
Promoted to higher position	0.11	0.15	-0.039	0.01
Selective entry program	0.16	0.14	0.016	0.01
Short term contract	0.19	0.17	0.020	0.01
Pr. of having at least 1 project approved	0.02	0.02	-0.001	0.00
Pr. of hiring at least 1 STC	0.05	0.06	-0.004	0.01
Projects approved by the Board	0.02	0.02	-0.001	0.01
Budget of approved projects (million USD)	82.85	74.00	8.850	36.52
Projects supervised	0.26	0.19	0.071	0.02
Supervised projects w/ successful rating	0.33	0.28	0.048	0.04
Number of mission travels	1.05	0.94	0.114	0.07
Duration of mission travels (days)	37.35	35.03	2.311	2.18
Countries visited on mission travels	10.34	8.41	1.927	0.46
Home-based work	0.27	0.34	-0.072	0.02
Compressed work schedule	0.51	0.43	0.074	0.02
Annual leave (days/year)	18.57	20.04	-1.468	0.45
Sick and family leave (days/year)	2.30	4.22	-1.914	0.23
Total leave (days/year)	21.35	24.86	-3.508	0.53

Note: The sample comprises first-time WBG parents based in Headquarters, and the statistics are measured the year prior to childbirth. Annual salary is net of taxes, measured in constant 1983-1984 US dollars. The duration of mission travel and the number of countries visited are conditional on travelling.

In addition, Table 2 examines differences in work-related travel–a central component in globally multinational firms and international organizations. Typically, staff in high-responsibility roles travel more, and such mobility is often necessary for project execution and career progression. Thus, travel frequency serves as a proxy for both role intensity and professional visibility. We do find gender differences on this dimension. Before childbirth, fathers travel more often than mothers, and when they do so, they travel

for longer periods and visit more countries on average. Further, before having a child, women use home-based work more often than men (34 compared to 27%), while the opposite is true regarding compressed work schedules (43% of women vs. 51% of men).[5] Leave-taking patterns also reflect clear gender differences: before childbirth, mothers took slightly more days of annual leave per year, and also made greater use of sick or family-related leave than fathers.

3 Empirical strategy

To estimate the causal effect of first childbirth on labor market outcomes, we adopt an event-study difference-in-differences (DiD) framework that follows the canonical approach of Kleven et al. (2019). For each parent, the "event" is defined as the birth of the first child, and event time τ measures the number of years relative to the birth year. We observe outcomes from four years before to eight years after childbirth, i.e., $\tau \in [-4, 8]$. We estimate the following two-way fixed effects (TWFE) specification separately for mothers and fathers:

$$y_{it\tau} = \sum_{\tau \neq -1} \delta_\tau \, \mathbb{I}(\tau = j) \; + \; \sum_{k} \beta_k \, \mathbb{I}(k = age_{it}) \; + \; \eta_i + \theta_t + \epsilon_{it}, \tag{1}$$

where $y_{it\tau}$ denotes an outcome of interest for individual i in calendar year t and event time τ. The coefficients δ_τ trace the dynamic response of earnings, promotions, or other labor outcomes relative to the year prior to childbirth ($\tau = -1$, the omitted category). The model includes a full set of age dummies, $\mathbb{I}(k = age_{it})$, to flexibly control for life-cycle patterns, as well as individual fixed effects η_i and calendar-year fixed effects θ_t. Standard errors are clustered at the individual level.

We present the event-study effects in percentage terms to facilitate interpretation and comparability. Following Melentyeva and Riedel (2025), percentage changes are computed as:

$$P_\tau = \frac{\hat{\delta}_\tau}{\bar{Y}_{\tau-1}},$$

where $\bar{Y}_{\tau-1}$ is the average outcome in the pre-birth year. Using the pre-birth level as the

[5] Under this compressed work schedule, employees can work an extra hour each day in exchange for one day off every two weeks. This type of schedule is more prevalent among higher-level positions, which suggests a possible trade-off between stability and career progression for women around the time of childbirth (see Figure **??** in the Appendix). Indeed, while this arrangement can be beneficial for some, it may be inconvenient for parents, who often need day-to-day flexibility to manage caregiving responsibilities, such as taking their children to (and picking them up from) school.

benchmark highlights how childbirth disrupts the pre-existing trajectory of each outcome.

A growing body of research has shown that conventional event-study estimators in staggered DiD settings may suffer from the so-called "forbidden comparisons" problem. When treatment occurs at different times, earlier-treated cohorts may implicitly serve as controls for later-treated cohorts, even though their outcomes have already responded to treatment. Such comparisons generate bias whenever treatment effects are dynamic or heterogeneous across cohorts (Callaway and Sant'Anna, 2021; Goodman-Bacon, 2021). To address this concern, we implement the estimator proposed by de Chaisemartin and D'Haultfoeuille (2024), which delivers group-time average treatment effects that are robust to both dynamic treatment effects and heterogeneity in treatment timing. This approach ensures that our estimates do not rely on inappropriate comparisons between already-treated and newly-treated parents.

The DiD design with staggered treatment timing identifies the effect of childbirth under two key conditions. First, outcomes for treated and not-yet-treated parents must follow parallel trends in the absence of childbirth. In our setting, the control group is composed of workers who will eventually have children. As a robustness check, we refine the control group by comparing employees of similar ages at the time of birth, following Melentyeva and Riedel (2025). This stacked DiD approach ensures that comparisons are made only among parents with comparable fertility timing, yielding qualitatively similar—although noisier—estimates due to reduced sample size.

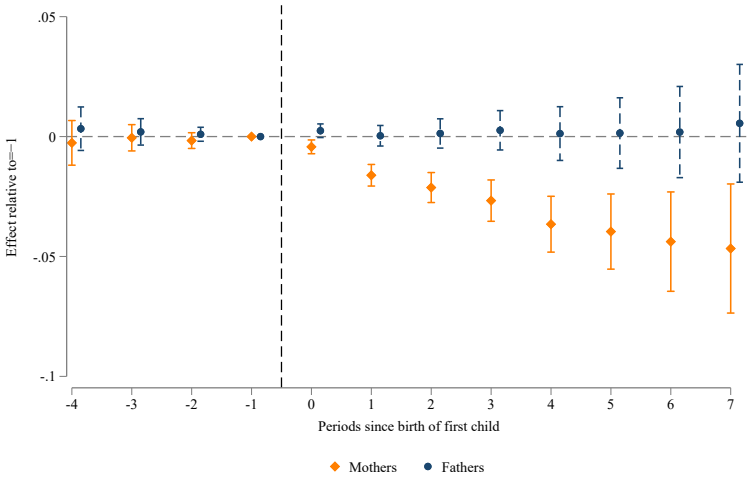
Second, the identification strategy requires the absence of anticipatory effects. Specifically, labor market outcomes should not respond to childbirth before $\tau < 0$. Potential long-term anticipation may arise if fertility plans influence earlier decisions, while short-term anticipation may occur if workers adjust behavior in the months immediately preceding childbirth (Melentyeva and Riedel, 2025). We assess this assumption by examining pre-event coefficients and by conducting additional checks for potential anticipatory behavior. Fathers' labor trajectories—typically unaffected by childbirth—serve as a useful benchmark for detecting deviations prior to the event.

4 Results

We first present the parenthood effects on annual earnings. Figure 1 plots dynamic event-study estimates of the impact of first childbirth on annual salaries for WBG employees, from four years prior to the birth of the first child to eight years afterwards. Each coefficient represents the percentage change in earnings at event time τ relative to the year immediately prior to childbirth ($\tau = -1$). The earnings trajectory for mothers

shows a sharp and persistent decline after the arrival of the first child. In the first year after childbirth, mothers' salaries fall by roughly 1.6 percent relative to non-mothers, and the gap widens steadily over time. By year 7, mothers earn about 4.6 percent less than they did at $\tau = -1$, implying a cumulative earnings loss of approximately 23.5 percent—equivalent to about USD 10,000 in our data.

Figure 1: Impact of first childbirth on annual salary



Note: Data cover the period 1987–2024, and the sample includes parents observed at least once before and at least once after childbirth. The sample is restricted to mothers (fathers) whose age at first childbirth is between 18 and 50 years (18 and 60 years). Each estimated coefficient captures the change in the outcome τ years relative to the year before childbirth, where $\tau = 0$ corresponds to the year of birth. The coefficients, estimated from separate regressions for mothers and fathers, are expressed relative to the average pre-birth level of the outcome for each group. The bars show 95% confidence intervals calculated using individual-level clustering. The specification includes full sets of age-in-years indicators and calendar-year fixed effects.

The pre-treatment coefficients (to the left of the dashed line) are small and statistically indistinguishable from zero, providing support for the parallel-trends assumption behind our identification strategy. In contrast to mothers, fathers experience virtually no change in their earnings trajectory around the birth of their first child: all post-birth estimates for men are close to zero and statistically insignificant. Taken together, these patterns indicate that fatherhood constitutes a non-event for men's labor market outcomes within the organization. Averaging over the seven years following childbirth, the implied child penalty—measured as the percentage by which fathers' earnings exceed those of mothers—is about 3 percent and statistically significant at the 5 percent level.

The child penalty we estimate—although economically meaningful and statistically

significant at the 5 percent level—is substantially smaller than the magnitudes typically reported in the literature. For example, Kleven et al. (2019) document a long-run earnings penalty of roughly 21 percent for mothers in Denmark, while Angelov et al. (2016) find a penalty of about 27 percent in Sweden. In more recent work, Kleven (2022) estimate an earnings penalty of approximately 36 percent for the United States over the decade following childbirth. Several factors help explain why our estimates are markedly lower.

First, our estimation approach and data structure differ from those used in studies such as Kleven (2022). In that paper, child penalties for the United States are estimated using traditional TWFE event-study models applied to longitudinal household survey data from the Panel Study of Income Dynamics (PSID). In contrast, our analysis leverages modern difference-in-differences methods that address well-known issues with TWFE estimators—such as heterogeneous treatment effects and implicit negative weighting—and that construct a control group more comparable to treated employees. Moreover, because our data come from a single global organization, we are able to abstract from the variation in career progression systems, promotion rules, and wage-setting institutions that naturally arises in studies spanning the broader labor market. These methodological and data differences help explain why the magnitudes we estimate are not directly comparable to those derived from survey-based analyses of national labor markets.

Second, our sample is highly selected. We focus on employees at the upper end of the organization's hierarchy—professionals who are highly educated, career-oriented, and employed under stable and formal contracts. A robust body of research shows that access to family-friendly policies, flexible work arrangements, and predictable promotion structures can substantially mitigate motherhood-related earnings losses (e.g., Staiger 2023). The World Bank Group provides a set of institutional conditions that differ markedly from those faced by the average worker in national labor markets, including generous parental leave provisions and a formalized internal labor market. These features likely limit the extent to which childbirth translates into substantial or persistent earnings declines, helping explain why the child penalties we estimate are smaller than those typically found in broader, more heterogeneous labor-market settings.

Third, evidence from studies that examine within-firm penalties is more comparable to our setting, and their estimates are considerably closer to ours. For example, Lucifora et al. (2021) study a large French firm and find that mothers' earnings fall by roughly 10 percent in the years following the first birth—substantially lower than national-level estimates for France, and much more aligned with the magnitude we find (around 5 percent over a similar horizon). This suggests that when heterogeneity across employers

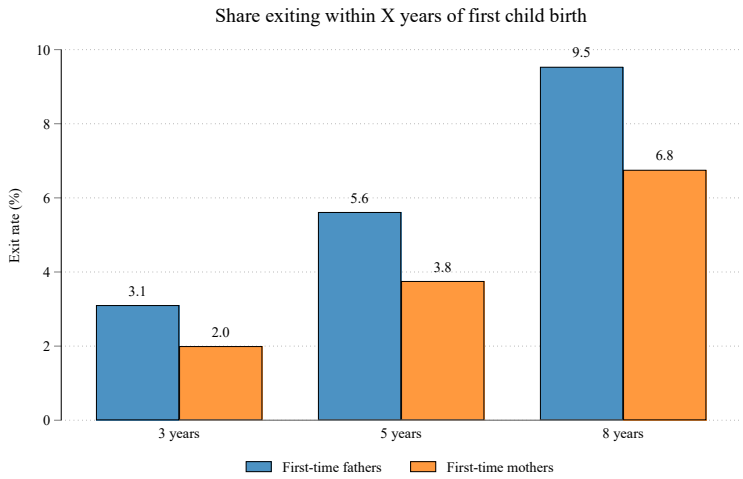
is removed, child penalties tend to be smaller, and our results are consistent with this pattern.

Overall, the relatively modest penalty we document is consistent with the characteristics of our setting: a highly educated and career-oriented workforce, operating within a single employer with strong family policies, and without the reallocations across firms that drive much of the large motherhood penalty documented in national-level studies.

As a robustness exercise, we address the fact that heterogeneity in age at first birth implies that not all "not-yet-treated" parents provide an appropriate control group for a given cohort of new parents. Following Melentyeva and Riedel (2025), we implement a stacked difference-in-differences approach (Cengiz et al., 2019; Wing et al., 2024) that constructs comparisons only among parents of similar ages. The procedure operates by creating a stacked dataset in which, for each group defined by age at first birth, we identify the corresponding untreated cohort that represents a valid control group. Using this stacked dataset, we then estimate a separate two-way fixed effects regression for each age-at-birth group, ensuring that identification relies exclusively on comparisons within age-homogeneous cohorts. This approach strengthens our confidence that the estimated child penalties are not driven by differential age profiles or life-cycle patterns across treatment and control groups.

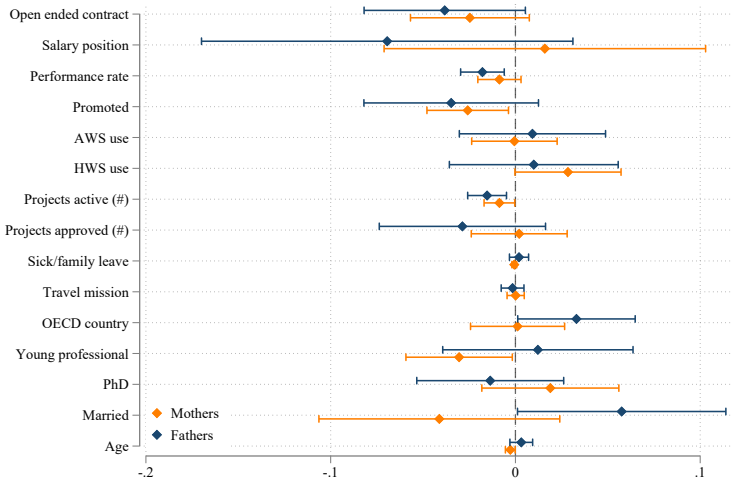
These observed salary penalties are estimated among individuals who remain employed at the firm after the birth of their first child. While our data allow us to observe detailed information on employees and their career trajectories, a limitation is that some workers may leave the organization after childbirth and therefore drop out of our sample. To document these patterns, Figure 2 plots the cumulative probability of exiting the World Bank Group within three, five, and eight years after childbirth for first-time mothers and fathers. Exit rates are low over the first three to five years—precisely the period closest to the event—and rise moderately when the horizon is extended to eight years. Across all three windows, mothers exhibit slightly lower exit rates than fathers, indicating that new mothers are, if anything, marginally more likely to remain employed at the World Bank Group during the years following childbirth.

Figure 2: Exit probability of leaving the firm



Note: Data cover the period 1987–2024, and the sample includes parents observed at least once before and at least once after childbirth. The sample is restricted to mothers (fathers) whose age at first childbirth is between 18 and 50 years (18 and 60 years).

Figure 3: Associations between pre-birth characteristics and post-birth exits



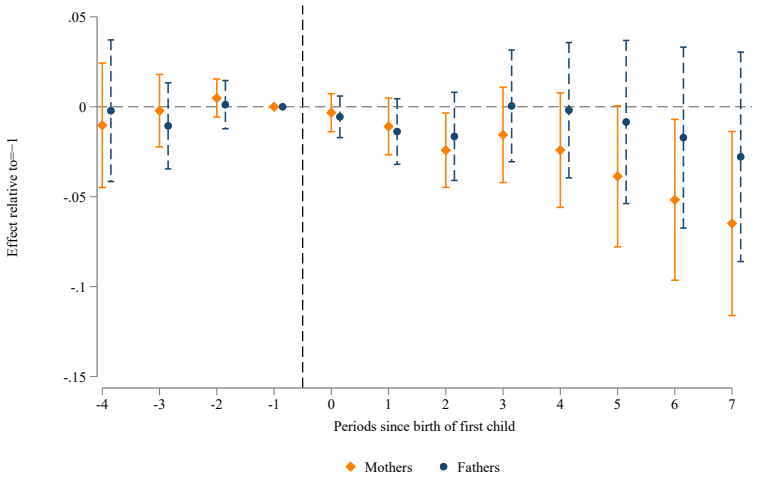
Note: Data cover the period 1987–2024, and the sample includes parents observed at least once before and at least once after childbirth. The sample is restricted to mothers (fathers) whose age at first childbirth is between 18 and 50 years (18 and 60 years).

A potential concern is that exits may not be random: if mothers and fathers who

leave the institution differ systematically from those who stay, our estimated salary effects could be biased. Figure 3 plots coefficients and 95 percent confidence intervals from regressions of the probability of exiting the firm within three years after childbirth on a set of pre-birth characteristics, estimated separately for mothers and fathers. The vast majority of estimated associations are small in magnitude and statistically indistinguishable from zero, indicating little systematic sorting on observable traits. A few coefficients are modestly different from zero—for example, fathers with higher performance ratings and a larger number of active projects, and mothers with higher promotion probability or who entered through the Young Professionals Program, exhibit slightly lower exit rates—but these patterns are limited in number and economically small. Overall, the evidence suggests that parents who leave the institution are not meaningfully different, on these dimensions, from those who remain. Combined with the relatively low cumulative exit rates documented in Figure 2, this reduces concerns that non-random attrition is driving our estimated child penalties.

Beyond retention decisions, we also examine whether parenthood affects the type of employment contract held by mothers and fathers. Figure 4 plots the event-study estimates for the probability of holding an open-ended contract. The pattern shows a clear divergence by gender: while fathers experience no discernible change in contract stability after the birth of their first child, mothers become increasingly less likely to hold an open-ended contract relative to their pre-birth baseline. By year seven, the probability that a mother holds an open-ended contract is roughly 5 percentage points lower than that of comparable non-mothers. This result stands in contrast to the exit patterns documented above—where mothers are slightly more likely to remain in the institution—and suggests that although mothers stay employed, they do so under contractual arrangements that are, on average, less stable than those held before childbirth.

Figure 4: Impact of first childbirth on contract stability



Note: Data cover the period 1987–2024, and the sample includes parents observed at least once before and at least once after childbirth. The sample is restricted to mothers (fathers) whose age at first childbirth is between 18 and 50 years (18 and 60 years). Each estimated coefficient captures the change in the outcome τ years relative to the year before childbirth, where $\tau = 0$ corresponds to the year of birth. The coefficients, estimated from separate regressions for mothers and fathers, are expressed relative to the average pre-birth level of the outcome for each group. The bars show 95% confidence intervals calculated using individual-level clustering. The specification includes full sets of age-in-years indicators and calendar-year fixed effects.

4.1 Mechanisms

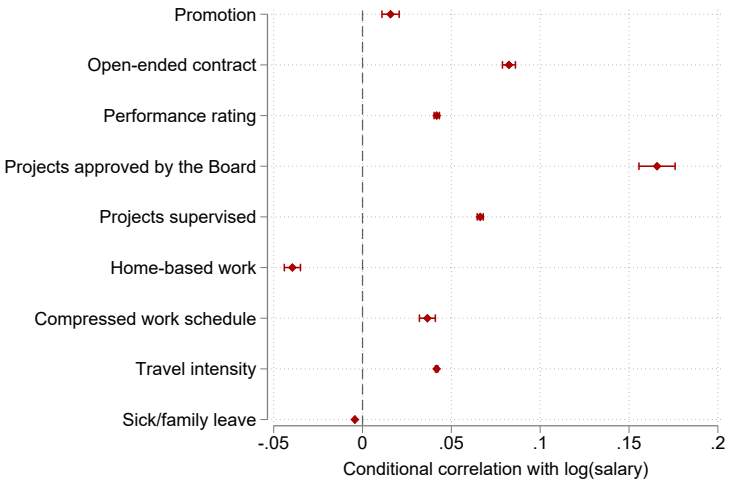
Having documented a meaningful and persistent decline in mothers' salaries following the birth of their first child—contrasted with the essentially flat trajectory observed for fathers—we next turn to the mechanisms underlying this pattern. Because several of the variables we use to study potential mechanisms are available only for a more limited time period, the analysis that follows focuses on a slightly shorter window around the birth event. Understanding why earnings diverge after childbirth, even within a highly skilled and career-oriented workforce, is central to interpreting the magnitude and nature of the child penalty in this setting.

As a first step, we examine whether parenthood affects the stability of employment contracts. Figure 4 plots the event-study estimates for the probability of holding an open-ended contract. The pattern shows a clear divergence by gender: while fathers experience no discernible change in contract stability after the birth of their first child, mothers become increasingly less likely to hold an open-ended contract relative to their pre-birth baseline. By year seven, the probability that a mother holds an open-ended

contract is roughly 5 percentage points lower than that of comparable non-mothers. This result stands in contrast to the exit patterns documented above—where mothers are slightly more likely to remain in the institution—and suggests that although mothers stay employed, they do so under contractual arrangements that are, on average, less stable than those held before childbirth.

We next assess whether contract stability is related to earnings differences, given that mothers become less likely to hold an open-ended contract after childbirth. Figure 5 plots, for the full sample of headquarters staff, the conditional correlation between log real salary and a set of labor outcomes, controlling for worker characteristics. As shown in the figure, holding an open-ended contract is strongly and positively associated with salary levels. While these associations are not causal, the pattern suggests that the decline in contract stability experienced by mothers—but not by fathers—may help explain part of the post-birth divergence in earnings documented earlier.

Figure 5: between real salary (logs) on labor outcomes



Note: Estimates come from regressions of log real salary on each variable separately, controlling for age and gender, and including year and unit fixed effects.

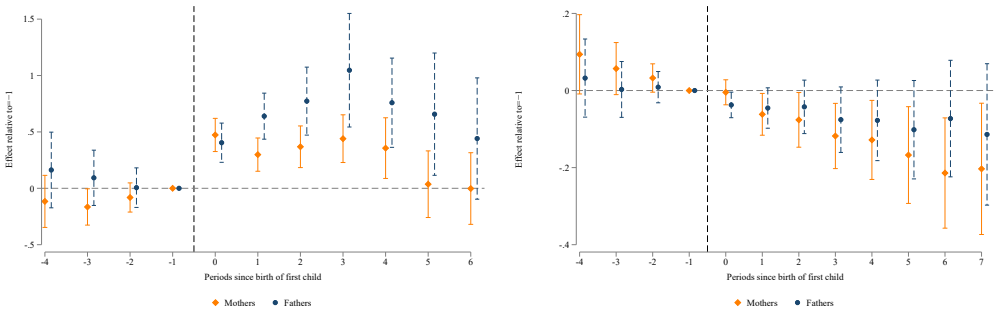
Although we cannot observe changes in hours worked—since standard hours are contractually predetermined—we can track indicators that reflect day-to-day work organization. In particular, we study the number of family and sick-leave days taken and the use of work arrangements that are less compatible with caregiving responsibilities.[6] Figure

[6]Specifically, panel (b) of Figure 6 shows the use of the Alternative Work Schedule, which allows employees to take one day off every two weeks in exchange for working an additional hour per day. For

6 shows that both mothers and fathers increase their use of family and sick leave during the first years following childbirth, though these effects fade and become statistically indistinguishable from zero toward the end of the analysis window. By contrast, a clear divergence emerges in the use of less family-friendly work arrangements: mothers are roughly 20 percent less likely to use these schemes seven years after childbirth, whereas fathers exhibit no discernible change in their behavior.

Figure 6: Impact of first childbirth on work patterns

(a) Family/sick leave (b) Less flexible scheme of work



Note: Data cover the period 1987–2024, and the sample includes parents observed at least once before and at least once after childbirth. The sample is restricted to mothers (fathers) whose age at first childbirth is between 18 and 50 years (18 and 60 years). Each estimated coefficient captures the change in the outcome τ years relative to the year before childbirth, where $\tau = 0$ corresponds to the year of birth. The coefficients, estimated from separate regressions for mothers and fathers, are expressed relative to the average pre-birth level of the outcome for each group. The bars show 95% confidence intervals calculated using individual-level clustering. The specification includes full sets of age-in-years indicators and calendar-year fixed effects. Units with lower or higher travel intensity are defined as those whose average annual mission travels are below or above the median across all units in a given year.

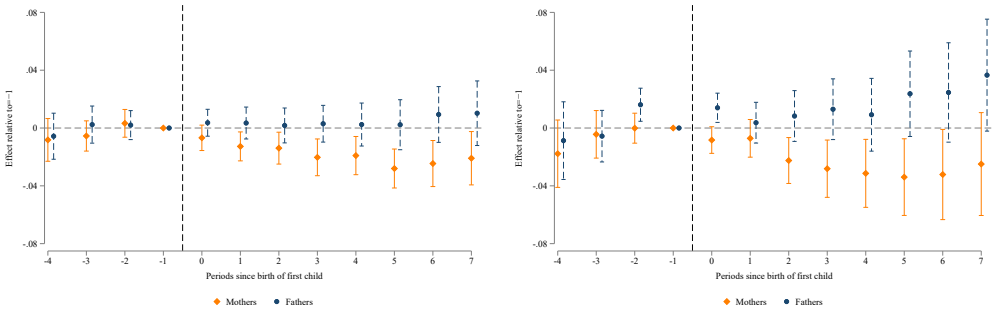
We also examine whether mothers and fathers differ in the extent to which they take on responsibilities commonly associated with performance and leadership within the firm. Figure 7 displays, in panel (a), the probability of managing at least one project, and in panel (b), the probability of hiring at least one external consultant. In this case, coefficients are expressed in levels rather than relative terms because the underlying control-group means are very small, which would mechanically inflate relative effects. Seven years after childbirth, mothers are approximately 2 and 4 percentage points less likely to manage projects or hire consultants, respectively. Although these magnitudes may appear modest, they are substantial when benchmarked against the control-group means of 1.7 percent and 5.5 percent. Fathers, by contrast, exhibit no systematic changes

parents managing household routines, the required longer workday may be more difficult to accommodate, even if it provides a periodic full day off.

in either dimension, though there is a slight upward tendency in consultant hiring toward the end of the period.

Figure 7: Impact of first childbirth on probability of leading teams

(a) Manage al least 1 project (b) Hire at least 1 consultant

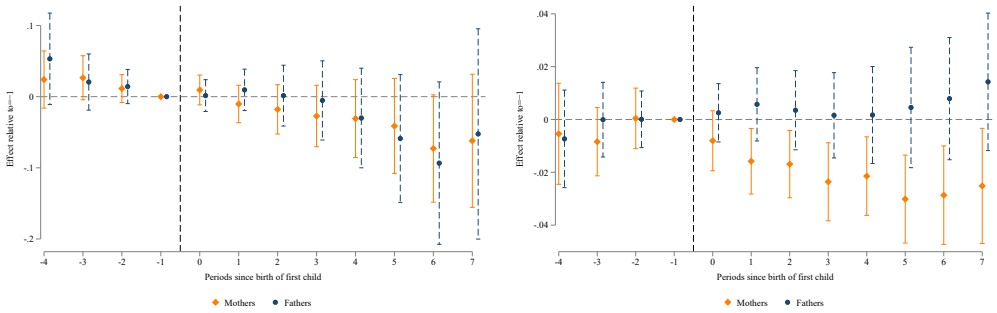


Note: Data cover the period 1987–2024, and the sample includes parents observed at least once before and at least once after childbirth. The sample is restricted to mothers (fathers) whose age at first childbirth is between 18 and 50 years (18 and 60 years). Each estimated coefficient captures the change in the outcome τ years relative to the year before childbirth, where $\tau = 0$ corresponds to the year of birth. The coefficients, estimated from separate regressions for mothers and fathers, are expressed relative to the average pre-birth level of the outcome for each group. The bars show 95% confidence intervals calculated using individual-level clustering. The specification includes full sets of age-in-years indicators and calendar-year fixed effects. Units with lower or higher travel intensity are defined as those whose average annual mission travels are below or above the median across all units in a given year.

We complement these extensive-margin results by examining the intensive margin of project-related responsibilities. Figure 8 presents, in panel (a), the number of projects supervised and, in panel (b), the number of projects approved. As in the previous figure, coefficients are expressed in levels rather than relative terms because the control-group means for these outcomes are very small, which would mechanically inflate percentage-based effects. Despite a visible decline in the number of supervised projects for both mothers and fathers, these post-birth changes are not statistically significant. By contrast, panel (b) shows a clearer pattern: mothers experience a decline of roughly 0.03 approved projects by the end of the analysis window, whereas the number of board-approved projects assigned to fathers remains essentially unchanged.

Figure 8: Impact of first childbirth on number of projects

(a) Projects supervised (#) (b) Projects approved (#)



Note: Data cover the period 1987–2024, and the sample includes parents observed at least once before and at least once after childbirth. The sample is restricted to mothers (fathers) whose age at first childbirth is between 18 and 50 years (18 and 60 years). Each estimated coefficient captures the change in the outcome τ years relative to the year before childbirth, where $\tau = 0$ corresponds to the year of birth. The coefficients, estimated from separate regressions for mothers and fathers, are expressed in levels. The bars show 95% confidence intervals calculated using individual-level clustering. The specification includes full sets of age-in-years indicators and calendar-year fixed effects. Units with lower or higher travel intensity are defined as those whose average annual mission travels are below or above the median across all units in a given year.

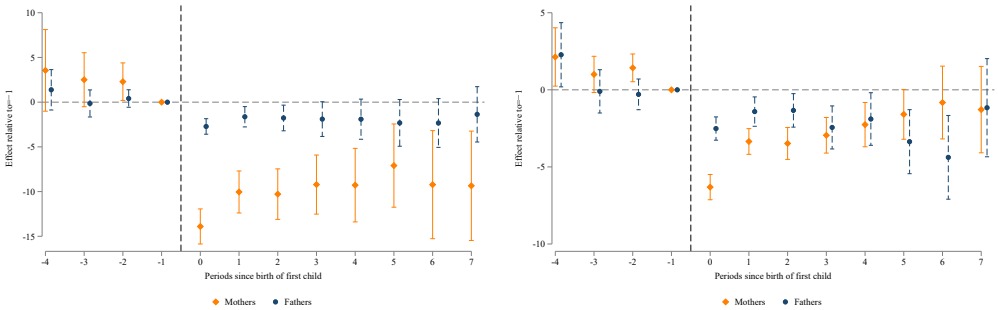
Working in multinational enterprises often entails job demands that are more intensive and less flexible than those in purely domestic firms. Employees are typically expected to be available outside regular business hours to coordinate across time zones and to undertake international travel—frequently on short notice (Bøler et al., 2018; Hewlett and Rashid, 2010). Moreover, because international firms must transfer, apply, and adapt firm-specific capabilities across diverse institutional environments, positions in these organizations tend to require higher cognitive and organizational skills (Narula and van der Straaten, 2021). As argued by van der Straaten et al. (2024), these features can exacerbate the "time incompatibility" and "work effort" penalties associated with parenthood, particularly for mothers. Our results on business travel are consistent with this interpretation. Figure 9 shows that mothers travel approximately 10 fewer days per year after the birth of their first child—a reduction that persists over time—while fathers experience only a small and short-lived decline. Conditional on traveling, both groups visit fewer countries, though the drop is larger for mothers. Furthermore, mothers become about 10 percentage points less likely to travel for at least 60 days per year, whereas the (very small) decline observed for fathers is only significant in the birth year. In high-intensity multinational environments where mobility and cross-border coordination are key components of career progression, these adjustments likely reflect meaningful

constraints on mothers' ability to sustain the travel-intensive work patterns that are often tied to advancement.

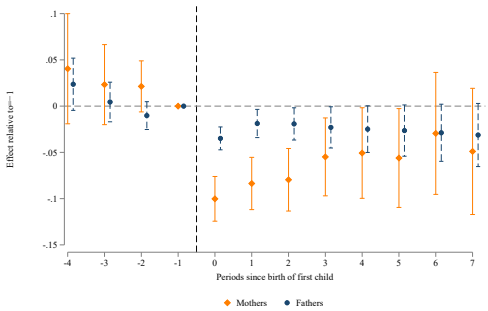
Figure 9: Impact of first childbirth on travel demands

(a) Number of days

(b) Number of countries visited

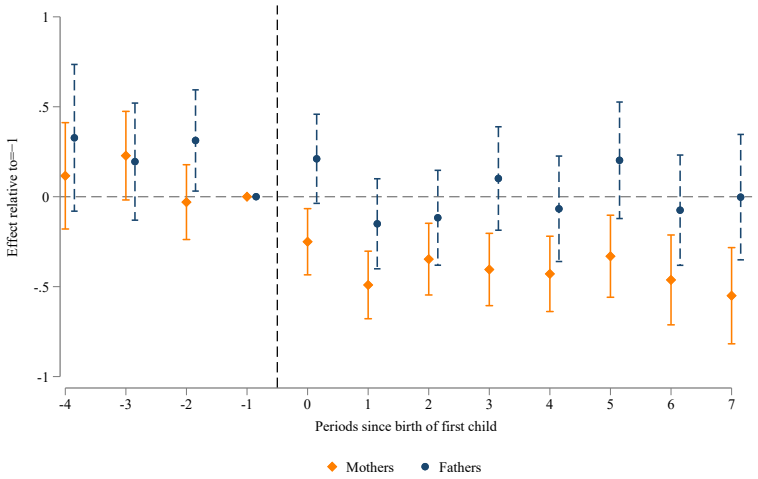


(c) Pr. of traveling for 60 days



Note: Data cover the period 1987–2024, and the sample includes parents observed at least once before and at least once after childbirth. The sample is restricted to mothers (fathers) whose age at first childbirth is between 18 and 50 years (18 and 60 years). Each estimated coefficient captures the change in the outcome τ years relative to the year before childbirth, where $\tau = 0$ corresponds to the year of birth. The coefficients, estimated from separate regressions for mothers and fathers, are expressed in levels in panel (a) and (b) and in relative terms in panel (c). The bars show 95% confidence intervals calculated using individual-level clustering. The specification includes full sets of age-in-years indicators and calendar-year fixed effects. Units with lower or higher travel intensity are defined as those whose average annual mission travels are below or above the median across all units in a given year.

Figure 10: Impact of first childbirth on promotion



Note: Data cover the period 1987–2024, and the sample includes parents observed at least once before and at least once after childbirth. The sample is restricted to mothers (fathers) whose age at first childbirth is between 18 and 50 years (18 and 60 years). Each estimated coefficient captures the change in the outcome τ years relative to the year before childbirth, where $\tau = 0$ corresponds to the year of birth. The coefficients, estimated from separate regressions for mothers and fathers, are expressed relative to the average pre-birth level of the outcome for each group. The bars show 95% confidence intervals calculated using individual-level clustering. The specification includes full sets of age-in-years indicators and calendar-year fixed effects.

Finally, we examine whether the patterns documented above translate into differential career progression. Figure 10 shows that mothers experience a substantial and persistent decline in their probability of being promoted after childbirth, defined as the likelihood that an employee in a given year holds a position with a higher grade than in the previous year. Although we do observe a slight pre-trend in the pre-birth period, that pre-trend is similar for both men and women. Yet, there is a clear drop after childbirth for mothers, with no significant change for fathers. Relative to non-mothers, mothers' promotion rates fall by roughly 50 percent in the years that follow the birth of their first child, with no evidence of recovery within our seven-year window. For fathers, in contrast, the event-study coefficients remain close to zero, indicating no meaningful change in their upward mobility after becoming parents.

These findings are closely aligned with evidence from Lucifora et al. (2021), who use detailed personnel records from a large French firm to show that the motherhood penalty within the organization is almost entirely driven by missed promotions and slower progression up the firm's internal job ladder. In their setting, mothers experience a sharp

reduction in promotion probability in the year of birth and the year after, and—even when promoted—gain fewer hierarchical ranks and smaller increases in pay compared to childless women. Our results are conceptually consistent with this "mommy track" mechanism: in both contexts, childbirth appears to slow mothers' advancement in ways that directly affect long-run earnings. A key difference, however, is that our setting allows us to open this black box. While Lucifora et al. (2021) show that promotions are the primary channel behind the motherhood penalty, they cannot fully identify why mothers are promoted less. In contrast, the evidence presented in the previous subsections reveals clear adjustments in work patterns, project responsibilities, travel intensity, and the allocation of high-visibility tasks—adjustments that cumulatively reshape mothers' career trajectories. By documenting these mechanisms directly, our analysis provides a more granular account of the behavioral and organizational channels through which childbirth translates into slower career progression.

Do mothers sort between different units and jobs after the birth? An additional channel through which parenthood may affect earnings is sorting across organizational units. After having a child, employees may actively seek positions or teams that make it easier to reconcile work and family responsibilities. If such units offer greater flexibility—e.g., because they rely more heavily on telework arrangements—but at the cost of flatter career ladders or lower pay, and if mothers are more likely than fathers to move into these units, then differential post-birth sorting could generate a motherhood effect in salaries even in the absence of unequal treatment within jobs.

To measure the characteristics of the units or jobs into which mothers and fathers may be resorting after the birth of their first child, we construct indicators of the underlying attributes of each job or unit that are net of individual employees' choices. For each outcome Y that captures an aspect of the work environment—such as a job's propensity to lead to promotions, its travel intensity, or a unit's typical reliance on flexible work arrangements—we estimate the following regressions:

$$Y_{ijt} = \beta_0 + \beta_1 \,\text{tenure}_i + \beta_2 \,\text{tenure}_i^2 + \gamma \text{grade}_i + \delta_j + \lambda_t + \varepsilon_{ijt}, \tag{2}$$

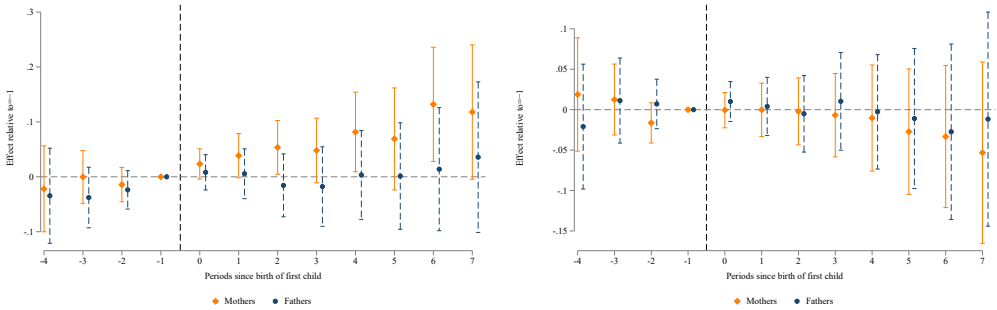
$$Y_{iut} = \beta_0 + \beta_1 \,\text{tenure}_i + \beta_2 \,\text{tenure}_i^2 + \gamma \text{grade}_i + \delta_u + \lambda_t + \varepsilon_{iut} \tag{3}$$

where δ_j and δ_u denote job and unit fixed effects, λ_t are year fixed effects and ε_{ijt} and ε_{iut} are idiosyncratic error terms. The estimated fixed effects capture the average level of the outcome that is inherent to each job or unit, holding constant employees'

grade, tenure, and common time shocks. We interpret these fixed effects as measures of job- and unit-level attributes—such as promotion "desirability," travel demands, or the extent of flexible work practices—that allow us to examine whether mothers and fathers sort into systematically different types of jobs or units after childbirth.

Figure 11: Impact of first childbirth on re-sorting

(a) Units with frequent use of home working (b) Units with high AWS use

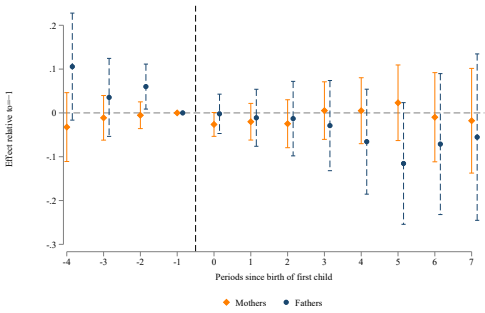


Note: Data cover the period 1987–2024, and the sample includes parents observed at least once before and at least once after childbirth. The sample is restricted to mothers (fathers) whose age at first childbirth is between 18 and 50 years (18 and 60 years). Each estimated coefficient captures the change in the outcome τ years relative to the year before childbirth, where $\tau = 0$ corresponds to the year of birth. The coefficients, estimated from separate regressions for mothers and fathers, are expressed in levels. The bars show 95% confidence intervals calculated using individual-level clustering. The specification includes full sets of age-in-years indicators and calendar-year fixed effects. Units with lower or higher travel intensity are defined as those whose average annual mission travels are below or above the median across all units in a given year.

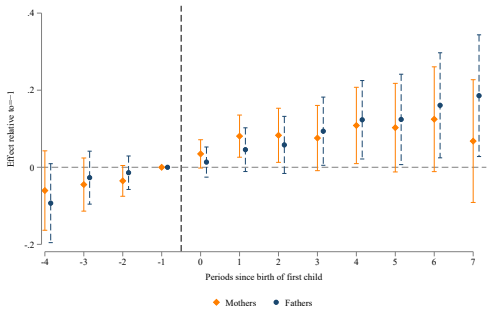
After constructing these job- and unit-level attributes, we use them to study whether mothers and fathers sort into systematically different organizational environments following childbirth. Figure 11 summarizes the resulting event-study patterns. Panel (a) shows that, after childbirth, mothers become increasingly more likely to work in units with frequent use of home-based work (HBW), whereas fathers' exposure to HBW-intensive units remains essentially unchanged. By contrast, panel (b) reveals no systematic changes in the probability of working in units with frequent use of the Alternative Work Schedule (AWS) for either mothers or fathers. Taken together, the evidence indicates that motherhood is associated with a gradual reallocation toward more telework-intensive (and plausibly more flexible) units, while there is no corresponding adjustment along the AWS margin.

Figure 12: Impact of first childbirth on re-sorting

(a) Unit with high female share



(b) Unit with high parent share

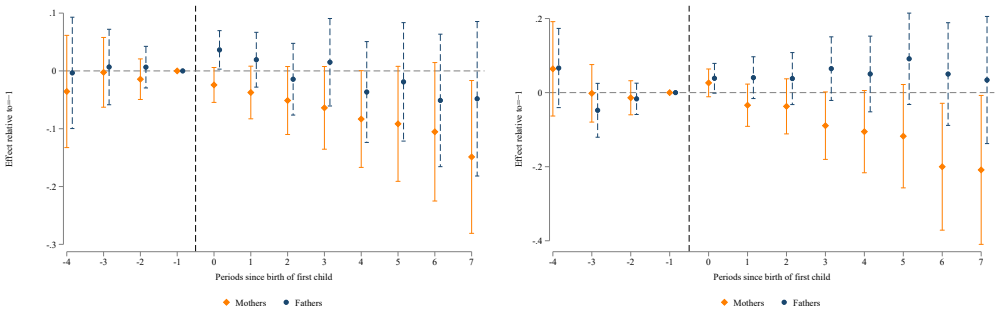


Note: Data cover the period 1987–2024, and the sample includes parents observed at least once before and at least once after childbirth. The sample is restricted to mothers (fathers) whose age at first childbirth is between 18 and 50 years (18 and 60 years). Each estimated coefficient captures the change in the outcome τ years relative to the year before childbirth, where $\tau = 0$ corresponds to the year of birth. The coefficients, estimated from separate regressions for mothers and fathers, are expressed in levels. The bars show 95% confidence intervals calculated using individual-level clustering. The specification includes full sets of age-in-years indicators and calendar-year fixed effects. Units with lower or higher travel intensity are defined as those whose average annual mission travels are below or above the median across all units in a given year.

Figure 12 examines whether parents reallocate into units that differ in their gender or parental composition. Panel (a) shows no meaningful change in the likelihood that mothers sort into units with a higher share of women after childbirth; the estimated effects fluctuate around zero and remain statistically indistinguishable from those for fathers. Panel (b) indicates that both mothers and fathers become somewhat more likely to work in units with a higher share of parents in the years following childbirth, although the magnitude of the change is similar across genders and the differences are not statistically significant. Overall, these results suggest that sorting along these compositional dimensions does not appear to be a major driver of the motherhood penalty.

Figure 13: Impact of first childbirth on re-sorting

(a) Unit with high pr. of promotion (b) Unit with high travel demands



Note: Data cover the period 1987–2024, and the sample includes parents observed at least once before and at least once after childbirth. The sample is restricted to mothers (fathers) whose age at first childbirth is between 18 and 50 years (18 and 60 years). Each estimated coefficient captures the change in the outcome τ years relative to the year before childbirth, where $\tau = 0$ corresponds to the year of birth. The coefficients, estimated from separate regressions for mothers and fathers, are expressed in levels. The bars show 95% confidence intervals calculated using individual-level clustering. The specification includes full sets of age-in-years indicators and calendar-year fixed effects. Units with lower or higher travel intensity are defined as those whose average annual mission travels are below or above the median across all units in a given year.

Figure 13 examines whether parents reallocate into jobs that differ in their promotion prospects or travel demands. Panel (a) shows a clear divergence by gender: by year seven, mothers are almost 20 percentage points less likely to hold jobs with high promotion potential relative to their pre-birth baseline, while the small decline observed for fathers toward the end of the period is not statistically significant. Panel (b) reveals an even stronger pattern for jobs with high mission-travel intensity. Mothers' likelihood of holding a travel-intensive job declines steadily after childbirth—by more than 20 percentage points by year seven—whereas the coefficients for fathers remain small and statistically indistinguishable from zero. These magnitudes indicate that mothers sort out of jobs with steeper career ladders and higher travel requirements, consistent with a reallocation away from the most demanding roles in the organization following the birth of their first child.

5 Heterogeneities

Having documented the mechanisms through which the first birth affects women's careers, we next examine how the magnitude of these penalties varies across different segments of the organization. Since the first birth generates substantial declines in mothers' la-

bor market outcomes—but not in fathers'—our heterogeneity analysis focuses on mothers. This section explores whether the motherhood penalty differs across jobs, units, managers, and individual characteristics, providing a first look at which organizational environments amplify or attenuate the effects of parenthood.

- Sociodemographic (married, Phd)
- Career commitment (long leave taken)
- Unit composition (share of women, share of parents)
- Unit flexibility (high use of leave or flexible scheme)
- Job demands (travel demands)
- Manager characteristics (gender, parental condition)
- Country of origin gender norms.

6 Discussion

TBC

This paper provides new evidence on how the transition to parenthood affects the careers of highly skilled employees working within a single large global organization. By leveraging rich administrative data and modern difference-in-differences methods, we document a modest but persistent motherhood penalty in earnings, contrasted with virtually no change in fathers' labor market trajectories. While substantially smaller than the penalties documented in national labor markets, the earnings losses we observe are economically meaningful and unfold in an institutional setting characterized by standardized career structures, generous family policies, and uniform HR practices.

Our analysis sheds light on the mechanisms underlying these penalties. The decline in mothers' earnings reflects systematic adjustments in contract stability, project leadership, consultant hiring, travel intensity, and exposure to high-visibility tasks. Mothers also experience a pronounced slowdown in promotions, consistent with an internal "mommy track" similar to that documented in other within-firm studies. Although fathers show no comparable changes, mothers gradually reallocate into jobs and units that offer greater flexibility—particularly those with higher use of home-based work and lower travel demands—even when these environments are associated with weaker promotion

prospects. These results point to a combination of behavioral responses and organizational constraints that jointly shape post-birth career trajectories.

Finally, our setting allows us to examine how organizational environments moderate the motherhood penalty. By comparing outcomes across jobs, units, and managerial characteristics—while holding constant the institutional framework—we show that the effects of childbirth vary meaningfully within the firm. Taken together, the results highlight both the limits and the potential of firm-level policies to narrow gender gaps after parenthood. Even in a structured and supportive institutional environment, childbirth reshapes women's careers along multiple margins, suggesting that reducing motherhood penalties requires a comprehensive understanding of how job demands, flexibility, managerial practices, and internal mobility interact to influence long-term advancement.

References

Angelov, N., Johansson, P., and Lindahl, E. (2016). Parenthood and the gender gap in pay. *American Economic Journal: Applied Economics*, 8(3):69–99. 13

Bøler, E. A., Javorcik, B., and Ulltveit-Moe, K. H. (2018). Working across time zones: Exporters and the gender wage gap. *Journal of International Economics*, 111:122–133. 21

Callaway, B. and Sant'Anna, P. H. C. (2021). Difference-in-differences with multiple time periods. *Journal of Econometrics*, 225(2):200–230. 11

Cengiz, D., Dube, A., Lindner, A., and Zipperer, B. (2019). The effect of minimum wages on low-wage jobs. *The Quarterly Journal of Economics*, 134(3):1405–1454. 14

de Chaisemartin, C. and D'Haultfoeuille, X. (2024). Difference-in-differences estimators of intertemporal treatment effects. *Review of Economics and Statistics*. 11

Goodman-Bacon, A. (2021). Difference-in-differences with variation in treatment timing. *Journal of Econometrics*, 225(2):254–277. 11

Hewlett, S. A. and Rashid, R. (2010). The battle for female talent in emerging markets. *Harvard Business Review*, 88(5):101–106. 21

Kleven, H. (2022). The geography of child penalties and gender norms: Evidence from the United States. Technical report, National Bureau of Economic Research Working Paper Number 30176. 7, 13

Kleven, H., Landais, C., and Søgaard, J. E. (2019). Children and gender inequality: Evidence from denmark. *American Economic Journal: Applied Economics*, 11(4):181–209. 10, 13

Lucifora, C., Meurs, D., and Villar, P. (2021). Gender gaps in career progression: Evidence from a large french firm. *Labour Economics*, 68:101945. 13, 23, 24

Melentyeva, V. and Riedel, L. (2025). Child penalty estimation and mothers' age at first birth. Discussion Paper 19/25, Rockwool Foundation Berlin and Centre for Research & Analysis of Migration (CReAM). Accessed: 2025-12-08. 10, 11, 14

Narula, R. and van der Straaten, K. (2021). A comment on the multifaceted relationship between multinational enterprises and inequality. *Critical Perspectives on International Business*, 17(1):151–170. 21

van der Straaten, K., Pisani, N., and Kolk, A. (2024). Parenthood wage gaps in multinational enterprises. *Journal of International Business Studies*, 55(6):805–815. 21

Wing, C., Freedman, S. M., and Hollingsworth, A. (2024). Stacked difference-in-differences. Technical report, National Bureau of Economic Research. 14