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2016:6

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Labour Market and
Discrimination Studies

The Gender Gap in Early Career Wage Growth: The role of children, job and occupational mobility*

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January, 2016

(Job market paper)

Abstract

During the first ten years in the labor market, male university graduates experience a faster wage growth than their female counterparts in the Swedish labor market. This paper investigates the role of job mobility and upward occupational mobility in explaining the gender gap in early career wage growth. The analysis reveals that, although job and occupational mobility significantly contributes to the early career wage growth of both males and females, the size of the wage growth effect of both types of mobility are significantly lower for females. This female mobility penalty persists even after accounting for gender differences in observable individual and job characteristics as well as unobserved individual specific heterogeneity. We further investigate to what extent this mobility penalty of women is explained by parental status. We find that women's penalty in returns to upward occupational mobility is largely linked to the timing of childbirth and child care, which suggests the presence of a trade-off between work and family. But women's penalty in returns to "voluntary" job mobility does not seem to be mainly associated with parental status, in which a sizable gender gap in return to "voluntary" job mobility is found among the childless as well as parents.

Key words: Gender wage gap, wage growth, job mobility, occupational mobility and children

* The author gratefully acknowledges the valuable comments given by seminar participants at the department of economic and statistics, Linnaeus University. The author thanks the Institute for Labour Market and Education Policy Evaluation (IFAU) for providing the data needed for this study. All remaining errors are the author's own responsibility.

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1. Introduction

Despite the declining gender wage gap over the past few decades, females still earn less than males in most countries (OECD, 2016). This finding is in stark contrast with the tremendous success many countries have had in closing the gender gap in educational attainment, high female labor force participation and the legislative effort to guarantee equal pay for equal value of work. In an attempt to understand the persistent gender wage gap, recent advances in the literature analyze the dynamics of gender wage gap over one's life cycle. These studies often find that, although the male-female wage gap is relatively small upon labor market entry, a considerable gender wage gap arises during the first few years after labor market entry (Loprest, 1992; Manning and Swaffield, 2008; Napari, 2009; Del Bono and Vuri, 2011; and Bertrand et al., 2010). Sweden, the focus in this study, is no exception, considering the early career dynamics of the gender wage gap, in which a sizable gender wage gap emerges during the first few years in the labor market. Given that early career wage growth constitutes a considerable part of the lifetime wage growth, explanation for the gender differential wage growth during professionals' early careers is important to understand the overall gender wage gap (Loprest, 1992). This paper seek explanations as to why Swedish young female university graduates lag behind their male counterpart in terms of wage growth during the first 10 years after labor market entry.

Traditionally, researchers have focused on human capital explanations based on *unequal division* of labor in the household as the main underlying mechanism. It is argued that women with children are more likely to have intermittent labor market attachment, work few working hours, are likely to have depreciation of acquired skill and are assumed to exert less effort in the work place given the additional burden women have in the household (Mincer and Polachek, 1974; Becker, 1985; Bertrand et al., 2010; Angelov et al., 2016). While this line of explanations continues to be important, a number of studies also show that a sizable gender wage gap is left unexplained after accounting for the gender difference in human capital and a number of job-related factors (Blau and Kahn, 2006; Wood et al., 1993; Manning and Swaffield, 2008; Albrecht et al., 2003).

In contrast, to much of the previous literature, this paper focuses on explanations based on job shopping and occupational mobility that have rather received little attention in the literature. Job shopping theories hypothesize that job mobility (firm change) is one way through which young workers improve their firm match quality and achieve higher wage growth (Jovanovic,

1979 and Johnson, 1978). Like job mobility, upward occupational mobility is the second channel through which young workers climb the occupational ladder to higher wage levels (McCall, 1990)[1]. However, it is conceivable that women may not benefit as much as men often for a number of reasons. First, this early stage of young males' and females' career is also the time to form family and have children. In a society in which women assume the majority of family responsibilities, motherhood may restrict women's job match quality and potential upward occupational move, since women need to consider the non-pecuniary aspects of a job that are in line with family commitment. As long as employers reward jobs with attributes that are difficult to reconcile with temporarily family commitment, gender differences in returns and/or rates of job and occupational mobility can partly explain the gender gap in early career wage growth (Goldin, 2014). Second, such gender differences can also be fueled by employers' statistical discrimination in hiring and/or promotion if employers perceive that women are more likely to quit their job or are less willing to work long hours or travel long distances (Phelps, 1972; Lazear and Rosen, 1990; and Belley et al., 2015). Finally, theories of psychological traits suggest that gender difference in negotiation skill or outcomes can contribute to the gender gap in returns to firm (occupational) change (Bertrand, 2011, Bowles, 2012).

Empirical studies examining the gender differential effect of job and occupational mobility on early career wage growth are relatively scarce. With regard to job mobility, the few studies within the US and Europe that address the issue typically find a substantial gender difference in wage growth returns to job mobility, partly explaining the gender gap in early career wage growth (Loprest, 1992; Manning and Swaffield, 2008; Napari, 2009; Del Bono and Vuri, 2011; Looze, 2014 and Fuller, 2008). Although motherhood is often discussed as the potential underlying factor for differential returns to job mobility, most of these studies fail to empirically investigate the issue (Manning and Swaffield, 2008; Looze, 2014 and Fuller, 2008, are the few exceptions). The literature on occupational mobility, on the other hand, largely focuses on gender difference in the average rate and/or returns to upward occupational mobility or at higher managerial positions (Jacobs, 1992; Bertrand and Hallock 2001; and Magnusson, 2010). But little attention has been given for the pattern and/or returns to upward occupational mobility during the early stage of women's careers (Fitzenberger and Kunze, 2005 and Addison et al., 2014, are among the few exceptions). In Sweden, Le Grand and Tahlin (2002) documented that job

[1] Upward occupational mobility may arise either through within firm promotion or through firm change.

mobility across and within firms positively contribute to the early career wage growth of young male workers. However, not much is known on how job and occupational mobility affects women's wage growth and to what extent this contributes to the gender differential early career wage growth.

By using the Swedish register panel data for the panel 1996-2012, this study examines the role of job and upward occupational mobility in explaining the gender gap in early career wage growth in the Swedish labor market. This paper contributes to the literature in two ways. First, to the author's knowledge, there are no Swedish studies that investigate the link between job mobility, upward occupational mobility and gender difference in early career wage growth in the Swedish labor market[2]. This contribution relates to prior studies on job mobility by Loprest (1992) for US and European studies, such as Manning and Swaffield (2008), Del Bono and Vuri (2011) and Napari (2009). In addition to the literature on job mobility, this paper also contributes to the small strand of literature that analyzes the impact of upward occupational mobility/promotion in early care wage growth (for example, Fitzenberger and Kunze 2005 and Addison et al., 2014). Second, this paper adds to the existing literature by investigating the extent to which female disadvantage in returns to mobility is explained by motherhood. Unlike most prior studies, such as Manning and Swaffield (2008), Looze (2014) and Fuller (2008), the availability of information on the exact year of childbirth allows us to analyze the temporary and long-run consequences of childbirth on the gender differential outcomes of job and occupational mobility.

The focus on university graduates is motivated by a combination of factors. First, unlike the evidence for the US, prior studies that analyzed the gender wage gap by education level documented that the gender wage gap among highly educated workers is higher than less educated workers in the Swedish labor market (Evertsson et al., 2009)[3]. This is surprising, given that women with a college education are better at signaling their long term-career commitment (though investment in higher education) to their employer than less educated women. Hence, it would be interesting to find the factors causing female university graduates to lag behind their male counterparts. Second, due to a lack of information on actual work experience, we use

[2] For Sweden, Magnusson (2010) analyzed the relationship between gender wage gap and occupational prestige, but the paper focuses on average wage gap in levels for the entire population. Our study rather investigates the gender gap in early career wage growth during the first 10 year in labor market and focusses on university graduates.

[3] Albrecht et al. (2003), for instance, documented that the "glass ceiling effect" found in Sweden is mainly driven by white collar workers.

information on the year of university graduation to follow the labor market history from the first year after labor market entry to 10 years in the labor market. By focusing on university graduates, we can track work history more accurately, since this group is more likely to join the labor market immediately and work continuously. However, using the year of graduation to measure the work history for those who are less educated can be complicated, since it is not obvious if the less educated will start their career immediately or will continue to pursue higher education after short break. Lastly, considering the growing share of university graduates in the labor force[4], understanding the factors behind gender gap among university graduates can contribute to our understanding of the overall gender gap in Sweden.

The main finding from this study can be summarized as follows. Like the US and other European countries, a considerable gender wage gap arises during the first ten years in the labor market. We find that the entry gender wage gap increases by about 10 percentage points within ten years after labor market entry, which corresponds to a 1 percent gender gap in annual wage growth. The empirical analysis shows that, although job and occupational mobility significantly contributes to the early career wage growth of both males and females, we find that the returns to both types of mobility are significantly lower for females. This female mobility penalty persists, even after accounting for gender differences in observable individual and job characteristics as well as unobserved individual specific heterogeneity. A classification of job mobility into voluntary and involuntary job mobility shows that the female penalty is mainly driven by voluntary firm changes.

We further explored to what extent women's penalty in returns to voluntary job and upward occupational mobility is explained by parental status. The female penalty in returns to upward occupational mobility is found to be largely linked with the timing of childbirth and child care, suggesting the presence of trade-off between work and family. But the female penalty in returns to job mobility does not seem to be mainly associated with parental status, where a sizable gender gap in return to voluntary job mobility is found among the childless as well as parents. Hence, in the case of job mobility, family consideration is a small part of the story, and other explanations such as gender difference in bargaining skills (outcome) and statistical discrimination cannot be ruled out.

[4] During 1997-2012, the share of population with at least 3 years of post-secondary education increase from 13% to 25% (Statistics Sweden).

The rest of the paper is organized as follows. Section 2 describes the data and explains the variables used in the analysis. Section 3 presents descriptive and graphical evidence of the gender wage gap over time. Section 4 describes the empirical model. Section 5 offers the empirical results, and finally, Section 6 concludes the paper.

2. Data

The empirical analysis is based on the panel data constructed from various Swedish register sources obtained from Statistics Sweden covering the period of 1996-2012. We used unique individual-firm identifiers to merge the wage structure statistics with various data sources from individual administrative registers (LOUISE and the multi-generation register) and firm register[5]. For the few cases in which an individual works in more than one firm, we consider the individual-firm identifier that generates the highest annual income in a given year. This panel data set consists of information on an average monthly wage, level and field of education, year of graduation, year of childbirth, firm identifier, occupation and a number of individual and job-related characteristics. Since our main interest is on the early career dynamics of young college graduates, the sample is restricted to young graduates during 1996-2002, and each graduate is followed from the first year after graduation up to 10 years in the labor market[6]. For example, graduates in 1996 are followed from 1997 to 2006, while graduates in 2002 are followed from 2003 to 2012. PhD graduates and individuals who are older than 35 years on the year of graduation are excluded from the sample. These restrictions are made to exclude individuals who may have prior experience before graduation and focus on graduates who made their first transition from college to work.

The outcome variable of interest, wage growth, is calculated from the average real monthly wage level, expressed in 2010 constant price. This wage data is obtained from the wage structure

[5]Wage structure statistics is a combination of survey of wages and salary structure from public and private sector collected by statistics Sweden. The statistics for the private sector is based on a random sample survey, which constitutes about 50 % the private sector, while the sample for the public sector constitutes the whole population. This data base is our main source of information on average wages and job characteristics such as occupation and sector by ownership status. Louise (also known as LISA) is a population wide longitudinal database, which is our main data source on annual income, years and levels of education, potential experience (year of graduation), age, gender and marital status. Multi-generational register links parents with their children and includes information on the year of child birth, birth order and others. The firm register includes information on firm identifiers (used to generate job mobility variable), firm size and industry. Employer-employee register is used to merge individual based registers with firm based registers.

[6] The analysis in this paper starts from 1996 because this is the year with complete information on the most important variables, primarily occupation.

register, which consist of all individuals employed in the public sector and individuals working in private firms with more than 499 employees and a randomly selected 50% sample of private-sector employees with a firm size between 10-499. The sample excludes individuals working in small firms with less than 10 employees. A consequence of the above random sampling is that wage is observed with gaps, which ultimately creates an unbalanced panel in annual wage growth. Table 1 below reports the number of gaps between consecutive wage observations for our sample of university graduates. It is apparent that, for the majority of college graduates, 85 percent of females and 91 percent of males, wage can be observed continuously. However, for about 15.9 percent of women and 8.6 percent of men, wage is observed with gaps.[7] Given the unbalanced panel data, defining wage growth as a difference between wage levels at year t-1 and t would discount individuals with intermittent wage observations, since one year of missing observation in wage level translates into two years of missing observations in wage growth. To use as much information as possible, we define wage growth as the difference in real log wage between the current year and the last observed year. That is, wage growth is the difference between wage at time t and time t-s, whereas, s represents the number of gaps between two subsequent wage observations, which will be added as a control in the main empirical model specification (discussed in Section 4). Since about 98 percent of males and females have less than or equal to 3 gaps between wage observation, we restrict our sample to individuals with at most 3 gaps[8]. The final sample consists of an unbalanced 723,752 individual-year observation, of which 61 percent are women[9].

[Table 1 about here]

There are four explanatory variables of main interest in the empirical analysis. The first is the female dummy, which takes a value of one if female and zero otherwise. The other three key variables are job mobility, upward occupational mobility and parental status. Job mobility is a dummy variable that takes a value of one when an individual changes firm between time t and t-s. The second variable of interest is upward occupational mobility, which is a dummy variable that

[7] The gender difference can partly be attributed to intermittent labor market participation of women due to parental leave taking.
[8] In addition, our sample does not include individuals who are self-employed, since the wage structure statistics do not have wage information on individuals who are self-employed.
[9] One reason for the higher share of females in the sample is the greater proportion of females among recent university graduates in Sweden. Second, the 50% random sampling comes only from the private sector, which is male dominated, and has also contributed to the low male sample.

takes a value of one if an individual attains a 5% or more increase in occupational prestige between year t and t-s[10]. The prestige scale is measured based on the widely used Standard International Occupational Prestige Scale (SIOPS) of Treiman (1976) and Ganzeboom and Treiman (1996), which largely reflects the degree of authority, skill and capital control of an occupation. The third variable of interest is parental status, which is a dummy that takes a value of 1 if an individual has a child and zero otherwise. To allow for the non-linear effect of children in the model, we further disaggregate parental status into five categories: childless on year t and t+1 (=1 if not yet have children and not expected to have children in one year time), will have first child next year, have first child this year, had a child 1-2 years ago (including years between births) and had a child three or more years ago (=1 if age of oldest child is greater than two).

In the empirical analysis, I will control for a number of common human capital variables and other individual characteristics. Human capital controls include year of university education (2-5 years) and field of education (9 broad categories of field of study), potential experience (years since graduation), tenure (number of years in the same firm) and gaps with zero annual income (gaps between consecutive wage observation associated with zero annual income). The information on demographic characteristics include marital status (=1 if married) and residence (=1 if living in the four Swedish biggest cities). We also have information on job-related characteristics such as firm size (5 categories), occupation (9 broad categories), industry (14 broad categories) and sector of employment (five categories by ownership status). The summary statistics for selected variables are reported in Appendix Table A1.

3. Descriptive and Graphical Evidence

3.1 The dynamics of men's and women's wage over life cycle

A typical finding in the US and the few European countries is that a substantial part of the life cycle gender wage gap arises during the first few years after labor market entry[11]. This section examines whether similar patterns exist in the case of Sweden by examining the dynamics of gender wage gap over a worker's life cycle. For the purpose of this analysis, we consider a longer panel data covering the period of 1990-2012 for graduate cohorts of 1990-2002. Figure 1 presents

[10] We choose 5% instead of just positive growth in prestige, since it can better capture the implied upward move in the degree of autonomy, skill or capital control of the new job position. But changing the threshold to more than 0 or 10% does not affect the main conclusion.

[11] An exception in this regard is Germany's apprenticeship graduates, where Fitzenberger and Kunze (2005) found a substantial gender gap at labor market entry, and this gap persisted over early careers.

the wage level and growth profiles of male and female university graduates from labor market entry up to twenty-two years in the labor market. From the wage-experience profile of male and female graduates (Figure 1), it is apparent that the gender wage gap is relatively small at labor market entry. But, a sizable gender wage gap immerges within 10 years in the labor market before it starts to stabilize during the mid-career stage. This pattern can be clearly seen from the wage growth profile (Figure 2), which shows that most of the gender wage gap is created during the first 10 years in the labor market. This result is similar to the findings from other US studies and those of European countries.

[Figure 1-4 about here]

One may be concerned that the above result is driven by the difference in the gender gap among different graduate cohorts. In the above pooled sample, since we are not able to follow all graduate cohorts of 1990-2002 over 22 years, part of the wage dynamics can potentially be influence by differences in the wage dynamics among different graduate cohorts. Figures 3 and 4 shows the gender gap dynamics in log wage and wage growth among graduate cohorts of 1990-1994, 1995-1998 and 1999-2002 separately. A graphical inspection of the above three cohorts, in Figures 3 and 4, show that our result is not driven by cohort effect.

Table 2 presents a more accurate picture of the gender wage gap in numbers from the labor market entry up to 10 years in the labor market for the graduate cohort used in our main analysis. The result from Column 1 shows that the raw gender wage gap at labor market entry is about 11%[12]. Compared to international studies, this entry gap is higher than that found for US and UK, but is comparable with other European countries such as Germany, Finland and Italy[13]. Immediately after labor market entry, the gender wage gap increases at a decreasing rate, reaching up to 21% just within 10 years in the labor market[14]. This gender wage gap dynamics is equivalent to a one percent gender gap in the annual wage growth. This paper is devoted to explaining this gender gap in wage growth within the next sections.

[12] Carlsson et al., 2015 analyzed the gender wage gap at labor market entry by using a combination of register and experimental data and show that pre-labor market factors, and especially the type of college major, explain much of the entry gender wage gap and find no evidence of gender discrimination in hiring.
[13] Bertrand et al., 2010 for US; Manning and Swaffield, 2008 for UK; Fitzenberger and Kunze, 2005 for Germany; Napari, 2009 for Finland; and Del Bono and Vuri, 2011 for Italy.
[14] We also find similar gender wage gap dynamics after controlling for pre-labor market factors (level and field of education, and graduate cohort*year-fixed effects). This is reported in Appendix Table A2.

[Table 2 about here]

3.2 Mobility Pattern and dynamics of wage growth

This section provides some descriptive evidence on the relative importance of gender difference in rates and returns to job and occupational mobility by using graphs and descriptive statistics. First we examine if gender difference in annual rates of job and occupational mobility are plausible candidates in explaining the observed gender difference in early career wage growth. A visual inspection of Figure 5 below indicates that women tend to change firms more often than men during the first four years in the labor market, but after four years, the pattern is reversed in favor of the men. Over a ten-year average, the annual rate of job mobility (firm change) is similar among males and females, averaging about 11.4 and 10.7 percent, respectively. When it comes to the annual rates of occupational mobility, Figure 6 indicates a gender difference starting from the second year in the labor market. On average, about 5.5% of women experience upward occupational mobility (at least 5 percent rise occupational prestige) annually, which is lower than the men's 6.7% increase. Hence, unlike job mobility, there is a small gender difference in the rates of upward occupational mobility.

[Figure 5-8 about here]

The second step is to examine if gender difference in returns to job and occupational mobility contributes to gender difference in early career wage growth. Figure 7 reports the returns to job mobility by decomposing annual wage growth into those who exhibit firm change and those who stayed in the same firm. A visual inspection of the wage growth dynamics provides two interesting results. First, both male and female graduates experience a higher wage growth when changing firms compared to within-firm wage growth. Second, the magnitude of the male-female gap in wage growth among those exhibiting firm change is higher that the gap among individuals who stayed in the same firm. In Figure 8, we examine the potential contribution of gender difference in returns to upward occupational mobility after decomposing wage growth by occupational mobility status. Like job mobility, we also find higher wage growth associated with upward occupational mobility for both male and female graduates compared to those with no occupational mobility. It is also evident from a visual inspection of the wage growth dynamics that the size of the male-female gap among graduates who experienced upward occupational mobility is higher than those without upward occupational mobility. The graphical evidence

indicates that, although job and occupational mobility are important for the early career wage growth of males and females, women seem to benefit to a lesser extent than men.

Panel B in Table 3 presents similar evidence of returns to job and occupational mobility by gender as in the graphs, but presents numbers instead. From the table, one can clearly see that the size of the gender gap in wage growth among individuals with firm change is 1.4 percent, which is higher than the 0.9 percent within firm gender gap. Similar results can be found for upward occupational mobility, in which the gender gap in wage growth is higher among those with upward occupational mobility. These results highlight the importance of gender difference in returns to job and upward occupational mobility in explaining the gender gap in early career wage growth.

[Table 3 about here]

Parenthood has been suggested as an important underlying mechanism contributing to the gender differential effect of job and occupational mobility on early career wage growth. To examine the potential contribution of parental status, we decomposed the rates and returns to mobility by parental status as shown in Columns 4 and 5 of Table 3. From Panel A, Column 4, we find a 1.5 percent gender gap in the annual rates of job mobility among childless groups, which shows that childless women change firms more frequently than childless men. But the situation is reversed after having children, where fathers are found to experience 2.2 percent more firm changes than mothers (Column 5). This result suggests that parenthood largely affects the timing of firm change by gender, but not the overall rate of job mobility. When it comes to the rates of upward occupational mobility, the figures show that the gender gap varies by parental status, where the gender gap in rates of upward occupational mobility is higher among parents compared to childless groups.

Panel B of Columns 4 and 5 reports the gender gap in annual wage growth by mobility and parental status. The figures on annual wage growth associated with firm change show that the size of the gender gap in annual wage growth does seem to vary by parental status. We find a sizable gender gap in wage growth among childless as well as parents. With regard to upward occupational mobility, there are clear signs of motherhood penalty in the returns to upward occupational mobility, where the gender gap among parents is two times higher than childless groups (see the last row of Table 3 in Columns 4 and 5).

In sum, the evidence from graphs and descriptive statistics suggest that the gender difference in the rates of job and occupational mobility are relatively small, but there is a sizable gender difference in returns. Since the gender difference in the rates of mobility is relatively small, our empirical analysis in the next section will primarily focus on the gender difference in the returns to mobility and its contribution to the divergent early career wage growth of male and female graduates.

4. Empirical Model Specification

Our empirical specification estimates the impact of job and occupational mobility on the gender gap in wage growth after taking into account the gender difference in human capital and family- and job-related characteristics. We estimate the wage growth equation based on the individual-year observations of male and female graduates during the first ten years in the labor market. The empirical model specification for wage growth is similar to the standard wage-level equation in the literature. The first difference in the wage growth equation is expected to remove all time-invariant individual characteristics in the model. However, following Loprest (1992) and Manning and Swaffield (2008), our empirical specification also controls for time-invariant factors, such as years and field of education, that are expected to affect wage growth. The general model specification of the wage growth equation is formulated as follows:

$$\Delta W_{it} = \beta_0 + \beta_1 F_i + \beta_2 job_{it} + \beta_3 F_i * job_{it} + \beta_4 Occ_{it} + \beta_5 F_i * Occ_{it} + \emptyset(e_{it}, g_{it}, s_{it}, n_{it}) + X_{it-s}\beta_6 + X_{it}\beta_7 + Z_i\beta_8 + \varepsilon_{it} \quad (1)$$

Where ΔW_{it} represent the change in monthly log wage of an individual i from year $t-s$ to year t (with s representing the gaps between consecutive wage observations). F_i is a female dummy, job_{it} is a job mobility dummy and Occ_{it} is occupational mobility. The coefficients β_3 and β_5 represent estimates on gender difference in returns to job and occupational mobility. The function $\emptyset(e_{it}, g_{it}, s_{it}, n_{it})$ includes a measure of human capital accumulation, where e_{it} is potential experience, n_{it} is the number of years of tenure in a firm, s is the duration of the gap between two consecutive wage observations and g_{it} is the duration of the gap with zero annual income. Potential experience and tenure are included in quadratic forms. The g_{it} in the above specification controls for intermittent labor market attachment that can arise due to

unemployment or family reasons[15]. Z_i is the vector of time-invariant factors such as years and fields of education, X_{it} and X_{it-s} are the vector of time-varying controls at time t and t-s. The controls in X include demographic characteristics (parental status, marital status and residence) and job-related characteristics (firm size, occupation, industry and sector by ownership status) and ε_{it} is the error term.

A methodological concern in a typical cross-sectional regression analysis of wage levels is that job movers/those promoted could be different from stayers/non-promoted in unobservable characteristics that are related to wage levels[16]. But with wage growth in focus, the first difference in wage level factors out the individual specific unobserved confounders and allows us to estimate the model with OLS. Yet, it is possible that the individual specific unobservable may affect not only the wage levels, but also the wage growth dynamics. To address this issue, we estimate the wage growth equation by adding individual fixed effects. As will be shown later, the main finding is not affected by individual specific heterogeneity.

One may also be concerned that current year movers could be different from stayers in unobserved time-varying characteristics that are related to wage growth. To address this issue, one would ideally need to compare the wage growth of the current year movers with the wage growth of the same individuals, had they stayed in the same firm/occupation. As a robustness check of the baseline results of this paper, I follow Mincer (1986) and Del Bono and Vuri (2011) and use the next year's job (occupational) movers as a proxy for the current year's job (occupational) movers had they stayed in the same firm/occupation. The wage growth gain to job (occupational) mobility can then be calculated by comparing the wage growth of the current year's movers with the wage growth of next year's movers. The empirical model specification can be formulated as follows:

$$\Delta W_{it} = \beta_0 + \beta_1 F_i + \beta_2 job_{it} + \beta_3 job_{it+s} + \beta_4 F_i * job_{it} + \beta_5 F_i * job_{it+s} + \beta_6 Occ_{it} + \beta_7 Occ_{it+s} + \beta_8 F_i * Occ_{it} + \beta_9 F_i * Occ_{it+s} + \beta_{10} Controls + \varepsilon_{it} \quad (2)$$

The general form of the empirical model specification is similar to model (1), except that this model introduces two dummy variable for next year's job mobility (job_{it+s}) and

[15] This model is adopted from Manning and Swafield (2008) and Del Bono and Vuri (2011), who also use similar functional form, with the former using a more flexible model.

[16] For example, individuals with low wages tend to have more motivation to change jobs than individuals with high wage levels.

occupational mobility (Occ_{it+s}) status and the female interactions $F * job_{it+s}$ and $F * Occ_{it+s}$. job_{it+s} takes a value of 1 if an individual changes firms at time t+1, but not at time t. Similarly, Occ_{it+s} takes a value of 1 if an individual experiences upward occupational mobility at time t+s, but not at time t. $F * job_{it+s}$ and $F * Occ_{it+s}$ represent female dummy interactions with next year's job and occupational movers. β_4 represents the gender gap in wage growth associated with job mobility for current year movers. β_5 represents the gender gap in wage growth for individuals who will change job next year (can be considered as a control group). In a difference-in-difference fashion, the gender gap in returns to job mobility can then be obtained from $\beta_4 - \beta_5$. Similarly, gender gap in returns to upward occupational mobility can be calculated by taking the difference of $\beta_8 - \beta_9$. As will be shown later, examination of the results from this model show that the result from OLS estimation are not driven by unobserved heterogeneity.

5. Results

5.1 Gender Gap in Returns to Job and Occupational Mobility

The main interest in this section is to investigate if gender differences in return to job and occupational mobility contributes to the gender difference in early career wage growth. But before estimating the wage growth equation with the two mobility status variables, it is interesting to see how much of the raw gender gap in wage growth is left unexplained after accounting for basic human capital and other demographic and pre-mobility job characteristics. Column 1 of Table 4 reports a raw gender wage growth gap of 1.1 percent. Adding human capital controls such as level of education, field of education, quadratic potential experience, quadratic tenure, gap with zero income, graduate cohort*year-fixed effects in column 2 lowers the gender gap in wage growth to about 0.5 percent. Among the human capital factors, gender difference in the field of education is found to be the single most important factor contributing to the differential early career wage growth. However, adding demographic controls (marital status, five dummies of parental status), big city residence at time t-s and job characteristics (firm size, industry, occupation and sector by ownership) at time t-s does not affect the gender gap in wage growth (column 3)[17]. In line with prior studies, such as Manning and Swafield (2008), almost half of the gender gap in wage growth is left unexplained after accounting for basic human capital and initial job characteristics.

[17] In this specification, we did not control for the current period's residence and job characteristics, since they can potentially be affected by job mobility or occupational mobility.

In Column 3 we estimate the wage growth model by introducing job and occupational mobility and their interaction with the female dummy to investigate if the gender difference in returns to job and occupational mobility contributes to the gender differential wage growth. From the regression we note that, although job and upward occupational mobility significantly contribute to the early career wage growth of male and female graduates, but the size of the effect varies by gender. The results show that job and occupational mobility significantly increase men's wage growth by about 2 and 3.1 percent, respectively, while the women's wage growth associated with job and occupational mobility is 0.9 and 0.8 percent less than men, respectively. In other words, women experience half and three-fourths of the wage growth men experience when changing firm and moving up the occupational ladder, respectively. The unexplained gender gap, on the other hand, dropped from 0.5 to 0.3 percent. This indicates that the gender difference in returns to job and occupational mobility explains about 18 percent of the observed gender gap in early career wage growth (0.2/1.1). Adding the current year's job characteristics and residence does not affect the main conclusion (Column 6).

[Table 4 about here]

Table 5 present the estimates based on the FE model and OLS regression of Equation 2 to examine if our result is robust to the unobserved individual heterogeneity. Column 1 reports the estimates from the fixed-effect model after controlling for the full model controls listed in Column 6 of Table 4. The results show a qualitatively similar result as in the OLS regression, in which we find a significant gender gap in returns to job and upward occupational mobility. This result indicates that our finding is not driven by time-invariant unobserved individual-specific heterogeneities. Column 2 estimates Equation 2, in which this year's wage growth of next year's job (occupational) movers is used as a proxy for the forgone wage growth of this year's job (occupational) movers. The gender gap in returns to job (occupational) mobility is then calculated by taking the difference in returns between this year's movers and next year's movers. The results show a significant gender gap in returns to job and occupational mobility, amounting to about 0.7 and 0.5 percent, respectively. These results are close to our estimate in Column 6 of Table 4. This exercise suggests that our result is unlikely to be driven by unobserved heterogeneity.

[Table 5 about here]

5.1.1 Firm change, between- and within-firm occupational mobility

In this study, we used standard definitions of job and occupational mobility to get a comparable result with other international studies. But since some of the upward occupational mobility can be the result of firm change, one may wonder if the female penalty in returns to upward occupational mobility is the outcome of female penalty with firm change, but not within the same firm.[18] To address the issue, I decomposed the two mobility variables into firm change (job mobility without occupational mobility), occupational mobility within firm (often referred to as promotion) and occupational mobility with firm change. Table 6 reports the estimates based on the new classification of the two mobility variables. The first column simply reports the 0.5 percent gender gap in the wage growth from Column 3 of Table 4, which was left unexplained after controlling for the pre-mobility characteristics. In Column 2, one can see that the introduction of firm change with its female interaction reduces the unexplained gender gap from 0.48 to 0.40 percent. Adding controls for occupational mobility within firm and with firm change in Columns 3 and 4 further reduces the unexplained gender gap to 0.35 and 0.28 percent, respectively. This suggests that all three mobility factors are important in explaining the gender gap in early career wage growth. In Column 5, we add the current year's job characteristics and residence. Looking at the female interactions with the three mobility variables in Column 5, we find a significant gender difference not only in the returns to firm change and occupational mobility with firm change, but also in the returns to occupational mobility within the firm (promotion). This indicates that the female penalty in upward occupational mobility is not entirely driven by firm change.

[Table 6 about here]

5.1.2 The role of voluntary and involuntary Job mobility

With regard to job mobility, prior studies such as Keith and McWilliams (1997) argue that the effect of job mobility may differ depending on the reason for job separation. For example, studies have shown that voluntary employee-initiated job mobility (mostly for career advancement) have a positive effect on wage growth, but employer-initiated non-voluntary job mobility (such as worker layoff or redundancy) is found to have negative effect on wage growth (Bartel and Borjas,

[18] Fryer (2007), for instance, argues that, if asymmetric information about male and female productivity is the main reason for employer discrimination against women, then we would expect no gender gap in returns to internal occupational promotion, but only to occupational promotions with firm change.

1981). In the presence of gender difference in the reason for mobility, estimates that do not take into account the gender difference in types of job mobility could be misleading (Keith and McWilliams, 1997).

Although information on the reasons for firm change is not available, I use information on firm size of previous employer to identify involuntary layoff. A firm change is considered as involuntary (due to layoff or redundancy) if a previous employer's firm size shrinks by more than 25 percent at time t and/or t-s; otherwise the job mobility is considered voluntary. In general, voluntary job mobility is expected to arise due to career aspiration or family reasons, but due to data limitation, we are not able to exclude involuntary firm changes associated with being fired from work. Table 7 presents the OLS and fixed-effect estimates on the impact of voluntary and involuntary job mobility. As one would have expected, voluntary job mobility is found to have a significant and positive effect on wage growth, but involuntary job mobility is found to have no significant effect on wage growth. It is also apparent that the gender gap in returns to voluntary job mobility is higher in favor of men. But women seem to have an advantage when it comes to involuntary job mobility[19]. This exercise suggests that the observed gender difference in returns to job mobility is mainly driven by voluntary job mobility.

[Table 7 about here]

5.2 The Role of Children

The analysis in the previous section demonstrated that returns to job and occupational mobility vary by gender, which partly contributes to the overall gender disparity in early career wage growth. We also find that the female penalty in returns to job mobility is mainly driven by voluntary job mobility. The follow-up question that we are interested in investigating is whether such women's voluntary job and occupational mobility penalty is explained by children. In light of the timing of childbirth and child care coinciding with periods of high mobility, such gender differential outcomes of job and occupational mobility can be related with women's greater responsibility for childcare in the household. This line of explanations is largely derived from the theory of compensating wage differential, where it can be argued that women, taking greater

[19] Nevertheless, due to the small share of males and females with involuntary job mobility, its overall effect on the gender gap in wage growth is low.

responsibility for childbearing and childcare, are willing/forced to forgo wage for the non-pecuniary aspects of a job when changing firms or occupational positions *(*Joshi et al., 1999).

To analyze the potential role of motherhood on the gender differential returns to mobility, we disaggregated voluntary job and occupational mobility by parental status. To control for gender differential effects of parental status that are not associated with mobility status, we added interaction between parental status and female dummy in the empirical model. Apart from the above changes, the full model controls used in Column 6 of Table 4 are added in wage growth equation.

Table 8 presents the estimates on the wage growth effects of voluntary job and occupational mobility by gender and parental status. Looking at the estimates for occupational mobility in Column 1, we find that the gender gap in returns to occupational mobility is higher among parents (1.1% at the 1% significance level) than childless employees (0.4% at 5% significance level). The gender gap among the childless becomes insignificant once we control for the individual-fixed effect in Column 2. But the gender gap among parents remains high and significant. This result suggests that women's penalty associated with occupational mobility is largely linked to the motherhood penalty. However, when it comes to voluntary job mobility, the gender difference in returns to voluntary job mobility is similar among parents and the childless, which is 1 and 0.9 percent, respectively (Column 1). Adding individual-fixed effect to the wage growth equation does not alter the result (Column 2).

[Table 8 about here]

Nevertheless, the above classification of parental status does not take into account the age of children, which may have different effects on women's job choices, market constraints and wage growth. We address this issue by disaggregating parental status into five categories: childless (childless and not expecting to have children within one year), will have first child next year, year of first childbirth, had a child 1-2 years ago (including years between births) and had a child 3 or more years ago. Table 9 reports the OLS and FE estimates on the impact of voluntary job and occupational mobility on wage growth by gender and parental status (five categories). First looking at the estimates on the interaction between occupational mobility and female dummy, in Column 1, we find that the size of the female penalty is high and significant among graduates who had their first child this year and graduates who had their child 1-2 years ago

(including the time between births). But the female penalty among the childless and those who had a child 3 or more years ago is low and borderline significant. In fact, the evidence for these latter groups is rather weak if one looks at the estimates from the fixed-effect model in Column 2. One can see that the gender gap in returns to upward occupational mobility is low and insignificant among the childless, those who will have their first child next year and those who had a child 3 or more years ago. On the other hand, the female penalty among graduates who had their first child this year and graduates who had their child 1-2 years ago is large and significant. This result strengthens our earlier conclusion that women's penalty to occupational mobility is largely related to motherhood wage growth penalty during childbirth and childcare periods.

Coming to voluntary job mobility, disaggregation of parental status reveals additional information. Although the female penalty of voluntary job mobility is persistent for all categories, the female penalty is found to be the highest among graduates who expect to have their first child next year (Column 1 of Table 9). As can be seen from the fixed-effects model in Column 2, this evidence is robust to control for unobserved individual heterogeneity. One possible explanation is that women who anticipate childbirth within one year may be willing to forgo wage increases for family-friendly jobs. Nevertheless, the presence of a significant female penalty among the childless who do not expect to have children within one year and those who had a child 3 or more years ago suggests that explanations based on the theory of compensating wage differential could be a small part of the story. Other potential explanations based on theories of employer statistical discrimination and gender difference in bargaining skills (outcomes) cannot be ruled out.

[Table 9 about here]

6. Conclusion

This paper investigated the role of job and occupational mobility in explaining the gender gap in early career wage growth among university graduates in Sweden. Using rich Swedish register data for the period from 1996-2012, we first showed that a sizable part of the male-female gap in wages arises during the first ten years in the labor market. We find that the gender wage gap increases by about 10 percentage points within ten years after labor market entry, which is equivalent to a 1 percent gender gap in the annual wage growth.

The analyses showed that, although job and occupational mobility significantly contributes to the early career wage growth of both males and females, the size of the wage growth effect of both types of mobility are significantly lower for females than males. After accounting for human capital, demographic and job characteristics, the wage growth associated with job and upward occupational mobility for women is half and a quarter less than men, respectively. This result is robust after accounting for unobserved individual-specific heterogeneity and alternative model specification. Considering the interrelationship between job and occupational mobility, we investigated whether the result on gender differential returns to occupational mobility is solely driven by firm change. But the evidence showed that there is a substantial gender difference in the return to upward occupational mobility, both within and between firms. Further classification of job mobility into voluntary and involuntary firm change reveals that the women's penalty is mainly driven by voluntary firm changes.

We investigated to what extent women's penalty in returns to voluntary job and occupational mobility is explained by parental status. The analysis showed that the gender gap in returns to upward occupational mobility is largely linked with the timing of childbirth and childcare. But women's penalty in returns to voluntary job mobility is not mainly associated with parental status, in which a sizable gender gap in returns to voluntary job mobility is found among the childless as well as parents.

This study highlighted the importance of job and occupational mobility for the creation of gender gap in early career wage growth. The analysis also showed that the female penalty in returns to upward occupational mobility is mainly driven by parents with very young children. To the extent that Swedish women take a longer parental leave than men, a typical explanation for the motherhood penalty is that human capital depreciation or skill atrophy could occur during the period outside work. Although such an argument gained empirical support in the US and other countries, studies for Sweden and Denmark did not find any empirical support in this regard (Albrecht et al., 1999, Gupta and Smith, 2001). A rather plausible explanation is that women's greater responsibility for childbearing and child care may undermine the work and effort put into the market work and the labor market outcome (Becker, 1985). As clearly stated by Albrecht et al. (2003), the presence of high minimum wage in the Swedish labor market makes it difficult to hire domestic workers to help with the housework. As a result, women who receive promotions

to higher occupational positions while having a young child may find it difficult to cope with the new job demands (in terms of working long hours, traveling or exerting more effort).

Unlike upward occupational mobility, the female penalty in returns to job mobility does not change with parental status. It should, however, be noted that the expectation of future child birth may influence job mobility decisions before childbirth, which in turn affects the job mobility outcome among the childless. We have seen such an indication from the analysis, where the female job mobility penalty is found to be one of the highest among graduates who will have children within the next year. However, explanation based on family reasons should be a small part of the story if one also considers the significant female penalty among the childless who do not expect to have children within one year and those who had a child 3 or more years ago. Other potential explanations based on theories of employer statistical discrimination and gender difference in bargaining skills (outcomes) cannot be ruled out. For instance, an empirical study based on recent college graduates in Sweden shows that women tend to submit a lower wage bid than men, despite having similar individual and job attributes (Säve-Söerbergh, 2007). Further studies with a focus on gender differences on wage bargaining behaviors can help to understand the underlying factor behind the observed gender difference in returns to job mobility.

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Tables

Table 1: Number of Gaps between wage observations

Number of gaps between wage observations	Female		Male	
	Percentage	Cumulative percentage	Percentage	Cumulative percentage
	(1)	(2)	(3)	(4)
1	83.9	83.9	91.4	91.4
2	10.7	94.6	4.9	96.3
3	3.0	97.6	1.4	97.8
4	1.0	98.7	0.8	98.6
5	1.5	100.0	1.4	100.0

Note: In the left hand side of the table a one year gap means, wage can be can be observed annually.

Table 2: Gender Gap in log wage and wage growth by Experience

Potential experience	Gender Gap in	
	Log wage	wage growth
	(1)	(2)
1	-0.110	-0.016
2	-0.115	-0.013
3	-0.125	-0.015
4	-0.138	-0.014
5	-0.150	-0.014
6	-0.167	-0.015
7	-0.18	-0.01
8	-0.192	-0.008
9	-0.200	-0.008
10	-0.210	-0.007
Average	-0.164	-0.011

Note: In column 2, the gender gap at each experience level is estimated after controlling for gap between wage observation.

Table 3: Descriptive Statistics by gender and parental status

	Total			Childless	Parent
Description	Female	Male	Female-Male Gap	Female-Male Gap	Female-Male Gap
	(1)	(2)	(3)	(4)	(5)
Panel A: Rates of job and occupational mobility					
Average annual share of workers:					
with firm change	0.107	0.114	-0.007	0.015	-0.022
with upward occupational mobility	0.055	0.067	-0.012	-0.007	-0.015
Panel B: Returns to job and occupational mobility					
Average annual wage Growth	0.037	0.047	-0.010	-0.008	-0.010
within firm	0.035	0.044	-0.009	-0.007	-0.009
with firm change	0.050	0.064	-0.014	-0.013	-0.016
with upward occupational mobility	0.035	0.044	-0.009	-0.007	-0.009
without upward occupational mobility	0.061	0.076	-0.015	-0.010	-0.020

Note: In panel A, for ease of interpretation we report annual mobility rates by dividing job and occupational mobility by the number of gaps between consecutive observations. In panel B, we also report annual wage growth by dividing wage growth by number of gaps between consecutive observations (this is approximately equal to adding control for wage gap in regression analysis).

Table 4: OLS regressions of wage growth on job and occupational mobility by gender

	Dependent Variable: log wage(t)-log wage(t-s)					
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.011***	-0.005***	-0.005***	-0.005***	-0.003***	-0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Job mobility				0.014***	0.020***	0.018***
				(0.001)	(0.001)	(0.001)
× Female					-0.009***	-0.009***
					(0.001)	(0.001)
Occupational mobility				0.026***	0.031***	0.031***
				(0.001)	(0.001)	(0.001)
× Female					-0.008***	-0.007***
					(0.001)	(0.001)
Experience		-0.028***	-0.027***	-0.029***	-0.029***	-0.029***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Experience Square		0.002***	0.002***	0.002***	0.002***	0.002***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tenure		0.005***	-0.005***	0.000	0.000	0.000
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tenure Square		0.0004***	0.00002***	0.000	0.000	0.00003*
		(0.00002)	(0.0001)	(0.000)	(0.000)	(0.00002)
Gap with zero income		-0.032***	-0.033***	-0.026***	-0.026***	-0.023***
		(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Gap b/n observations	0.031***	0.034***	0.037***	0.034***	0.034***	0.033***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Controls						
Years and field of education	No	Yes	Yes	Yes	Yes	Yes
Parental and marital status	No	Yes	Yes	Yes	Yes	Yes
Graduate cohort ×year	No	Yes	Yes	Yes	Yes	Yes
Job characteristics at t-s	No	No	Yes	Yes	Yes	Yes
Big city at t-s	No	No	Yes	Yes	Yes	Yes
Job characteristics at t	No	No	No	No	No	Yes
Big city at t	No	No	No	No	No	Yes
Constant	0.017***	0.047***	0.018	0.007	0.007	-0.001
	(0.000)	(0.002)	(0.012)	(0.012)	(0.012)	(0.022)
Observations	723,752	723,752	723,752	723,752	723,752	723,752
R-squared	0.018	0.066	0.071	0.076	0.077	0.087

Note: The control for job characteristics at t-s include: firm size (5 categories), sector by ownership (5 categories), industry (14 categories) and occupation (single digit). The job characteristics control on year t excludes occupation due to its high relation with occupational prestige status. Parental status constitutes five dummies classified by years since birth. The standard errors in parenthesis are robust standard error with clustering at individual level. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Gender gap in wage growth using fixed effect and alternative model specifications

	Dependent Variable: log wage(t)-log wage(t-s)	
VARIABLES	(1)	(2)
	FE	OLS
Female		-0.002***
		(0.000)
Job mobility	0.019***	0.017***
	(0.001)	(0.001)
× female	-0.008***	-0.009***
	(0.001)	(0.001)
Occupational mobility	0.025***	0.031***
	(0.001)	(0.001)
× female	-0.005***	-0.007***
	(0.001)	(0.001)
Job mobility next period		-0.004***
		(0.001)
× female		-0.002**
		(0.001)
Occupational mobility next period		0.000
		(0.001)
× female		-0.002*
		(0.001)
(Job mobility× female) – (Job mobility next period × female)		-0.007***
		(0.001)
(Occupational mobility × female) – (Occupational mobility next period × female)		-0.005***
		(0.002)
Observations	723,752	676,062
R-squared	0.066	0.090
Number of id	122,390	

Note: Full model controls that are listed in column 6 of table 4 are included. The standard errors in parenthesis are robust standard error with clustering at individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Gender gap in wage growth by firm change, occupational mobility between and within firms

	Dependent Variable: log wage(t)-log wage(t-s)				
VARIABLES	(1)	(2)	(3)	(4)	(5)
Female	-0.0048***	-0.0040***	-0.0035***	-0.0028***	-0.0025***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Firm change only		0.0044***	0.0053***	0.0167***	0.0148***
		(0.001)	(0.001)	(0.001)	(0.001)
× Female		-0.0075***	-0.0080***	-0.0089***	-0.0082***
		(0.001)	(0.001)	(0.001)	(0.001)
Occupational mobility within firm			0.0224***	0.0252***	0.0254***
			(0.001)	(0.001)	(0.001)
× Female			-0.0083***	-0.0084***	-0.0077***
			(0.001)	(0.001)	(0.001)
Occupational mobility with firm change				0.0607***	0.0605***
				(0.002)	(0.002)
× Female				-0.0182***	-0.0160***
				(0.003)	(0.003)
Controls					
Human capital controls	Yes	Yes	Yes	Yes	Yes
Graduate cohort*Year	Yes	Yes	Yes	Yes	Yes
Family status	Yes	Yes	Yes	Yes	Yes
job characteristics at t-1	Yes	Yes	Yes	Yes	Yes
Big city at t-1	Yes	Yes	Yes	Yes	Yes
job characteristics at t	No	No	No	No	Yes
Big city at t	No	No	No	No	Yes
Constant	0.0182	0.0190	0.0193	0.0082	0.0015
	(0.012)	(0.012)	(0.012)	(0.012)	(0.022)
Observations	723,752	723,752	723,752	723,752	723,752
R-squared	0.071	0.071	0.072	0.077	0.088

Note: Human capital controls include field and years of education, quadratic experience, quadratic tenure, gaps between observation and gaps due to unemployment. Family status includes parental status (5 dummies) and marital status. The control for job characteristics at t-s include: firm size (5 categories), sector by ownership (5 categories), industry (14 categories) and occupation. The job characteristics control at t excludes occupation due to its high relation with occupational prestige status. The standard errors in parenthesis are robust standard error with clustering at individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Gender gap in wage growth by voluntary and involuntary job mobility

	OLS	FE
VARIABLES	(4)	(5)
Female	-0.003***	
	(0.000)	
Voluntary Job mobility	0.021***	0.023***
	(0.001)	(0.001)
× Female	-0.011***	-0.011***
	(0.001)	(0.001)
Non-voluntary job mobility	0.001	-0.001
	(0.002)	(0.002)
× Female	0.008***	0.011***
	(0.003)	(0.003)
Occupational mobility	0.031***	0.025***
	(0.001)	(0.001)
× Female	-0.007***	-0.005***
	(0.001)	(0.001)
Constant	-0.001	-0.018
	(0.022)	(0.032)
Observations	723,752	723,752
R-squared	0.088	0.067
Number of id		122,390

Note: Full model controls that are listed in column 6 of table 4 are included. The standard errors in parenthesis are robust standard error with clustering at individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 8: Gender Gap in returns to job and occupational mobility by parental status

VARIABLES	OLS	FE
	(1)	(2)
Occupational mobility		
childless	0.029***	0.022***
	(0.001)	(0.002)
childless× female	-0.004**	-0.003
	(0.002)	(0.002)
parent	0.034***	0.029***
	(0.002)	(0.002)
Parent × female	-0.011***	-0.008***
	(0.002)	(0.002)
Voluntary Job mobility		
childless	0.020***	0.021***
	(0.001)	(0.001)
childless× female	-0.010***	-0.010***
	(0.001)	(0.001)
parent	0.018***	0.020***
	(0.001)	(0.001)
Parent × female	-0.009***	-0.008***
	(0.001)	(0.002)
female	-0.002***	
	(0.000)	
Constant	0.001	-0.017
	(0.022)	(0.033)
Observations	723,752	723,752
R-squared	0.087	0.066
Number of individuals		122,390

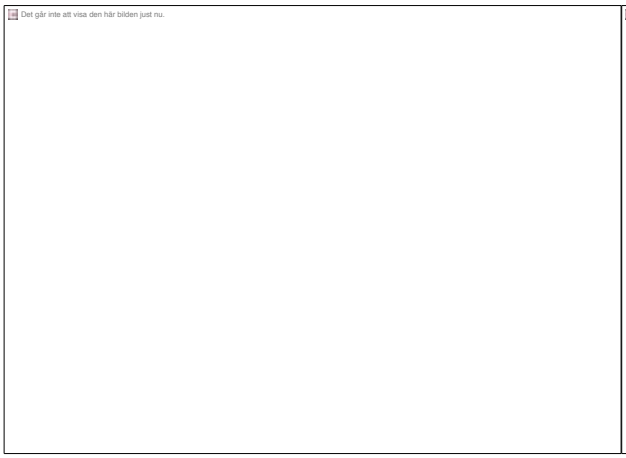
Note: Full model controls that are listed in column 6 of table 4 are included. The standard errors in parenthesis are robust standard error with clustering at individual level. *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Gender Gap in returns to job and occupational mobility by years since birth

	OLS	FE
VARIABLES	(1)	(2)
Occupational mobility		
Childless (at t and t+1)	0.028***	0.022***
	(0.002)	(0.002)
× Female	-0.004**	-0.003
	(0.002)	(0.002)
Will have first child next year	0.026***	0.019***
	(0.004)	(0.004)
× Female	-0.001	0.002
	(0.005)	(0.006)
Year of 1st birth	0.033***	0.027***
	(0.004)	(0.005)
× Female	-0.027***	-0.028***
	(0.007)	(0.008)
had a child 1-2 years age	0.033***	0.027***
	(0.002)	(0.002)
× Female	-0.013***	-0.010***
	(0.003)	(0.003)
Had a child 3 or more years ago	0.037***	0.033***
	(0.003)	(0.003)
× Female	-0.006*	-0.005
	(0.003)	(0.004)
Voluntary Job mobility		
Childless (at t and t+1)	0.022***	0.024***
	(0.001)	(0.001)
× Female	-0.012***	-0.013***
	(0.002)	(0.002)
will have first child next year	0.024***	0.026***
	(0.004)	(0.004)
× Female	-0.019***	-0.020***
	(0.004)	(0.004)
Year of 1st birth	0.021***	0.025***
	(0.003)	(0.004)
× Female	-0.009	-0.008
	(0.005)	(0.006)
had a child 1-2 years ago	0.018***	0.020***
	(0.002)	(0.002)
× Female	-0.008***	-0.007***
	(0.002)	(0.002)
Had a child 3 or more years ago	0.014***	0.016***
	(0.002)	(0.003)
× Female	-0.008***	-0.005*
	(0.003)	(0.003)
Female	-0.002***	
	(0.000)	
Constant	-0.001	-0.018
	(0.022)	(0.033)
Observations	723,752	723,752
R-squared	0.088	0.067
Number of individuals		122,390

Note: Full model controls that are listed in column 6 of table 4 are included. The standard errors in parenthesis are robust standard error with clustering at individual level. *** p<0.01, ** p<0.05, * p<0.1.

Figures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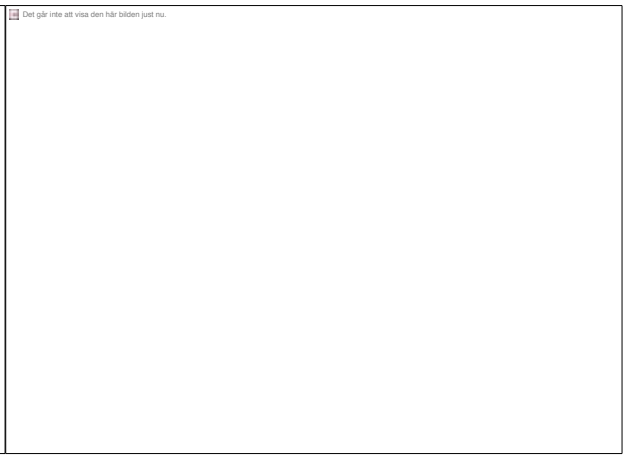
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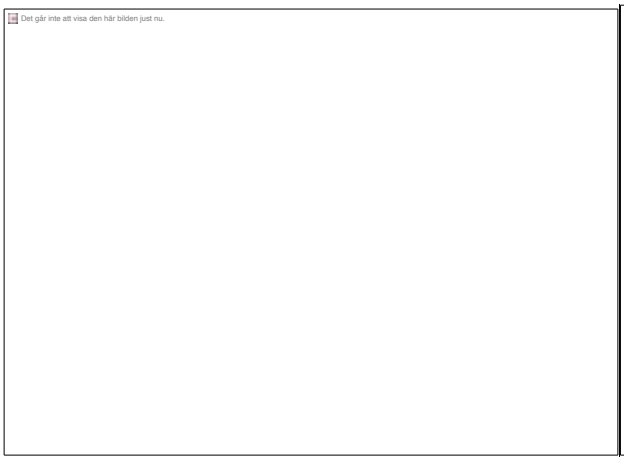
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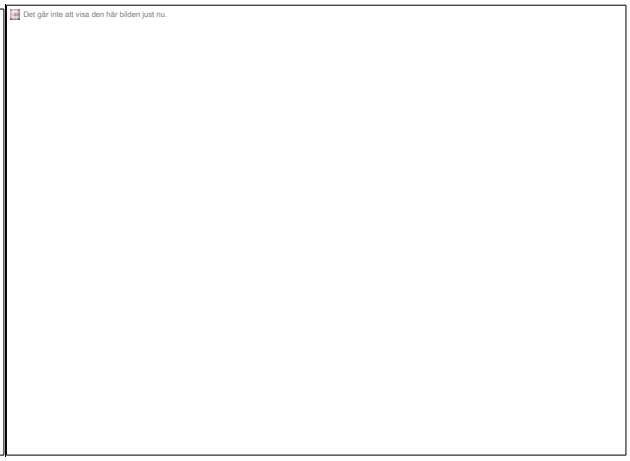
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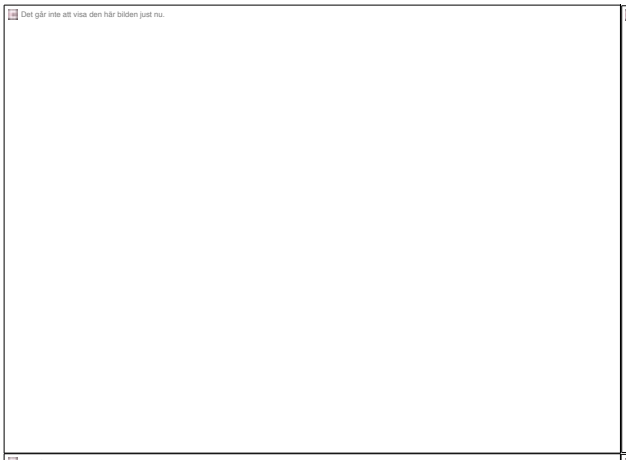
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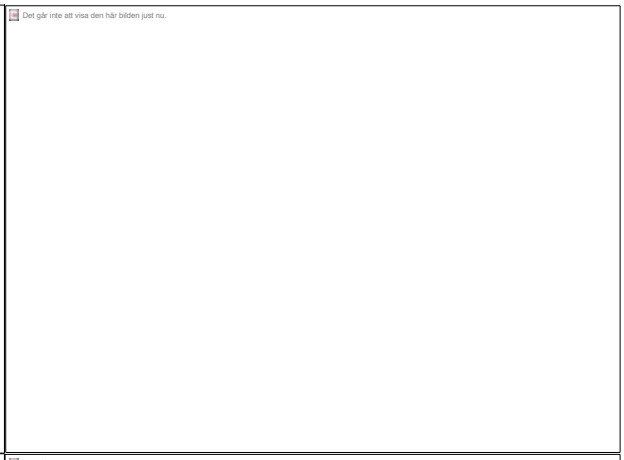
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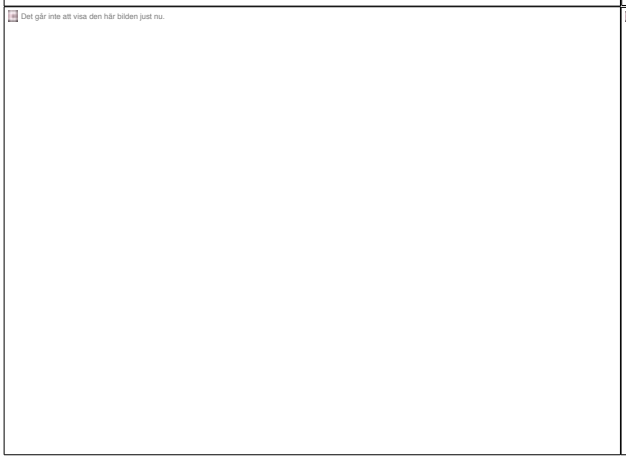
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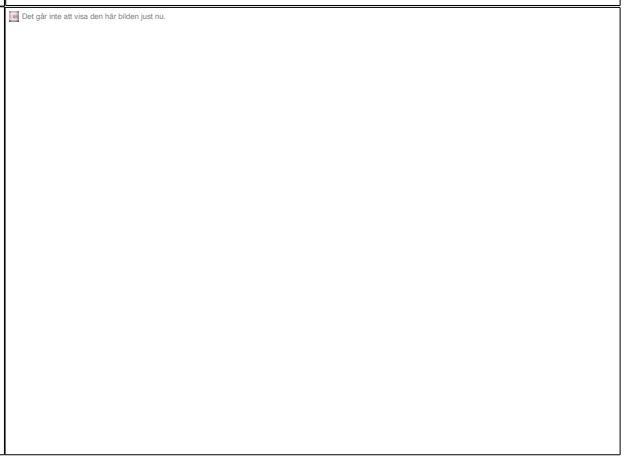
Det går inte att visa den här bilden just nu.

Appendix

Table A1: Summary Statistics for Male and Female Graduates

Variables	Female mean	Male mean	Gender Gap
Wage Growth	0.042	0.050	-0.008
Annualized wage growth	0.037	0.047	-0.010
Occupational mobility (1/0)	0.062	0.073	-0.011
Job mobility (1/0)	0.126	0.130	-0.004
Voluntary job mobility	0.114	0.108	0.006
Involuntary job mobility	0.012	0.022	-0.010
Potential experience	5.667	5.741	-0.074
Tenure	4.585	4.358	0.227
Gaps between consecutive observation	1.170	1.073	0.097
Gaps due to unemployment	1.004	1.001	0.003
Age	32.770	33.260	-0.490
Married (1/0)	0.399	0.371	0.028
Parent (1/0)	0.551	0.498	0.053
Childless (at t and t+1)	0.375	0.445	-0.070
will have first child next year	0.069	0.055	0.014
Year of 1st birth	0.026	0.060	-0.034
Had a child	0.290	0.290	0.000
3 or more years after last birth	0.240	0.150	0.090
Years of Education (2-5)	3.229	3.260	-0.032
Field of Education			
Teachers training	0.309	0.160	0.149
Humanities and Arts	0.035	0.034	0.001
Social Science	0.176	0.192	-0.016
Natural Science	0.041	0.073	-0.031
Technology	0.079	0.373	-0.294
Agriculture	0.005	0.010	-0.005
Health	0.333	0.102	0.232
Service	0.022	0.056	-0.034
unspecified	0.000	0.000	0.000
Sector of Employment			
private sector-white collars	0.010	0.034	-0.023
private sector-blue collar	0.277	0.555	-0.278
Public sector-Municipality	0.426	0.222	0.204
Public sector- regional level	0.098	0.136	-0.038
Public sector-State	0.189	0.053	0.137
Occupation			

Legislators, senior officials and manager	0.032	0.069	-0.038
Professionals	0.480	0.507	-0.027
Technicians and associate professionals	0.421	0.340	0.081
Clerks	0.029	0.023	0.006
Service workers and shop sales workers	0.030	0.027	0.004
Skilled agricultural and fishery workers	0.001	0.001	0.000
Craft and related trades workers	0.001	0.010	-0.009
Plant and machine operators and assemblers	0.003	0.019	-0.016
Elementary occupations	0.003	0.004	-0.001
Firm Size			
less than 10	0.001	0.002	-0.001
10-49	0.013	0.020	-0.007
49-249	0.047	0.085	-0.038
250-499	0.040	0.072	-0.032
500-999	0.072	0.122	-0.050
greater or equal to 1000	0.826	0.698	0.128
Industry			
Agriculture and Fishing	0.006	0.010	-0.004
Mining	0.001	0.002	-0.001
Manufacturing	0.074	0.229	-0.155
Electricity and Gas	0.004	0.014	-0.010
Construction	0.006	0.028	-0.021
Sales	0.002	0.003	-0.001
Hotel and Restaurant	0.002	0.002	0.000
Transport and Communication	0.044	0.065	-0.021
Finance	0.031	0.050	-0.019
Real estate Development	0.072	0.161	-0.089
Public Administration	0.065	0.102	-0.037
Education	0.162	0.094	0.068
Health and Social Works	0.507	0.214	0.293
Other community activities	0.025	0.028	-0.003

Table A2: Gender wage Gap with controls for pre-market factor

Experience	Female-Male Gap	standard error
	(1)	(2)
1	-0.042***	0.001
2	-0.045***	0.001
3	-0.051***	0.002
4	-0.057***	0.002
5	-0.062***	0.002
6	-0.074***	0.002
7	-0.081***	0.002
8	-0.087***	0.002
9	-0.093***	0.002
10	-0.098***	0.002

Note: The dependent variable is the log real monthly wage. Each row in the above table represent a separate OLS estimate of the gender wage gap after controlling for pre-labor market factors (level and field of education, and graduate cohort*year fixed effect).