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Abstract

Understanding disparities in the rates at which men and women's wages grow over the life course is critical to explaining the gender pay gap. Using panel data from 2009 to 2019 for the United Kingdom, we examine how differences in the rates and types of job mobility of men and women – with and without children - influence the evolution of wages. We contrast the rates and wage returns associated with different types of job moves, including moving employer for family reason, moving for wage or career-related reasons, and changing jobs but remaining with the same employer. Despite overall levels of mobility being similar for men and women, we find important differences in the types of mobility they experience, with

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mothers most likely to switch employers for family related reasons and least likely to move for wage or career reasons, or to change jobs with the same employer. We find that, while job changes with the same employer and career related employer changes have large positive wage returns, changing employers for family related reasons is associated with significant wage losses. Our findings show that differences in the types of mobility experienced by mothers compared to other workers provide an important part of the explanation for their lower wage growth and play a crucial role in explaining the emergence of the motherhood wage gap in the years after birth.

Keywords: job mobility, gender wage gap, wage growth, motherhood

INTRODUCTION

Across rich nations, wage penalties to motherhood now account for almost all the remaining gender pay gap (Kleven et al., 2019, Cortes and Pan, forthcoming). As exposure to motherhood increases, the associated disadvanatage accumulates (DiPrete and Eirich, 2006). In the United Kingdom (UK), mothers wages are similar to those of women without children in the years just before birth but the motherhood pay penalty grows to 7% after five years and 15% a decade later (Andrew et al., 2021). Yet, despite a considerable body of work examining motherhood earnings penalites, the need for a more explicit understanding of the mechanisms leading to divergences in the wages of mothers, fathers and those without children remains.

In this article we focus on the contribution of job mobility to gender pay gaps. In spite of its importance to wages, job mobility has attracted relatively little attention as an explanation for motherhood pay penalties. This is despite the fact that previous studies have shown job mobility to play a crucial part in explaining the evolution of wages in the early stages of young men and women's careers (Topel and Ward, 1992, Loprest, 1992), the same period over which significant wage gaps begin to emerge (Costa Dias et al., 2021). As gender pay gaps are closely related to parenthood (Andrew et al., 2021, Kleven et al., 2019), gender differences in job mobility, and related wage growth, may play an important role in explaining the motherhood pay gap. While researchers have previously compared young men and women's rates of, and returns to, job mobility (Keith and McWilliams, 1999, Fuller, 2008, Manning and Swaffield, 2008, Pearlman, 2018), few have examined how parenthood affects the chances of moving jobs or the wage returns to mobility. Those studies that have focussed on mothers have looked only at mobility between employers (Cha, 2014, Looze, 2014, Looze, 2017). However, because external job offers are a key mechanism by which employees negotiate higher earnings with their current employer (Bagger et al., 2014), job changes with the same employer may also play an important role in determining wages. Indeed, research suggests that mothers who

remain with the same firm have higher rates of wage growth than those who move (Yu and Kuo, 2017).

In this paper, we use ten years of panel data, from 2009/10 to 2018/19, for the UK to examine the influence of gender and parenthood on patterns of job mobility and related wage returns. We extend previous research on job mobility and parenthood in several ways. First, recent studies of motherhood and wage returns to job mobility have focussed on those changing employers. We provide a more complete picture of the effect of mobility on wages by looking at both those who move jobs but remain with the same employer, and those who move employer. Compared to recent studies of job mobility, which have either examined wage changes over a time of window less than a year (Cha, 2014), or have focussed on a single cohort of women (Looze, 2014, Looze, 2017), we are able to observe the impact of job mobility on the wages of a nationally representative sample of workers over a sustained period of time. Second, we distinguish between different types of job mobility, for family and work related reasons. This distinction is important because of the qualitative differences in the types of job moves men and women, and those with and without children, make. Finally, prior studies have focussed on the United States which may differ to countries such as the UK, which guarantee maternity and family leave but also have a higher prevalence of part-time work. These differences in policy may affect employment rates and job mobility (Mandel and Semyonov, 2006).

We contribute to the large literature on motherhood earnings penalties by showing that parental responsibilities lead to qualitative differences in the mobility patterns of men and women, and that these differences translate into different wage trajectories. While we find that men and women have similar overall levels of mobility, there are important differences in the type of mobility experienced and its returns. We estimate that these differences lower wage growth by approximately a quarter for mothers aged 25, and by about half for mothers aged

40. These differences accumulate over time and have a substantial influence of the earnings penalties associated with childbirth. Our estimates suggest that a mother giving birth at age 25, can expect to earn 14% less per hour than a similar man at age 40, and that around a quarter of this difference is explained by lower growth due to differences in job mobility.

LITERATURE REVIEW

In the UK, sharp gaps in the employment and work hours of mothers and other workers emerge shortly after the birth a child (Harkness et al., 2019). Motherhood wage penalties emerge more slowly, as the cumulative effect of exposure to motherhood reduces earnings growth, leading to widening gaps in the pay of mothers and other workers in the years after birth (Harkness, 2016, Andrew et al., 2021). Given that initial differences in wages are small, and as wages are initial pay plus future growth, any understanding of pay differentials needs to explain differences in growth. Human capital accumulation and job search are two of the main mechanisms driving earnings over the lifecycle (Rubinstein and Weiss, 2006). Losses in work experience provide a partial explanation for the lower wages of mothers (Costa Dias et al., 2021), with falling returns to work experience providing a further explanation for the widening gap (Miller, 2011). Lower returns to experience may be driven by changes in job mobility, with mothers less likely to make career enhancing job moves, and more likely to experience lower (or negative) returns to mobility. Differences in job mobility, and in wage returns to mobility, are therefore a further, and potentially important, source of growing wage disparities between mothers and other workers. Below we set out the mechanisms which may contribute towards differences in the mobility of mothers and other workers and related wage returns.

Job mobility, wage growth and pay gaps

The importance of job mobility to wage growth during the early stages of individuals' careers has been extensively documented. Mobility plays a critical role in matching workers to jobs, and has a central role in determining individuals' lifetime wages (Le Grand and Tahlin, 2002,

Dustmann and Pereira, 2008, Topel and Ward, 1992). During the early stages of individuals' careers, workers seek to improve on their current job match through 'job-shopping'. For young workers, voluntary employer mobility is associated with substantial wage gains (Topel and Ward, 1992, Fredriksson et al., 2018, Kronberg, 2013). Young workers, who have had less time to find a 'good' job match, are most likely to change jobs, with the number of within- and between-firm job moves contributing to higher wage growth. For older workers, who have settled into jobs, outside wage offers are used to generate gradual wage increases (Haltiwanger et al., 2018, Bagger et al., 2014). Reduced mobility, however, has lasting consequences for earnings growth: for example, during recessions both the number of job moves and the chances of moving up the job ladder fall (Moscarini and Postel-Vinay, 2016) leading to very substantial falls in wage growth (Haltiwanger et al., 2018).

Parenthood is a critical life course event which, given the constraints it places on women (who typically carry the burden of care) is likely to affect mothers' geographical mobility and limit their temporal flexibility, reducing the number of job opportunities available to them. Parental responsibilities limit the time and effort mothers can invest in searching for alternative employment leading to lower job search intensities (Yankow and Horney, 2013, Keith and McWilliams, 1999). For mothers, job mobility may be difficult or costly, creating frictions in the labour market which further limit mobility. Having an established relationship with their employer may help them to negotiate work and care arrangements, legislation which gives women entitlements to flexible working or family leave is frequently based on tenure with the current firm, and the need to be near school or childcare are all factors limiting mobility, particularly when children are young (Looze, 2017). In addition, mothers may also have fewer resources to invest in professional social networks that can provide them with information about existing job opportunities (Campbell, 1988) and be less able to profit from the networks they do have (Zhou, 2019). All these factors restrict mothers job mobility.

Even when mothers are mobile, they are more likely to 'job shop' on non-wage characteristics, such as shorter commute times (Le Barbanchon et al., 2020, Eriksson and Lagerström, 2012), the absence of long working hours (Cha and Weeden, 2014, Goldin, 2014, Meekes and Hassink, 2022) and/ or flexible working hours or other family-friendly characteristics (Mas and Pallais, 2017). They are also less likely to be motivated by money when they do move (Manning, 2003, Petrongolo and Ronchi, 2020). Job moves for family, rather than career-related reasons do not improve the match between employee and employer skills, and may lead to reduced firm specific skills, damaging wage prospects over the longer term. As a result, mothers are less likely to make 'good' job moves, which move them up the wage ladder, compared to other workers and are more likely to make 'bad' moves, for family related reasons, with lower wage returns (Fuller, 2008, Bielby and Bielby, 1992, Keith and McWilliams, 1999). Thus, changes in labour supply as a result of motherhood are expected to reduce the rate of, and returns to, job mobility (Kronberg, 2013, Fuller, 2008, Bruns, 2019) and the chances of mothers climbing the wage ladder. Together these effects are expected to lead to substantial reductions in wage growth.

Discrimination and monopsony's effect on between and within firm mobility

Discrimination against mothers in the workplace has been well documented, with employers typically regarding mothers as less committed or competent than men or women without children (Correll et al., 2007, Benard et al., 2007, Mari and Luijkx, 2020). Discrimination has direct consequences for mothers' job mobility, reducing their chances of promotion or new job offers. Reduced internal and external opportunities for job moves in turn limit wage growth. The effect of reduced job mobility on wages will be exacerbated in monopsonistic labour markets if employers exploit the fact that mothers have few outside options and pay them wages below the market rate as a result. Monopsonistic labour markets provide a further explanation

for low wage-growth among mothers, and for motherhood pay gaps (Manning, 2003, Langella and Manning, 2021, Ashenfelter et al., 2010).

One consequence of mothers' low levels of job mobility is that mothers may become increasingly concentrated among low-wage firms (Fuller, 2008). A growing number of studies have shown that a large part of the gender pay gap can be explained by men and women sorting into low- and high-wage firms (Card et al., 2015), with mothers in particular more likely to work in low paying firms (Fuller, 2017, Yu and Hara, 2021). Low wage firms are particularly likely to have a high share of part-time workers, and are less likely to require long overtime hours, and while these 'family friendly' characteristics may partly explain the segregation of mothers into lower paying firms, these compensating wage differences cannot fully explain the wage gap (Fuller, 2008). Instead, discrimination against mothers – which reduces external job opportunities (Correll et al., 2007) and internal opportunities for promotion, are more important explanations for mothers' segregation into low-wage firms (Fuller, 2008, Fuller, 2017). Those mothers who stay with the same firm may face fewer barriers to progression than those moving jobs. This may be particularly important to new mothers, as having an established relationship with their employer may mean they are in a better position to negotiate flexibility around care needs (Fuller, 2008, Looze, 2017). On the other hand, employers may take advantage of mothers who remain with the same firm, in the knowledge that their choices are constrained, and this may lead to mothers becoming stuck in the same job with little progression (Harkness et al., 2019).

Summing up

In sum, we expect parenthood to affect the job mobility of women in the following ways. First, because mothers face high costs of job mobility, we expect them to make fewer external job moves. Second, we expect mothers will be more likely to move for family related reasons than other workers, and to make relatively few career-related moves. Regarding wages, wage returns

for non-career reasons are expected to be lower than those for career related moves. Moreover, as external career-related moves are less common, mothers may be less able to negotiate internal job moves or promotions and, when they do, are expected to receive smaller wage rises than comparable childless women or men. These effects are expected to be compounded by discrimination towards mothers, which may reduce wage returns to external, career-related job moves. For those making internal job moves, discrimination (which is exacerbated by employers' holding monopsony power) may reduce wage gains for mothers making internal moves. Together, these differences in job mobility and their returns are expected to provide an important part of the explanation for the reduced wage growth of mothers and the widening of the wage gap over time.

METHODS

Data

Previous studies of gender differences in job mobility have been plagued by a lack of quality mobility measures in survey data, including distinguishing within and between employer job moves, as well as capturing heterogeneity in the reasons for moving employer. In this study, we use the first ten waves from the UK Household Longitudinal Study (UKHLS), covering the period 2009-2019. UKHLS is a large nationally representative panel survey with a sample of approximately 40,000 households in the first wave. It interviews all individuals aged 16 and over annually and is uniquely suited to assess job mobility as it collects information on job and employer changes as well as detailing individuals' motivation for moving job, in addition to following individuals when they move address.

We focus on the working age population and restrict our sample to individuals aged 22-55 (inclusive), to focus on the working life years that are most likely to be impacted by motherhood. The original sample included 144,313 person-year observations for 33,915

individuals. The final sample used in all the analyses consists of an unbalanced 105,007 individual-year observations for 25,720 individuals, of which 55.8 percent are women.

Measures of job mobility and wage changes

We examine both job mobility with the same employer and mobility between employers. Among those changing employer we distinguish between job changes motivated by work or career decisions, and employer changes motivated by family reasons. We assume that the respondent moved employers for work/career reasons either because they selected options "being promoted", "left for better job", "more money" when asked about the reasons for the most recent job change, or selected options "better money", "better career prospects", "more responsibility" when asked about the attractiveness of the current job. Family motivated employer changes are assumed when the respondent selected the options "left to have baby", "look after family", or to "look after other person" when answering the question about the reasons for the most recent job change or selected the options "nearer home/less travel", "shorter/fewer hours", "more flexible hours", "less demanding/easier" when answering the question about the attractiveness of the current job. The detailed distribution of responses to the survey questions are reported in Supplementary Tables S1 and S2.

We estimated wage returns using hourly wages. While the UKHLS contains an indirect measure of hourly wages (based on weekly or monthly earnings and hours worked per week) for all employed individuals, this measure is known to suffer from division bias (Stewart and Swaffield, 2002a). We take advantage of a direct hourly wages measure being available for a subsample of hourly paid individuals and apply the imputation procedure proposed by Skinner et al. (2002b) to obtain a more accurate wage measure for the entire sample (detailed information about the imputation procedure is found in Supplementary Material, Appendix 1).

We define wage growth as the difference in real log wages between the current year *t* and the last observed year *t-s*, where *s* represents the number of gap years between two

consecutive wage observation. For most of our sample we measure wage growth over a one-year interval (between t-1 and t). However, the unbalanced nature of our panel means we also have a small number of individuals in our sample with intermittent wage data (3.4 percent of men and 2.9 percent of women in our sample have a gap between wage observations of more than one year, see Supplementary Table S3). To avoid discarding this information we follow Manning and Swaffield (2008) and include the length of the gap between observations as a control in our models). Throughout, the coefficients on job mobility and other characteristics should therefore be interpreted as estimates of their association with annual wage growth.

Explanatory variables

The explanatory variables we include as controls are age, education (6 categories: degree; other higher degree; A-level etc; GCSE etc; other qualification; no qualification), self-reported health status (0/1), carer status (0/1 define), cohort (3 categories: born 1953-1969; born 1970-1982; born 1983-1999), region and year fixed effects. We condition on the individual's labour market history, for which we include a quadratic in number of months spent in employment, number of months spent in unemployment, number of months spent in inactivity, number of months spent on parental leave and a dummy indicating that the respondent experienced an unemployment spell since the last interview. This retrospective information comes from the UKHLS data files on individuals' work-life histories, which collected survey data on individuals' prior labour market experience from leaving school until the year they entered the survey. We used the Working Life Histories dataset, produced by Wright (2020), which contains a sequence of main economic activity spells with start and end dates, to construct variables capturing the lifetime history of employment, unemployment and inactivity. Finally, we control for prior job characteristics (dummy for part-time employment, firm size logged and employment in public sector) in our specifications. Prior job characteristics may be the result of previous job moves, and as such endogenous to mobility returns. We include them

here partly because we wish to take a conservative approach when estimating returns to mobility and partly because endogeneity is less likely to be an issue when examining annual, rather than long-term, wage growth. To assess the robustness of our findings, we have also estimated the same specifications excluding job characteristics, but we find results (available from the authors) are unchanged.

Methods

We first document gender differences in within and between employer job mobility, as well as differences in work/career and family motivated mobility, distinguishing between parents with dependent children aged less than 16 and other workers. We calculate raw and adjusted mobility rates by age, with the latter being estimated using the following logit model:

$$\log\left(\frac{p_{it}}{1-p_{it}}\right) = \alpha + \sum_{k} \beta_k F_i * P_{it} * A_{it} + \gamma X_{it-s} + \delta Z_{it-s} + \varphi W_{it-s} + \rho Gap_{it,t-s} + \varepsilon_{it}$$

where p_{it} is the probability of observing a job/employer move for individual i in year t, F is a female dummy, P is a parent dummy, A is age, X_{it-s} is a vector of demographic characteristics, including education, self-reported health status, carer status, cohort, region, and year fixed effects. Z_{it-s} is a vector of variables capturing labour market history, described above, W_{it-s} is a vector of lagged job characteristics, and $Gap_{it,t-s}$ is the number of years between two consecutive interviews. The summary statistics are reported in Supplementary material, Table S4. We use a fully saturated model, with the effect of parenthood allowed to vary across gender and age. The effects are captured by the set of coefficients β_k. Given the non-linear nature of the model and the presence of multiple interaction terms, we present predicted probabilities rather than coefficients.

To assess differences in annual wage growth between job movers and stayers, we estimate a series of wage growth equations. The specification for wage growth is similar to that

of Del Bono and Vuri (2011) and Manning and Swaffield (2008) and is estimated by pooling the individual-year observations of male and female workers during the period of 2010-2019 in following form:

$$\Delta W_{it,t-s} = \alpha + \sum_{k} \beta_k M_{it} F_i P_{it-s} A_{it} + \gamma X_{it-s} + \delta Z_{it-s} + \varphi W_{it-s} + \rho Gap_{it,t-s} + \varepsilon_{it}$$

$\Delta W_{it,t-s}$ is the change in real hourly wages between year t and the most recent previous interview $t-s$, M_{it} is a mobility dummy, F_i is a female dummy, A_{it} is age and X_{it-s}, Z_{it-s} and W_{it-s} are vectors of demographic, labour market history and job characteristics defined as above. As before, models are saturated. Two specifications are estimated: one in which we include within and between employer mobility and a second one where we separately include work related and family motivated employer mobility.

Because workers only move if they have a reason to, the job moves we observed are not random. If personal characteristics that are more likely to make a person mobile (for example, career orientation) are also associated with wages, a spurious correlation between job mobility and wage growth might emerge. If selection into mobility affects men and women, and parents and individuals without children differently, this could potentially bias our results. To guard against this possibility, we carry out two robustness checks. First, we test the sensitivity of our results to selection into mobility by re-estimating our wage growth equations on a restricted sample of movers only. This approach exploits variation in the timing of mobility only and eliminates any common time invariant propensity to move jobs. Second, we estimate a more stringent specification that includes individual fixed effects. This eliminates any time-invariant individual unobserved heterogeneity.

In the final part of our analysis, we quantify the contribution of job mobility to differences in wage growth rates for mothers and other workers using the decomposition method proposed by Gelbach (2016). The importance of a covariate has traditionally been measured by estimating regression models with and without the covariate. This approach

however is sensitive to the order in which covariates are introduced. Gelbach (2016) proposed a new method that takes into account correlations between covariates and is invariant to the order in which covariates are added to increase explanatory power. We follow the Gelbach method and estimate two wage growth models. The 'base' model contains age (and its square), year and region fixed effects, the number of gap years and a dummy for motherhood interacted with age. The 'full' model adds all the controls used in our main specification, including the job mobility indicators. Decomposition results show what part of the lower wage growth experienced by mothers is explained by the job mobility variables.

RESULTS

Gender differences in mobility patterns

We start by providing descriptive evidence on gender differences in within and between employer mobility rates, by age and parenthood status (Table 1). There is substantial mobility in our data. On average over the observed period, 13% of employees change jobs in a year, with around two thirds moving between employers. Over 60% of between employer moves are work related moves with family related moves representing fewer than 20% of all employer changes. The remaining moves include involuntary job changes (redundancies, dismissals, end of contracts), retirement, changes for health reasons, moving area and others. As expected, mobility declines with age. The table also shows that – on average – mothers make fewer internal and external job moves, and when they do move jobs are more likely to do so for family related reasons.

To gain a better understanding of variations in mobility rates, we ran logit models controlling for demographics characteristics, previous labour market history and lagged job attributes, as described above. We also ran models without controlling for job characteristics and obtained substantially similar results (available from the authors). Figures 1.1 to 1.4 show the predicted probability of experiencing each type of mobility by sex, parenthood status, and

- because rates of job mobility vary substantially with age - by age (model coefficients are reported in Supplementary Table S5). We find fatherhood has little or no impact on mobility rates. Within employer, between employer and between employer work related job mobility rates are virtually identical for men with and without children. Compared to men without children, fathers are slightly more likely to change employers for family related reasons at younger ages, but the differences are not statistically significant at the 95% level (as seen by the overlapping confidence interval plots).

Table 1: Annual probability of job changes by sex and parenthood status

	Men with children	Men without children	All men	Women with children	Women without children	All women
All job changes	13.3%	14.6%	14.0%	12.4%	14.6%	13.6%
	0.2%	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.1%*
Within employer job changes	4.3%	3.8%	4.0%	3.9%	4.4%	4.2%
	0.1%	*0.1%*	*0.1%*	*0.1%*	*0.1%*	*0.1%*
Employer changes, incl.	9.0%	10.8%	9.9%	8.5%	10.2%	9.4%
	0.2%	*0.2%*	*0.1%*	*0.2%*	*0.2%*	*0.1%*
for work reasons	5.6%	6.7%	6.2%	4.4%	6.1%	5.3%
	0.2%	*0.2%*	*0.1%*	*0.1%*	*0.1%*	*0.1%*
for family reasons	1.1%	0.9%	1.0%	2.0%	1.4%	1.7%
	0.1%	*0.1%*	*0.0%*	*0.1%*	*0.1%*	*0.1%*
for other reasons	2.3%	3.1%	2.7%	2.1%	2.7%	2.4%
	0.1%	*0.1%*	*0.1%*	*0.1%*	*0.1%*	*0.1%*

Notes: Population aged 22-55 years; N=105,007 person-year observations. Standard errors are shown in italics below each number.

Work related reasons include the following: when answering the question about the reasons for the most recent job change, the respondent selected options "being promoted", "left for better job", "more money", or when answering the question about the attractiveness of the current job, the respondent selected options "better money", "better career prospects", "more responsibility".

Family related reasons include the following: when answering the question about the reasons for the most recent job change, the respondent selected options "left to have baby", "look after family", "look after other person", or when answering the question about the attractiveness of the current job, the respondent selected options "nearer home/less travel", "shorter/fewer hours", "more flexible hours", "less demanding/easier".

Figure 1: Annual (adjusted) proportion of workers experiencing different types of job mobility, by sex and parenthood status

Figure 1.1: Within employer

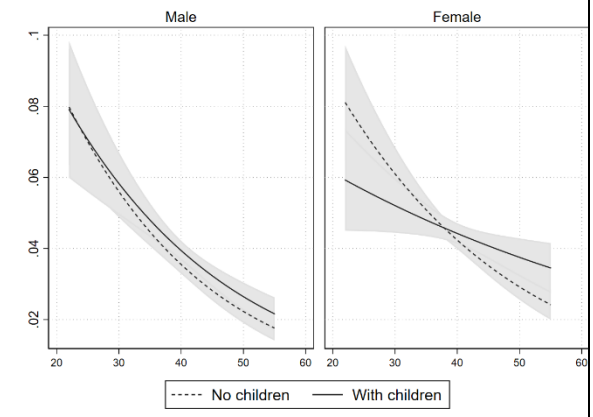


Figure 1.2: Between employer

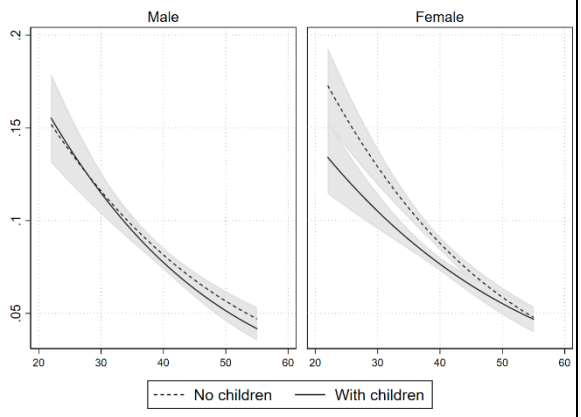


Figure 1.3: Employer changes for work reasons

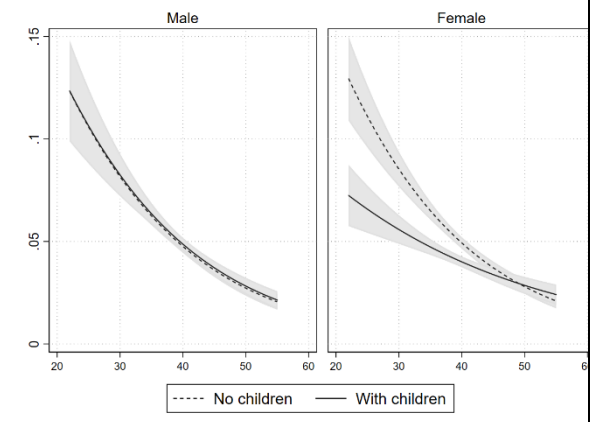
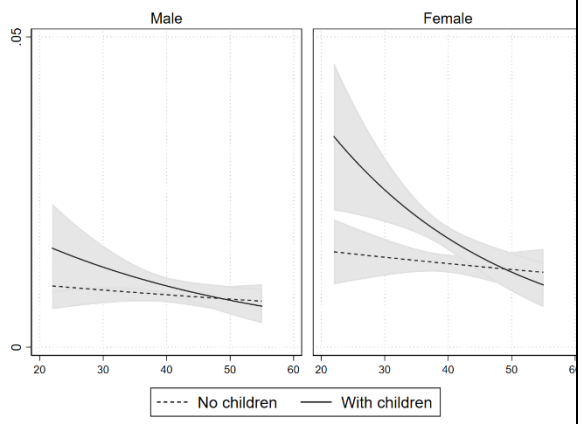


Figure 1.4: Employer changes for family reasons



Source: Authors' calculations based on UKHLS, Waves 1-10

Note: The underlying models are presented in Supplementary material, Table S5.

In contrast to fatherhood, motherhood is associated with lower rates of mobility. Compared to women without children, mothers' rates of job mobility vary less with age (seen by the flatter profiles in the figures 1.1-1.4). Mothers are about 1 percentage point (p.p.) less

likely to change jobs with the same employer when they are under 35 and around 1 p.p. more likely to do so at older ages. However, these differences are not statistically significant at the 95% level. Motherhood also affects between employer mobility, with mothers around 0.5 to 1p.p less likely to change employers at all ages, with the difference being statistically significant in the middle of the age interval.

The largest effects of motherhood are observed for work related and family related between moves (Figures 1.3 and 1.4). Mothers in their early twenties are approximately 5pp, or around a third, less likely to change jobs for work related reasons than men or women without children. While this difference falls with age, it remains statistically significant until approximately age 45. We also find that mothers are more likely to switch employers for family related reasons. Again, the biggest differences are found at younger ages with mothers in their early twenties around twice as likely to move employers for family related reasons as women without children and these differences decline with age.

Gender specific returns to job mobility

Figure 2 compares wage returns to different types of job mobility for men and women with a and without children. Estimates are based on the models described above (the full set of coefficients from the models presented in Supplementary Table S6). It should be noted that the same models without controlling for job characteristics yielded similar results (available from the authors). The first panel, figure 2.1, shows wage gains associated with moving jobs with the same employer by age. Contrary to expectations, we find no evidence of heterogeneity in returns to job mobility with the same employer by gender or parenthood status. For those in their twenties and early thirties changing jobs with the same employer is associated with average wage increases of 6 to 8 percent (0.06 to 0.08 log points), with wages growing twice as fast as for those who do not change jobs. Comparing wage changes associated with moves between employers and within employer moves, wage growth is typically slightly higher for

within employer movers and for those without children although, for older workers, the picture is more mixed. For all moves, returns to job mobility decline with age, becoming negative for between employer movers for men and childless women by around age of 50. However, as discussed before, we expect returns to employer moves to be heterogeneous and dependent on the reason for moving.

Figure 2.2 shows the estimated returns to moves for work- and family-related reasons. Individuals who change jobs for work related reasons see between 5 and 8 p.p. extra wage growth, or wage growth which is around three times greater than that for individuals who do not move jobs. We also find that fathers' benefit less from work related job moves, while for women returns are similar for those with and without children. Finally, it is notable that wage growth is greater at younger ages, particularly for women (although wage growth is positive at all ages). In contrast, for all workers, family related mobility is associated with reduced wage growth with wage growth 3 to 10 p.p. lower than for those who stay in the same job.

To sum up, we find significant positive returns to within employer job mobility and to between employer job moves for work-related reasons. The wage growth associated with external job moves brings considerably greater wage returns to internal moves, particularly when workers are young. On the other hand, moving employers for family related reasons is linked to considerably lower wage growth. Generally, we find similar wage returns by gender and parenthood status, although fathers who move for work-related reasons have slightly lower wage returns and men without children appear to incur slightly larger penalties when moving for family related reasons later in life. We do not find any evidence of differential wage growth by sex or parenthood status among those who do not move jobs.

Figure 2: Predicted wage gains associated with different types of job mobility, by sex and parenthood status

Figure 2.1: Within and between employer changes

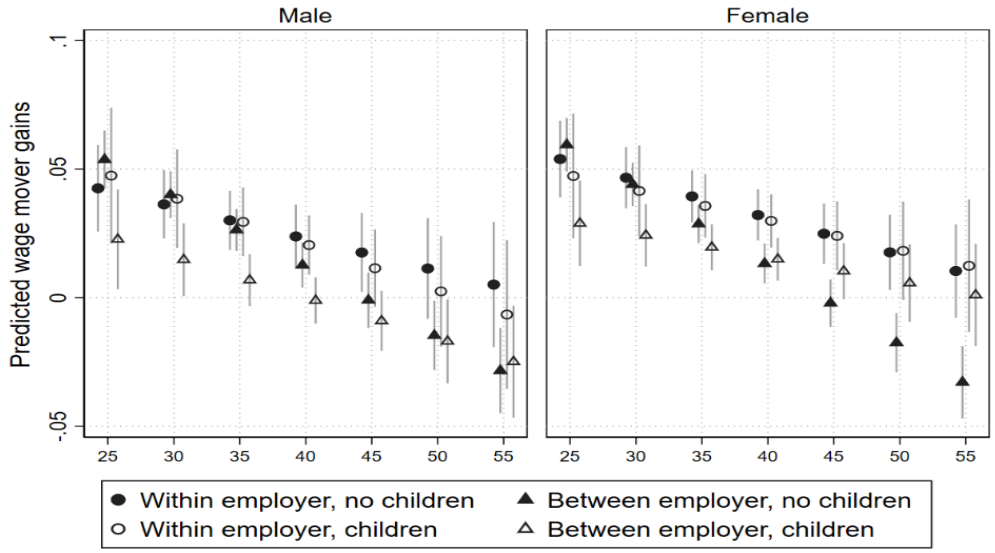
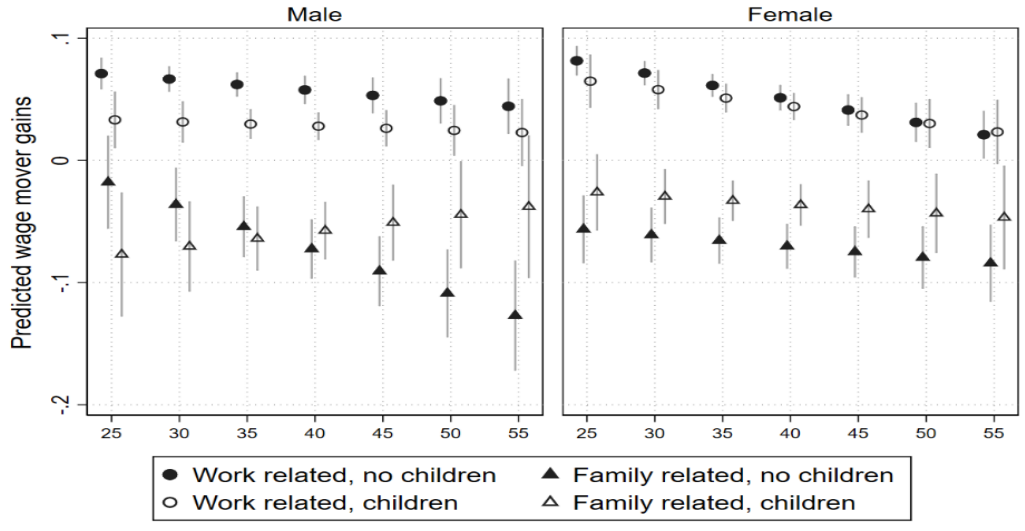


Figure 2.2: Work and family job changes



Source: Authors' calculations based on UKHLS, Waves 1-10

Note: The underlying models are presented in Supplementary material, Table S6.

Robustness tests

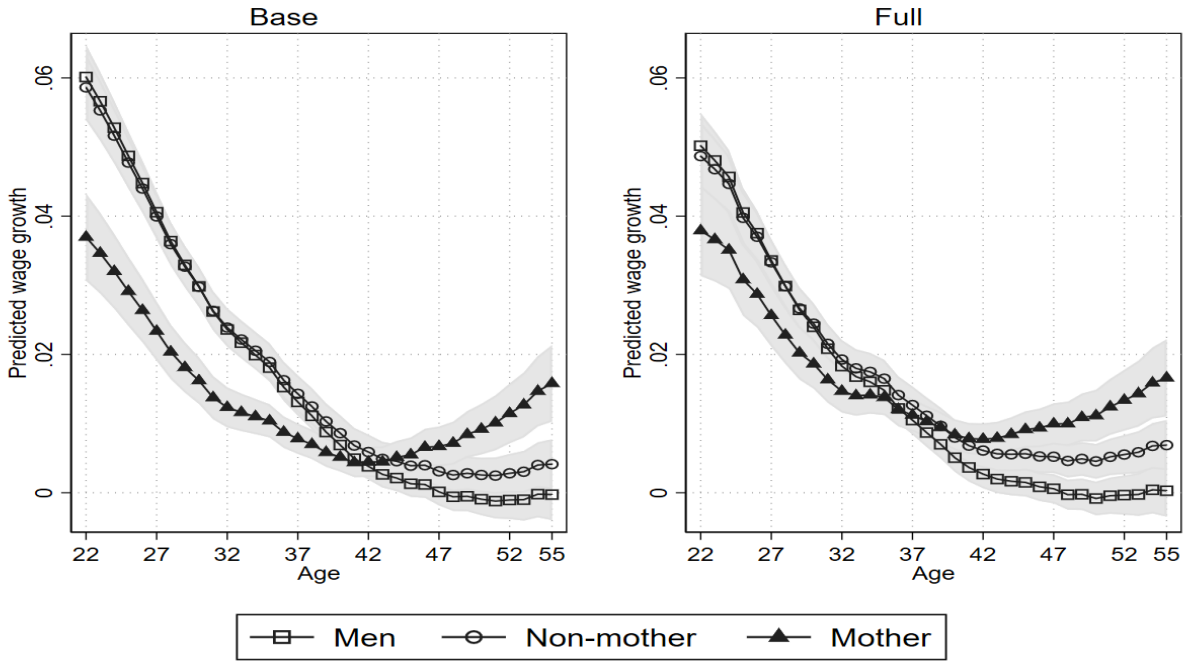
Results for wage returns to mobility may be vulnerable to selection bias if individuals who change jobs/employers are systematically different from those who do not, and these differences are not captured by our covariates. To address this concern, we perform two robustness tests. First, we re-estimate wage returns to all types of mobility using a sample restricted to only mobile workers. For each type of mobility, we restrict the sample to workers who have experienced that type of mobility at least once in our window of observation. By focusing on movers, we remove any time-invariant unobserved differences between movers and stayers that are correlated with the mobility decision. A second robustness test includes individual fixed effects which remove time-invariant individual unobserved heterogeneity. Results from both models are similar to the estimates previously presented (see Supplementary Table S7), substantively and in terms of effect sizes.

To test the reliability of our job mobility measures, and returns to them, we examine an alternative measure of career progression based on the occupational prestige scale. This is based on the widely used Standard International Occupational Prestige Scale (SIOPS) of Ganzeboom and Treiman (1996) which reflects the authority, skill, and capital control of an occupation. We create a dummy variable which takes the value of 1 if an individual attains at least a 5% increase in occupational prestige between year t and t-s and 0 otherwise. In line with our previous findings, using this measure we find upward occupational mobility rates to be approximately 30% lower for mothers than women without children, but no difference in the occupational mobility by parenthood status for men (Supplementary Figure S1 and S2). As before, we also find higher wage growth as a result of upward occupational mobility for men under 45 without children than for fathers of the same age while, for women who do upgrade, the difference in wage gains between those with and without children is small and declines with women's age (Supplementary Figure S3).

How much does mobility explain mothers' lower wage growth?

To understand the importance of job mobility as an explanation for the lower wage growth of mothers, we use the decomposition method suggested by Gelbach (2016). Because our previous analysis has shown there is little difference in mobility patterns between men with and without children, and for simplicity, we only distinguish between mothers (of children younger than 16), women without children and men.

Figure 3: Predicted wage growth for men, women without children and mothers by age



Source: Authors' calculations based on UKHLS, Waves 1-10

Figure 3 shows predicted wage growth curves for these three groups. The left panel ('Base') shows predicted wage growth controlling only for age, and year and region fixed effects. As expected, mothers experience considerably lower wage growth compared to men and women

without children until aged in their 40s. Among women in their twenties and early thirties, wage growth is approximately 2 percentage points lower than for men or women without children. From age 45, mothers' growth exceeds that of childless women, suggesting some catch up. It is notable, too, that rates of wage growth for men and childless women are almost identical, reinforcing the notion that caring for children is now the most important reason for the gender pay gap (Andrew et al., 2021).

Table 2: Gelbach decomposition results

	Gap -'Base'	Gap 'Full'	Explained by mobility	As a share of 'Base' gap
Age 25	-0.017	-0.014	-0.004	22.39
Age 30	-0.012	-0.010	-0.003	24.25
Age 35	-0.007	-0.006	-0.002	28.73
Age 40	-0.002	0.002	-0.001	54.03

Note: gaps are calculated relative to men with similar characteristics
Source: Authors calculations based on UKHLS, Waves 1-10.

The right panel (called 'Full') shows the same predicted wage growth but now additionally controlling for education, health status, labour market history, prior job characteristics and job mobility. Adding these controls eliminates approx. 43% of the observed wage growth gap for mothers at age 25 and reverses the sign of the gap at age 40. Using the Gelbach method, we find that differences in within employer, work-related, family-related mobility explain approximately 22% (or about half of the additionally explained variance) of mothers' lower wage growth relative to men at age at age 25 and approximately 55% at age 40 (See Table 2). The overall gap in wage growth between mothers and men falls with age, whereas the share of this gap explained by differential mobility patterns increases.

Differences in wage growth accumulate over time. A woman having a child at age 25 can expect to earn 0.15 log points or 14% less by age 40 compared to a man. About 26% of this difference is generated by lower wage growth due to differential job mobility patterns. A parallel decomposition exercise examining wage growth differences by years since first birth instead of age yielded substantially similar results (results available from the authors).

DISCUSSION

Despite significant progress over the last half of century, women's wages remain lower than those of men, with differences being particularly large for mothers (Sigle-Rushton and Waldfogel, 2007, Harkness and Waldfogel, 2003, Budig et al., 2012). The lower earnings of mothers have been attributed to a number of causes, including reduced labour market experience as a result of time out of the labor force or working part-time (Blundell et al., 2016); losses in job specific human capital when women do not return to the same job after maternity (Waldfogel, 1998); and occupational choices, which tend to favor jobs with family friendly working conditions (England, 2005, Fuller, 2017, Fuller and Hirsh, 2019). Other studies, which take a more dynamic perspective, emphasise the role of reduced training and promotion opportunities shifting women onto the 'mommy track' after childbirth (Wilde et al., 2010). We explored a further, important mechanism behind the motherhood wage penalty, the effect of motherhood on job mobility, within and between employers, and wage growth. We find that, while rates of job mobility are similar for mothers and other workers, there are significant differences in the types of job moves that mothers and other workers make. We calculate that these differences account for between 22 and 55% of the difference in wage growth between women with children and men and can account for 26%. of the widening of the wage gap between mothers and men by age 40.

We started by examining overall rates of job mobility. While we predicted that mothers would make fewer external moves than other workers, our findings show that, in fact, the share

of workers moving employers were similar. As expected, we found that mothers were up to 30% less likely to change employers for work/career related, and twice as likely to change jobs for family reasons, as childless women, or men. Having fewer external, career-related opportunities was expected to reduce mothers' ability to negotiate promotions with their employer and reduce internal job moves. We find that this is indeed the case, with mothers less likely to make internal job moves. While few studies have used UK data to examine the influence of parenthood on job mobility, our findings are in line with prior research for the UK, which found few gender differences in job mobility (Manning and Robinson, 2004, Manning and Swaffield, 2008, Booth and Francesconi, 2000). Studies using US data suggest a similar picture, with women are more likely to switch to part-time jobs or/and to switch jobs for family reasons than men (Felmlee, 1984, Keith and McWilliams, 1999). Looking specifically at mothers, Looze (2014, 2017) shows that having children reduces the probability of women making wage enhancing job moves and raises the chances of moving for family related reasons.

Women may not only have lower mobility levels, but they may also experience lower levels of wage growth when they do change jobs/ employers. Prior studies, using data for North America, find returns to job mobility to be lower for women than men (Loprest, 1992, Keith and McWilliams, 1999, Pearlman, 2018, Fuller, 2008) with similar patterns found in Germany (Wieschke, 2020), Spain (Hospido, 2009) and Italy (Del Bono and Vuri, 2011). Differences in types of mobility contributed to these differences, with women more likely to switch from full-time to part-time jobs and to have family related separations, to search less before changing jobs, and less likely to move into better paid occupations.

Extending this analysis to mothers, we also find that average returns to mobility are lower for mothers than other workers. However, this is driven by differences in the types of job mobility that mothers and other workers experience as job moves motivated by work or career reasons have very different returns to moves made for family reasons. Consistent with

both job matching and monopsony models, we find that changing employers for work/career related reasons is associated with significant wage returns. For these workers, wage growth is up to three times faster than that for those who do not change jobs. Moving job with the same employer is also associated with greater wage growth, but at a lower rate than for external, career-related moves. In contrast, family motivated mobility has negative returns. We do not, however, find that - among those who change jobs – wage growth systematically differs between men and women or those with and without children. Thus, it is differences in the types of mobility experienced rather than returns to that mobility that contribute to the lower rate of wage growth of mothers compared to other workers in the years after children born. These findings are similar to those of Keith and McWilliams (1999) in the US and Wieschke (2020) in Germany, who report that mothers are more likely to switch jobs for family related reasons and experience lower wage growth in response.

Overall, the findings on differences in the rates at which mothers moves jobs with the same employer indicate that mothers may face direct or indirect discrimination in the workplace, with employers overlooking mothers for promotion. Moreover, the processes by which internal moves are frequently negotiated on the basis of external offers, more than likely disadvantage women with children. It is likely that both supply and demand side factors play a role in limiting job moves made for career-related reasons, with childcare constraints on the one hand limiting women's desire to move jobs while employer discrimination may limit the job choices available to them.

As jobs have become increasingly insecure and internal job ladders have shrunk, moving jobs has become an increasingly important mechanism for building young peoples' careers (Kronberg, 2013). For mothers, constrained job opportunities make progression harder, with fewer making 'good' (or wage enhancing) job moves and more making moves for family related reasons that are often accompanied by lower wages. We examined how differences in

mobility, and returns to mobility, contributed to the gap in wage growth between mothers and other workers. We find that these differences can explain up to 55% of the lower wage growth of mothers. For a woman who had a first child at age 25, cumulative lower wage growth leads to hourly wages that are 14% lower than those of a similar man at age 40. Around a quarter of this difference is explained by differential job mobility Prior studies found, for the most part, differences in job mobility made a relatively small contribution to the wage gap among young workers because differences in mobility were small (Manning and Swaffield, 2008). However, they considered only the first 10 years of young peoples' career and did not look specifically at parents, for whom differences in mobility are likely to be larger.

Overall, our findings paint a picture of family related responsibilities significantly constraining the labour market choices of women. In turn, these constraints are reflected in lower wage growth. We do not find evidence of direct blanket employer discriminations. Mothers who change jobs for work/career related reasons reap the full wage rewards associated with these types of job moves. However, the negative wage returns associated with family motivated employer changes suggest that employers may be able to take advantage of women's constrained choices. Our findings are consistent with a monopsonistic labour market competition model where employers exploit mother's preferences for non-wage job attributes by paying them lower wages.

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Supplementary Material

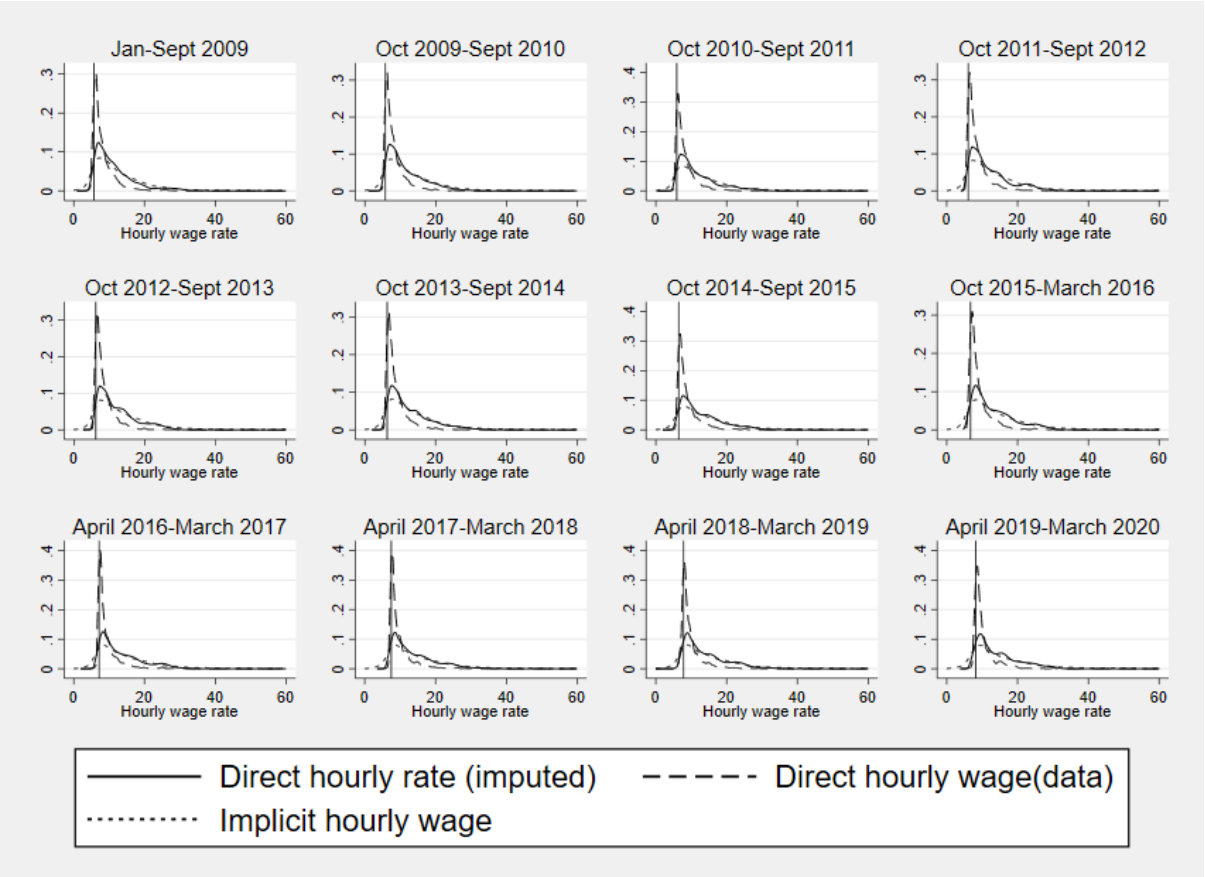
Appendix 1: Hourly Wage Imputation in UKHLS

Average hourly earnings are not directly available in the UKHLS, except for a subsample of respondents who are paid by the hour. We thus use an imputation procedure to derive an hourly pay measure for the remainder of the sample.

For all workers in our sample, we have information about the usual monthly pay and the usual hours worked. We use these data to construct a derived measure which we term the '**implicit**' hourly wage. For cases where the usual monthly pay is missing, we use the total individual gross labour income measure, imputed by the UKHLS team. Both pay and hours measures include overtime work. The exclusion of reported overtime paid hours makes little difference. We have capped our measure of total weekly hours at 80 before computing our measure of *implicit* hourly pay. Finally, to avoid estimates being affected by implausibly large values, we have capped the implicit hourly pay measure at the largest observed direct measure. While convenient and easy to calculate, it is well known that implicit hourly pay measures derived from survey data suffer from division bias resulting in some implausibly small values and an overestimation of the proportion of low paid workers (Stewart and Swaffield, 2002b, Skinner et al., 2002a).

We adapt an imputation procedure developed by Skinner, Stuttard et. al. (2002a). The procedure assigns an imputed value to observations missing the direct hourly pay measure by matching them to a *donor* observation with a valid non-missing value. In the first step, we regress the direct measure of hourly pay on the implicit measure and other individual and job characteristics: gender, age (quadratic), qualifications (6 categories), region, marital status, the number of children aged under 5, occupation (3-digit SOC codes), industry (2 digit SIC codes), firm size, public sector, part-time employment and year. We then use this regression to predict hourly wages for all individuals in our sample of interest (employed men aged 25-64 and employed women aged 25-59) who have non-missing values for the predictor variables. Next, we use the predicted hourly wage to match observations missing direct hourly pay to a donor observation whose direct hourly wage is observed. Donors are selected randomly from the ten nearest '*neighbours.*' A neighbour is defined as an observation with a value of the predicted hourly wage within +/- 50p of the target's predicted hourly wage. For each observation that we wish to impute a value for, we first select the ten neighbours whose predicted hourly wage is closest to the target observation's predicted hourly wage (if they exist) and then randomly choose one among the 10 (or less if ten neighbours do not exist) and assign its value to the missing observation. To avoid outliers affecting our results, we exclude donors whose residuals (calculated as the difference between the observed and predicted hourly rate) lie in the top and bottom 1 % of the distribution. To reduce variance inflation, we follow Skinner, Stuttard et. al. (2002a) and repeat the imputation 20 times. Our final imputed values are the means of the twenty imputations. We carry out the imputation separately for each year (note that a year usually straddles two waves in the UKHLS data). Figure A1 below shows

the distribution of implicit, direct, and imputed measures of hourly wages. Compared to the implicit measure, the imputed hourly pay distribution is less smooth and exhibits stronger bunching around the minimum wage.



Appendix 2: Summary statistics and regression coefficients

Table S3: Number of gaps between wage observations

	Men		Women	
	N	Percentage	N	Percentage
1	44,764	96.6	56,955	97.1
2	1,073	2.3	1,214	2.1
3+	520	1.1	481	0.8
Total	46,357	100.0	58,650	100.0

Notes: Population aged 22-55 years; N=105,007 person-year observations

A one-year gap means that wages are observed annually, a 2 year gap implies that there is a 2 year gap between wage observations (either due to non-employment or missing information), and so on.

Table S4: Summary statistics of variables used in regressions

Variables	Mean		Gender gap
	Men	Women	
Ln hourly wages	2.54	2.42	-0.12
Wage growth (between t and t-s)	0.01	0.01	0.00
All job changes (1/0)	0.13	0.13	0.00
Within employer job changes (1/0)	0.04	0.04	0.00
Between employer job changes (1/0)	0.09	0.09	0.00
Wage/career related job changes (1/0)	0.06	0.05	-0.01
Family related employer changes (1/0)	0.01	0.02	0.01
Education			
Degree	0.37	0.37	0.01
Other higher degree	0.12	0.15	0.03
A-level etc	0.23	0.20	-0.03
GCSE etc	0.19	0.19	0.00
Other qualification	0.06	0.05	-0.01
No qualification	0.03	0.02	0.00
Parent of a child up to 16 (1/0)	0.48	0.50	0.01
Carer for a sick, disabled or elderly person (1/0)	0.12	0.17	0.05
Age, years	40.49	40.71	0.22
Poor health (1/0)	0.20	0.24	0.03
Intervening unemployment spell (1/0)	0.01	0.02	0.01
Number of months in employment	217.89	207.04	-10.85
Number of month in unemployment	5.10	3.44	-1.66
Number of months in inactivity	1.52	19.14	17.62
Number of months in parental leave	0.02	4.22	4.20
Employment in public sector (1/0)	0.26	0.49	0.23
Firm size	5.39	5.16	-0.23
Part-time employment (1/0)	0.05	0.32	0.27
Cohort			
Born 1953-1969)	0.38	0.39	0.00
Born 1970-1982	0.41	0.40	0.00
Born 1983-1999	0.21	0.21	0.00

Notes: Population aged 22-55 years; N=105,007 person-year observations

Table S5: Probability of job changes: by gender, age and parenthood status

	Dependent variable: log(probability of a job change in year t/(1-probability of a job change in year t))							
	(1) Within employer change		(2) Between employer change		(3) Employer change for work reasons		(4) Employer change for family reasons	
VARIABLES	B	se	B	se	B	se	B	se
Age, years	-0.0484***	(0.0059)	-0.0357***	(0.0039)	-0.0532***	(0.0050)	0.0011	(0.0102)
Parent	-0.0283	(0.2304)	0.1337	(0.1586)	-0.0245	(0.1948)	1.2259**	(0.4380)
Parent x Age	0.0045	(0.0059)	-0.0049	(0.0040)	0.0009	(0.0051)	-0.0262*	(0.0111)
Female	-0.1484	(0.1627)	0.2843**	(0.1059)	0.1478	(0.1305)	0.6404*	(0.3072)
Female x Age	0.0091*	(0.0043)	-0.0054+	(0.0028)	-0.0030	(0.0037)	-0.0037	(0.0078)
Female x Parent	-0.8964**	(0.3057)	-0.6166**	(0.2087)	-1.1363***	(0.2642)	0.3903	(0.5257)
Female x Parent x Age	0.0188*	(0.0077)	0.0127*	(0.0053)	0.0220**	(0.0069)	-0.0073	(0.0134)
Cohort (Ref: born 1953-1969)								
Born 1970-1982	-0.0590	(0.0658)	-0.1081*	(0.0478)	-0.1121+	(0.0629)	0.2393*	(0.1159)
Born 1983-1999	0.0025	(0.1093)	-0.2075**	(0.0781)	-0.1852+	(0.0999)	0.2525	(0.1895)
Education (Ref: Degree)								
Other higher degree	-0.1764***	(0.0486)	-0.1131**	(0.0353)	-0.1456**	(0.0447)	0.0514	(0.0850)
A-level etc	-0.1891***	(0.0429)	-0.1836***	(0.0304)	-0.2512***	(0.0381)	-0.0494	(0.0763)
GCSE etc	-0.4032***	(0.0510)	-0.2679***	(0.0335)	-0.3624***	(0.0434)	0.0349	(0.0797)
Other qualification	-0.6454***	(0.1002)	-0.2400***	(0.0553)	-0.3554***	(0.0750)	0.0601	(0.1305)
No qualification	-1.1667***	(0.1936)	-0.5827***	(0.0882)	-0.7279***	(0.1231)	-0.1238	(0.1954)
Part-time employment	-0.4895***	(0.0511)	0.0976**	(0.0307)	0.1422***	(0.0396)	0.0303	(0.0688)
Firm size	0.1136***	(0.0069)	-0.0549***	(0.0049)	-0.0471***	(0.0062)	-0.0468***	(0.0120)
Employment in public sector	0.1797***	(0.0342)	-0.5078***	(0.0262)	-0.5582***	(0.0340)	-0.4179***	(0.0633)
Number of months in employment	0.0017**	(0.0006)	-0.0047***	(0.0004)	-0.0039***	(0.0005)	-0.0040***	(0.0009)
Number of months in employment sq.	-0.0000+	(0.0000)	0.0000***	(0.0000)	0.0000***	(0.0000)	0.0000***	(0.0000)

	Dependent variable: log(probability of a job change in year t/(1-probability of a job change in year t))							
	(1) Within employer change		(2) Between employer change		(3) Employer change for work reasons		(4) Employer change for family reasons	
VARIABLES	B	se	B	se	B	se	B	se
Number of months in unemployment	0.0011	(0.0011)	0.0030***	(0.0006)	0.0020*	(0.0009)	0.0036*	(0.0014)
Number of months in inactivity	0.0006	(0.0006)	0.0009*	(0.0004)	0.0009	(0.0005)	0.0004	(0.0008)
Constant	-1.9343***	(0.2642)	0.1655	(0.1816)	-0.0190	(0.2314)	-4.4326***	(0.4716)
Observations	105,007		105,007		105,007		105,007	

Notes: Estimates after controlling for year and region fixed effects. All controls are lagged. Standard errors in parentheses *** p<0.001, ** p<0.01, * p<0.05, + p<0.1

Table S6: Returns to job mobility: by gender, age and parenthood status

	(1) Within or between employer change		(2) Employer change for work or family reasons	
VARIABLES	B	se	B	se
Female	-0.0147*	(0.0067)	-0.0152*	(0.0067)
Parent	-0.0072	(0.0089)	-0.0083	(0.0088)
Age, years	-0.0021**	(0.0007)	-0.0022**	(0.0007)
Female x Parent	-0.0108	(0.0117)	-0.0111	(0.0117)
Female x Age	0.0004*	(0.0002)	0.0004**	(0.0002)
Parent x Age	0.0002	(0.0002)	0.0002	(0.0002)
Female x Parent x Age	0.0003	(0.0003)	0.0003	(0.0003)
Within employer job change	0.0735***	(0.0215)	0.0725***	(0.0215)
Job change x Female	0.0184	(0.0278)	0.0187	(0.0278)
Job change x Parent	0.0204	(0.0402)	0.0214	(0.0402)
Job change x Female x Parent	-0.0474	(0.0537)	-0.0472	(0.0536)
Job change x Age	-0.0013*	(0.0006)	-0.0013*	(0.0006)
Job change x Female x Age	-0.0003	(0.0007)	-0.0003	(0.0007)
Job change x Parent x Age	-0.0006	(0.0010)	-0.0006	(0.0010)
Job change x Female x Parent x Age	0.0012	(0.0014)	0.0012	(0.0014)
Employer change	0.1398***	(0.0132)		
Job change x Female	-0.0112	(0.0176)		
Job change x Parent	-0.0689*	(0.0268)		
Job change x Female x Parent	-0.0157	(0.0353)		
Job change x Age	-0.0034***	(0.0003)		
Job change x Female x Age	0.0004	(0.0005)		
Job change x Parent x Age	0.0015*	(0.0007)		
Job change x Female x Parent x Age	0.0008	(0.0009)		
Work related employer change			0.1146***	(0.0165)
Job change x Female			0.0087	(0.0220)
Job change x Parent			-0.0728*	(0.0335)
Job change x Female x Parent			0.0356	(0.0455)
Job change x Age			-0.0017***	(0.0005)
Job change x Female x Age			-0.0002	(0.0006)
Job change x Parent x Age			0.0011	(0.0009)
Job change x Female x Parent x Age			-0.0003	(0.0012)
Family related employer change			0.0921*	(0.0448)
Job change x Female			-0.1144*	(0.0545)
Job change x Parent			-0.2159**	(0.0789)
Job change x Female x Parent			0.2379*	(0.0938)
Job change x Age			-0.0040***	(0.0011)
Job change x Female x Age			0.0029*	(0.0014)

Job change x Parent x Age			0.0059**	(0.0020)
Job change x Female x Parent x Age			-0.0056*	(0.0024)
Other employer change			0.0325	(0.0233)
Job change x Female			0.0311	(0.0316)
Job change x Parent			0.1095*	(0.0477)
Job change x Female x Parent			-0.1586*	(0.0622)
Job change x Age			-0.0020***	(0.0006)
Job change x Female x Age			-0.0004	(0.0008)
Job change x Parent x Age			-0.0023+	(0.0012)
Job change x Female x Parent x Age			0.0041**	(0.0016)
Education (Ref: Degree)				
Other higher degree	-0.0020	(0.0017)	-0.0017	(0.0017)
A-level etc	-0.0042**	(0.0015)	-0.0038*	(0.0015)
GCSE etc	-0.0069***	(0.0016)	-0.0064***	(0.0016)
Other qualification	-0.0034	(0.0025)	-0.0028	(0.0025)
No qualification	-0.0062+	(0.0035)	-0.0056	(0.0035)
Carer for a sick, disabled or elderly person	-0.0001	-0.0001	-0.0001	-0.0001
Age squared, years	0.0000	0.0000	0.0000	0.0000
Poor health	0.0026*	0.0026*	0.0026*	0.0026*
Intervening unemployment spell	-0.0178***	(0.0043)	-0.0077+	(0.0044)
Number of months in employment	-0.0001***	(0.0000)	-0.0001***	(0.0000)
Number of months in employment sq.	0.0000***	(0.0000)	0.0000***	(0.0000)
Number of months in unemployment	0.0000	(0.0000)	0.0000	(0.0000)
Number of months in inactivity	0.0001***	(0.0000)	0.0001***	(0.0000)
Number of months in parental leave	0.0000	(0.0000)	0.0000	(0.0000)
Part-time employment	-0.0057***	(0.0015)	-0.0058***	(0.0015)
Employment in public sector	-0.0122***	(0.0012)	-0.0119***	(0.0012)
Firm size	-0.0010***	(0.0002)	-0.0010***	(0.0002)
Gap between wage observations	0.0129***	(0.0016)	0.0131***	(0.0016)
Constant	0.0593***	(0.0136)	0.0617***	(0.0136)
Observations	105,007		105,007	
R-squared	0.0222		0.0259	

Notes: Estimates after controlling for year and region fixed effects. All controls are lagged. Standard errors in parentheses *** p<0.001, ** p<0.01, * p<0.05, + p<0.1.

"Other employer change" is all the remaining employer changes apart from work and family related employer changes.

Appendix 3: Robustness tests

While we control for a large number of demographics, work history and job-related characteristics, our results could still be vulnerable to bias from selection effects. If individuals who change jobs/employers are systematically different from those who do not and these differences are not captured by our covariates, unobserved heterogeneity could be driving our results. To address these concerns, we perform two robustness tests.

First, we re-estimate wage returns to all types of mobility using a restricted sample that includes mobile workers only. For each type of mobility, we restrict the sample to workers who have experienced that type of mobility at least once in our window of observation. Focusing on movers removes any time-invariant unobserved differences between movers and stayers that are correlated with the mobility decision. Instead, the estimates exploit only differences in the timing of mobility among movers. In a second specification, we include individual fixed effects, which remove any time invariant individual unobserved heterogeneity.

Table S7 shows our main estimates, estimates form the movers sample only, and estimates from the fixed effects specification. All three types of models yield very similar results, not only substantively but also with respect to effect sizes. We conclude that our main results are unlikely to be affected by bias stemming from selection into mobility.

Table S7: Annual average wage returns to job and employer mobility, by specification

		Main specification		Movers sample		Individual FE	
		B	se	B	se	B	se
Job mobility	Men	0.0082**	(0.0025)	0.0077**	(0.0029)	0.0138***	(0.0031)
	Women	0.0165***	(0.0022)	0.0165***	(0.0026)	0.0227***	(0.0028)
Within employer mobility	Men	0.0201***	(0.0043)	0.0239***	(0.0046)	0.0242***	(0.0050)
	Women	0.0278***	(0.0037)	0.0323***	(0.0041)	0.0285***	(0.0044)
Between employer mobility	Men	-0.0008	(0.0030)	0.0042	(0.0034)	0.0084*	(0.0037)
	Women	0.0096***	(0.0027)	0.0139***	(0.0031)	0.0195***	(0.0033)
Work related employer mobility	Men	0.0335***	(0.0039)	0.0367***	(0.0044)	0.0479***	(0.0046)
	Women	0.0444***	(0.0038)	0.0502***	(0.0042)	0.0562***	(0.0044)
Family related employer mobility	Men	-0.0562***	(0.0085)	-0.0499***	(0.0094)	-0.0746***	(0.0103)
	Women	-0.0482***	(0.0061)	-0.0441***	(0.0067)	-0.0517***	(0.0073)
Upward occupational mobility	Men	0.0933***	(0.0038)	0.1014***	(0.0044)	0.1092***	(0.0043)
	Women	0.1270***	(0.0034)	0.1372***	(0.0040)	0.1471***	(0.0039)

Notes: Estimates after controlling for all variables listed in Table 7 and year and region fixed effects. Standard errors in parentheses *** p<0.001, ** p<0.01, * p<0.05, + p<0.1

Appendix 4: Results for upward occupational mobility

An alternative method of measuring career progression is provided by the literature on occupational mobility. In these studies occupational mobility is approximated by changes in individual's scores on occupational scales which provide a vertical ranking of all occupations (Bukodi et al., 2011). For instance, Bukodi et al. (2012) compared the occupational mobility of men and women in the UK across three different birth cohorts - 1946, 1958 and 1970. They find men reached higher levels of attainment than women in each cohort, but the divide has narrowed over time. Women's part-time work is an important explanation of the remaining gender differences in occupational attainment. Among the cohort born in the 1970s, women who had never worked part-time reached career levels very similar to men.

We tested the reliability of our job mobility measures by comparing our results to one of the measures of upward occupational mobility. Upward occupational mobility is a dummy variable that takes a value of 1 if an individual attains at least a 5% increase in occupational prestige between year t and t-s. The prestige scale is measured based on the widely used Standard International Occupational Prestige Scale (SIOPS) of Ganzeboom and Treiman (1996), which reflects the authority, skill, and capital control of an occupation. The standard three-digit occupational classification ISCO-88 available in UKLHS was mapped into the SIOPS which ranges from 1 to 100.

Figure S1: Annual proportion of workers experiencing upward occupational mobility, by sex, age and parenthood status

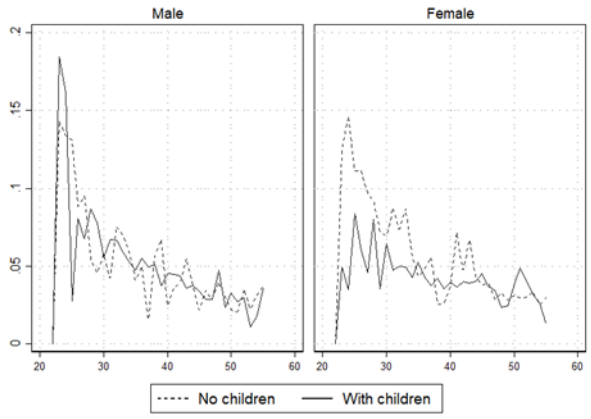


Figure S2: Annual (adjusted) proportion of workers experiencing upward occupational mobility, by sex, age and parenthood status

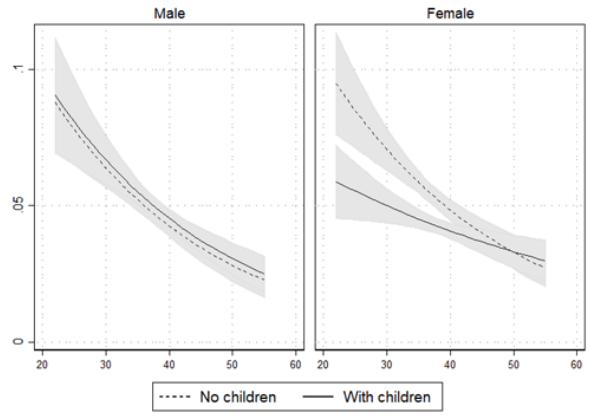


Figure S3: Predicted wage gains associated with upward occupational mobility, by sex, age and parenthood status