Job Search and Mobility Over the Life-Cycle: Implications for the Child Penalty

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Abstract

We document using Dutch administrative and survey data that women's job mobility drops around childbirth. Women make fewer job-to-job transitions starting one year before birth until many years after. They are also less likely to engage in on-the-job search and work in jobs with low amenities related to irregular hours. We develop a life-cycle labor supply, job search and job switching model for women in which mothers and pregnant women face higher search costs. Jobs are characterized as bundles of wages and amenities, the latter decrease work disutility. We use the model to quantify a novel channel through which the child penalty operates: because (expecting) mothers perform less job search, they remain in jobs with low wages and amenities, therefore working and earning less. Search costs related to childbirth reduce lifetime earnings by 10.1%, accounting for 33.7% of the child penalty. We validate our model with a recent reform which eliminated tenure requirements for parental leave. Mothers increased job switching before birth but decreased employment in the year of birth.

JEL codes: J24, J31, J62

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1 Introduction

Women's careers are severely impacted by childbirth, with earnings and wage growth decreasing dramatically in what is prominently known as the "child penalty" (Angelov et al., 2016; Kleven et al., 2019a,b). Understanding the mechanisms behind this substantial penalty remains critical for reducing labor market inequality and informing effective policy interventions. While existing research primarily attributes the child penalty to mothers' reduced labor supply and human capital depreciation, other important factors merit deeper investigation. There is growing evidence that women may seek jobs with family-friendly amenities—such as flexible schedules or predictable hours—that facilitate balancing career and childcare responsibilities, potentially accepting lower wages in exchange for these benefits consistent with compensating wage differentials. Limited job mobility may also act as a pathway through which the child penalty operates: if mothers face barriers to job switching that prevent them from accessing better wage-amenity combinations, reduced mobility could significantly compound earnings losses through forgone opportunities for career advancement.

Job search and switching may be particularly difficult for pregnant women and mothers. Reduced time and mental capacity for job search, employer discrimination, tenure requirements for parental benefits, and adjustment costs to new work environments all potentially constrain mothers' job mobility. If these constraints prevent mothers from climbing the job ladder or accessing jobs that better accommodate their family responsibilities, the resulting reduction in job-to-job transitions could account for a substantial portion of the child penalty—a mechanism that has received limited attention in the existing literature.

In this paper, we bring these factors together in a life-cycle framework and provide the first comprehensive analysis of how job search and switching behaviors contribute to the child penalty. Using novel linked Dutch administrative and survey data spanning 2006-2020, we document that women's job mobility drops dramatically around childbirth and examine how wages, amenities, job search, and job switches are jointly determined over the life cycle. The administrative data provide longitudinal records of employment, wages, job-to-job switches, and household composition for the universe of Dutch residents, while cross-sectional labor force survey data offer rich information on on-the-job and off-the-job search behavior and job amenities. We develop and estimate a dynamic

discrete-choice model of women's employment, job search, and job switching decisions using the Method of Simulated Moments, where jobs are characterized by both wage and amenity bundles, and mothers face higher search costs that constrain their mobility.

We first document a set of novel stylized facts on mothers' labor market dynamics around childbirth. Women's job-to-job transition rates begin declining approximately one year before birth, reaching their lowest point shortly after birth and remaining persistently lower for many years. On-the-job search follows a similar pattern, with women's search activity dropping substantially below pre-birth levels. Simultaneously, we observe systematic shifts toward family-friendly job characteristics: women are significantly less likely to work overtime, on weekends, during non-standard hours, or in shift work arrangements after becoming mothers. Using firm-level measures constructed through wage decompositions following Abowd et al. (1999) and principal component analysis of amenity variables, we create discrete job types based on wage and amenity combinations, showing that mothers sort into jobs offering higher amenities but lower wage premiums, suggesting wage-amenity trade-offs that may limit earnings growth.

Importantly, we demonstrate that job-to-job transitions are highly effective for wage growth. Each job switch increases hourly wages by approximately 4%, representing a 140% increase compared to yearly within-job wage growth. This finding underscores the potential cost of reduced mobility: when mothers make fewer job transitions, they forgo substantial opportunities for wage advancement that could partially offset other sources of the child penalty.

To quantify these effects, we develop and estimate a discrete-choice life-cycle model featuring women's decisions on work hours, job search, and job acceptance. Women are subject to exogenous fertility and labor market shocks, and can engage in job search both while employed (on-the-job search) and while non-employed (off-the-job search). In our random search framework, each job is characterized by a wage-amenity bundle drawn from a known distribution, and women face search costs that vary by motherhood status. The consideration to engage in costly search depends on current job characteristics and family circumstances: when a woman becomes pregnant or has a child, her search cost increases, but her need for better amenities also rises. The distribution of jobs affects the wage-amenity trade-off; if wages and amenities are positively correlated, job search can allow women to obtain both higher wages and better amenities, while negative correla-

tion forces difficult choices between pay and family-friendly conditions. High-amenity jobs reduce work disutility, particularly for mothers, while job search is costly but effective in generating offers. The model incorporates human capital evolution that depends on current job characteristics and working hours, creating persistent effects of employer choices on future labor market outcomes.

Our estimated model reveals that search costs are substantially higher for pregnant women and mothers, ranging from roughly 1,200-1,300 EUR per month in equivalent terms. On-the-job search increases job-finding rates from 26% for non-searchers to 79% for searchers, highlighting the importance of search effort for career advancement. High-amenity jobs reduce work disutility by 9%, while high-wage jobs increase wages by increase wages by .27 log points relative to low-wage positions, which is around one fifth of the average salary. Most women start their careers in low-wage and low-amenity jobs when young but rapidly transition to better job. By age 30, nearly 40% are employed in the "best" job type, high-wage and high-amenity jobs. The job offer distribution is relatively balanced, with substantial opportunities for both wage and amenity improvements through mobility.

Using counterfactual simulations, we quantify the contribution of child-related search costs to the child penalty. When we eliminate the additional search costs faced by mothers and pregnant women, search rates increase by approximately 25% and job switching rises by over 20%. This leads more women to obtain high-wage and high-amenity jobs, incentivizing longer work hours and higher wages. The results show that child-related search and mobility costs account for 34% of the child penalty, equivalent to a 10% decrease in life-cycle earnings. This substantial effect operates through complementarities between labor supply and job search, with dynamic compounding as women who fail to advance early in their careers face persistent disadvantages.

We then use the model to evaluate the job mobility and labor supply effects of a policy change in 2015 that eliminated a tenure requirement for parental leave. Prior to the reform, women were only eligible for unpaid parental leave with an employer if they had worked there for at least one year. After 2015, parental leave entitlement no longer required any employer-specific tenure. The law change should have had a direct positive impact on expecting mothers' mobility since switching employers no longer signified losing parental leave entitlement. Indeed our simulations show that job switches of pregnant

women increase by 12.6%. As all women can enjoy unpaid leave, the employment rate in the year of birth decreases by 3.8%. However, as non-working mothers can return to their pre-birth employers, 1.8% work more in the first year after giving birth. Overall, lifetime earnings decrease slightly by 0.2%, as the disemployment effect in the year of birth dominates.

Our difference-in-difference strategy exploits variation across industry-level bargaining agreements. In particular, one industry did not have a tenure requirement before 2015, and hence can serve as a control group. We demonstrate that parallel trends are satisfied. Comparing pregnant women working in treated vs. not treated industries, before and after the reform, we find that the reform led to an 18.2% increase in job switching. The magnitude of the effect closely aligns with our model simulations for the immediate impact. Importantly, our structural model then allows us to trace out the longer-term consequences of the reform on career trajectories and lifetime earnings—effects that are difficult to identify empirically using difference-in-difference methods due to their dynamic and cumulative nature.

Finally, we demonstrate that endogenous job search adjustments significantly amplify the effects of other labor market policies. When we simulate a childcare subsidy of 200 EUR per child, the effect on earnings is 22% larger when allowing for endogenous search and switching responses compared to keeping these behaviors fixed. This occurs because job search and labor supply are complementary: policies that increase work incentives also motivate women to seek better job matches, creating multiplicative effects on earnings.

To our knowledge, this is the first paper to investigate the dynamic role of job search and job switching on women's life-cycle labor supply and career outcomes around childbirth. Although the importance of job search and mobility for wage growth is well-established in the search literature, life-cycle models commonly used to study female labor supply typically set wages equal to marginal productivity (van der Klaauw, 1996; Francesconi, 2002; Blundell et al., 2016; Eckstein et al., 2019). A handful of papers examine job mobility between different occupations or career tracks (Adda et al., 2017; Hotz et al., 2017; Bang, 2022), but do not take into account search frictions or on-the-job search decisions. On the other hand, search models are often limited in their life-cycle features in order to preserve stationarity and tractability. This is particularly limiting when studying

women's labor market behavior which varies starkly by precise family circumstances.

The novelty of our approach lies in integrating a wide array of mechanisms behind the child penalty within a unified framework. By combining a rich structural framework with detailed data on job search and workplace amenities, we are uniquely positioned to examine women's dynamic search and sorting decisions across the life cycle. How women's labor supply and fertility are jointly determined has been studied by Francesconi (2002), Adda et al. (2017), and Wang (2023). We also add to a handful of recent papers which emphasize the role of amenities for mothers' careers. For instance, job flexibility is examined in Flabbi and Moro (2012), Goldin (2014), Adda et al. (2017), Hotz et al. (2017), Xiao (2019), and Bang (2022). Le Barbanchon et al. (2020) find that mothers accept lower wages in exchange for shorter commutes.

Our work also contributes to the growing literature on gender differences in job search behavior. Faberman et al. (2025) analyze how gender differences in search effort, job preferences, and amenity valuations contribute to the gender wage gap, developing an equilibrium search model with multi-dimensional job characteristics. However, their focus is on the overall gender wage gap rather than the specific dynamics around childbirth. Wiswall and Zafar (2017) provide experimental evidence on gender differences in job preferences, while recent work by Lochner and Merkl (2023) and Fluchtmann et al. (2024) documents gender differences in job application behavior. Our paper is the first to examine how these search behaviors change specifically around the timing of childbirth and to quantify their contribution to the child penalty.

In addition, a handful of papers examine how job mobility might affect women's and men's wage growth. For example, Loprest (1992) suggests low wage growth of women compared to men can be attributed to differences in wage growth when changing jobs. Lafférs and Schmidpeter (2023) document the importance of job mobility after birth on mothers' long-term earnings and Bronson and Thoursie (2023) highlight the role of within-firm mobility on wage growth. Beyond analyzing how reduced job search and mobility around childbirth affect labor market outcomes within our model, we also offer new regression-based evidence showing that tenure-linked child benefits significantly reduce job switching among pregnant women, validated through a natural experiment.

The rest of the paper is organized as follows: Section 2 describes our data sets, and

Section 3 documents stylized facts describing women's endogenous job search, switching, and amenity choices around childbirth. Section 4 develops our life-cycle model, and Section 5 discusses the key parameter estimates of the model. Section 6 discusses the counterfactual simulation results including comparing simulated reform effects with results from the difference-in-difference analysis.

2 Data

Our analysis draws on three linked administrative and survey datasets from the Netherlands covering 2006-2020, creating a comprehensive picture of women's labor market dynamics around childbirth. All datasets can be linked through unique person identifiers, enabling us to track individuals' employment histories, job search behavior, and workplace characteristics over time.

2.1 Administrative Employment and Registry Data

Our primary data source is matched employer-employee administrative records maintained by Statistics Netherlands (CBS), covering the universe of Dutch residents. These data provide monthly information on employment spells, including working hours, gross wages, employer identifiers, and exact start and end dates. The longitudinal nature allows us to construct complete employment histories and identify job-to-job transitions with precise timing.

The administrative records also include comprehensive individual characteristics (age, gender, education, nationality) and detailed household composition. Crucially for our analysis, we observe exact birth dates for all children, enabling precise identification of fertility events and tracking of labor market outcomes relative to childbirth timing. Marriage and divorce events are similarly recorded with exact dates. Employer identifiers allow us to link workers across firms and construct firm-level wage premiums using two-way fixed effects decompositions following Abowd et al. (1999).

2.2 Labor Force Survey

We supplement the administrative data with the Dutch Labor Force Survey (LFS), a repeated cross-sectional survey conducted continuously by CBS with approximately 60,000 households per year. The LFS provides information not available in administrative records,

	Low Edu.	High Edu.
Proportion	0.60	0.40
Employed	0.76	0.90
Earnings	1487	2425
Age First Birth	27.9	30.8

particularly job search behavior and workplace amenities. For job search, the survey distinguishes between on-the-job search (searching while employed) and off-the-job search (searching while unemployed), with respondents reporting whether they actively searched for work in the past four weeks. For workplace amenities, the survey includes detailed questions about overtime requirements, evening and night work, weekend work, and shift work arrangements, typically measured on a three-point scale (never, sometimes, regularly).

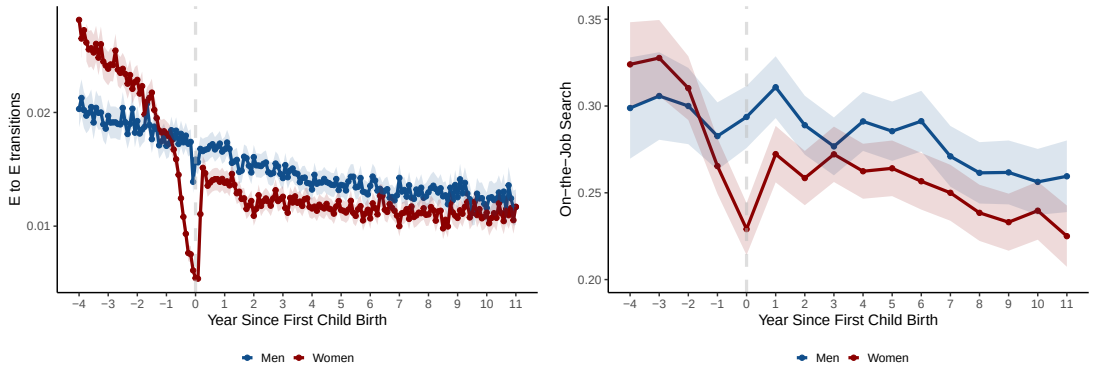
2.3 Working Conditions Survey

The Working Conditions Survey (Nationale Enquête Arbeidsomstandigheden, NEA) surveys approximately 20,000-60,000 employed adults annually about workplace conditions and policies. The NEA collects information on the same key amenity measures as the LFS: overtime work, evening and night work, weekend work, and shift work arrangements, using identical question formats and response scales. We combine both LFS and NEA data to construct firm-level amenity measures through aggregation of individual responses within firms. The larger combined sample improves the precision of firm-level measures, particularly for smaller firms. The NEA also provides additional variables related to job amenities, thus serves as a robustness check for our amenity measures from the limited but common set of amenity questions available in LFS and NEA. Finally, the NEA also includes on-the-job search questions, allowing us to construct on-the-job search related moments based both on NEA and LFS.

2.4 Sample Construction and Key Variables

Our main estimation sample includes women aged 22-45, capturing prime childbearing and career-building years. We require at least six months of employment history and non-missing education information. The final linked sample contains approximately 70,000 unique women contributing 660,000 person-month observations.

Figure 1: Changes in Job Switching Rates and On-the-Job Search around First Birth



(a) Job-to-Job Transitions (b) On-the-Job Search

Notes: This figure shows how job mobility measures change around the birth of the first child. Panel (a) displays monthly job-to-job transition rates from the administrative data. Panel (b) shows the probability of engaging in on-the-job search from the Labor Force Survey. The horizontal axis represents years relative to the birth of the first child, with 0 indicating the year of birth. The sample includes men and women aged 22-45.

3 Stylized Facts

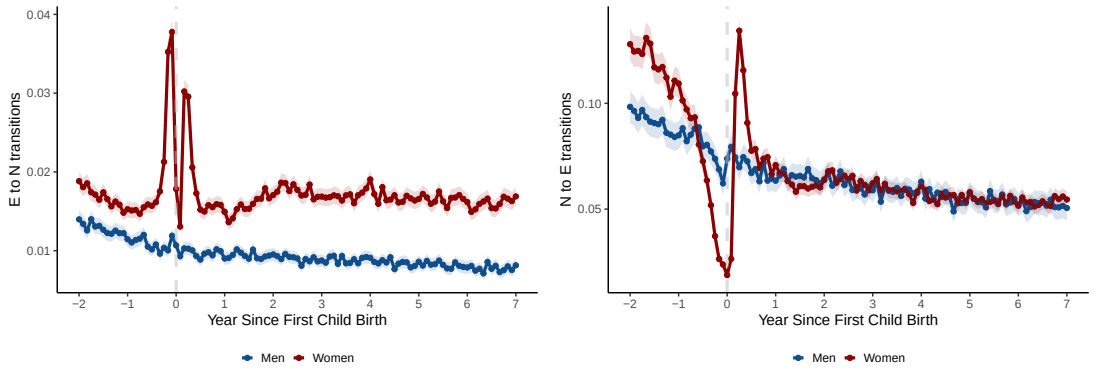
In this section, we document important empirical patterns describing women's labor market dynamics around childbirth. Using rich administrative and survey data, we present evidence on transitions in and out of employment, job search behavior, job-to-job mobility, and changes in job characteristics that collectively illuminate how motherhood affects women's career trajectories.

3.1 Labor Market Transitions Around Childbirth

The birth of a child represents a critical juncture in women's careers, generating substantial changes in labor market attachment and mobility. Figure 1 illustrates how job search and switching patterns evolve for both men and women relative to the birth of their first child.

The left panel of Figure 1 shows that women's job-to-job transition rates begin declining approximately one year before childbirth, reaching their lowest point shortly after birth and remaining persistently lower than pre-birth levels for many years. In contrast, men's transition rates remain relatively stable throughout the same period. The right panel reveals a similar pattern for on-the-job search behavior, with women's search activ-

Figure 2: Employment-to-Non-employment and Non-employment-to-Employment Transitions Around First Birth



(a) Employment to Non-employment (b) Non-employment to Employment

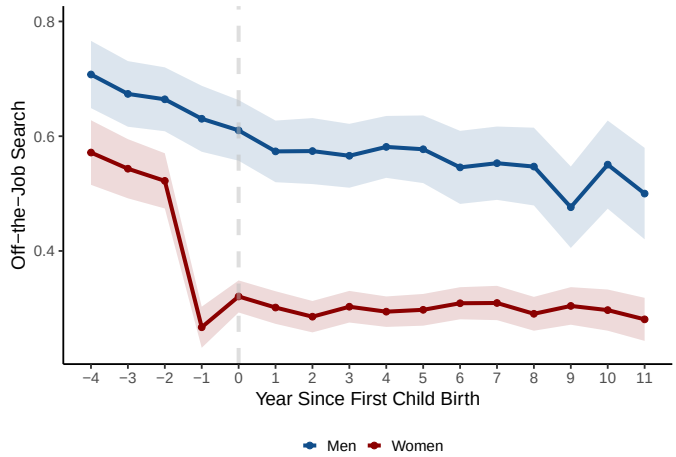
Notes: This figure shows transition rates between employment and non-employment states around the birth of the first child. Panel (a) displays the monthly probability of transitioning from employment to non-employment (EN). Panel (b) shows the monthly probability of transitioning from non-employment to employment (NE). The horizontal axis represents years relative to the birth of the first child, with 0 indicating the year of birth. The sample includes men and women aged 22-45 observed in the Dutch administrative data from 2006-2020.

ity dropping substantially below men's rates around birth and recovering only partially in subsequent years. This reduced search intensity likely contributes to the lower job-to-job transition rates, reflecting increased mobility constraints for mothers.

These mobility constraints extend beyond job-to-job transitions to include movements between employment and non-employment states, as shown in Figure 2. Women's transitions from employment to non-employment spike sharply around childbirth and remain elevated compared to men's in subsequent years, reflecting both temporary maternity leaves and more permanent exits. Simultaneously, their transitions from non-employment to employment are disrupted, particularly in the periods immediately before birth and 1-2 years postpartum, when rates fall significantly below men's. These patterns indicate substantial friction in women's labor market attachment around motherhood.

The overall decline in women's labor market mobility is further evidenced by their off-the-job search behavior, as shown in Figure 3. Non-employed women dramatically reduce their job search intensity after childbirth compared to men, with the gap persisting for several years. This drop mirrors the decline in on-the-job search we observed earlier, suggesting that motherhood broadly increases mobility constraints regardless of employ-

Figure 3: Off-the-Job Search Intensity Around First Birth



Notes: This figure shows the probability of engaging in off-the-job search (job search while not employed) around the birth of the first child. The horizontal axis represents years relative to the birth of the first child, with 0 indicating the year of birth. The vertical axis shows the fraction of non-employed individuals actively searching for work. The sample includes men and women aged 22-45 from the Dutch Labor Force Survey data from 2006-2020.

ment status.

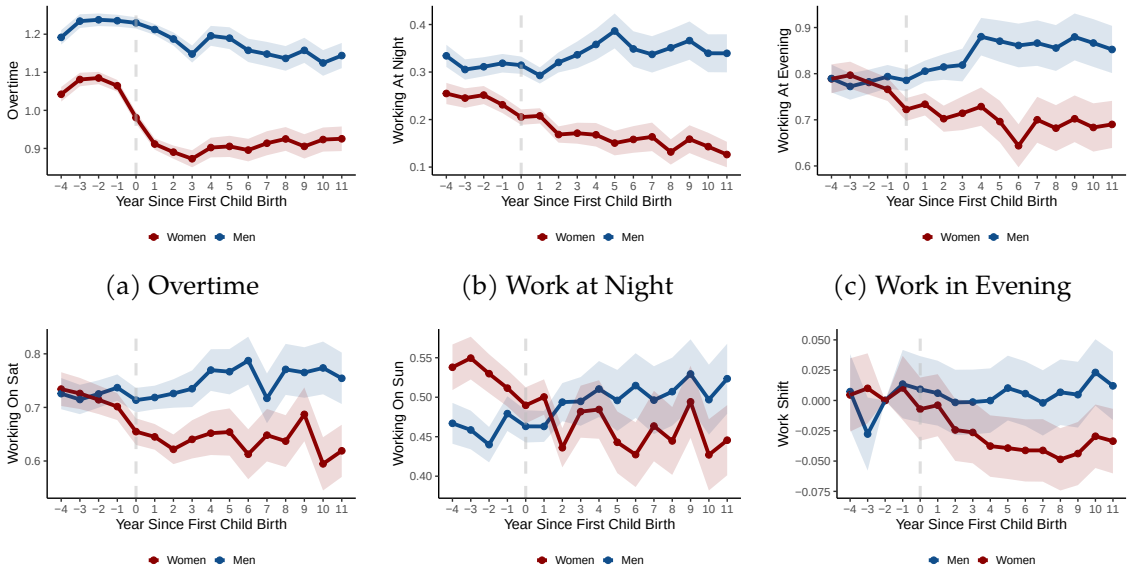
Collectively, these findings demonstrate that women face significant barriers to labor market mobility around childbirth. Whether measured by direct job-to-job transitions, employment status changes, or search behavior while employed or non-employed, women show consistently reduced mobility compared to men and to their own pre-birth patterns. These constraints emerge during pregnancy and persist long after childbirth, potentially limiting women's career progression and wage growth opportunities through job switching.

3.2 Changes in Job Characteristics Around Childbirth

Following childbirth, women's job characteristics change substantially. We observe systematic shifts in both specific job amenities and the types of firms where mothers work. Figure 4 shows how various job amenities related to work schedule flexibility evolve around the birth of a first child.

Women experience significant changes in their job characteristics starting shortly before childbirth and continuing afterward. After giving birth, women are substantially less

Figure 4: Changes in Job Amenities around First Birth

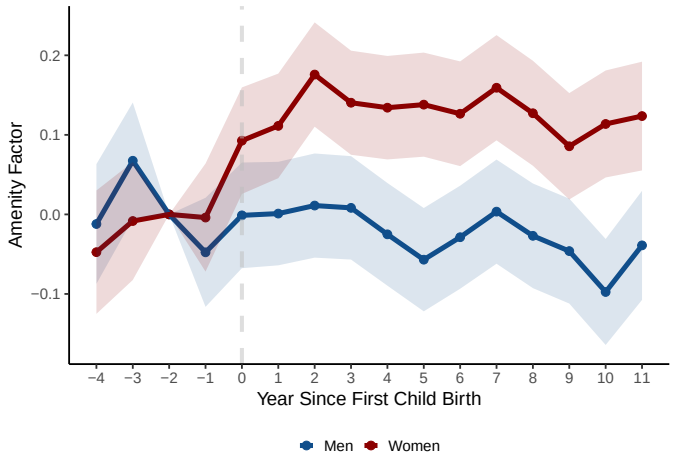


(a) Overtime (b) Work at Night (c) Work in Evening

(d) Working on Saturdays (e) Working on Sundays (f) Shift Work

Notes: This figure shows changes in job amenities around the birth of the first child. The outcomes are measured in categories of frequencies where answers can take values 0 - never, 1 - sometimes and 2 - regularly. The horizontal axis represents years relative to the birth of the first child, with 0 indicating the year of birth. The sample includes men and women aged 22-45 from the Dutch Labor Force Survey, 2006-2020.

Figure 5: Changes in Composite Amenity Measure around First Birth



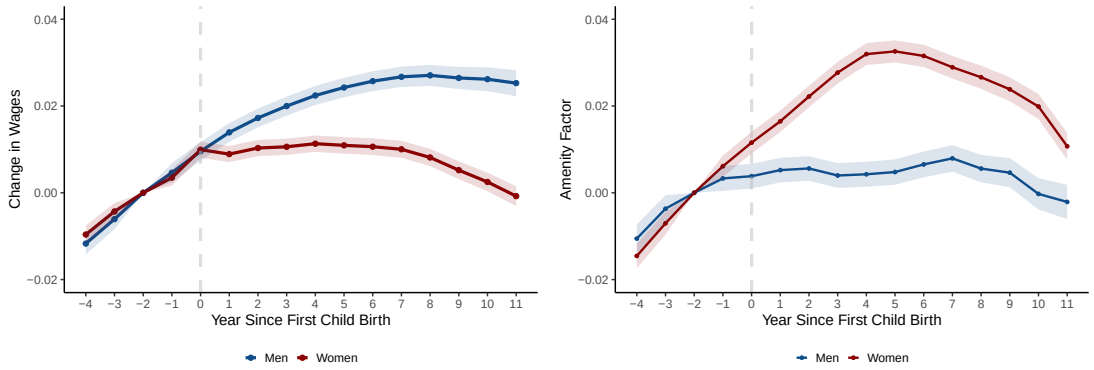
Notes: This figure shows changes in the composite amenity measure around the birth of the first child. The composite amenity measure is constructed using principal component analysis of the six individual amenity measures shown in Figure **??**. The measure is standardized to have mean zero and standard deviation one in the overall sample. Higher values indicate more family-friendly job characteristics (fewer irregular hours, less weekend work, etc.). The horizontal axis represents years relative to the birth of the first child, with 0 indicating the year of birth. The sample includes men and women aged 22-45 from the Dutch Labor Force Survey, 2006-2020.

likely to work overtime (Panel a), on weekends (Panels b and c), during non-standard hours (Panels d and e), or in shift work arrangements (Panel f). In contrast, men's amenities show little change around the birth of their first child.

To obtain a more comprehensive measure of family-friendly job characteristics, we construct a composite amenity index using principal component analysis (PCA). This technique allows us to extract the common variation across the individual amenity measures, creating a single dimension that captures the overall family-friendliness of jobs. Higher values of this index indicate fewer irregular or non-standard working hours, representing more family-friendly positions. Figure 5 shows how this composite amenity measure changes around childbirth for men and women.

The composite amenity measure clearly demonstrates the divergence in job characteristics between men and women following childbirth. Women's jobs become significantly more accommodating to family responsibilities, with the amenity index rising sharply after childbirth and remaining elevated for many years. Men's job characteristics, in contrast, remain largely unchanged throughout the same period. This pattern indicates that

Figure 6: Changes in Firm-Level Characteristics around First Birth



(a) Firm Wage Fixed Effect (b) Firm Amenity Factor

Notes: This figure shows how firm-level characteristics change around the birth of the first child. Panel (a) displays the average firm wage fixed effect, estimated from AKM-style wage decomposition after controlling for worker characteristics. Higher values indicate employment at firms that pay higher wages to all employees. Panel (b) shows the firm-level amenity factor, derived from principal component analysis of family-friendly work conditions at the firm level. Higher values indicate more family-friendly work environments. Both measures are standardized to have mean zero and standard deviation one in the overall sample. The horizontal axis represents years relative to the birth of the first child, with 0 indicating the year of birth. The sample includes men and women aged 22-45 from merged Dutch administrative and Labor Force Survey data, 2006-2020.

women systematically sort into more family-friendly jobs after becoming mothers.

These changes in job-level amenities reflect broader shifts in firm selection patterns. Figure 6 shows how the characteristics of firms where women work change around childbirth, as measured by firm-level wage premiums and amenity offerings. Panel (a) reveals that around childbirth, women experience a decline in the average firm wage fixed effect, indicating a shift toward employment at firms that pay lower average wages relative to the market. Simultaneously, Panel (b) shows that women sort into firms offering higher levels of family-friendly amenities after becoming mothers. Men experience no comparable changes in either dimension. This pattern suggests that women may trade employment at higher-paying firms for those offering more accommodating work environments after childbirth.

The systematic shifts in both individual job characteristics and firm-level attributes around motherhood indicate that women's job choices change substantially after having children. These changes appear to prioritize family-friendly working conditions, poten-

tially at the expense of wage growth. In the next section, we explore how job mobility—specifically, job-to-job transitions—contributes to these changes in job characteristics and whether mothers face different trade-offs than non-mothers when switching employers.

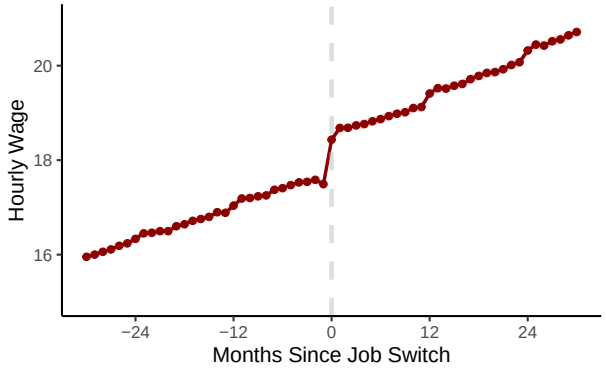
3.3 Job Switching and Wage-Amenity Trade-offs

3.4 Mechanisms Driving Changes in Job Characteristics

Moreover, women's child-friendly amenities increase after first birth as shown in Figure 4. After birth, women are more likely to work in jobs that require less irregular working hours (evening, night, weekends) and overtime work. The outcomes are measured in categories of frequencies where answers can take values 0 - never, 1 - sometimes and 2 - regularly. For men, there is little change; the pre-birth trends continue for most amenities. Panel (f) further shows a composite amenity measure that sums up the five other categories. Again, it is evident that differences between men and women's amenities emerge 1-2 years before the birth of the first child.

The last piece of evidence that underlines the importance of job switching for wage growth is shown in Figure 7. The sample here is women aged between 22 and 45. The left panel shows a discrete jump in hourly wage after the event of a job-to-job switch. The right panel shows the same result using regressions with and without an individual fixed effect. Women's hourly wage increases roughly by .72 EUR following a job switch, and this is roughly 4% of the average wage. Compared to the yearly within-job wage increase, job-to-job switching increases hourly wage by an additional 140%.

Figure 7: Δ Hourly Wage EE Transition

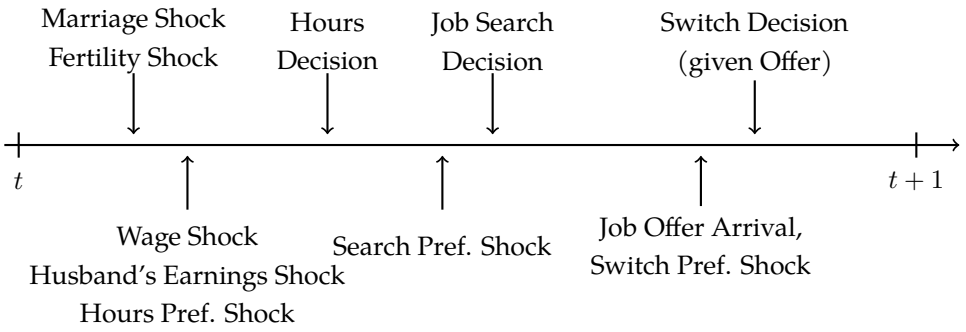


	Hourly Wage	
Switch	0.721	0.744
	(0.023)	(0.056)
t	0.069	0.064
	(0.001)	(0.002)
N	842967	842967
Indiv. FE	Yes	No

4 Model

To quantify the life-cycle impact of job search and switching behaviors associated with childbirth, we develop and estimate a discrete-choice life-cycle model of women's employment and job search. Our model features women's decisions on whether to search for a job as an employed or unemployed person, whether to accept a particular job with a wage and amenity value attached to it upon job arrival, and how many hours to work given the work conditions and family environment. Jobs are characterized by different wages and amenity values drawn from a known distribution. When a woman searches, she is subject to a search cost, which may depend on the motherhood or pregnancy status. Also, once she decides to switch her job upon job arrival, she is subject to a switching cost, which again may depend on the observable characteristics of the household. Human capital may appreciate or depreciate depending on the current job characteristics and working hours. Allowing the current job characteristics to affect the human capital level in the next period creates persistent effects of employer choices on the future labor market outcomes and, eventually, lifetime career outcomes. We elaborate on the key model features below.

4.1 Timing Assumption



Let t denote the age of a woman in the model, and p_t denote the spouse's characteristics if married, such as labor income and working hours at t. At the beginning of each period t, the woman gets to know whether she will have a newborn in the next period. The probability of giving birth next period is π, which is a function of age t, education e, and the number of existing children k_t. Upon a fertility shock, a child will be born at the beginning of the next period after one year of pregnancy. At the same time, marriage (if unmarried) or divorce (if married) shocks will be drawn for the individual, which may depend on the age and the number of children in the household. Subsequently, an

exogenous wage shock and spouse's earnings shock will be realized.

Once these shocks are realized, the woman makes her labor supply decision conditional on preference shocks. If she is employed, she chooses how many hours to work (including zero hours, i.e., not working) given the current wage level and job amenity from a discrete set of working hours.[1] When she chooses not to work (zero working hours), the employment relationship with the current employer may be lost, given her tenure and parental leave status. If she starts the period as non-employed, nothing happens.

After the labor supply decision, the woman gets to choose whether to search for a job or not, which will be denoted as $s_t \in \{0, 1\}$. Both employed and unemployed women can search for a new job. We assume a job search is costly with a search cost $c_s(k_t)$, which is a function of the number of children in the household and the pregnancy status. Once the woman decides to search, she may get a job offer with some probability $\phi(s, h, w, a)$. We allow the job finding rates to depend on the search decision (s), employment status (h), and the current job type (w, a). Jobs are characterized by a wage offer and amenities, and are drawn from a joint distribution, F of wages (w) and amenities (a): $(w, a) \sim F(w, a)$. After receiving a job offer, the individual can choose whether to accept or reject the job offer. If they change their job from the existing one, they are subject to a switching cost $c_d(t)$, which is a function of age t.

4.2 Human Capital

Human capital evolves depending on the current job type and working hours, and we allow the accumulation rates to partly differ by the education level. Specifically, the law of motion for the human capital is as follows:

$$x_{t+1} = g_1(e, h_t) * (x_t + g_2(w_t, a_t))$$

When the individual chooses not to work $(h_t = 0)$, then the human capital depreciates with rate δ.

[1] We do not differentiate unemployment from non-employment, and we use the terms interchangeably throughout this paper.

4.3 Value Functions

As there are multiple stages of decision-making within a period, we have a few different recursive formats to represent the value functions of an individual. Specifically, there are three different value functions within a period t.

- V^h: value function at the hours choice stage
- V^s: value function at the job search stage
- V^a: value function at the job acceptance/switching stage

Let $\Omega_t = \{e, x_t, k_t, n_t, m_t, p_t\}$ denote all the relevant state space variables, where e denotes education level, x_t denotes the human capital, n_t the number of children, k_t the age of the youngest child, m_t the marital status, and p_t the spouse's labor market characteristics. At each decision node, there is a choice-specific preference shocks $(\epsilon^s, \epsilon^a, \epsilon^h)$, which are independent across all choices.[2] A detailed description of each value function is given below:

Hours Decision: At the beginning of each period, employed workers will decide how many hours to work, given all their state variables. Relevant state variables include the current wage and amenity (w, a), family structure (k_t, n_t), and spouses' characteristics (p_t). The woman's labor income depends on the current job characteristics, working hours, and current level of human capital. We also allow for a wage shock η_t. Total household income is the sum of a woman's and her spouse's labor income, and there is no saving in the model.

Choosing not to work (zero working hours) can mean two different things: 1) voluntary quitting or 2) parental leave. The woman will be entitled to take parental leave when her child is less than or equal to 8 years old and her job tenure with the current employer is more than one year. The baseline model specification assumes the pre-reform parental leave regime with a one-year tenure requirement. Otherwise, not working would lead to a non-employment. This tenure requirement binds women who just started a new job

[2] In the estimation, we assume these choice shocks follow the extreme value type I distributions, and we estimate the scale of the shocks within the model. The scale of the preference shock for hours choice is normalized to be 1.

and gave birth to a child in the same year. The model would create incentives for women who are expecting a child not to change their jobs during the pregnancy period.

$$V_t^h(\Omega_t, w_t, a_t, \tau_t) = \max_{h \in \{0, PT, FT\}} \underbrace{u(y_t, n_t)}_{\text{utility from consumption}} + \underbrace{u(k_t, n_t, a_t, p_t)}_{\substack{\text{disutility of working} \\ \text{depending on children and job amenities}}} + \epsilon_t^h$$

$$+ \mathbb{I}(h=0) \Bigg(\underbrace{\mathbb{I}(\tau_t = 1 \ \& \ k_t \leq 8) \mathbb{E} V_t^s(\Omega_t, w_t, a_t, \tau_t)}_{\text{parental leave, keep the current job}}$$

$$+ \underbrace{(1 - \mathbb{I}(\tau_t = 1 \ \& \ k_t \leq 8)) \mathbb{E} V_t^s(\Omega_t, 0, 0, 0))}_{\text{voluntary quitting, lose the current job}} \Bigg)$$

$$y_t = f(w_t, a_t, x_t, h_t, \eta_t) + y_p(p_t) \quad \text{(labor income)}$$

Job Search Decision: At the job search stage, the only choice variable is whether to search or not, $s \in \{0, 1\}$. Both employed and unemployed women can search. If she searches, i.e., $s = 1$, she bears the search cost $c_s(k)$, regardless of her employment status. However, we allow the job-finding rates to depend on both the employment and search status. Also, we let the job-finding rates depend on the current/previous job characteristics. In particular, an employed (unemployed) woman would have a higher probability of finding a job within the same wage and amenity group as the current (previous) employer. This is to capture the persistence in the job types that a person holds in the data.

The probability of finding a job is $\phi(s, h, w, a)$, and a new job offer (w', a') will be drawn from a distribution F. There is a choice-specific preference shock, ϵ_t^s, which follows an extreme value type I distribution with a scale parameter, σ_s. Upon a job offer, the woman proceeds to the job acceptance stage. If no job offer arrives, the current period ends and she moves to the hour-decision stage in the next period with the current job characteristics, (w, a, τ).[3]

[3]For the unemployed, the current job characteristics would be (0,0,0).

$$V_t^s(\Omega_t, w_t, a_t, \tau_t) = \max_{s\in\{0,1\}} \phi(s,h,w,a)\mathbb{E}V_t^a(\Omega_t, w_t', a_t', w_t, a_t, \tau_t) + (1-\phi(s,h,w,a))\mathbb{E}V_{t+1}^h(\Omega_{t+1}, w_{t+1}, a_{t+1}, \tau_{t+1}) + c_s(k)\mathbb{I}(s=1) + \epsilon_t^s$$

Job Acceptance Decision: Conditional on having a job offer, she can decide whether to accept or reject the offer, $d \in \{0,1\}$. If she accepts, $d=1$, then she starts the next period with the new employer (w', a') and pays a switching cost $c_d(t)$. Otherwise, she continues with the current employer (w,a) on choosing working hours in the next period. Similar to the job search stage, there is a choice-specific preference shock, ϵ_t^a, which follows an extreme value type I distribution with a scale parameter, σ_a.[4]

$$V_t^a(\Omega_t, w_t', a_t', w_t, a_t, \tau_t) = \max_{d\in\{0,1\}} d\left(\mathbb{E}V_t^h(\Omega_t, w_t', a_t', 0) + c_d(t)\right) + (1-d)\mathbb{E}V_{t+1}^h(\Omega_t, w_t, a_t, \tau_t) + \epsilon_t^a$$

At the end of the period, all the state variables evolve either deterministically based on the decisions or stochastically based on the exogenous law of motion. Flow utility consists of the utility from consumption and utility from children (disutility of working), search and switching costs, and choice-specific preference shocks. Transition to the next period also depends on the working hours in the current period. In particular, our baseline model is based on the institutional details in the pre-reform period. Thus, if the woman chooses zero working hours when she has a newborn (i.e., taking a parental leave), depending on her tenure status, she may be able to keep her current employment contract (w,a) or not. If she loses her job, she becomes unemployed and has to search and obtain a job offer next period in order to be able to work. When a childless woman chooses to work zero hours, we treat this as a voluntary transition to unemployment/nonemployment.

[4] All the choice-specific shocks are period-specific, and we assume these are independent of each other. The scale parameters, σ_s and σ_a, will be estimated within the model.

$$x_{t+1} = \Gamma(x_t, h_t, a_t) \quad \text{(human capital evolution)}$$

$$n_{t+1} = \begin{cases} n_t & \text{with prob. } 1-\pi_t\text{, no fertility shock} \\ n_t + 1 & \text{with prob. } \pi_t\text{, fertility shock} \end{cases} \quad \text{(number of children)}$$

$$k_{t+1} = \begin{cases} k_t + 1 & \text{with prob. } 1-\pi_t\text{, no fertility shock} \\ 0 & \text{with prob. } \pi_t\text{, fertility shock} \end{cases} \quad \text{(age of the youngest child)}$$

$$\tau_{t+1} = \begin{cases} 1 & \text{if} \quad h_t > 0 \quad \& \quad d_t = 0 \\ 0 & \text{if} \quad \text{otherwise} \end{cases} \quad \text{(tenure)}$$

4.4 Remarks

Our model incorporates a comprehensive list of factors through which having children affects women's labor market outcomes. Often, these channels are interdependent, possibly in a dynamic way. For instance, women expecting a lower labor market mobility in the future may be pickier when it comes to choosing their first job. Or, having less mobility in the future may force women to choose a better amenity job now at a cost of lower wages. These forward-looking women's dynamic incentives have some important policy implications. First, policies targeting different ages of women can potentially have differential contemporaneous effects at the targeted ages, as well as differential long-term effects.

5 Estimation

We estimate the main part of our model using the Method of Simulated Moments. Prior to this, we first estimate the fertility process, husband's earnings process, and initial characteristics, such as distributions of job types at the starting age and educational attainment, directly from the data.

In addition, we construct firm-specific wage and amenity values from our data and define job types based on these estimates. In our estimation, we use two levels of wages (high/low) and two levels of amenities (high/low), thus having four different job types. We call these four job types LALW (Low-Amenity-Low-Wage), LAHW (Low-Amenity-High-Wage), HALW (High-Amenity-Low-Wage), and HAHW (High-Amenity-High-Wage) in the rest of the paper. First, to sort jobs into high- and low-wage jobs, we residualize hourly wages from life cycle trends, education, and individual fixed effects.[5] Then, we compute the firm-level average of the residual wages, i.e., the firm fixed effects. Firms with above median fixed effect are then assigned as the "high" wage type. For amenity, we regress the composite amenity measures from panel (f) in Figure 4 on firm fixed effects and proceed analogously to the wage type. The resulting types have high explanatory power: the amenity type explains 34% of the variation in amenities, and the wage type 44% of the wage residual.

Except for the parameters estimated outside of the model, we finally have 43 parameters and 112 moments. Moments used to identify these parameters pertain to full-time, part-time rates, job search and switching rates, and average hourly wages by education, age, number and age of children, as well as job type. Moreover, we include various dynamic moments such as job-type to job-type transitions, work hour transitions and wage growth by job type and work hours choice.

[5] Specifically, we control for age, age squared interacted with education level, and individual fixed effects.

Table 1: Estimates: Utility Parameters

Parameter	
Consumption	
Constant	2.76
Scalar	1.25
Work Disutility	
Constant	0.92
PT Discount	0.00
Pregnancy	0.00
Child Age 0	0.83
Child Age 1-2	2.20
Child Age 3-6	2.37
Child Age 7-12	1.77
Child Age 13-17	0.45
First Kid	0.59
Second Kid	0.38
Third Kid	-0.08
HA Discount	0.92
HA Discount, Mothers	0.00

Table 2: Estimates: Human Capital and Wage Parameters

Parameter	
Human Capital Process	
Depreciation	0.95
Part-time*Educ1	-0.04
Part-time*Educ2	-0.84
Increase in HWHA	0.50
Increase in LWHA	-0.03
Increase in HWLA	-0.50
Wage Parameters	
Intercept	2.78
Experience	0.09
Experience Sq.	-0.01
Educ2	0.17
Educ2*Exp	-0.03
Educ2*Exp Sq.	0.01
HW Intercept	0.28

Table 3: Estimates: Search and Switching Parameters

Parameter	
Job Finding Rate	
When Search	0.80
Unemployed + Not Search	0.66
Unemployed + Search	1.00
Same Job Type	0.35
Offer Distribution	
LWLA Offer	0.33
LWHA Offer	0.29
HWLA Offer	0.17
Preference Shock Scale	
Switch	0.66
Search	0.93
Search Cost	
Constant	0.25
Child Age 0-2	0.88
Child Age 3-7	0.83
Child Pregnancy	0.89
Child Age 7-13	0.97

We highlight some of our key findings from these estimates. The full parameter estimates are reported in Tables 1 to 3. First, our finding shows that working women face 8% lower disutility of working when they work at high amenity jobs. Also, the estimates in the wage profile exhibit the high wage job type having .28 log points higher hourly rates, which is roughly 22% of average wages. Furthermore, as expected, search costs are higher for pregnant women and mothers. The coefficients range from .9 to 1.0, which corresponds to a monthly cost of approximately 1200-1300 EUR. Searching increases job finding rates from 13% to 80% if the individual is employed, and from 66% to 100% if the individual is not employed. The distribution of job offers is relatively even; around 30% are LALW and HAHW jobs, respectively, and roughly 20% are LAHW and HAHW jobs.

Most of our estimates are consistent with the general intuition about women's labor supply and labor market characteristics facing these women: work disutility increases in the number of children; The age of the youngest child does not seem to matter too much, as can be seen from the employment and hours profile in Appendix A.1. Wages increase with experience and more so for highly educated women. Human capital depreciates by .05 if the woman does not work and it also decreases when women work in a part-time position, especially for highly educated women.

Table 4: Model Fit - Transition Matrix by Job Types

t+1/t	LALW	HALW	LAHW	HAHW
LALW	0.41 / **0.46**	0.17 **0.18**	0.11 / **0.10**	0.07 / **0.08**
HALW	0.20 / **0.17**	0.37 **0.44**	0.07 / **0.09**	0.11 / **0.06**
LAHW	0.20 / **0.16**	0.11 **0.16**	0.65 / **0.59**	0.12 / **0.12**
HAHW	0.18 / **0.22**	0.35 **0.22**	0.18 / **0.21**	0.70 / **0.73**

Table 5: Model Fit - Job Switching by Job Type and Motherhood Status

	Model	Data
Job Switch LALW Childless	0.28	0.35
Job Switch LALW Mother	0.21	0.16
Job Switch HALW Childless	0.26	0.30
Job Switch HALW Mother	0.20	0.15
Job Switch LAHW Childless	0.17	0.20
Job Switch LAHW Mother	0.13	0.10
Job Switch HAHW Childless	0.12	0.18
Job Switch HAHW Mother	0.11	0.10

Overall, the model fits the data well. As can be seen from panel (a) in Figure 8, the model closely tracks the distribution of job types along the life-cycle. Most women start working in LALW jobs at age 22 and transition to HAHW within the first 10 years. The proportion of other off-diagonal job types does not change drastically with age, but there is a slight increase in LAHW jobs while HALW jobs decrease somewhat. Panel (b) and (c) show that the model reproduces full-time and part-time rates observed in the data by age and time to first birth.

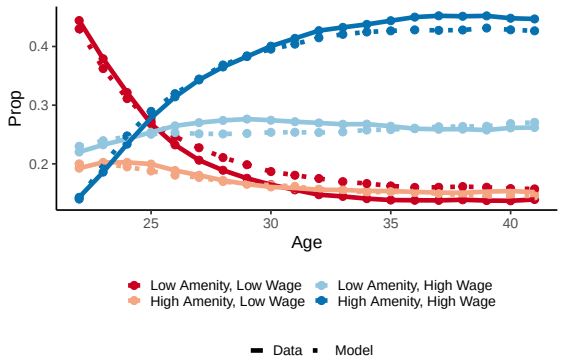
Tables 4 shows that our model can replicate the job type to job type transition rates almost perfectly, while Table 5 shows it can also generate higher transition rates for mothers and low-wage jobs just as there are in the data.

6 Counterfactual Simulation

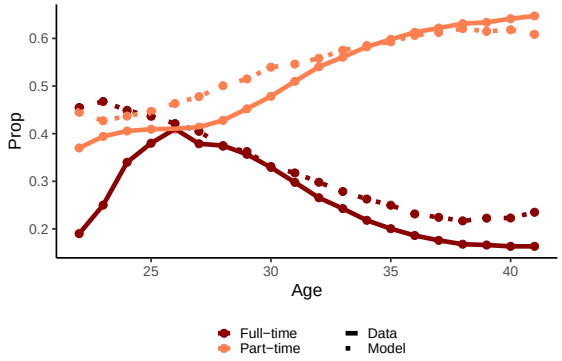
6.1 Child-Related Search Costs

We have shown that our model estimates provide convincing evidence as to why women with children have lower job search and switching rates, thus having lower wages. One thing that we can further investigate, using our estimated model, is to what extent the

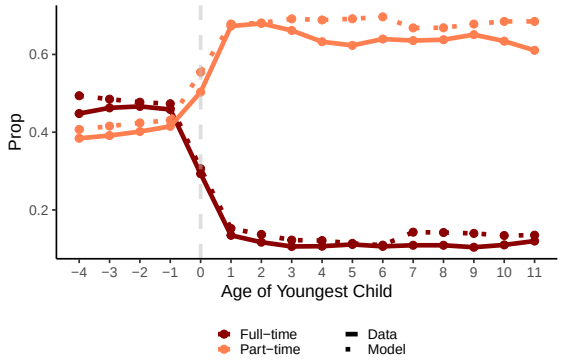
Figure 8: Model Fit



(a) Job Types by Age



(b) Full and Part-Time by Age



(c) Full and Part-Time Around First Birth

lower job search and switching contribute to the child penalty. Although a large proportion of job transitions into HAHW jobs occurs before the arrival of children, the reduced ability of mothers to transition into 'good jobs', especially when faced with high work disutility costs due to children, might lower their labor supply and exacerbate the child penalty. At the same time, mothers might prefer HALW jobs to LAHW jobs, the wage-amenity tradeoff, which can decrease wage levels further.

For this counterfactual, we simulate the scenario in which women face no additional child-related search costs; that is, cost parameters for pregnancy and children of any age group are set to be equal to those for childless women. From Table 6, it is evident that this has a large direct effect on mothers' on-the-job search and job-to-job switching. Both increase by more than 20%. Non-mothers are barely affected, although there is a small increase in both search and switching by roughly 2%, likely driven by pregnant women who were also directly affected. From the last four rows of the table, we can see that increased search allows women to transition out of low-wage into high-wage jobs. This leads to an increase of 1.6% in hourly wage for women aged 45. At the same time, there are 3% more women working in high amenity jobs. As a result, we have more women working. Overall, women's employment increases by 3.1% while the impact on discounted earnings, which includes the effect on wages, is larger at 3.7%.

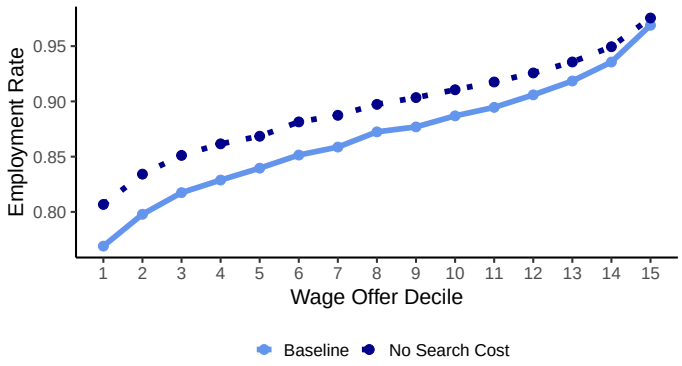
Figure 9 further illustrates how high amenity affects women's labor supply, thus discounted lifetime earnings. For any given wage offer, women are more likely to work in the counterfactual scenario with low search costs, since they are more likely to have a high amenity job and therefore face lower work disutility. At the median wage offer, the probability of working increases by roughly 3 pp. from 85%.

We further decompose the child penalty into various channels: higher work disutility and higher search costs due to children. For this simulate two scenarios, one where we set all to zero (this captures the entire child penalty) and one where only the child-related search cost parameters are zero. The results show that job search and switching contributes 34% percent of the overall child penalty. Figure 10 displays how the various channels affect lifetime wages of low and high education women. The overwhelming part of the effect is for highly educated women. While, search costs negatively affect wage growth for both education groups similarly, work disutility creates a large gap for the higher educated group.

Table 6: Counterfactual Results - No Search Cost

	Baseline	No Search Cost	% Diff
Search Non-Mothers	.553	567	+2.6%
Search Mothers	.425	.550	+29.5%
Switching Non-Mothers	.175	.179	+2.3%
Switching Mothers	.115	.142	+22.8%
Employment	.869	.897	+3.1%
Lifetime Earnings	514.2k	533.1k	+3.7%
% in HAHW	39.5	40.6	+2.7%
% in LAHW	27.1	27.8	+2.7%
% in HALW	15.4	14.5	-5.3%
% in LALW	18.1	17.1	-5.3%
Hourly Wage Mother Age 45	19.5	19.8	+1.6%

Figure 9: Counterfactual: No Search Costs - Wage Offer Acceptance

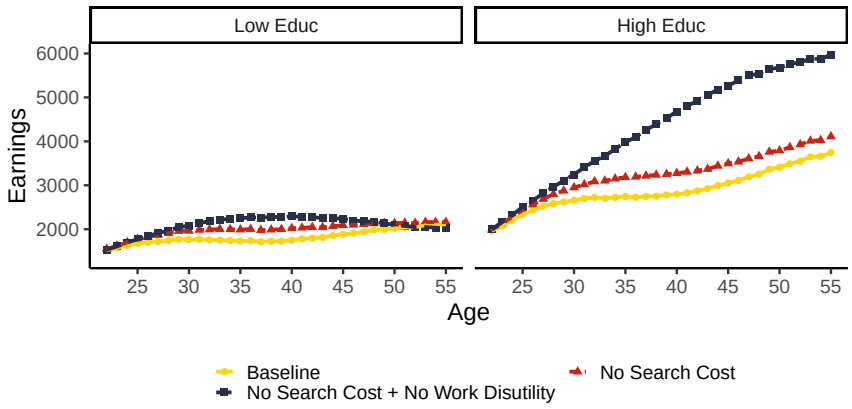


We conclude that low search costs allow many women to switch to both higher wages and higher amenity jobs on average and contribute significantly towards closing the child penalty. The wage-amenity trade-off is not very pronounced, as many women can switch along diagonal job types as opposed to along off-diagonal job types. In other words, the high prevalence of HAHW jobs allows many women to secure a pareto-dominant job.

6.2 No Amenity Value

Next, we quantify the importance of having higher amenity values on women's labor supply and earnings by evaluating a counterfactual scenario in which high amenity jobs do not offer any lower work disutility. In our estimated model, the channel through which high amenity jobs provide value is discounted work disutility. Thus, setting the discount parameter for the high-wage jobs to zero means the only dimension in which women can

Figure 10: Counterfactual: No Search Costs - Contribution to Child Penalty



obtain 'better' jobs is wages, and thus, the incentive for search might decrease as well.

Table 6 shows the effect of setting the amenity disutility discount to zero.[6] Both mothers and non-mothers work and earn less, since they now face higher work disutility. Mothers are more severely affected due to the additional disutility from working with children; their employment rate decreases by 4.4%. Also, since previously high amenity jobs decreased in value, women have lower incentives to search. Those in LALW jobs, previously the 'worst' jobs, search 1.1% less. At the same time, women in HAHW jobs search slightly more, since they are more likely to switch than in the baseline. The bottom four rows show that since HAHW and LAHW jobs are now equal, as are HALW and LALW jobs, the previously high amenity jobs lose in proportion while the previously low amenity jobs gain. Nevertheless, because women search less and job switching decreases, there are overall fewer women in high-wage jobs.

The overall negative impact on discounted earnings is 3.9%, comparable to the no search cost scenario. However, here, the behavior of all women is strongly affected, while it was mostly mothers who reacted to the previous scenario.

6.3 Childcare Subsidies

Since our model is the first to embed endogenous job search decisions into a life-cycle framework, we can use it to better understand how women's job search responds to other

[6] We keep four job types, in the sense that job offer distributions are unchanged.

Table 7: Counterfactual Results - No Amenity Value

	Baseline	No Amenity Value	% Diff
Search HAHW	.46	.46	+.6%
Search LALW	.51	.50	-1.1%
Earnings Non-Mothers	24.4	23.7	-3.1%
Earnings Mothers	20.8	19.9	-4.4%
Lifetime Earnings	514.2k	494.2k	-3.9%
% in HAHW	39.5	35.9	-9.1%
% in LAHW	27.1	29.9	+10.3%
% in HALW	15.4	14.9	-3.0%
% in LALW	18.1	19.4	+7.0%

commen child policies, such as child subsidies. In particular, consider giving a subsidy of 200 EUR per child which is contingent on mothers working. The results are presented in Table 8. It is evident that women's life-time earnings increase moderately more, by 1.8% instead of 1.4%, when women can adjust their search. This is because job search is complementary to labor supply. If a childcare subsidy increases labor supply incentive of mothers, it also raises the motivation to land a good job, as the overall gains are higher. Therefore, more women work in the highest type jobs when they can influence sorting.

Table 8: Counterfactual Results - Childcare Subsidies With and Without Search Adjustments

	Baseline	Fixed S & S	Endogenous S & S
Employment	0.869	+1.5%	+1.4%
Lifetime Earnings	512.8k	**+1.4%**	**+1.8%**
% in HAHW	0.410	-0.4%	+2.0%
% in LAHW	0.268	-0.1%	+0.6%
% in HALW	0.152	0.4%	-2.4%
% in LALW	0.169	0.2%	-3.9%

6.4 2015 Parental Leave Tenure Reform

Now we turn to a reform in 2015 that eliminated a tenure-requirement for parental leave. Prior to 2015, only women who had worked at the same employer for at least one year were eligible for unpaid parental leave. After the reform, women no longer had to be employed at the same employer for at least one year and could take leave even after just having switched jobs. We expect this reform to primarily have increased the job switching

of pregnant women, since doing so no longer disqualifies them for parental leave.

Parental leave allows women to not work for a period of time and return to work at their pre-birth employer without having to search for a job first. In the Netherlands, unpaid leave is granted for 26 times the weekly hours that the woman worked on average in the previous year. That corresponds to a break of roughly 6 months. In addition, there is paid leave for 16 weeks which covers around one and a half months prior to giving birth and two and a half months after giving birth. For simplicity, we will assume that women can take one year of maternity leave in which they do not work and return to their previous employer.

6.4.1 Difference-in-Difference Estimates

We first provide empirical evidence on how the reform affected women's job mobility using a difference-in-difference approach. For this, we exploit variation in the pre-reform tenure requirement across sector-level bargaining agreements. One sector, 'Mental Health Care', did not impose the tenure requirement in the pre-reform years. This sector employs roughly 2% of the labor force and serves as a control group for our analysis. Given that we observe the universe of employees, this leaves us with a large enough sample of roughly 800-900 first-time pregnant women per year who work in this sector. Pregnant women working in all other sectors are treated by the reform. For this analysis, we focus on first-time mothers during their pregnancy period, defined as 1 to 10 months prior to their first birth. Our main analysis uses monthly data spanning from 2010 to 2020, providing substantial pre- and post-reform observations. Our primary specifications include 4,899,406 person-month observations for the baseline model and 4,780,446 observations when including control variables.

Table 9 presents summary statistics for our sample divided into four groups: control group pre-reform, treatment group pre-reform, control group post-reform, and treatment group post-reform. This breakdown allows us to assess whether characteristics changed differentially between groups following the reform.

Several patterns emerge from this breakdown. First, educational attainment is consistently higher in the control group (Mental Health Care sector) compared to the treatment group, with approximately 80% of control group women having college degrees versus 50-52% in the treatment group. Second, women in the control group are slightly older

Table 9: Summary Statistics by Treatment Status and Reform Period

	Pre-Reform		Post-Reform		
	Control	Treatment	Control	Treatment	Total
Age	29.85	28.54	30.13	28.90	28.74
	(3.62)	(4.32)	(3.57)	(4.11)	(4.21)
College Education	0.80	0.52	0.78	0.50	0.51
	(0.40)	(0.50)	(0.41)	(0.50)	(0.50)
Working Hours	138.51	134.88	136.20	134.63	134.80
	(24.55)	(40.08)	(25.79)	(39.81)	(39.74)
Monthly Wages (€)	2674.95	2161.42	2817.83	2308.51	2243.02
	(944.73)	(1118.45)	(1084.72)	(1205.12)	(1164.14)
Total Fertility	2.08	2.01	1.45	1.42	1.72
	(0.67)	(0.70)	(0.56)	(0.55)	(0.69)
Observations	4,765	282,162	4,860	277,504	569,291

Notes: Standard deviations in parentheses. The control group consists of pregnant women in the Mental Health Care sector, while the treatment group includes pregnant women in all other sectors. Pre-reform period covers observations before October 2014, and post-reform period covers October 2014 onwards. College Education is a binary indicator (1 = college degree).

(by about 1.3 years) and have higher monthly wages (by approximately €500) than the treatment group in both periods. Third, total fertility over the lifecycle does not differ across treatment and control groups, but both groups experience decreased life-time fertility over time, likely reflecting broader demographic trends.[7] Importantly, the relative differences between treatment and control groups remain largely consistent across the pre- and post-reform periods, supporting the parallel trends assumption underlying our difference-in-difference design. Also, we control for age and education using their fixed effects to account for the observed heterogeneity between the two groups. The sample is well-balanced across time periods, with approximately 287,000 observations in the pre-reform period and 282,000 in the post-reform period. In both periods, the control group accounts for roughly 2% of the entire sample.

Importantly, the relative differences between treatment and control groups remain largely consistent across the pre- and post-reform periods, supporting the parallel trends assumption underlying our difference-in-difference design. Also, we control for age and

[7] Also, women who experience their first pregnancy during post-reform may have more children in the future which we would not observe during our sample period, thus the life-time total fertility for the post-reform period may be underestimated.

education using their fixed effects to account for the observed heterogeneity between the two groups. The sample is well-balanced across time periods, with approximately 287,000 observations in the pre-reform period and 282,000 in the post-reform period. In both periods, the control group accounts for roughly 2% of the entire sample.

The formal difference-in-difference estimation is specified as:

$$\text{Switch}_{it} = \beta_0 + \beta_1 Post_t \times Treated_i + \beta_2 Post_t + \beta_3 Treated_i + \gamma X_{it} + \epsilon_{it} \quad (1)$$

where $Treated_i$ indicates whether woman i belongs to the treatment group, $Post_t$ indicates whether the time period t is after October 2014, and X_{it} represents a vector of control variables including age, education, and number of children.[8]

Table 10 presents the regression results with job switches measured in percentage points. The interaction coefficient (β_1) is positive and statistically significant, indicating that the reform announcement increased monthly job-switching rates among treated pregnant women by 0.198 percentage points when including control variables. This effect is economically significant: it represents approximately an 12.6% increase relative to the pre-reform baseline switching rate of 1.57 percentage points among the treatment group. In annual terms, this corresponds to an increase in the probability of switching jobs at least once during a year from 17.3% to 19.3%, a 2.0 percentage point or 11.4% relative increase. These results highlight how the removal of tenure-based restrictions on parental leave substantially enhanced pregnant women's job mobility.

To assess the validity of our difference-in-difference design, Figure 11 presents an event study analysis, plotting monthly job-switching rates for both treated and control women around the reform announcement. Time period 0 corresponds to October 2014, when the policy change was announced. Note that the estimates are quite noisy for the control group due to the much small sample size. Nevertheless, we observe that both control and treatment groups exhibit similar average switching rates before the reform, in a roughly parallel fashion. After the reform announcement treated women significantly increasing their job switching rates, while the control group shows no significant changes. The treatment group's switching rate jumps up sharply in period 1 and remains elevated in

[8]The reform was announced in October 2014 before its implementation in January 2015. To capture potential anticipatory responses, we define our pre-reform period as before October 2014 and post-reform period as October 2014 onwards in our empirical analysis.

Table 10: Difference-in-Difference Analysis: Effect of Parental Leave Reform on Monthly Job Switching

	Job Switches in Percentage Points	
	(1)	(2)
Post × Treated (β_1)	0.114*	0.198**
	(0.085)	(0.085)
Post (β_2)	0.077	0.233**
	(0.085)	(0.095)
Treated (β_3)	0.477***	0.231***
	(0.063)	(0.063)
Controls	No	Yes
R^2	0.0001	0.0123

Notes: Standard errors in parentheses. *** p<0.001, ** p<0.01, * p<0.05. The sample consists of monthly observations from 2010 to 2020 for women during their pregnancy period (1-10 months prior to first birth). Treatment group includes first-time pregnant women in all sectors except Mental Health Care, while the control group includes first-time pregnant women in the Mental Health Care sector. Control variables include age fixed effects, education fixed effects, year fixed effects, and month fixed effects.

subsequent periods. This pattern is consistent with our difference-in-difference results.

These results strengthen our main insight that institutional factors can significantly impact mothers' job search and mobility decisions. The relaxation of the tenure requirement led to increased job switching among pregnant women, allowing them to potentially secure better job matches before childbirth. This finding provides direct evidence that tenure-contingent benefits like parental leave can create significant constraints on women's job mobility around childbirth, potentially contributing to the child penalty through reduced job-to-job transitions.

To ensure the robustness of our findings, we conduct several additional checks. First, we estimate the model using narrower time windows around the reform: one year (October 2013.10- September 2015), two years (October 2012- September 2016), and three years (October 2011-September 2017) before and after the announcement. The treatment effect remains positive and significant across all specifications, with coefficients ranging from 0.19 to 0.34 percentage points.

Second, we perform placebo tests using pseudo reform dates and unaffected women.

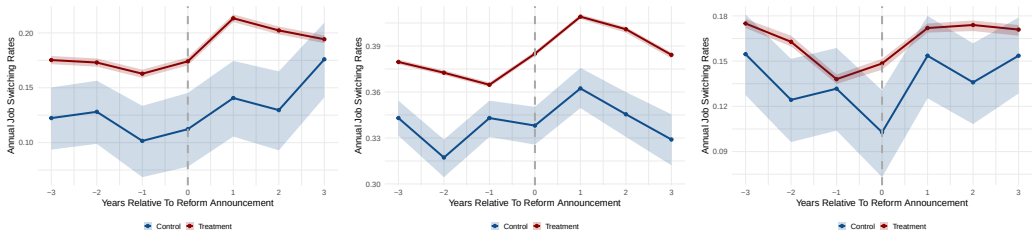
Figure 11: Event Study: Impact of Parental Leave Reform on Annual Job Switching Rates of Pregnant Women



Notes: This figure presents an event study analysis of the 2015 parental leave tenure reform's impact on annual job switching rates. The horizontal axis shows years relative to the reform announcement (time period 0 = October 2014). The vertical axis shows annual job switching rates, calculated from monthly rates using the formula $y = 1-(1-x)^{12}$, where x is the monthly switching rate and y is the annual rate. This transformation assumes that monthly job switching follows an independent and identically distributed process, where the probability of not switching jobs over a full year equals the probability of not switching in a single month raised to the power of 12. Treatment group includes first-time pregnant women in all sectors except Mental Health Care, while the control group includes first-time pregnant women in the Mental Health Care sector only. Shaded areas represent 95% confidence intervals.

Using post-reform periods (July 2017-June 2018 vs. July 2016- June 2017), we find an insignificant effect (-0.21 percentage points, p=0.277), as expected. For pre-reform periods (March 2012 -February 2013 vs. March 2011- February 2012), we found a negative and significant effect (-0.56 percentage points, p=0.003), suggesting if anything a declining trend in switching rates before the actual reform. We also set another falsified control using women covered by another treated collective agreements, and run the difference-in-difference regression for women aged 40 (not likely to become pregnant) and childless women various years before first birth. None of these placebo tests yield positive and significant effects similar to our main specification, supporting the causal interpretation of our findings.

Figure 12: Event Study: Placebo Tests for the Impact of Parental Leave Reform on Annual Job Switching Rates



(a) Random CA (b) Childless (c) Aged 40

Notes: This figure presents placebo event study analyses comparing annual job switching rates between treated and control groups for three alternative samples. The horizontal axis shows years relative to the reform announcement (time period 0 = October 2014). The vertical axis shows annual job switching rates, calculated from monthly rates using the formula $y = 1 - (1 - x)^{12}$, where x is the monthly switching rate and y is the annual rate. This transformation assumes monthly job switching follows an independent and identically distributed process. The vertical dashed line indicates the announcement of the reform in October 2014. Shaded areas represent 95% confidence intervals.

To complement our difference-in-difference placebo tests, we also conducted event study analyses with these alternative comparison groups. Figure 12 presents the results from the three placebo event study analyses. In panel 12a, using pregnant women from a randomly selected collective agreement as control, both treatment and control groups show similar increases post-reform, lacking the distinctive treatment-specific jump seen in our main analysis. Panel 12b shows childless women who had not yet experienced their first birth, where both groups follow parallel trends with minimal divergence at the reform threshold. Panel 12c displays women aged 40 (unlikely to experience pregnancy), who exhibit higher overall mobility rates but no differential response to the reform. In all

three placebo tests, we observe either parallel movements across both groups post-reform or patterns inconsistent with our main finding—the sharp, immediate increase in job switching specifically among treated pregnant women following the reform announcement. The control series maintain relatively stable trajectories relative to their treatment counterparts across the reform threshold. This visual evidence further supports our conclusion that the tenure requirement elimination specifically impacted pregnant women's labor market mobility rather than reflecting broader sectoral or demographic trends.

6.4.2 Simulated Reform Effects

Turning to the effects predicted by our model, Table 6 shows the simulated results. Pregnant women are 2 percentage points more likely to switch jobs, a 12.6% increase compared to pre-reform levels. This number is very close to the result of the difference-in-difference regression, validating the accuracy of our estimated model. There is some evidence that they switch to slightly better jobs, the percentage of HAHW workers increases by .2%. At the same time mothers work 2.8 percentage points less in the year of giving birth, which is driven by the women that became eligible for parental leave after the reform. These women switched jobs just in the year prior to giving birth, which are roughly 21% in the baseline. In the subsequent year, employment increases by 1.4 percentage points. This is because job protection is offered to more women, and all those that did not work in the year of giving birth can return to their pre-birth employer instead of needing to search for a new job. Overall, lifetime earnings change only slightly and there is a decrease by .2 %. This is because positive job selection and employment are just outweighed by negative employment effects in the year of birth.

Despite small effects on lifetime earnings, there are sizeable contemporaneous effects around the birth of the first child. Figure 13 shows the how earnings and utility change around the birth of the first child. Earnings effects are negative overall and somewhat larger for high education women. In the year of birth, the decrease is largest at around 50 EUR per month or 3.3% of average earnings. Nevertheless, average utility is higher at any point in time, since women benefit from the option of staying at home. The increase in the year of birth is 2.5% in consumption equivalent terms.

Figure 13: Simulation of PL Reform Effects: Changes in Earnings and Utility Around First Birth

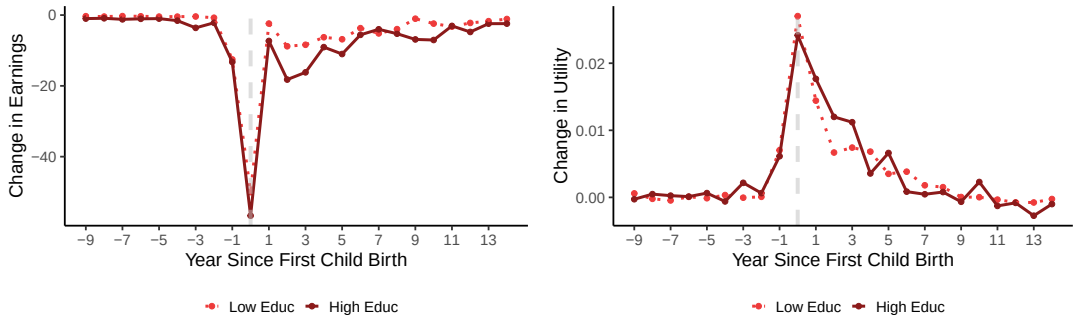


Table 11: Simulation of Reform Effects- No Parental Leave Tenure Requirement

	Baseline	PL Reform	% Diff
Search Pregnant Women	.443	.447	+0.9%
Switching Pregnant Women	.167	.188	+12.6%
Employment Mothers with Newborn	.746	.718	-3.8%
Employment Mothers with 1-yo	.872	.886	+1.8%
Lifetime Earnings	512.8k	511.9k	-.2%
% in HAHW Mothers	.426	.427	+.2%
% in LAHW Mothers	.261	.260	-.5%
% in HALW Mothers	.155	.155	+.4%
% in LALW Mothers	.158	.158	-.3%

7 Conclusion

In this paper, using Dutch administrative data and the representative household survey, we documented that women have lower job search and mobility starting shortly before childbirth until many years after. Simultaneously, family-friendly amenities such as regular and predictable work hours increase for women after childbirth, suggesting that these amenities benefit working mothers. Furthermore, we develop and estimate a novel dynamic discrete-choice model of women's work hours, job search, and switching behaviors, which can capture the observed pattern in the data. In our model, higher-amenity jobs allow women, especially mothers, to work with lower disutility of working. Our results show that women face child-related search costs that lead to a total of 3.7% decrease in discounted lifetime earnings. The main reason is that they fail to obtain better jobs and,

as a result, work and earn less. Lastly, we also find that eliminating high amenities has a similarly large negative impact on earnings. This is because women work less due to greater work utility costs, especially when they have children.

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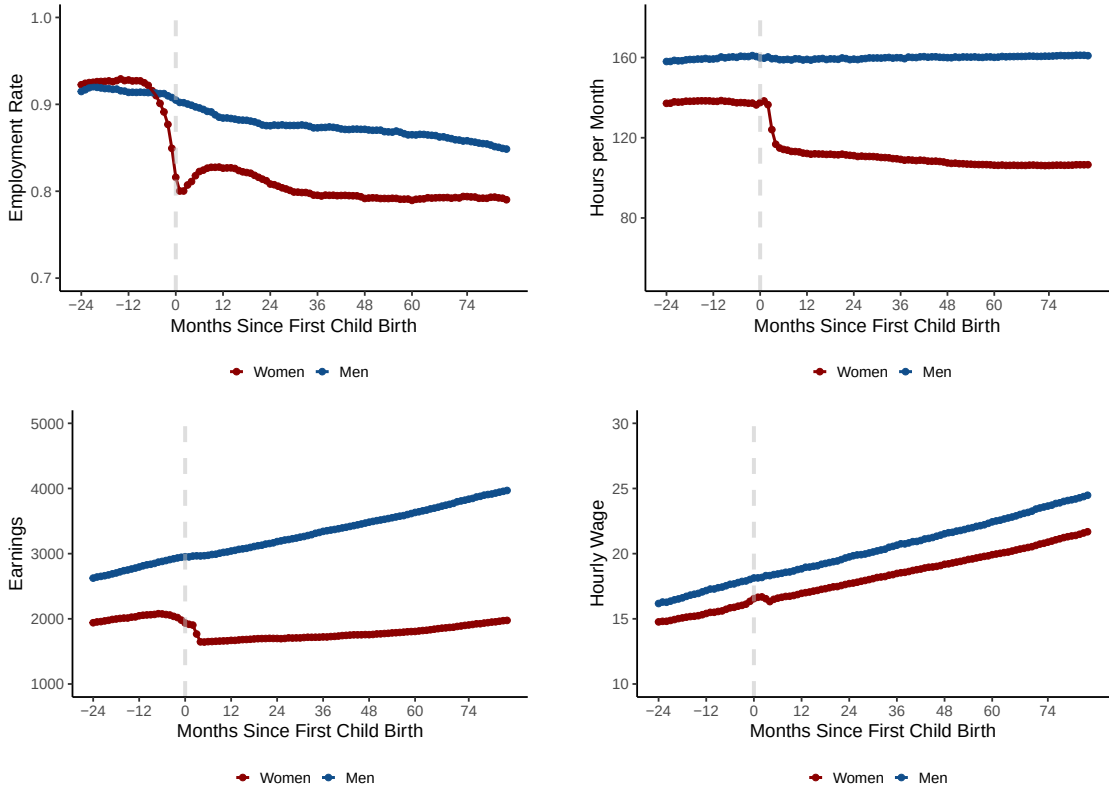
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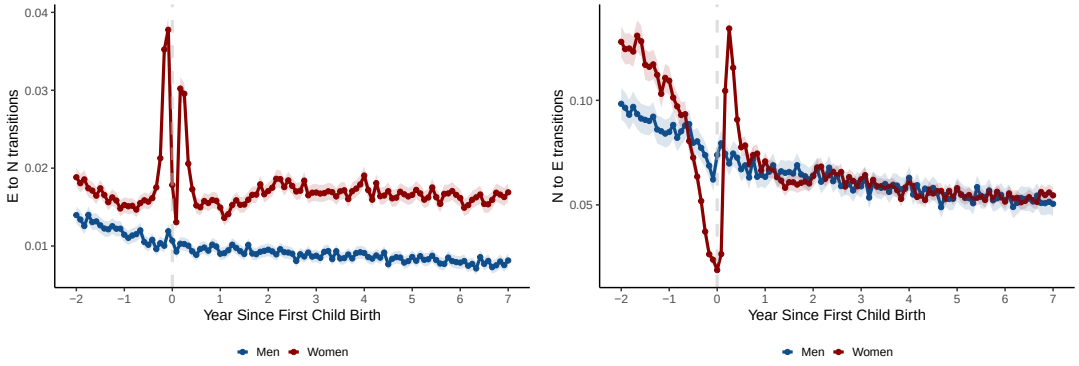
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A Appendix

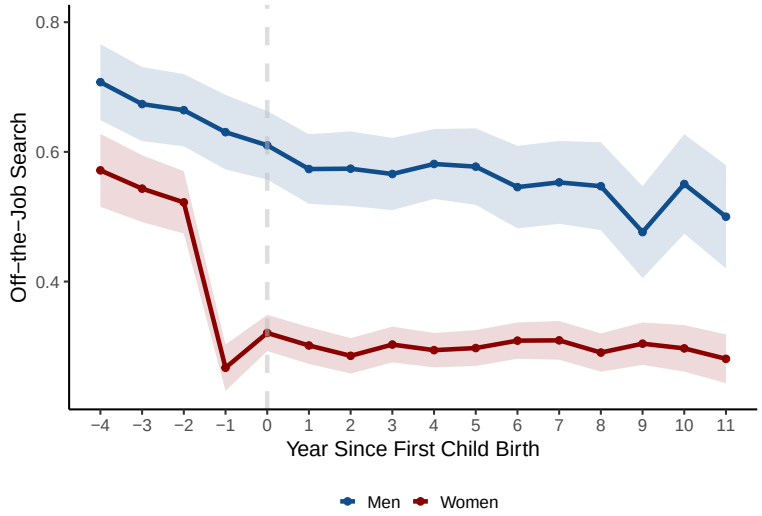
A.1 Hours, Employment and Earnings around Birth



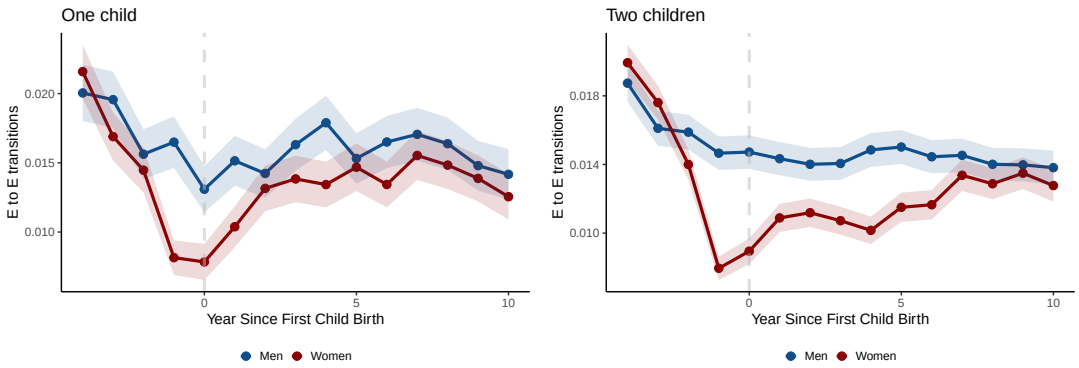
A.2 EN and NE Transitions



A.3 Off-The-Job Search



A.4 Job-To-Job-Switching by Number of Children



A.5 Construction of Job Types

In our analysis, jobs are categorized into distinct types based on wage levels and amenity values at the firm level. This appendix explains the methodology used to construct these job types.

A.5.1 Wage Classification

To classify firms by wage levels, we implement an Abowd, Kramarz, and Margolis (AKM) style wage decomposition (Abowd et al., 1999):

1. **AKM Regression**: We estimate a two-way fixed effects model on the matched employer-employee administrative data:

$$\ln(w_{ijt}) = X_{it}\beta + \alpha_i + \psi_j + \epsilon_{ijt} \tag{2}$$

where w_{ijt} is the hourly wage of individual i at firm j in period t, X_{it} includes time-varying individual characteristics, α_i represents individual fixed effects, and ψ_j represents firm fixed effects.

2. **Firm Wage Classification**: After estimating the model, we extract the firm fixed effects (ψ_j) which capture the wage premium paid by each firm.

3. **Threshold Determination**: We merge these firm-level wage fixed effects to our worker-level estimation sample and compute the median based on the distribution of fixed effects across workers (not firms). The median wage fixed effect for women is -0.18, with the distribution ranging primarily from -0.52 (1st percentile) to 0.12 (99th percentile).

A.5.2 Amenity Classification

For amenity classification, we follow a similar approach but with modifications necessitated by data constraints:

1. **Amenity Regression**: Since we do not observe multiple amenity responses for the same individual over time, we use a modified approach:

$$A_{ijt} = X_{it}\gamma + \phi_j + \nu_{ijt} \tag{3}$$

where A_{ijt} is the composite amenity measure derived from the principal component analysis of flexible work arrangements, X_{it} includes detailed individual characteristics, and ϕ_j represents firm fixed effects.

2. **Firm Amenity Classification**: We extract the firm fixed effects (ϕ_j) which capture

the family-friendliness of each firm's working conditions.

3. **Threshold Determination**: Similarly, we compute the median amenity value from the worker-level distribution. For men, the median amenity fixed effect is 0.17, substantially higher than women's median of -0.07.

A.5.3 Job Type Distributions by Gender

The cross-classification of firms by wage and amenity levels produces four job types: High-Amenity High-Wage (HAHW), High-Amenity Low-Wage (HALW), Low-Amenity High-Wage (LAHW), and Low-Amenity Low-Wage (LALW).

Tables 12 and 13 present the empirical distributions of these job types in our women and men panels, respectively. While we would expect perfectly balanced 50-50 splits along each dimension based on our worker-level median classification, the observed distributions show slight deviations. This is because the tables present the joint distribution from the subset of observations where both wage and amenity fixed effects are observed. Since wage fixed effects have higher coverage in our data than amenity fixed effects, the marginal distributions in the joint sample differ slightly from 50-50. This implies higher wage firms are more likely to have workers reporting the amenity variables.[9]

Both genders show similar overall patterns in terms of wage distribution, with approximately 58% of both men and women working in high-wage firms. There are notable differences in specific job type distributions: men are more concentrated in LAHW jobs (30.3% compared to women's 29.3%) and less represented in HAHW jobs (27.8% compared to women's 29.0%). The gender differences in thresholds are particularly striking for amenities, where men's median (0.17) is significantly higher than women's (-0.07), indicating that men typically work in firms with higher baseline amenity levels.

For comparative analyses involving men, we apply the same methodology but determine the thresholds separately using the distribution of firm fixed effects in the male sample. This approach recognizes that the distribution of wages and amenities differs between men and women, ensuring that the high/low designations are relative to gender-specific distributions.

[9] This is partly due to the size effects; higher paying firms are on average larger in employment size and thus workers are more likely to be a part of the sample.

Table 12: Distribution of Job Types in Women Panel

	High Amenity		
High Wage	0	1	Total
0	20.68%	21.01%	41.70%
1	29.33%	28.97%	58.30%
Total	50.02%	49.98%	100.00%

Table 13: Distribution of Job Types in Men Panel

	High Amenity		
High Wage	0	1	Total
0	19.66%	22.19%	41.85%
1	30.33%	27.82%	58.15%
Total	49.99%	50.01%	100.00%

B Estimation Details

B.1 Marriage, Divorce and Fertility

Marital transitions are taken as exogenous. The functions assume a logit form. Marriage probabilities depend on age (t) and education (e). The probability that a single woman marries in a given period is:

$$\ln\left(\frac{p_{e,t}^{mar}}{1-p_{e,t}^{mar}}\right) = \theta_{01e} + \theta_{11e} age_t + \theta_{21} age_t^2 + \theta_{21} age_t^3$$

The probability of pregnancy depends on age (t), education (e), marital status and age of the youngest child. The probability that a single woman marries in a given period is:

$$\ln\left(\frac{p_{e,t}^{f}}{1-p_{e,t}^{f}}\right) = \rho_{0e} + \rho_{1e} age_t + \rho_{2e} age_t^2 + \rho_{3e} age_t^3 + \rho_{4e}\mathbb{1}\{hasonechild\}$$

$$+\rho_{5e}\mathbb{1}\{hastwochildren\}+\rho_{6e}\mathbb{1}\{youngestisone\}+\rho_{7e}\mathbb{1}\{youngestistwo\}+\rho_{8e}\mathbb{1}\{youngestisthree\}$$

The probability of divorce depends on age, education, and the presence of children.

$$\ln\left(\frac{p^{div}_{e,t,n}}{1-p^{div}_{e,t,n}}\right) = \theta_{00e} + \theta_{10} age_t + \theta_{20} age_t^2 + \theta_{30}\mathbb{1}\{haschild\} + \theta_{40} age_t \mathbb{1}\{haschild\}$$

B.2 Husbands' income

Husbands' income depend on the woman's age and education.

$$y^h_{te} \;=\; \psi_{0e} + \psi_{1e} age_t + \psi_{2e} age_t^2 + \xi^h_t$$