The Glass Room: Gender Gap in Job-to-Job Transition Rates in West Germany*

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Abstract

We conduct an empirical study using German administrative and nationally representative survey datasets covering the last four decades to examine life-cycle labor supply and job search behavior by gender. Our analysis reveals that full-time employed women are 10% less likely than men to change employers. This gap in job-to-job mobility has remained stable over the past decades and emerges primarily after childbirth. To better understand the underlying mechanisms, we investigate three potential factors: search effort, commuting and working hours, and the difficulty in finding a new employer. Our findings suggest that while mothers exert higher effort to search, they face greater time constraints, resulting in higher matching frictions. Because job search contributes to earnings growth, this disparity in search friction largely contributes to the motherhood penalty and the gender earnings gap. Our findings highlight the need for policies that address the challenges that working mothers are facing, including the provision of flexible work arrangements and support for childcare responsibilities.

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Introduction

Numerous studies have examined female labor market outcomes in developed countries, both over time and throughout the life-cycle. Although women's educational attainment and labor supply have increased, the gender earnings gap persists, and women continue to be underrepresented in high-paying positions.[1] While the remaining gender earnings gap can be attributed largely to gender differences in hours worked, occupations, and industry choices, less is known about the specific mechanisms that hinder women who aspire to have a family and a career from ascending to the upper echelons of the career ladder.

Our study contributes to the existing literature by examining on-the-job search outcomes among men and women in West Germany. On-the-job search generates outside options that contribute to the wage growth, both within, through wage renegotiation, and between jobs.[2] If frictions to search and matching deferentially affect the incentives and ability of men and women to shop for jobs, this would generate a differential in their ability to climb the job ladder over the life cycle. Empirically, this would translate in a gender gap in job-to-job transition rates. Therefore, the analysis of job search outcomes by gender helps comprehend potential barriers hindering women's career advancement.

We use the administrative German data set (SIAB), and supplement it with a nationally representative survey (SOEP). SIAB data set is a 2% random draw of the German social security records from 1975 to 2017 that contains all spells of employment, promotion, and social benefits of employed workers. It contains workers' full employment biographies including information on daily earnings, date of birth, educational attainment, occupation, commuting status, hours (full- or part-time) and industry. The sample we use for the analysis consists of 571,284 individuals, which allows us to precisely estimate the gender gap in job-to-job transitions over time and over the life cycle. Among the 290,193 women that we observe, 144,473 have received maternity benefit after 1975 and are identified as becoming mothers between 1975 and 2017. We use this sub-sample of women to analyze the job-search outcomes before and after birth.

We first document the evolution of female labor force participation in Germany, describing changes in labor market states. Our analysis reveals that the increase in female labor force participation in West Germany has been primarily driven by a rise in the share of women working part-time, while the proportion of women working full-time has slightly declined over

[1] See, for example, Blau and Kahn (2017); Goldin (2014); Olivetti and Petrongolo (2016).

[2] For a theory of on-the-job search as job shopping see for instance Burdett (1978); Burdett and Mortensen (1998); Jovanovic (1984); Bagger et al. (2014).

the last three decades. The same statistics by motherhood status indicate that the shift in women's labor supply is largely attributable to a change in the behavior of mothers. Before having children, women's labor force participation rates resemble those of men and have experienced minor changes in recent decades. These findings align with the analysis of Goldin (2020), who portrays the most recent cohorts of American women as aspiring to balance family and career aspirations. However, among recent cohorts of German mothers, most women are working part-time, but only a few are working full-time after childbirth, indicating that balancing a full-time work and raising a child remains challenging for women. To better understand the obstacles that discourage mothers from pursuing full-time employment, we study the labor market outcomes of full-time workers in West Germany by gender and motherhood status.

We provide evidence of a stable gender gap in job-to-job transitions among full-time workers. Specifically, we document that full-time working women are 10% less likely to change employers than their male counterparts. This gender gap is stable across the 25-45 year old age range, and when adjusted for the age-composition of the labor force, it has remained relatively constant between 1995 and 2015. Interestingly, our analysis shows that gender differences in education, industry choices, and working experience do not explain the gender gap in job-to-job mobility, but instead increase it. Adjusting for these factors reveals a larger gender gap in changing employers. Additionally, changes in women's education relative to men's, industry distribution, and work experience over time have had only minor effects on the gap trend evolution. These findings suggest that other gender-specific factors contribute to the observed gender differential in job-to-job transitions among full-time workers.

We hypothesize that the gender gap in job-to-job transitions among full-time workers is linked to the motherhood penalty. When women become mothers, there are significant changes in their labor market outcomes, which likely contribute to discouraging them from working full-time. The most notable evidence of it is the sharp decline in full-time employment that follows childbirth, but motherhood can also affect the labor market outcomes of full-time working women.

To explore our hypothesis, we compare women who have not yet become mothers to those who are already mothers. Our analysis reveals that before motherhood, women's likelihood of job-to-job transitions closely resembles that of men. However, after having children, the probability of full-time working women doing a job-to-job transition decreases by 20%. We also find that women who give birth after age 31 have the job-to-job transition probability closest to that of men before having children. Nonetheless, this group still experiences a

decline in job-to-job transitions after childbirth. These findings suggest that motherhood plays a major role in the gender gap in job-to-job transitions among full-time workers.

There are several reasons why the probability of job-to-job transitions could decrease for full-time working women after childbirth. One possibility is that social norms and bargaining within the household may result in mothers taking on a disproportionate share of childcare responsibilities, reducing their leisure time and making them less willing to commute or work longer hours.[3] Another possibility is that mothers become less willing to change employers, possibly due to psychological factors. To better understand the underlying mechanisms contributing to the gender gap in job-to-job transitions for full-time workers, we qualitatively investigate three potential factors: search effort, commuting and working hours, and the difficulty in finding a new employer. While search efforts increase after childbirth and full-time working mothers continue working long hours, they are less likely to commute and more likely to have difficulty finding a new employer than women before childbirth. Our findings suggest that despite a rise in search intensity, mothers seem to face higher time constraints that generate higher frictions in finding suitable job matches compared to men and non-mothers. The resulting matching frictions can come from both the supply and demand sides. For instance, if mothers reduce their radius of search due to a stronger dislike of commuting, it can create frictions from the supply side (in line with the findings of Le Barbanchon et al. (2021)). Furthermore, if the average mother is (correctly or incorrectly) perceived as less willing to work long hours compared to the average non-mother or man, it can create matching frictions from both the supply and demand side. These findings align with the analysis of a need of a more equal share of childcare responsibilities within the household (Doepke et al., 2022).

To discuss the impact of the gender gap in job-to-job transitions on the gender earnings gap, we conduct simulations of annual earnings for a hypothetical full-time worker between the ages of 25 and 45. We use estimated earnings growth rates by age and gender for both within and between firm transitions and estimated probabilities of job-to-job transitions by gender and age. While the simulated earnings profiles are steeper than observed in the data due to the absence of periods of unemployment, part-time work, and non-participation, we find that the gender gap in within- and between-growth rates, as well as differences in initial conditions and job-to-job transition probabilities, account for 59% of the gender earnings gap among full-time workers at age 45. Specifically, while women's earnings in the data represent 71% of men's earnings at age 45, the simulated earnings prediction is

[3]This interpretation is consistent with the sharp decrease in full-time employment that follows childbirth for women.

83%. This suggests that the gender gap in search frictions that arises with motherhood plays a significant role in shaping the gender earnings gap of full-time workers and largely contributes to the motherhood penalty.

Through a series of counterfactual analyses, we examine the individual contributions of the gender gap in within- and between-growth rates, in initial conditions and job-to-job transition probabilities to the gender earnings gap. Our findings suggest that job-search outcomes play a critical role, as the disparities in earnings growth rates and job-to-job transition probabilities contribute significantly to the gap. Specifically, closing the gap in job-to-job transition rates has a minor effect, explaining just one percentage point (or 6%) of the predicted gap, whereas eliminating the gender gap in within-firm earnings growth rates has a much greater impact, accounting for six percentage points (or 35%) of the predicted gap. Since the ability to find suitable job matches is essential for both within- and between-job growth, closing the gender gap in matching frictions would close the gap in job-to-job transitions and improve earnings growth rates.[4] Additionally, the gender earnings gap reduction for full-time workers could have a ripple effect on the share of full-time employed women as the opportunity cost of working part-time would increase. Thus, the impact of reducing matching frictions and closing the job-to-job transition gap would be far greater than the one percentage point estimate. Finally, we note that closing the gap in initial conditions at age 25 would have the greatest impact, with a reduction of eight percentage points, accounting for 47% of the predicted gap.[5] These findings highlight the importance of addressing gender differences in matching frictions and differences at the earliest stage of the career to reduce the gender earnings gap in the economy.

Related Literature

Our study contributes to the existing literature on women's labor supply and the gender earnings gap. See for instance Goldin (2006); Fogli and Veldkamp (2011); Olivetti and Petrongolo (2016); Blau and Kahn (2017); Albanesi and Şahin (2018). While previous studies have focused on the evolution of labor force participation rates, unemployment and wages, our study examines job-to-job transition rates and documents greater search frictions for full-time working women than for men and discusses potential implications of these search frictions for the gender earnings gap.

Additionally, our study contributes to the literature on the motherhood penalty (Adda

[4]At the same level of occupation, industry, and education, a gender gap in earnings growth rate could remain if there exist gender differences in asked salary as documented in Reuben et al. (2017); Kiessling et al. (2019); Roussille (2020).

[5]This finding is consistent with Reuben et al. (2017) who find that gender differences in students' preferences and salary expectations account for a quarter of the gender earnings gap.

et al., 2017; Kleven et al., 2019; Gallen et al., 2022), which explores the challenges women face in combining career and family responsibilities. We shed light on another potential explanation for this penalty, showing that motherhood leads to lower full-time job-to-job transition probabilities, which suggests that mothers face higher search frictions and lower earnings growth rates. Our findings are consistent with previous research that has emphasized the gender differences in the value of commute time (Le Barbanchon et al. (2021)) and time flexibility (e.g., Bertrand et al. (2010); Goldin (2014)) and preference for lower working hours. By documenting this consequence of motherhood on female labor market outcomes, our study provides further insights into the mechanisms underlying the motherhood penalty.

The remainder of the article is organized as follows. Section 1 describes the data and the labor market in West Germany. Section 2 presents the evidence on gender differences in job-to-job transitions. Section 3 delves into potential explanations for this gap and highlights the higher search intensity of full-time working mothers, their preference for shorter commutes and working hours, and the resulting challenges they face in finding a new employer compared to men and non-mothers. In Section 4, we discuss the implications of the gender gap in job-to-job transitions for the gender earnings gap. Section 5 concludes.

1 Men's and Women's Labor Supply in West Germany

1.1 Data

The data we use is a 2% random draw from the German Social Security records (SIAB data), supplemented by information from the official unemployment records. We restrict our sample to all workers in West Germany, since their employment biographies are observed for all years from 1975 to 2017. Over this period, the dataset records for each worker the exact date of any change to a new job or to (and from) unemployment. Furthermore, it contains an obligatory yearly entry for each worker, reported by employers. Thus, an accurate calendar of labour market status is provided with minimal, if any, measurement error for each worker. It further provides information about whether a worker is on an apprenticeship training scheme.

We create a yearly data base of employment biographies of workers. A worker can be employed in a full-time job, employed in a part-time job or unemployed. If the worker changes status, the record includes the spell for the period from the start of the calendar year (or the start of the spell, whichever is more recent) to the date of termination of spell within a given year. In case of multiple spells, we then compute the yearly state as the

longest spell in the calendar year. In addition, the data on age, educational qualifications, occupation and industry classifications are provided. Thus, the data allows us to construct very accurate work histories. [6]

From this database, we construct a sample of workers whom we observe at least once in the labour force. Each missing year for a worker is counted as out of the labor force, since any employment or unemployment activity happened after 1975 would have entered the database. One limitation of the dataset is that since the self-employed and civil servants do not pay social security contributions, they are excluded from the registry. In order to account for that, we drop observations for men (women) with more than 6 (10) consecutive years out of the labor force after 31 (35) or who spend 80% of the years between 25 and 55 being out of the labor force in our database. We also use the provided information on hours worked, which distinguishes between full-time and part-time employees. The decisive factor for this classification is the ratio between the contracted hours and the usual working hours in the establishment (Frodermann et al. (2021)). Since childbirth is not directly observable in the SIAB data, we therefore rely on the imputation of childbirth date by Müller et al. (2022). We also restrict our sample to workers from 25 to 54 to abstract from schooling and retirement decisions. Our final sample consists of 394,193 female workers with 6,619,702 employment records, and 439,380 male workers, with 8,053,619 employment records.

1.2 Trends in Labor Force Participation In West Germany

Table 1 compares the labor force participation rates (LFPRs) of 25-54-year-old men and women in West Germany with the average LFPRs in fifteen OECD countries.[7] Women in West Germany and other OECD countries have increased their LFPRs, and the proportion of inactive women has decreased significantly in both West Germany (from 31 to 17 percent) and other countries (from 36 to 22 percent).[8] However, a distinctive trend in the West German labor market is the considerable rise in part-time employment among women over the last thirty years, which surpasses the OECD average. While a third of employed women

[6]The database contains also information on the firm in which each worker is employed. Using separate information on the firm we can link each worker to the characteristics of a firm. When the firm has many establishments the data refers to one establishment and not to a whole firm. However, for now, we only use data at the worker level.

[7]Appendix Table S1 compares the labor force participation rates of 25-54-year-old men and women in all Germany from the SIAB and OECD datasets. The trends in employment, unemployment and inactive are similar which is reassuring regarding the cleaning strategy of the data set. The trends in the incidence of part-time job differs which can be due to the absence of civil servant in the SIAB data set.

[8]Olivetti and Petrongolo (2016) documents a rise in women's labor force participation across developed economies over the past few decades.

worked part-time between 1986 and 1995, this figure increased to over half of employed women between 2006 and 2015. Therefore, the increase in female LFPRs can be attributed solely to the growth in the number of women working part-time. Figure 1 illustrates the trends for each labor market state, with a slight decline observed in the share of women working full-time.[9] In summary, Table 1 indicates that the substantial increase in female LFPRs from 65 to 76 percent in West Germany between 1986 and 2015 is driven by a surge in female part-time work from 20 to 41 percent, while female full-time work has slightly decreased from 45 to 35 percent.

Table 1: German Labor Force Participation Rates 1988-2017 (%)

	25-54 Women			25-54 Men		
	1986-1995	1996-2005	2006-2015	1986-1995	1996-2005	2006-2015
Panel A: West Germany (SIAB)						
Employed	65	72	76	86	85	84
Full-time	70	57	46	99	96	90
Part-time	30	43	54	1	4	10
Unemployed	4	4	7	4	6	7
Inactive	31	24	17	10	10	9
Panel B: non- Germany (OECD)						
Employed	55	65	69	87	88	84
Full-time	74	74	75	97	96	95
Part-time	26	26	25	3	4	5
Unemployed	9	7	9	6	5	8
Inactive	36	28	22	6	7	8

Notes: This table shows labor force participation rates by gender for three decades from 1988 to 2017. Sample in *Panel A* includes salary workers aged 25–54 in West Germany, source: SIAB. Sample in *Panel B* includes salary workers aged 25–54 in non-Germany countries which include Belgium, Canada, Denmark, France, Greece, Ireland, Japan, Italy, Luxembourg, Netherlands, New Zealand, Portugal, Spain, the United Kingdom and the United States. Source: OECD. We distinguish four states: Full-time workers, Part-time workers, Unemployed workers and Inactive.

In Figure 2 and Appendix Table S2, we present the same statistics broken down by motherhood status. Interestingly, we find that mothers' labor supply is more similar to that of men and has experienced relatively little change over time, with an increase in part-time employment of only 12 percentage points (from 6% to 18%) and almost no decrease in full-time employment. However, there has been a significant surge in mothers' LFPRs,

[9]Figure 1 indicates that the 2008 recession did not drive the increase in female part-time work. However, a sudden increase of about ten percentage points is observed in 1999 due to a change in the Social Security records. Part-time marginal employment only enters the database in 1999.

Figure 1: Trends in Labor Market States by Gender

Notes: This figure displays the trend in labor force participation rates by gender between 1986 to 2015. Sample includes salary workers ages 25–54. We distinguish four states: Full-time workers, Part-time workers, Unemployed workers and Inactive. Data are from the SIAB.

with less than half of mothers working in 1985 compared to over three-quarters in 2015. This sharp increase is driven primarily by a rise in part-time employment rates.[10] These results indicate that balancing full-time work and raising a child remains a challenge for women in West Germany. To better understand the obstacles that discourage mothers from pursuing full-time employment, we study the job search outcomes of full-time workers in West Germany.

2 Gender Gap in Job-to-Job Transitions

We examine gender differences in job-to-job transition rates, which refer to the probability of changing employers, for full-time workers over time and across the life cycle.[11] We focus on the 1995-2015 period and on full-time workers between the ages of 25 and 45 as we observe

[10] A sudden increase of about twenty percentage points is observed in 1999 due to a change in the Social Security records. Part-time marginal employment only enters the database in 1999.

[11] Appendix Table S3 and Figure S1 display the yearly transition matrix between labor market states. The share of men and women who have moved to full-time employment conditional on being employed full-time has remained remarkably stable over the last three decades.

Figure 2: Trends in Labor Market States by Motherhood Status

Notes: This figure displays the trend in labor force participation rates by motherhood status between 1986 to 2015. Sample includes salary workers ages 25–54. We distinguish four states: Full-time workers, Part-time workers, Unemployed workers and Inactive. Data are from the SIAB.

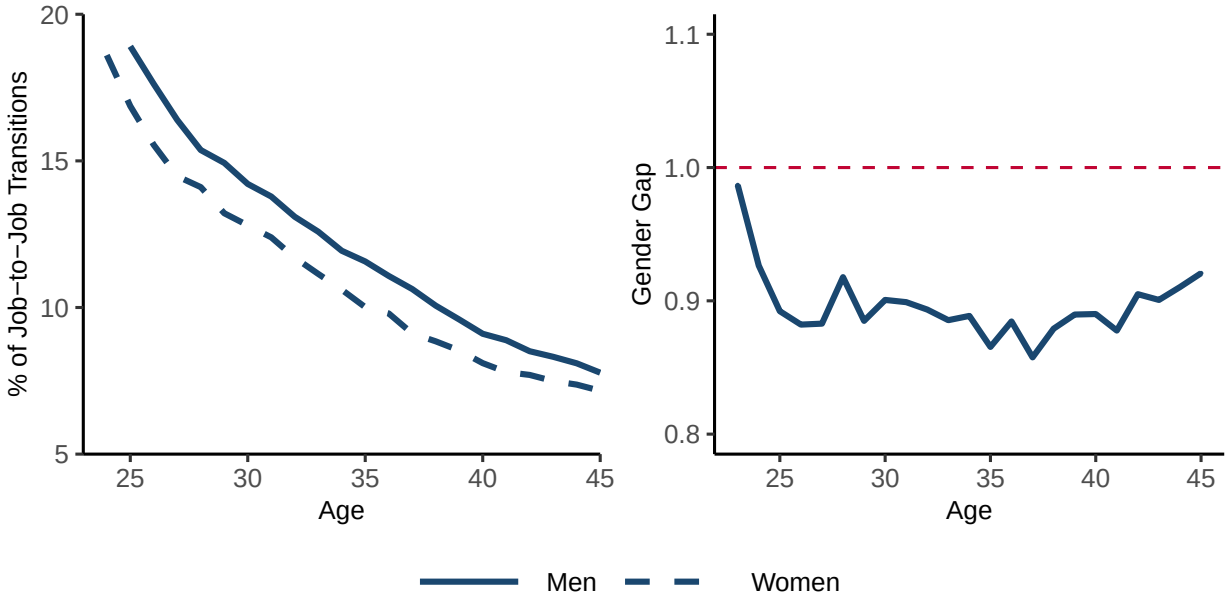
their complete work history (25-45) for this sample in the SIAB dataset.[12] Figure 3 illustrates the job-to-job transition rates by gender across the life-cycle, as well as the gender job-to-job transition gap, which measures the ratio between female and male transition rates. Our results show that from ages 25 to 45, women in full-time employment are 10% less likely to change employers than men. Figure 4 shows that the yearly magnitude of the gap is closer to one and its trend seems slighlty decreasing over the 1995-2015 period.[13]

However, there are certain characteristics of workers that can influence job-to-job transitions. For example, as discussed in Bagger et al. (2014), low-skilled and older workers tend to have lower job-to-job transition rates. Therefore, if female full-time workers are on average younger than their male counterparts, this could potentially account for their higher yearly job-to-job transition rates and the relatively small gender gap observed each year. To address this issue, we explore how age, education, and industry compositions of the female and male labor force affect the gender gap in job-to-job transitions.

[12]It is worth noting that our analysis excludes 2010 and 2011 due to a change in counting movements from part-time to full-time employment in these years, as visible in a spike in Figure S1.

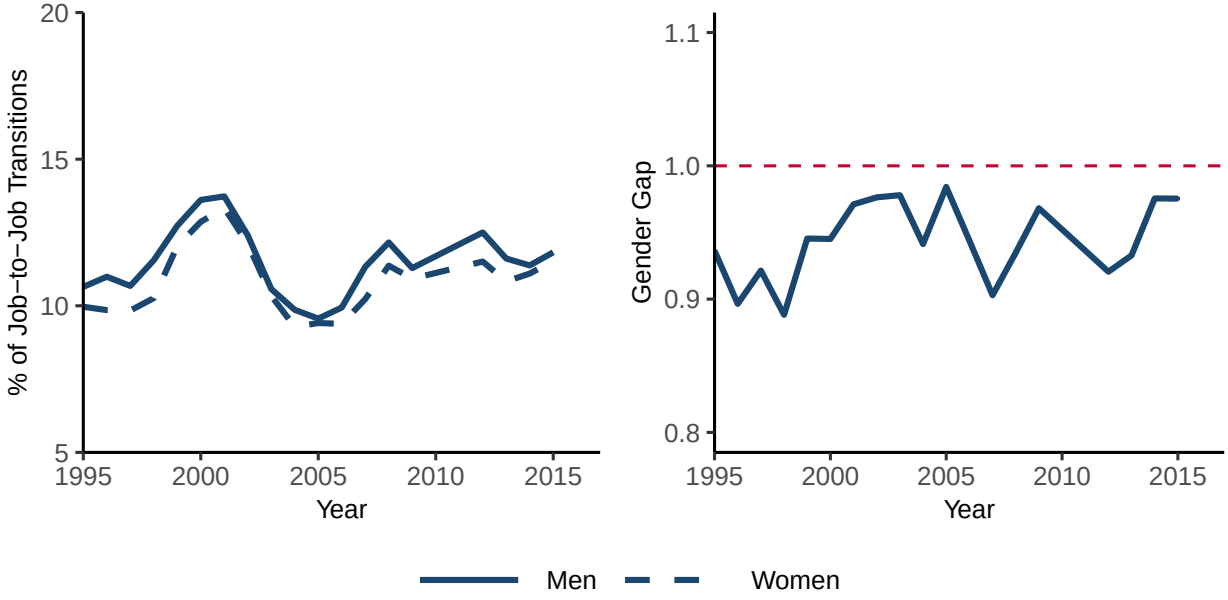
[13]Job-to-job transition rates appear to be counter-cyclical, but the cyclical properties of the gender gap in job-to-job transitions are more challenging to discern.

Figure 3: Job-to-Job Transitions by Gender across the Life-Cycle



Notes: Left panel: Yearly job-to-job transition rates by gender. Right panel: Gender gap in job-to-job transition rates, defined as the ratio between the female and male job-to-job transition rates. The sample in restricted to 25-45 workers who work full-time over two consecutive years. Source: SIAB.

Figure 4: Job-to-Job Transitions by Gender over Time

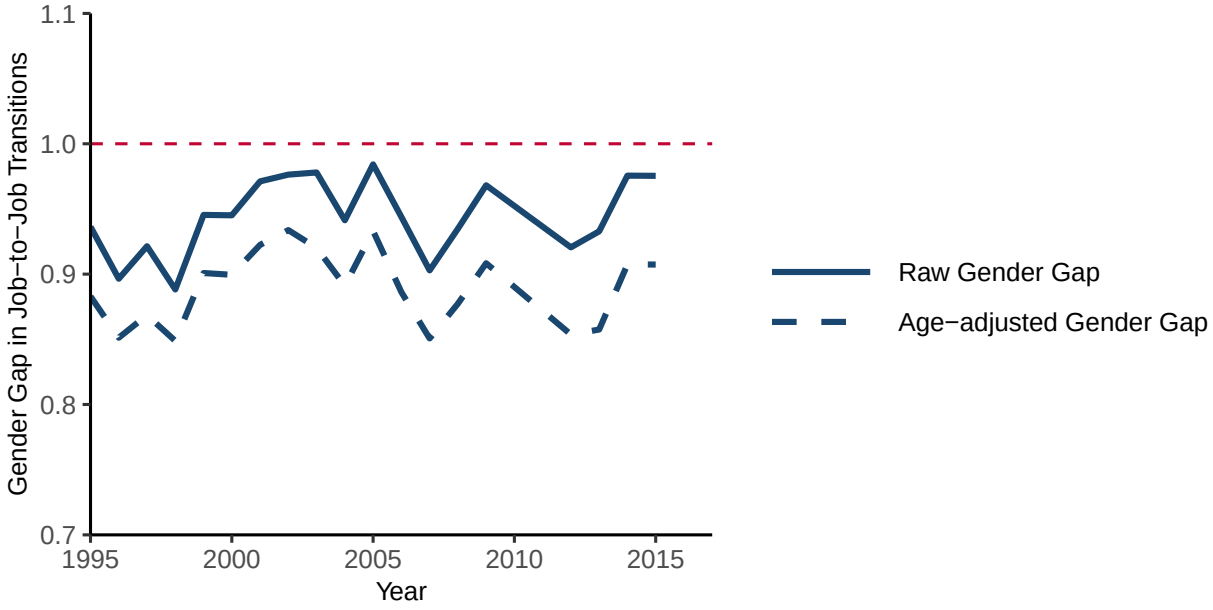


Notes: Left panel: Yearly job-to-job transition rates by gender. Right panel: Gender gap in job-to-job transition rates, defined as the ratio between the female and male job-to-job transition rates. The sample in restricted to 25-45 workers who work full-time over two consecutive years. Source: SIAB.

2.1 Age Composition

As displayed in Appendix Figure S2, female full-time workers are between one and one and a half year younger than their male counterparts between 1995 and 2015. This observation suggests that age composition can potentially contribute to the relatively low yearly magnitude of the job-to-job transition gap.

Figure 5: Age Composition and Gender Job-to-Job Transition Gap



Notes: Raw and age-adjusted gender job-to-job transition gaps. The counterfactual gender job-to-job transition gap is calculated as the ratio between the age-adjusted female job-to-job transition rate computed using male age composition and the actual male job-to-job transition rate. Source: SIAB.

To assess the impact of the age composition of the labor force on gender differences in job-to-job transition rates, we adopt a methodology similar to that used in prior studies such as Shimer (1998) and Albanesi and Şahin (2018).[14] Specifically, we compute age-adjusted job-to-job transition rates by dividing full-time workers into two gender groups, men (m) and women (f), and then further dividing each group into twenty age groups ($A_g = \{25, ..., 45\}$ for $g \in \{m, f\}$). Let $\lambda_p^g(a)$ denote the fraction of workers in group a in year p, and let $t_p^g(a)$ denote the job-to-job transition rate for workers in group a in year p. We can then calculate the job-to-job transition rate for gender g in year p as $t_p^g = \sum_{a \in A_g} \lambda_p^g(a) t_p^g(a)$. To obtain an age-adjusted job-to-job transition rate for women, denoted $\tilde{t}_p^f$, we assume that the age composition of the female labor force is the same as

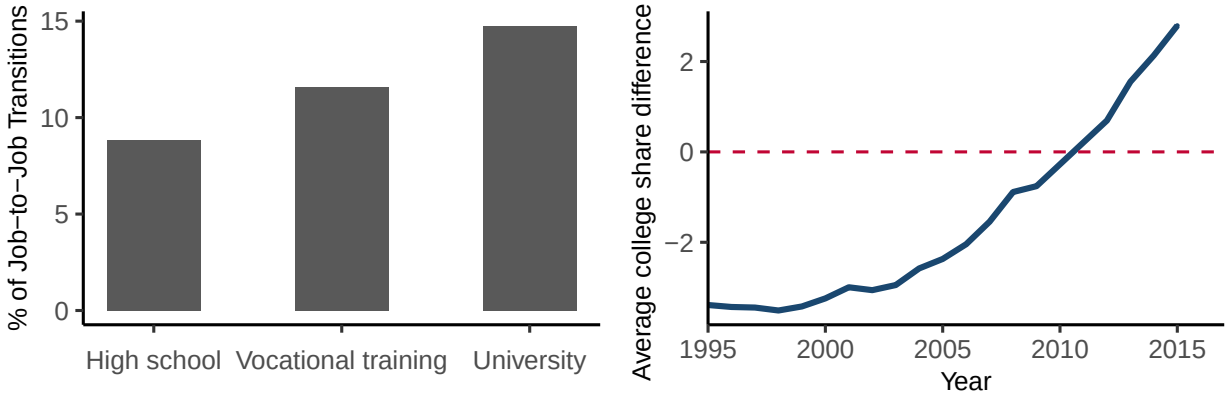
[14] We use an Oaxaca-Blinder method to isolate the effect of age composition.

that of men's, i.e., $\tilde{t}_p^f = \sum_{a \in A_f} \lambda_p^m(a) t_p^f(a)$. Figure 5 displays both the raw and age-adjusted gender job-to-job transition gaps. Because full-time female workers are younger on average than their male counterparts, the age-adjusted gender job-to-job transition gap is larger than the raw gap. The age-adjusted gap remains relatively constant over the 1995-2015 period, with a yearly magnitude of around 90%, suggesting that the decreasing trend in the raw gap is largely driven by changes in the age composition of full-time workers.

2.2 Education and Industry Choices

Educational attainment and industry choices are additional characteristics of full-time workers that can affect job-to-job transition rates and may vary by gender. As depicted in the left panel of Figure 6, higher levels of educational attainment are associated with higher job-to-job transition rates. Meanwhile, the right panel shows a relative increase in the proportion of female full-time workers who hold college degrees, with the share surpassing that of male full-time workers since 2010. Table 2 also reveals substantial differences in job-to-job transition rates and industry distributions between female and male full-time workers.

Figure 6: Educational Attainment and Job-to-Job Transitions



Notes: Left panel: Male job-to-job transition rates by education. Right panel: percentage point differences in the share of college graduates between full-time working men and women. Source: SIAB.

To isolate the role of gender composition in age, education, and industry, we calculate an age-education-industry-adjusted job-to-job transition rate for women. Similarly as before, this is done by assigning the male composition in age, education, and industry to the female labor force.

Figure 7 illustrates both the raw and age-education-industry-adjusted job-to-job transition gaps. The two gaps are almost identical across the life cycle, suggesting that the role

Table 2: Industries

		1996-2005		2006-2015	
	% JtJ	Size	% Women	Size	% Women
Information and communication	19.1	12.1	40.6	17.4	35.6
Accommodation and food service	18.6	1.9	54.7	2.2	47.8
Transport and Storage	17.1	4.6	19.8	5.1	19.1
Wholesale and retail trades	12.9	14.6	39.1	14.5	35.3
Other services	12.0	2.7	55.3	2.7	54.3
Financial and insurance activities	11.8	4.8	48.2	4.3	43.4
Construction	11.9	7.1	9.9	6.2	8.4
Human health services	11.5	8.2	73.0	8.4	70.1
Education	11.3	1.6	64.7	1.8	61.4
Agriculture, forestry and other	10.8	3.2	14.2	2.6	18.5
Public administration and defense	9.4	4.8	43.5	3.9	46.3
Manufacturing 1	9.0	8.4	31.9	6.8	27.8
Manufacturing 2	8.9	11.2	17.4	9.9	16.5
Manufacturing 3	8.5	14.3	17.2	13.6	15.2

Notes: This Table shows the average job-to-job transition rate, size in terms of the number of full-time employees and share of women among full-time employees by industry. Source: SIAB.

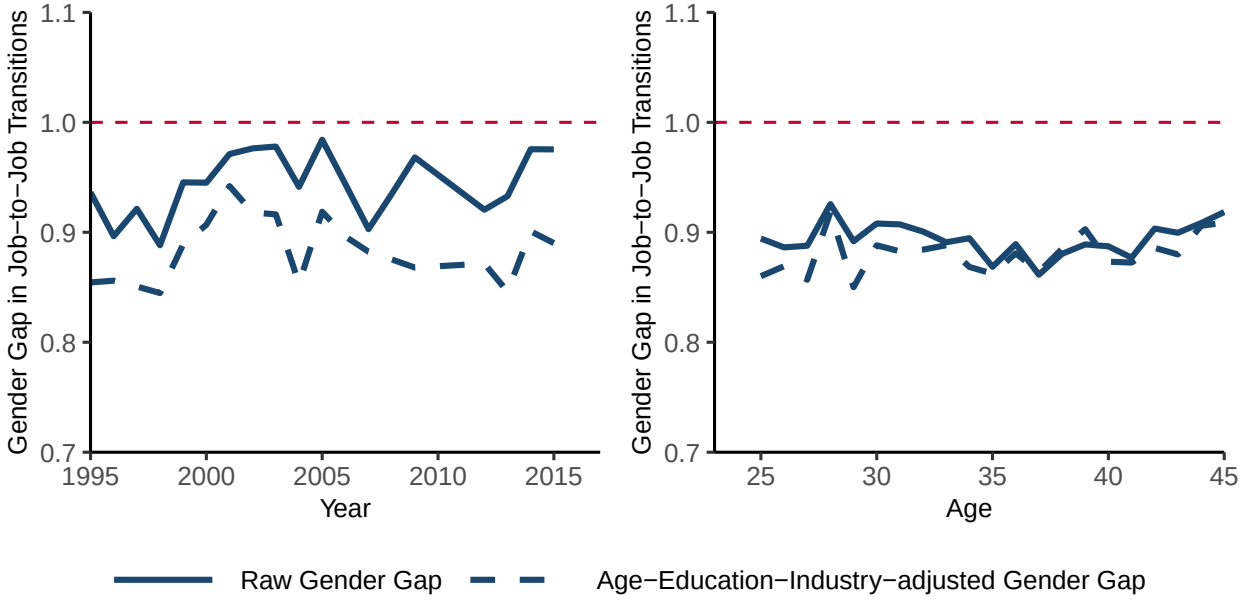
of gender differences in education and industry composition in the gender gap of job-to-job transitions is minimal.

2.3 Labor Force Attachment

Full-time working men and women also differ in terms of their work experience and the number of years they have worked for the same employer. Consistent with job-search theory, the left panel of Figure 8 shows a negative correlation between the number of years worked at the same firm and the probability of a job-to-job transition. The right panel of the same figure illustrates that women have worked for one year less than men at the same firm, which is in line with the gender difference in age composition.

In Figure 9, we present both the raw and age-tenure-adjusted job-to-job transition gaps. To isolate the role of gender in the effect of age and tenure on job-to-job transitions, we calculate an age-tenure-adjusted job-to-job transition rate for women by assigning the male composition in age and tenure to the female labor force. The adjusted gap is calculated as the ratio between the female age-tenure-adjusted job-to-job transition rate and the male actual one. Across the life cycle and over time, the adjusted gap is consistently lower than the raw gap, indicating that, after controlling for age and tenure, full-time working women are almost

Figure 7: Education-Industry Composition and Gender Job-to-Job Transition Gap



Notes: Raw and age-education-industry-adjusted gender job-to-job transition gaps. The counterfactual gender job-to-job transition gap is calculated as the ratio between the age-education-industry-adjusted female job-to-job transition rate and the actual male job-to-job transition rate. Source: SIAB.

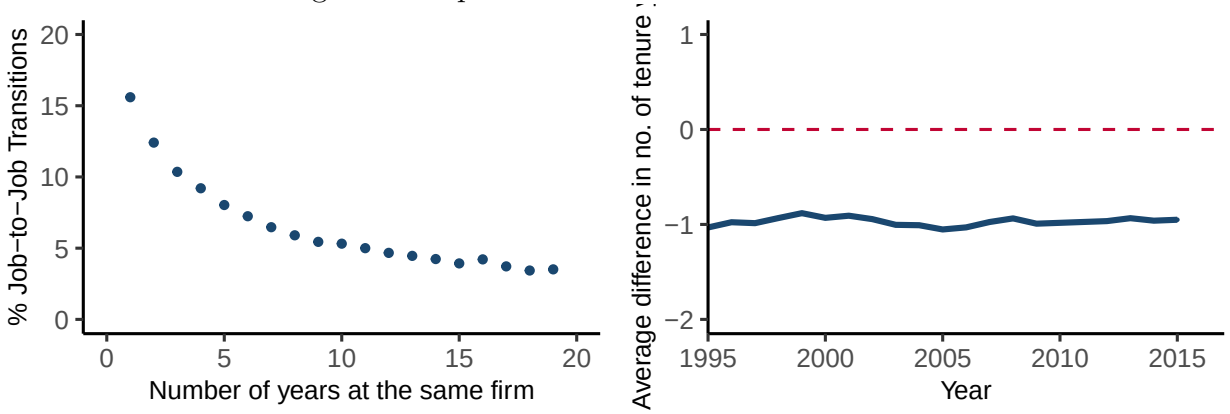
15% less likely than men to change employers. Interestingly, the age-tenure-adjusted gap is U-shaped across the life cycle and has a constant trend over time. These counterfactual exercises suggest that gender differences in age, tenure, education, and industry choices cannot fully account for the observed gender gap in job-to-job transitions.

2.4 Motherhood Penalty

We hypothesize that the gender gap in job-to-job transitions among full-time workers is linked to the motherhood penalty. When women become mothers, there are significant changes in their labor market outcomes, which likely contribute to discouraging them from working full-time. The most notable evidence of it is the sharp decline in full-time employment that follows childbirth, but motherhood can also affect the labor market outcomes of full-time working women. In this section, to explore our hypothesis, we compare job-to-job transition rates of women who have not yet become mothers to those who already have a child.

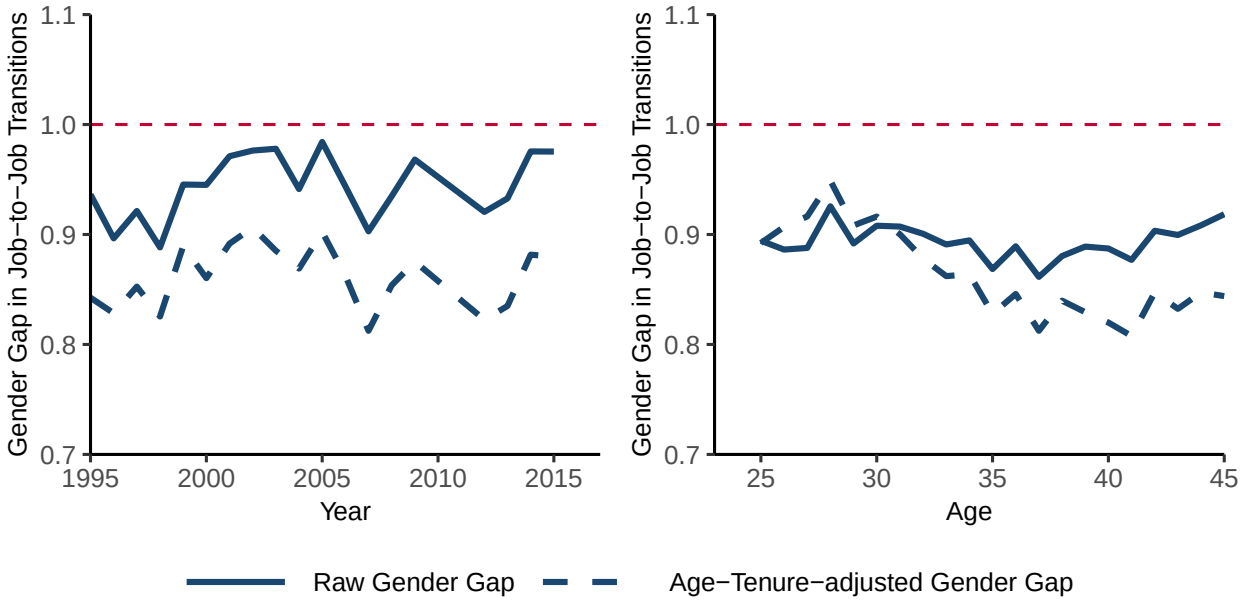
The left panel of Figure 10 shows that women's likelihood of job-to-job transitions closely resembles that of men before motherhood, especially for older non-mother women. However, after having children, the probability of full-time working women to change employers decreases by 20%. In the right panel of Figure 10, we repeat the analysis for women who give

Figure 8: Experience and Job-to-Job Transitions



Notes: Left panel: Male job-to-job transition rates by number of consecutive years at the same firm. Right panel: average gender difference in the number of consecutive years at the same firm. Source: SIAB.

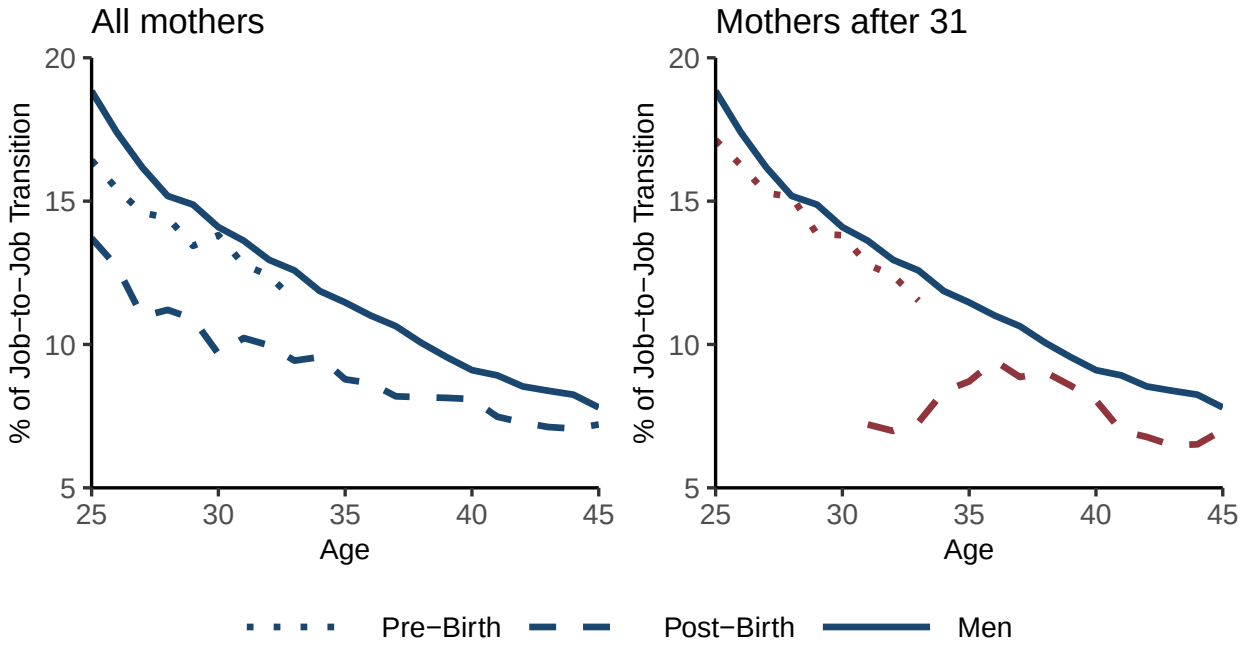
Figure 9: Experience and Gender Job-to-Job Transition Gap



Notes: Raw and age-tenure-adjusted gender job-to-job transition gaps. The counterfactual gender job-to-job transition gap is calculated as the ratio between the age-tenure-adjusted female job-to-job transition rate and the actual male job-to-job transition rate. Source: SIAB.

birth after the age of 31 and find that this group has job-to-job transition rates closest to that of men before having children. Nevertheless, they also experience a decline in mobility after childbirth. These findings suggest that motherhood plays a significant role in explaining the gender gap in job-to-job transitions among full-time workers.

Figure 10: Life-Cycle Trends in Job-to-Job Mobility by Motherhood Status



Notes: Yearly job-to-job transition rates by gender and motherhood status. The sample in restricted to 25-45 workers who work full-time over two consecutive years. Source: SIAB.

3 Plausible Explanations of the Gender Gap in Job-to-Job Mobility

There are several plausible reasons why the probability of job-to-job transitions could decrease for women after childbirth. One possibility is that social norms and bargaining within the household may result in mothers taking on a disproportionate share of childcare responsibilities, reducing their leisure time and making them less willing to spend time commuting or working longer hours. This interpretation is consistent with the sharp decrease in full-time employment that follows childbirth for women. Another possibility is that mothers become less willing to change employers, possibly due to psychological factors. Empirically, we should see a decrease in search intensity. These, in turn, may result in fewer on-the-job

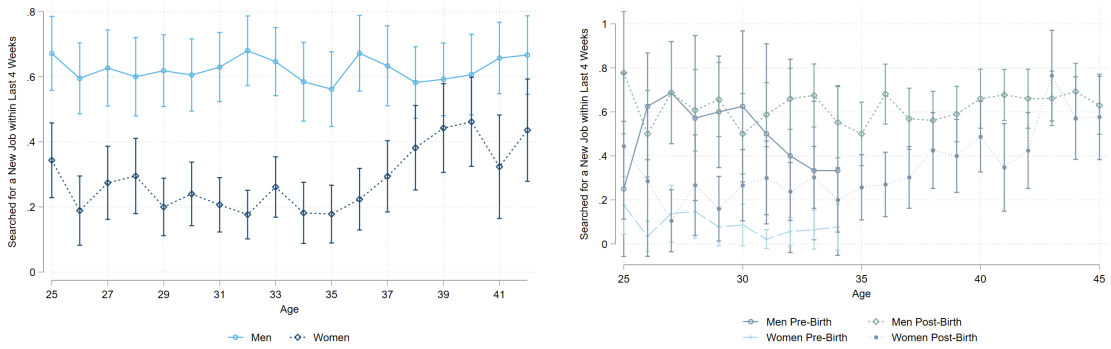
offers for mothers, even when they work full-time, either from a supply or demand side. To better understand the underlying mechanisms contributing to the gender gap in job-to-job transitions, we qualitatively investigate three potential factors: search effort, commuting and working hours, and the difficulty in finding a new employer.

3.1 Search Intensity

The first explanation for drop in job-to-job transitions for women after childbirth we consider is a change in search behavior. Specifically, women become less willing to change employers after childbirth due to psychological factors such as a change in risk aversion for instance.

We use data from the German Socio-Economic Panel (SOEP). The SOEP is a well-established representative panel study that began in 1984 (Goebel et al., 2019) and surveys around 12,000 households and their members each year. Along with socio-demographic information it provides data on labor force status, labor earnings, occupations as well as on the household context of mothers. Importantly, it also records full birth histories that allow to identify fathers and mothers and when they have become parents. We use the SOEP data from the period 1984 until 2020. We condition our sample on individuals who work full-time which reduces our sample size to 12,203 women and 19,305 men between 25 and 45.

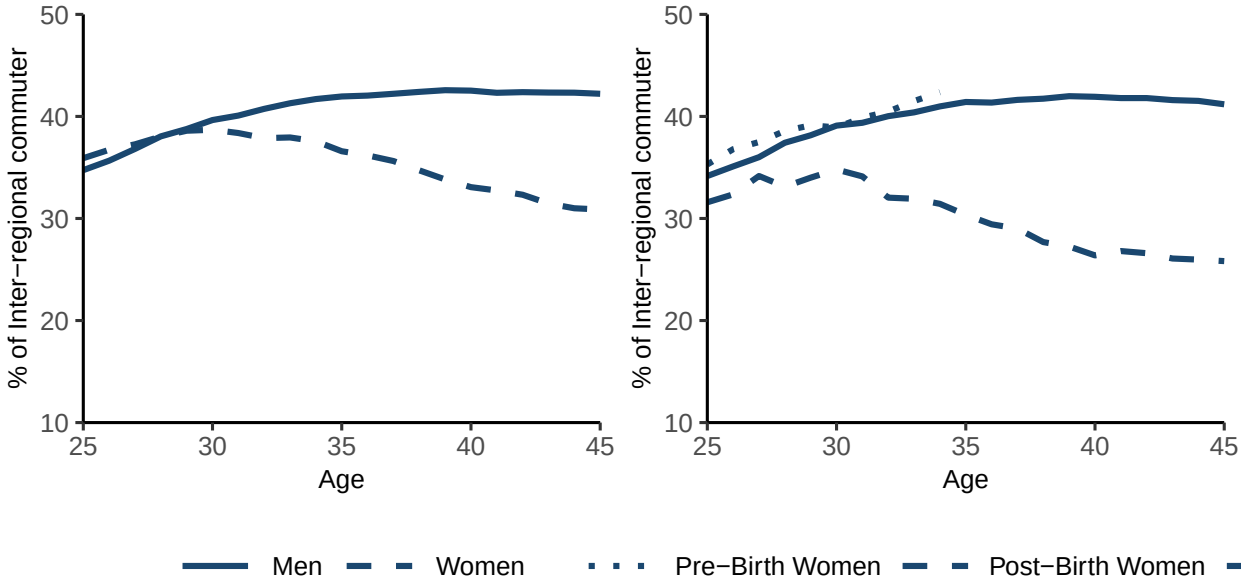
Figure 11: On-the-job search intensity



Notes: The outcome is the binary variable which reports the answer to the following question, with "Yes" being stored as 1 and "No" being stored as 0: "Have you actively looked for work within the last four weeks?". Sample: Full-time workers from 25 to 45. Source: SOEP 1984-2020.

The search behavior of full-time working women is displayed in Figure 11, which indicates that women are less likely than men to search for a new job. However, this probability increases after childbirth, indicating that mothers exert higher search effort despite facing potentially higher time constraints. Importantly, this findings indicates that the decrease in

Figure 12: Inter-Regional Commuters



Notes: Share of inter-regional commuters among full-time workers by gender and motherhood status.
Source: SIAB.

job-to-job transition rates after childbirth is not driven by lower levels of search intensity, as search rates remain high after childbirth.

3.2 Commute and Working Hours

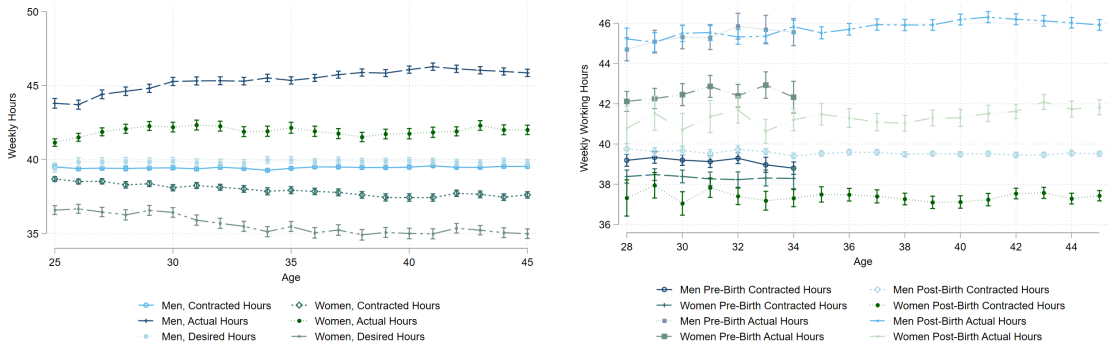
A second possible explanation for the gender gap in job-to-job transitions after childbirth is related to the unequal distribution of childcare responsibilities. Women tend to become more time constrained after having children, and even those who choose to continue working full-time may wish to reduce their commuting and work hours.

As shown in Figure 12, there is a decrease in the likelihood of commuting after childbirth, suggesting that mothers are less fond of commuting. Unlike the findings of Le Barbanchon et al. (2021), we do not observe a gender difference in commuting probabilities before childbirth.[15]

Figure 13 displays desired, contracted, and actual working hours by gender and motherhood status. Women's desired hours are lower than their contracted ones. After childbirth, we observe a slight decrease in actual and contracted hours for women (less than an hour per week), while the gap between contracted and actual hours remains the same.

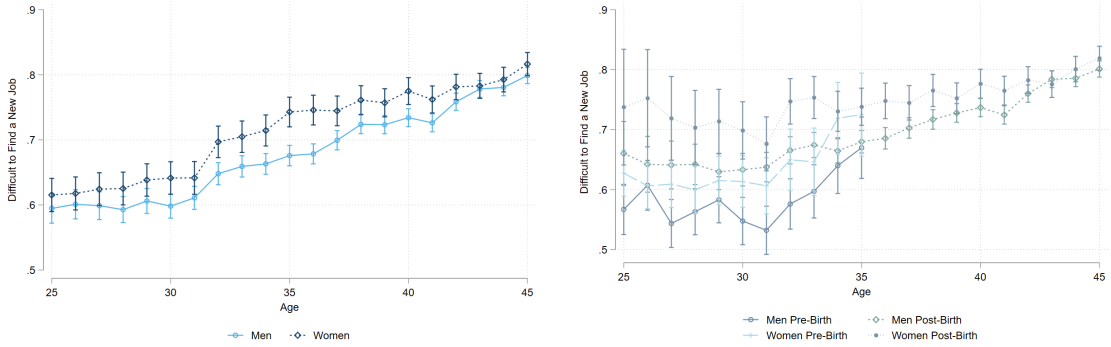
[15] Appendix Figure S3 presents the number of kilometers to the workplace by gender and motherhood status for full-time workers using the SOEP dataset, and the conclusions are the same.

Figure 13: Working Hours



Notes: These Figures show contracted, actual and desired hours by gender and motherhood status for full-time workers. Source: SOEP 1984-2020

Figure 14: Difficulty to Find a New Employer



Notes: The outcome is the variable that reports the answer to the following question, with "Immpossible/Difficult" being stored as 1 and "Easy" being stored as 0: "If you were currently looking for a new job: Is it or would it be easy, difficult, or almost impossible to find an appropriate position?" Source: SOEP 1984-2020.

These findings indicate that mothers face significant time constraints, as evidenced by their decision to commute less. Nevertheless, full-time working mothers continue to work between 41 and 42 hours per week.

3.3 Difficulty to Find a New Employer

Thirdly, we investigate the perceived difficulty of finding a new employer. Figure 14 shows that women face higher difficulties in finding a new employer than men, regardless of their motherhood status. However, the difficulty greatly increases after childbirth. While about 60% of childless women below the age of 30 find it difficult to find an appropriate position, a little over 70% of mothers consider it challenging.

Those results suggest that while search efforts increase after childbirth and that full-time working mothers continue working long hours, they are less likely to commute and more likely to have difficulty finding a new employer than women before childbirth. Mothers seem to face higher time constraints that most likely generate higher frictions in finding suitable job matches compared to men and non-mothers. The resulting matching frictions can come from both the supply and demand sides. For instance, if mothers reduce their radius of search due to a stronger dislike of commuting, it can create frictions from the supply side (in line with the findings of Le Barbanchon et al. (2021)). Furthermore, if the average mother is (correctly or incorrectly) perceived as less willing to work long hours compared to the average non-mother or man, it can create matching frictions from both the supply and demand side. These findings align with the analysis of a need of a more equal share of childcare responsibilities within the household (Doepke et al., 2022).

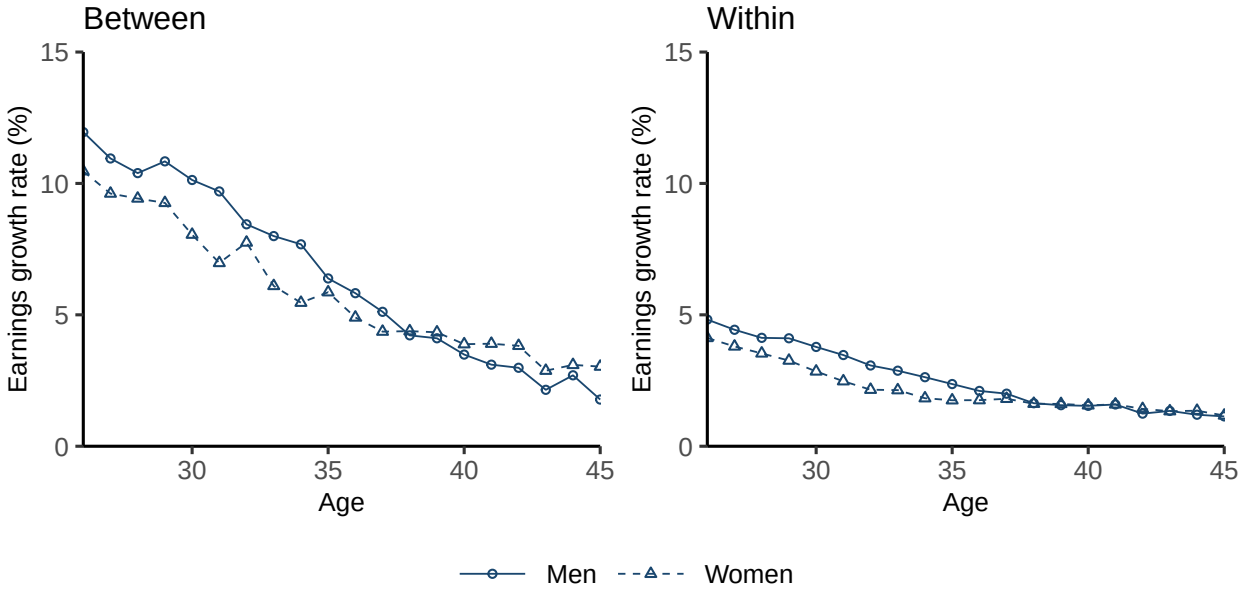
4 Consequences of the Gender Gap in job-to-job Mobility for the Gender Earnings Gap

The gender gap in job-to-job transition rates for full-time workers suggests that women face higher frictions in finding suitable job matches compared to men. The ability to search for and obtain higher-paying jobs is critical for career advancement, as wage growth, both within and between jobs, is impacted by the number of outside job options. It is likely that women's reduced ability to shop for jobs hinders their career growth and contributes to the gender wage gap both within and between jobs.[16]

To assess the contribution of the gender gap in job-to-job transition rates to the gender earnings gap among full-time workers, we begin by estimating average earnings growth rates within and between jobs for men and women across different age groups. In Figure 15, we display the interaction coefficients of a regression of annual earnings growth rate on gender and age dummies for job-to-job transitions (left panel) and within firm transitions (right panel). Consistent with the theory of on-the-job search as job shopping, we observe that between-job growth rates are higher than within-job growth rates. Our estimates indicate that earnings growth rates, both within and between jobs, are lower for women than for men before the age of 36, and similar thereafter.

[16] For a theory of on-the-job search as job shopping see for instance Burdett (1978); Burdett and Mortensen (1998); Jovanovic (1984); Bagger et al. (2014).

Figure 15: Between and Withing Earnings Growth Rates

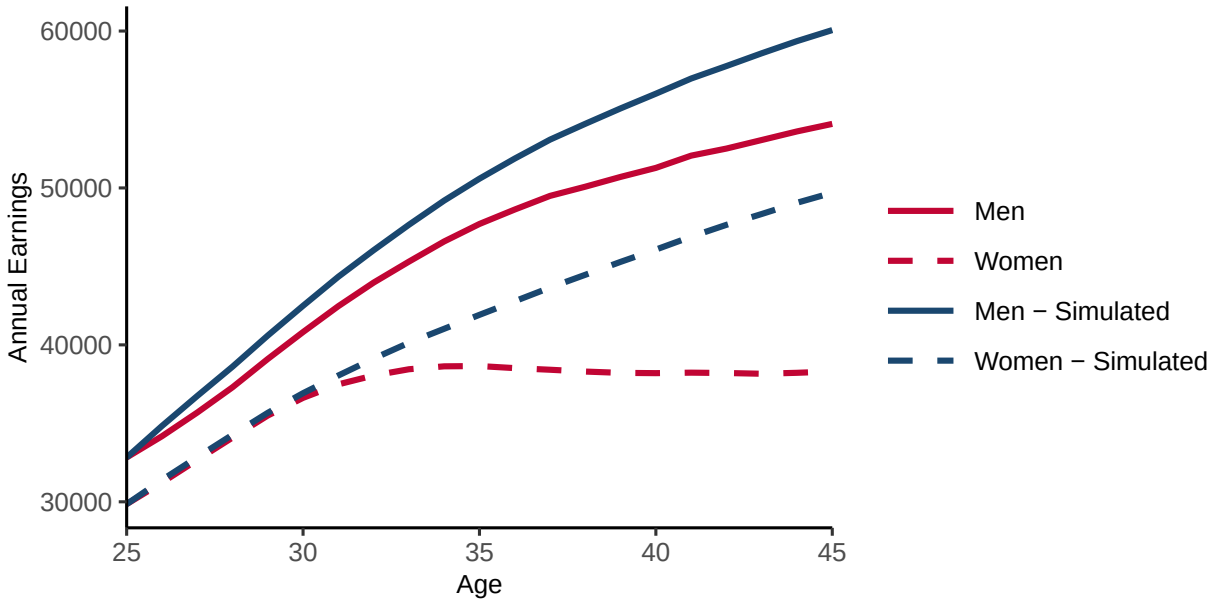


Notes: Estimated age specific earnings growth rate by gender. The sample includes full-time workers from 25 to 45 who were working full-time the year before. Right panel restricts the sample to workers who experienced a job-to-job transition. Left panel restricts the sample to workers who stayed within the same firm. 1995-2015. Source: SIAB.

In Figure 17, we conduct simulations of annual earnings for a hypothetical full-time worker between the ages of 25 and 45. We use estimated earnings growth rates by age and gender for both within and between firm transitions and estimated probabilities of job-to-job transitions by gender and age. While the simulated earnings profiles are steeper than observed in the data due to the absence of periods of unemployment, part-time work, and non-participation, we find that the gender gap in within- and between-growth rates, as well as differences in initial conditions and job-to-job transition probabilities, can account for 59% of the gender earnings gap among full-time workers at age 45. Specifically, while women's earnings in the data represent 71% of men's earnings at age 45, the simulated earnings prediction is 83%. This suggests that the gender gap in search frictions that arises with motherhood plays a significant role in shaping the gender earnings gap of full-time workers and largely contributes to the motherhood penalty.

Figure presents a series of counterfactual analyses, in which we examine the individual contributions of the gender gap in within- and between-growth rates, in initial conditions and job-to-job transition probabilities to the gender earnings gap. Our findings suggest that job-search outcomes play a critical role, as the disparities in earnings growth rates and job-

Figure 16: Annual Earnings Profiles of Full-Time Workers



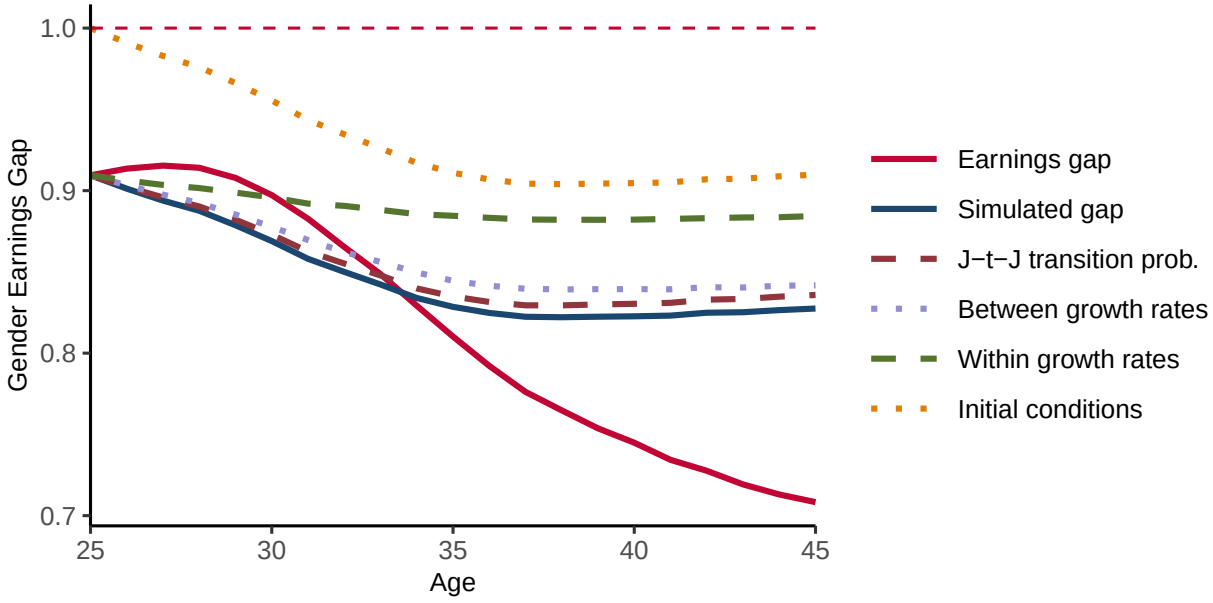
Notes: Red lines display annual earnings of full-time working men and women by age. The sample includes full-time workers from 25 to 45 who were working full-time the year before. 1995-2015. Source: SIAB. Blue lines display the simulated average earnings profiles of men and women who would have been working full-time from 25 to 45 years old.

to-job transition probabilities contribute significantly to the gap. Specifically, closing the gap in job-to-job transition rates has a minor effect, explaining just one percentage point (or 6%) of the predicted gap, whereas eliminating the gender gap in within-firm earnings growth rates has a much greater impact, accounting for six percentage points (or 35%) of the predicted gap. Since the ability to find suitable job matches is essential for both within- and between-job growth, closing the gender gap in matching frictions would close the gap in job-to-job transitions and improve earnings growth rates.[17] Additionally, the gender earnings gap reduction for full-time workers could have a ripple effect on the share of full-time employed women as the opportunity cost of working part-time would increase. Thus, the impact of reducing matching frictions and closing the job-to-job transition gap would be far greater than the one percentage point estimate. Finally, we note that closing the gap in initial conditions at age 25 would have the greatest impact, with a reduction of eight percentage points, accounting for 47% of the predicted gap.[18] These findings highlight

[17] At the same level of occupation, industry, and education, a gender gap in earnings growth rate could remain if there exist gender differences in asked salary as documented in Reuben et al. (2017); Kiessling et al. (2019); Roussille (2020).

[18] This finding is consistent with Reuben et al. (2017) who find that gender differences in students' preferences and salary expectations account for a quarter of the gender earnings gap.

Figure 17: Gender Gap in Annual Earnings of Full-Time Workers



Notes: The red solid line display the gender gap in annual earnings of full-time working men and women by age. The sample includes full-time workers from 25 to 45 who were working full-time the year before. 1995-2015. Source: SIAB. The blue solid line display the simulated average gender gap in annual earnings of full-time working men and women by age. The other lines represent the same gap if we assign male job-to-job transition rates to women (dashed red line), if we assign male between earnings growth rates to women (dotted purple line), if we assign male within earnings growth rates to women (dashed green line), and finally, if we close the gap in initial conditions (dotted orange line).

the importance of addressing gender differences in matching frictions and differences at the earliest stage of the career to reduce the gender earnings gap in the economy.

5 Conclusion

Using both German administrative and nationally representative survey datasets, we provide evidence of a persistent gender gap in job-to-job transitions among full-time workers in West Germany. Specifically, we find that full-time employed women are 10% less likely than men to change employers, and this gap emerges with the birth of a child, suggesting gender differences in matching frictions. We rule out factors such as age, education, industry, and tenure as explanations for the observed gender gap.

We investigate three potential factors to explain the matching frictions that cause the decrease in job-to-job transition rates of mothers: search intensity, commuting, and perceived difficulty in finding a new employer. We find that full-time working mothers exert higher search intensity, work a similar number of hours to childless women, but are less likely to commute and face greater challenges in finding a suitable job match. These frictions can stem from a supply side if mothers reduce their radius of search, but also from a demand side if employers perceive mothers as less willing to work long hours compared to their male and non-mother female counterparts.

Closing the gender gap in matching frictions would have significant implications for job-to-job transitions rates as well as for within- and between-job earnings growth rates. We argue that reducing matching frictions for full-time working mothers could then lead a significant decrease in the gender earnings gap among full-time workers. Furthermore, such a reduction would increase the opportunity cost of working part-time, potentially leading to a higher share of full-time employed women. Therefore, the impact of reducing matching frictions goes beyond just closing the job-to-job transition gap. Our findings emphasize the need for policies that address the challenges faced by working mothers, such as providing flexible work arrangements and supporting childcare responsibilities. Such policies can help reduce matching frictions, increase job mobility, and ultimately lead to better labor market outcomes for women.

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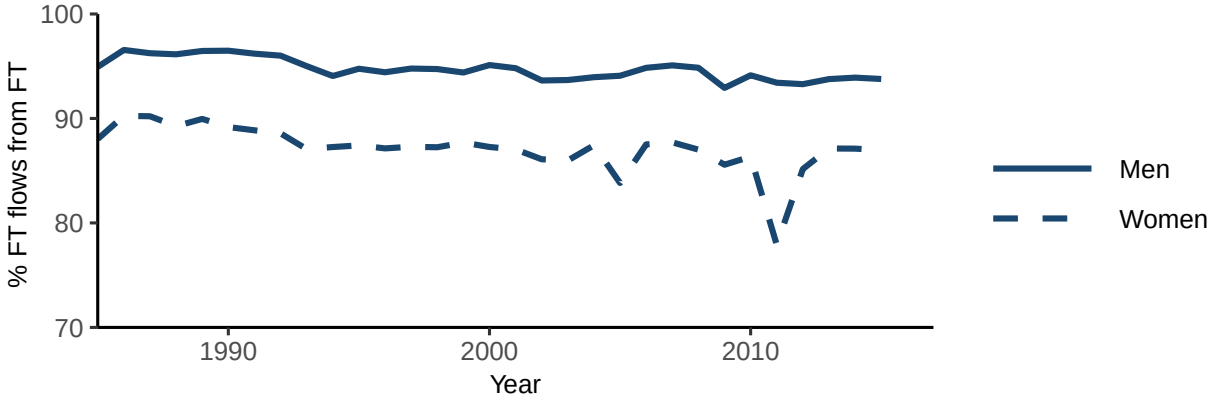
A Appendix

Table S1: German Labor Force Participation Rates 1991-2015 (%)

	25-54 Women			25-54 Men		
	1991-1995	1996-2005	2006-2015	1991-1995	1996-2005	2006-2015
Panel A: Germany (SIAB)						
Employed	64	70	75	84	83	82
Full-time	72	61	49	99	96	89
Part-time	28	39	51	1	4	11
Unemployed	7	6	8	5	7	8
Inactive	29	23	17	11	10	10
Panel B: Germany (OECD)						
Employed	64	69	76	88	85	87
Full-time	70	63	61	98	96	94
Part-time	30	37	39	2	4	6
Unemployed	9	9	6	6	8	6
Inactive	27	23	18	7	7	7

Notes:This table shows labor force participation rates by gender for three decades from 1988 to 2017. Sample in *Panel A* includes salary workers aged 25–54 in West Germany, source SIAB. Sample in *Panel B* includes salary workers aged 25–54 in Germany. Source: OECD. We distinguish four states: Full-time workers, Part-time workers, Unemployed workers and Inactive. .

Figure S1: Trends in Labor Market Flows from Full-time Employment by Gender



Notes: This figure displays the trend in flows from full-time Employment by gender between 1986 to 2015. Sample includes full-time workers aged 25–54. Data are from the SIAB.

Table S2: Female Labor Force Participation Rates 1988-2017 (%)

	Pre-Birth Women			Post-Birth Women		
	1986-1995	1996-2005	2006-2010	1986-1995	1996-2005	2006-2010
Employed	80	83	84	51	67	76
Full-time	92	86	78	58	43	34
Part-time	8	14	22	42	58	66
Unemployed	3	3	3	5	5	5
Inactive	17	14	13	45	29	19

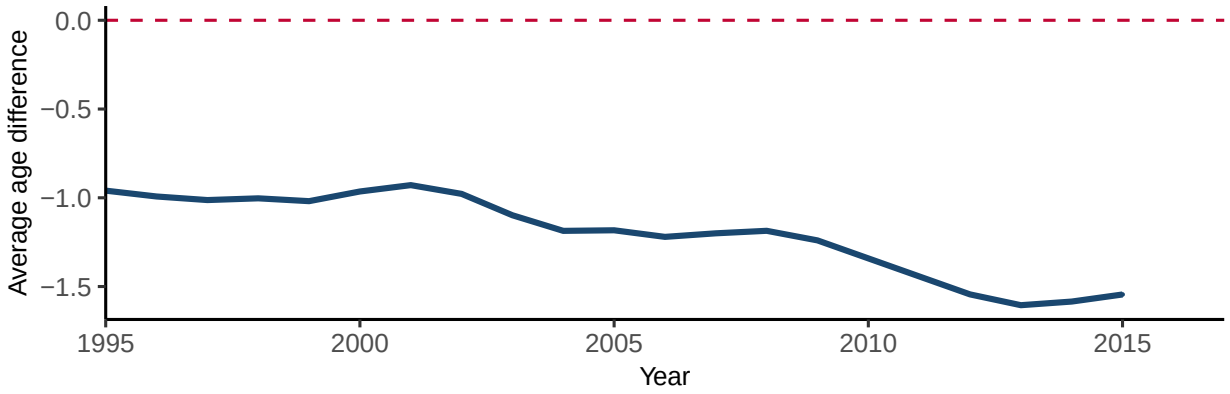
Notes: This table shows labor force participation rates by gender for three decades from 1986 to 2010. Sample in includes female salary workers aged 25–54 in West Germany who received childbirth benefits after 1975, source: SIAB. We distinguish four states: Full-time workers, Part-time workers, Unemployed workers and Inactive.

Table S3: Flow Matrix - 1985-2015

	Men (%)				Women (%)			
	FT	PT	U	I	FT	PT	U	I
Full-time (FT)	95	1	2	2	87	4	3	6
Part-time (PT)	18	69	5	8	5	86	2	6
Unemployed (U)	29	5	52	15	17	14	44	25
Inactive (I)	24	6	7	63	9	14	4	73

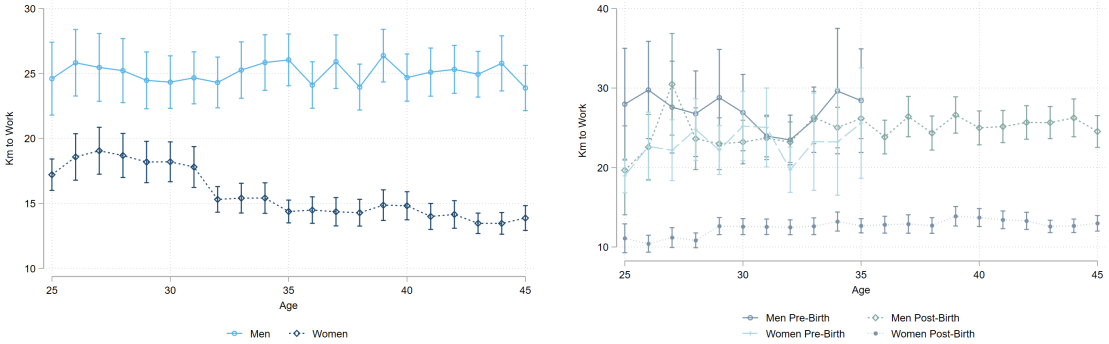
Notes: This table shows labor flows by gender for three decades from 1985 to 2015. Sample in includes salary workers aged 25–54 in West Germany , source: SIAB. We distinguish four states: Full-time workers, Part-time workers, Unemployed workers and Inactive.

Figure S2: Age Composition



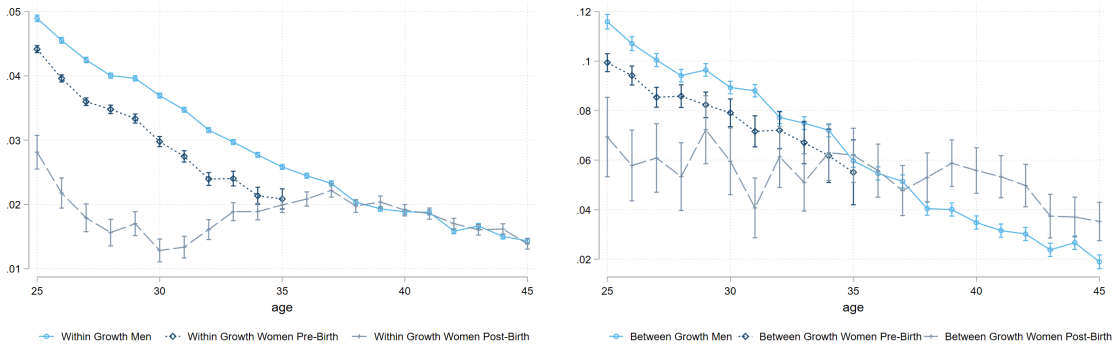
Notes: Average gender difference in age of full-time workers by year. Source: SIAB.

Figure S3: Distance in Kilometers to the Place of Work



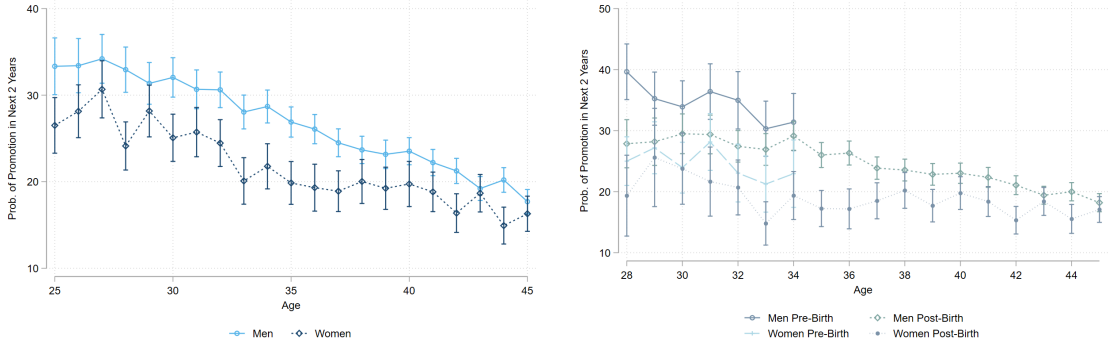
Notes: These Figures show the number of kilometers to the place of work by gender and motherhood status for full-time workers. Source: Soep 1984-2020

Figure S4: Between and Within Earnings Growth Rates by Gender and Motherhood Status



Notes: Estimated age specific earnings growth rate by gender and motherhood status. The sample includes full-time workers from 25 to 45 who were working full-time the year before. Right panel restricts the sample to workers who experienced a job-to-job transition. Left panel restricts the sample to workers who stayed within the same firm. 1995-2015. Source: SIAB.

Figure S5: Perceived Probability of Promotion at Current Place of Employment



Notes: The outcome is the variable which reports the answer to the following question, with answers being in range from 0% to 100%: "How likely is it that will you receive a promotion at your current place of employment within the next two years?" Source: SOEP 1984-2020.