Is it the way she moves? New evidence on the gender wage growth gap in the early careers of men and women in Italy*

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Abstract

This paper explores a newly available Italian panel dataset obtained from a 1:90 sample of social security administrative records (INPS) to investigate whether observed differences in the characteristics of workers and firms, and observed differences in job mobility are able to explain gender differences in log wage growth. We focus on the wage growth of individuals aged 15-30, a crucial period in the formation of lifetime earnings. We find that there is a significant and growing pay differential between men and women during their early careers, and that between-firm wage growth is substantially higher for men than for women. Controlling for individual observed and unobserved heterogeneity does not reduce, instead exacerbates the effect of a firm change on the gender wage growth gap. On the other hand, when we take into account the type of industry, occupation, and the size of the firm workers move to when changing employer we see a reduction of the unexplained gender differential. We also find that women are not always penalized with respect to men, but this occurs only for positive wage changes, for the highest wage increases, and when women move towards larger firms. These results suggest that job and firm characteristics, rather than across-the-board discrimination, are the most important determinants of the gender wage growth differential in the Italian labour market.
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1 Introduction

This paper analyses gender differences in early career wage growth by exploring the Italian Social Security employer-employee administrative records (INPS). This issue has been neglected until recently in Italy because appropriate microdata were not publicly available. The INPS archives are the first large dataset to provide information on workers' labour market histories and earnings over a long period of time, and give the opportunity to address this topic.

The study of early career wage growth is important because it has been shown that wage growth in the first few years of a worker's experience accounts for over two thirds of lifetime wage growth (Murphy and Welch, 1990; Borjas and Rosen, 1980). Previous literature on wage dynamics has focused in particular on the impact of job mobility (Topel and Ward 1992; Light and McGarry, 1998). In some studies, differences in mobility behaviour and in returns to mobility between men and women have been found responsible for a large part of the differences between men's and women's wage growth (Loprest, 1992; Light and Ureta, 1995). There are at least two reasons why men and women have different wage growth rates when changing employer. The first explanation suggests that women have different job preferences, so that they are more willing to accept jobs with a more flexible schedule, or value more some non-pecuniary aspects of the job and are prepared to accept lower wages in return. Second, there could be some form of discrimination in the labour market which implies that women are excluded from high-paying jobs. This may happen if, for example, employers think that women are more likely to drop out of the labour force or to demand shorter hours in the future and therefore are less willing to invest on women and to employ them in jobs with high responsibilities and high rewards. Very little is still known about the role these factors play in the Italian labour market. In this study we investigate the early career wage growth of men and women who work mainly full-time and show a strong attachment to the labour force. By limiting our analysis to this particular group, we can abstract from differences in working hours and participation behaviour and concentrate our attention on the characteristics of the job and the firm.

Our data reveals a substantial gap in the early career wage growth of men and women. We see that wages increase by 21 percent for men and 20 per cent for women three years after labour market entry, but the gap widens rapidly over time. By the end of the first nine years of experience real wages are 36.3 per cent higher for men but only 30.1 higher for women. Moreover, we find striking gender difference in within-firm and between-firm wage growth. While men gain on average about 6 percentage points when moving to a different employer, the rewards for women is only 4

percentage points.

We begin by estimating via ordinary least squares a wage growth model that is standard in most respects, and controlling for a set of characteristics of worker and the previous employer. The estimates reveal that mobility is positively related to wage growth for men, but in the case of women the premium is significantly negative. This is so also after accounting for the relationship between mobility and unobserved individual fixed effect, as we find evidence of a positive selection of women among the group of movers. Since the gender differential due to changes of firm is the most important part of the log wage growth differential, our analysis proceeds by focusing only on between-firm wage changes. This leads us to investigate whether the way men and women choose to move when changing firm can explain the observed differences in wage growth. It turns out that once we control for the particular types of changes into different industries, occupations and firms of various sizes, the unexplained gender differential is dramatically reduced. We also find that women are not always penalized with respect to men, but that this occurs only for positive wage changes, for the highest wage increases, and when women move towards larger firms. These results suggest that job and firm characteristics, rather than across-the-board discrimination, are the most important determinants of the gender wage growth differential in the Italian labour market. The reminder of our paper is divided into 5 sections. Section 2 presents our data, Section 3 gives an overview of the gender differences in wage growth and job mobility, Sections 4and 5 discuss the results from the wage growth regressions, while the final section concludes.

2 The data

2.1 The INPS administrative archives

The data used in this paper have been extracted from the Italian Social Security Administration (INPS) archives, which collect information on employers and employees for the entire private sector in Italy (more than 10 million employees and 1.2 million employers per year). People born on the 10th of March, June, September and December of each year have been selected from the INPS archives to form a 1:90 random sample of employees. Information on these individuals is collected every year, so it is possible to create a panel and derive labour market histories for the period between 1985 and 1997.[1] For each worker in the panel we have information on gender, date and place of birth, starting and ending date, occupation, industry, type of contract (full-time or part-

[1]The original file includes the years 1998 and 1999. These years could not be used in our analysis as information on some firm characteristics is missing for a very large part of the sample in 1998 and for the entire sample in 1999.

time), gross earnings, weeks and days of paid work of each employment spell registered during the year. We also have an employer identifier and a set of variables related to the firm, such as average number of employees during the year, geographic location and initial year of activity. In Italy this dataset is truly unique in terms of the coverage and accuracy of the individual labour market histories and wage information it provides. Its very large sample size and its panel structure are other attractive features which have encouraged its use (see recent working paper published by Laboratorio Revelli and ISFOL). Because of its administrative nature, however, the dataset presents also some drawbacks. In particular, there is very little demographic information on the individual. So, we do not know anything about his or her family or children, and we have no information about his or her level of education or years of schooling. Moreover, the datasets covers only periods in employment and it is impossible to know whether a gap in the records corresponds to a period of unemployment, self-employment or the worker in question moved to the public sector.[2]

2.2 The sample selection

As we mentioned above, the dataset does not provide any information on educational qualification of the worker. So, in order to overcome this problem, we construct a proxy of the highest completed level of education using the age at which an individual first started to work.[3] This is done as follows. We do not observe all the employment spells of our workers, but only those recorded from 1985 onwards. We therefore select our sample by taking all individuals who enter the panel between the age of 15 and 18 in 1985, between the age of 15 and 19 in 1986, between the age of 15 and 20 in 1987, and so on. This way we know that an individual whose first employment record in the panel is observed at age 20 has not been observed in the data before 1987 and consider 20 as his age of entry in the panel. There is some uncertainty about the previous work experience of those between 15 and 18 years included in 1985, for which we have incomplete information, but we assume that this is not going to affect our results. In order to derive a proxy of educational qualifications, we further specify the age at which the individual first started to work in a non-seasonal job. By seasonal job we intend an employment spell which lasts less than 4 weeks, or a spell which lasts between 4 and 17 weeks and occurs during the period between June and September. So, we do not consider short spells of employment or spells which are compatible with school as part of the employment history

[2]Information on Agriculture, self-employment and part of the Public Administration are also covered by INPS but at present only data on the private sector are available.

[3]Bonjour and Pacelli (1998) tested on Swiss data the size and the direction of bias when age is used as a proxy for education and experience. They find that using age as a proxy for education leads to a small bias for men and full time working women.

of the worker. We then define all individuals who start working (in a non-seasonal job) between the age of 15 and 18 as having lower secondary education, all those who start working between the age of 19 to 25 are having higher secondary education, and those who start working between the age of 26 and 29 as having a tertiary qualification level.[4] Each record in the original data corresponds to a single employment spell when this begins and ends within the same calendar year, while spells which span more than one year are divided into different yearly records. In order to derive the working histories of individuals and analyse their wages and wage growth over time we reorganise the data into a person-year longitudinal dataset with only one record of employment per year. This implies that if there is more than one employment spell during the year, only the longest spell is included in the data. From this information, we define work experience as the total number of years the individual is observed in the panel. Tenure is calculated as the number of weeks an individual is observed working for the same employer and this is then converted into years. For the purposes of this analysis job mobility is defined in terms of changes of employment. So that when we talk about different jobs we intend to indicate the number of times a worker has changed employer.[5] The earning variable used is the real daily (gross) wage. The nominal daily wage is first obtained by dividing the total amount earned during that year or during that employment spell (if within the year) by the number of days worked over the period. The nominal daily wage is then deflated by the Consumer Price Index (base year 1995) to obtain a measure of real daily wages. Since the information on the number of hours worked per day is not available in the data, we need to distinguish full-time workers from part-time workers. However, the number of part-time workers is too small to allow a separate analysis (less than 7% of the sample), and it is not clear how to consider movements between full-time to parttime work in the absence of accurate information on hours.[6] In what follows we therefore consider only individuals who worked full-time throughout their observed working history. Furthermore, since we do not have any information on periods of non-employment, we exclude from the data all individuals who experience a break greater than 2 years while changing employer. There are about 14 per cent of workers who experience such a large gap in their experience, and almost three quarters of them are men. These restrictions introduce important elements of selection in our data. Women in particular are more likely to switch to part-time work, for example, and this has been shown to contribute substantially to the formation of the gender wage growth gap (Loprest, 1992). Long career breaks could be due to unemployment

[4]This procedure is similar to the one adopted by Favaro and Magrini (2005).

[5]There is a very limited number of recalls in the data, so that once workers leave an employer do not usually come back.

[6]The low fraction of part time workers is due to the fact that part-time work is a very recent phenomenon in Italy.

or the birth of a child and these two different events may have very different implications for the career development of young men and women. So, although it would be very important to consider the information on part-time workers and on gaps in labour market experience, limitations in the data lead us to select only individuals with a very strong attachment to the labour market both in terms of hours and experience. As our focus is on early career wage growth, all individuals included in the final sample must have at least two years of data available. Individuals with very high (more than 85 per cent) or very low (less than 85 per cent) wage growth are also excluded, as are the very few workers with more than 10 years of experience (about 5 per cent of the sample). Since our analysis reveals important differences according to educational levels and since those with tertiary education are observed for a very short period (as they enter the panel quite late by construction), our study is restricted to workers with lower and upper secondary education.

3 Early career mobility and wage growth

Our sample of workers can be followed for a period of up to 9 years since the beginning of the working career. So, we can observe the workers entry wage and then analyse how this changes over time. Figure 1 presents log wage profiles disaggregated by sex and level of education at different levels of potential experience. Consistent with human capital theory, we find concave-shaped profiles for both men and women, which first increase steeply with experience in the panel and then seem to reach a maximum around 8 or 9 years. The figures show the existence of a very small gender wage gap at entry. This gap increases over time, and becomes more evident after the first three years of experience (top-left panel). We also display the same log wage profiles for low and high education workers separately (respectively top-right panel and bottom-left panel in figure 1). Here we see that the widening of the gender wage gap seen for the total sample is mainly due to the behaviour of individuals with low education, who see the difference between the log wage of men and women more than double from 0.6 to 1.6 percentage points. On the other hand, for those with high education we observe a roughly constant difference in the wage profiles of men and women of about 0.7 percentage points. These patterns translate into the log wage growth rates presented in Figure 2. Here we notice that wage growth is consistently higher for men than for women during the entire working experience. We see that log wages first increase at a rate of about 0.7 percentage points for the first few years and then start to slow down. There is also substantial heterogeneity in wage growth across education groups; low educated workers experience substantially high wage increases earlier on in their experience followed by a dramatic slowdown, while for highly educated

workers the wage growth profile appears rather flat. Several studies conducted on the U.S. labour market show that mobility plays an important role in the wage growth of young men and women (Topel and Ward, 1992; Loprest, 1992). Differences between men and women in job mobility and in returns to job mobility might be responsible for a substantial part of the observed differences between mens and womens wage growth rates but very little is still known about the role these factors play in the Italian labour market. This data represents the ideal setting to analyse this issue. Figure 3 shows that male workers change firm more frequently than women during their early career, but the difference is rather small. Over their entire experience in the panel, the average man has worked with 2.7 employers while the average woman has changed firm 2.3 times. A similar picture emerges when looking at year-to-year firm changes (Figure 4). Men have a higher propensity to change employer with respect to women each year. This is particularly so for men with low educational level. However, the difference is rather small, just between 3 to 4 percentage points, and much less for more educated workers. On the other hand, comparing the wage growth of men and women and distinguishing within- and between-firm wage changes we get some striking differences. First of all, we see in Table 1 that for the sample of all workers the difference in within-firm wage growth between men and women is only about 0.4 percentage points. When looking at changes across firms we see instead that men gain about 2 percentage points more than women. In particular, the main difference is to be found in the fact that while men who move to a different firm gain more than those who stay with the same employer, the opposite happens in the case of women. This is also true for different levels of education, although the gender gap in between-firm wage growth is generally lower for the high education group. Figure 5 explores the same effects by displaying within-firm and between-firm gender differences in log wage growth by experience. The top two graphs in Figure 5 show that what found in Table 1 holds for all levels of experience. The differences are even more striking if we display within-firm and between-firm growth rate by education (centre and bottom graphs). For low educated men and women, who stay with the same employer between *t-1* and *t*, the gender wage gap is very small, while the between-firm male wage growth is clearly much higher than the between-firm female wage growth. For highly educated workers we find smaller differences and we see that these differences appear later on in the workers experience. This is exactly the same pattern seen in the U.S data analysed by Loprest (1992). It could be explained by the fact that women are more likely to experience involuntary separations, or do not have access to higher paying jobs because of discrimination. It could be simply due to the fact that men and women have different job preferences and this translates into different

job-search strategies and different jobs. The next two sections intend to address these questions and explore whether observed and unobserved differences in the characteristics of workers, and observed differences in the types of jobs and between-firm mobility are able to explain the gender gap in log wage growth or whether even after taking all these factors into account we still fail to account for it.

4 The gender differential in log wage growth

We start by considering the difference in log wage growth between men and women. In Table 2, we first present the unadjusted gender log wage growth differential and then control for a set of observable characteristics of the worker and the firm. Each specification is estimated on the whole sample and on the separate groups of workers with low and high education, respectively. As we can see, the raw gender differential in year-to-year wage growth rates is only about 0.7 percent for the whole sample, about 0.6 percent for the sample of low educated workers and almost zero and entirely not significant for the group of workers with high education.[7] Contrary to what one would expect, controlling for experience and job characteristics increases the differential for the entire sample as well as for the subsamples corresponding to different educational groups. This indicates that observed characteristics are such that women should progress even more rapidly than men during the initial years of their career. The same phenomenon occurs when comparing levels of log wages between men and women. In this case, the unadjusted differential is 4.2 percentage points for the whole sample, and 8 and 6 percentage points, respectively, for the low and high education samples. Accounting for observed characteristics using a specification similar to the one reported in Table 1 shows that the unexplained difference between men and womens wages increases to about 7.5 percentage points for the whole sample and to almost 9 percentage points for the sample of more educated women. The only exception is observed for the group of low educated women, whose adjusted differential decreases to 5.3 percentage points (results not shown). Going back to the determinants of log wage growth rates, we see from Table 2 that having a longer tenure in the previous period and coming from a firm with more than 15 employees at t-1 decreases the rate of wage growth, while white collar workers and workers who were in an apprenticeship position in the previous year see their wages rise faster in the following year. We also control for the type of

[7] In the analysis that follows we consider a combined equation for men and women. Although a test of whether two separate equations for men and women differed only by a constant was usually rejected, the analysis conducted on separate equations revealed the same qualitative results presented here. Here we prefer a single equation for ease of exposition as it allows us to highlight more clearly differences across education groups.

contract at entry in the panel, as this could be an important determinant of early career progression. Here we see that the wage growth path of those starting with an apprenticeship contract is lower than the path of those who start with a permanent contract. This is so in particular for the group of lower education workers, where almost 80 percent begin with an apprenticeship contract. On the other hand, a worker who begins with a fixedterm contract (Contratto di Formazione Lavoro) enjoys a more rapid log wage growth and particularly so if she is in the high education group. As we saw in Table 1, the gender differential in log wage growth is mainly found in conjunction with a change of firm. Table 3 proposes the same comparisons in a regression framework. We present here the raw and regression-adjusted log wage growth gender differential, distinguishing between periods in which there has been a change of firm by means of a dummy variable and considering its interaction with the gender indicator. The unadjusted differential imply that on top of an unexplained difference of about 0.4 percentage points in log wage growth, women accumulate another 1.6 percentage point wage loss when moving to another firm with respect to men. This difference is even bigger and absorbs any unexplained gender difference when considering the group of lower educated workers. So, we see that controlling for observable characteristics does not reduce, but on the contrary increases this gender wage differential, particularly for the low education group. It would be important to distinguish between voluntary and involuntary changes of firm as one can assume that only those changes classified as involuntary are truly exogenous. Unfortunately, we do not have such information, nor can we derive it by identifying firm closures, for example. This is because we only have a 1:90 sample of the universe of workers covered by the Social Security dataset, and the risk of misclassifying involuntary and voluntary separations is too high to proceed in this direction.[8] What we can do, however, is to see whether there are systematic differences in mobility patterns across men and women which could indicate something about the voluntary or involuntary nature of the separation. For example, we observe the interval of time between the end of a job and the beginning of the next job in another firm, which could be seen as a measure of unemployment. Shorter intervals could result from voluntary moves, while longer gaps could be an indicator that an involuntary separation occurred. Looking at this variable we see that the interval between two jobs is usually longer for men than for women (6 months for men compared to 5 for women). The main differences are mainly at shorter interval durations. About 40% of men against 43.5 per cent of women move to another firm within 2 months of leaving the previous job. We therefore looked at whether the gender difference in between-firm wage growth would be

[8]Earlier attempts in this direction were abandoned because of the excessive number of assumption required in identifying firm closures.

sensitive to the length of the interruption, but we could not find any evidence that this was the case (results not shown). We further ask whether the same effects of firm mobility are to be found in a fixedeffect regression where we deal with the endogeneity of mobility by assuming that this is simply due to unobserved individual characteristics which stay the same over time. Looking at the regressions which include all the control variables in Table 4 (third and fourth column), we see that while the effect of mobility for men remains positive and virtually unchanged in terms of magnitude, the effect on women becomes even more negative. This suggests that there is a small influence of self-selection into mobility for men, while unobserved personal characteristics play a stronger role for women. However, even if selectivity on the basis of individual heterogeneity seems to be more of an issue for female mobility, the direction of the bias indicates that it is not an explanation of the lower log wage growth of women with respect to men. In fact the opposite holds true. In other words, the results point out that an explanation of the gender mobility-penalty is more likely to be found in unobserved characteristics of the job or the firm, or in the presence of stronger discrimination towards female movers. So, in the next section, we turn our attention to an analysis of the between-firm wage growth and explore to what extent different characteristics of the firms or the jobs men and women move to provide an explanation of the gap and whether any unexplained difference still remains.

5 Between-firm job changes and determinants of the gender wage growth gap

First of all, we would like to know whether there are gender differentials in log wage growth among firm-movers across the entire distribution of log wage changes, or whether these gender differences are concentrated among particular types of wage changes. In order to do so, we run quantile regressions of the log of between-firm wage growth, distinguishing the effect of gender at the 25th, 50th and 75th percentile of the distribution. The results are very clear-cut. As we can see in Table 5, the effect of being female becomes negative and higher in magnitude the higher the wage growth. In other words, it seems that the most part of the gender imbalance is to be found among those who experience significant wage increases. It could be that the distribution of wage growth is very dissimilar for men and women, and that women observe more negative wage changes. In fact, there is some evidence that this might be the case as the median wage growth for men is

almost 5 percent while for women it is only 3.3 percentage points.[9] We therefore run separate regression on positive and negative wage changes and consider for each regression the impact of the gender dummy. As Table 6 shows, we find that for negative changes in log wage women lose as much as men, sometimes even less, but that when we look at wage increases women seem to suffer considerably. Their average wage growth is about 3 to 4 percentage points lower than that of men. So there are substantial asymmetries in the distribution of log wage growth for men and women, with the main differences concentrated in the positive part of the distribution. This result is interesting as it confirms that there is a considerable amount of selection which could explain the observed differences in gender wage growth. For example, if we were to classify negative wage changes as involuntary and positive wage changes as voluntary, we would perhaps conclude that the entire gender wage growth differential is due to unobserved characteristics of the firm or the job which we cannot control for. One way to proceed is to try to explore whether there are important differences in the types of firm changes which are behind the observed gender differential. In other words, we need to ask whether when changing employer men and women choose to move to different occupations, or to different industries, or to different firms, such that women gain systematically less than men. In order to do this we construct a series of dummies which assume value one when the worker changed industry, occupation or moved to a firm with a different size from period *t-1* to period *t*.[10] Table 7 presents a set of regressions which take these variables into account. In the first column we report the average gender differential in between-firm wage growth after controlling for a series of characteristics of the job at time t-1. This differential, which is about 2.5 percentage points for all workers, remains substantially unchanged when we control for changes in industry, occupation or firm size, but it decreases considerably and becomes even insignificant when we introduce interaction terms of these variables and the gender indicator. With the exception of the group of highly educated workers, all the interaction terms are statistically significant and indicate that a substantial part of the gender wage growth differential is to be attributed to the different types of firm changes observed for men and women, in particular those which involve a change in occupation or firm size. As there are several industries, occupation and firm size categories, there are better ways to take into account the way in which changes in these job characteristics

[9] We also estimated two different equations for men and women. Considering all year-to-year wage changes we looked at the effect of a between-firm move dummy. A comparison of the estimated male and female coefficients on this dummy at different points in the distribution revealed the same pattern shown in Table 4; smaller gender differences in log wage growth at the lowest percentiles and higher penalties for women at the top (results not shown).

[10] We also considered whether the worker changed geographical area (down to the level of the province), but we never found any effect for this, so it was not considered in the final analysis.

affect log wage growth. Following Loprest (1992) and Winter-Ebmer and Zweimuller (1999), we construct a set of variables which represent the average premium (or penalty) associated with a specific change of occupation, industry or firm size. These variables are calculated as the difference in the coefficients of a simple regression of log wages on industry, occupation, firm-size dummies and all other controls. So, for example, if the wage of someone who works in a firm with size 5-14 is 4.3 percent higher with respect to someone working in a smaller firm, we attribute a 4.3 percent wage growth to each move between a firm of size 0-4 to a firm of size 5-14. We construct a change premium (penalty) variable for each type of move, involving a change of industry, occupation or firm size. Then we run a regression of log wage growth onto the usual set of controls and these variables. The coefficient on the variable representing the firm-size premium will tell us, for example, how much of the average premium (or penalty) associated to a change of firm size is to be gained when moving across employers. The interaction between this variable and a gender dummy will indicate whether there are differences between men and women in terms of the firms they move to and whether these differences are such to affect the gender log wage growth gap. The results in Table 8 follow this procedure. We first consider what happens when adding the industry, occupation and firm size premiums. As we can see from the second column, individuals changing industry experience a wage increase equal to 49 percent of the cross- sectional industry premium. This percentage is about 77 for changes of occupation and 54 for changes in firm size. Unlike what we observed in Table 7, after accounting for the different types of moves we can explain already quite a large part of the gender differential in wage growth, which decreases from 2.42 percentage points to 1.64 percentage points. Adding the interactions between a gender dummy and the change in industry, occupation and firm size premiums reveals significant and quite large gender differentials with respect to these variables. It is therefore clear that men and women do not move in similar ways and that this type of heterogeneity penalizes women in terms of log wage growth. In particular, we see that what matters most are changes across occupations and firm size. With the only exception of the group with low education, movements across industries do not seem to exert an important influence. However, and in contrast with what seen in Table 7, we still observe a significant and negative (although smaller) unexplained gender differential for the entire sample and for the group with high education. In Table 9 we push this analysis a bit further and separate the firm size premium into the premium gained through changes to larger and smaller firms. As we can see from the second column of coefficients, individuals who move to larger firms experience an increase in the wage of roughly 49 per cent of the cross-sectional size gap, while those who move to smaller

firms see a wage decrease of more than 63 per cent and this difference is statistically significant, as indicated by the p-value shown at the bottom of the table. However, the next column shows that this effect is entirely due to a gender asymmetry. As we can see, after controlling for gender, we find no differences between the average wage gain and loss of men who move to firms with different size. It is only for women that we observe an imbalance. Women who move to larger firms are able to command only about 31 per cent (obtained by summing up 0.5666 and -0.2461) of the average OLS firm size differential, whereas those who move to smaller firms lose more than 62 per cent (obtained by summing up 0.6116 and 0.0530). Interestingly, the unexplained sex differential in log wage growth diminishes even further and becomes completely insignificant.

6 Discussion

This paper presents a study of the gender differences in wage growth in the early careers of men and women in Italy. We focus here in particular on wage growth due to job mobility. This is because differences in returns to job mobility are found to be the most important source of the observed differential in log wage growth between men and women. Gender differences in mobility patterns, especially those due to womens intermittent participation in the labour force, are not explored in this study as we restrict our analysis to individuals who are similar in their labour force attachment.

Our analysis has a mainly descriptive intent. We first show that while there is very little difference in the between- and within-firm wage growth of men, women seem to suffer slower wage growth when changing employer. This difference cannot be attributed to self-selection of workers into mobility. On the contrary, evidence from individual fixed-effects regressions seems to indicate that women with unobserved characteristics positively related to log wage growth are more likely to move across firms. In other words, unobserved individual heterogeneity exacerbates rather than explain the observed gender mobility-penalty. Following Loprest (1992) we ask whether there are characteristics of the firms or the jobs men and women move to that can be held responsible for the observed gender differential. As our data only includes full-time workers, we exclude a priori all direct effects of hours of work and focus instead on industry, occupation and firm-size effects. The analysis shows that there are significant differences in the types of occupation, industry and firm-size changes between men and women and that these differences have a strong impact on the male-female wage growth. In fact, accounting for the different types of between-firm moves seems to absorb the entire unexplained gender differential in wage growth rates.

Furthermore, we observe that the main differences between men and women are to be found among those who experience positive wage growth and those who move to larger firms. As these types of changes are more likely to be voluntary, these findings broadly support the hypothesis that the main explanation for the gender mobility penalty observed in the Italian labour market is to be found in unobserved firm and job-specific characteristics.

References

Bonjour, D. and L. Pacelli (1998): "Wage Formation and the Gender Wage Gap: Do Institutions Matter? Italy and Switzerland Compared", U.C.L. Discussion Paper, n.12/98

Borjas, G. and S. Rosen (1980): Income Prospects and Job Mobility of Younger Men., in Research in Labor Economics, edited by Ronald Ehrenberg. Greenwich, CT: JAI Press.

Capellari, S., Chies, L. and S. Zaccarin (2004): The MaleFemale Wage Gap and the Firm Effect: The Case of Young Italian Workers, Labour, vol. 18(4): 675697

Cardoso, A. R. (2005): Big Fish in Small Pond or Small Fish in Big Pond? An Analysis of Job Mobility, IZA Discussion Paper, n. 1900

Contini B. and Villosio C. (2000): Job Changes and Wage Dynamics, LaboratorioRevelli Working Paper, n. 5

Dustmann, C. and S. Pereira (2005): Wage Growth and Job Mobility in the U.K. and Germany, IZA Discussion Paper, n. 1586

Favaro, D. and S. Magrini (2005): Group versus Individual Discrimination among Young Workers: A Distributional Approach, Universita Ca Foscari di Venezia, Nota di Lavoro 02/2005

Fitzenberger, B. and A. Kunze (2005): Vocational Training and Gender: Wages and Occupational Mobility among Young Workers, IZA Discussion Paper, n.1766

Kunze, A. (2003): Gender Differences in Entry Wages and Early Career Wages, Annales dEconomie et Statistique, vol. 71/72: 245-266.

Kunze, A. (2005): The Evolution of the Gender Wage Gap, Labour Economics, vol. 12: 73-97

Lazear, E. P. and S. Rosen (1990): Male-Female Wage Differentials in Job Ladders, Journal of Labor Economics, vol. 8(1): 106-123.

Light, A. and M. Ureta (1995): Early-Career Work Experience and Gender Wage Differential, Journal of Labour Economics, vol. 13(1): 121-154

Light, A. and K. McGarry (1998): Job Change Patterns and the Wage of Young Men, Review of Economics and Statistics, vol. 80(2): 276-286

Loprest, P. J. (1992): Gender Differences in Wage Growth and Job Mobility, American Economic Review, vol. 82(2): 526-532

Manning, A. and H. Robinson (2004): Something in the Way She Moves: A Fresh Look at an Old Gap, Oxford Economic Papers, vol. 56:169-188

Murphy, K. and F. Welch, (1990): Empirical Age-Earnings Profiles, Journal of Labour Economics, vol. 8: 202-29

Munasinghe, L. and T. Reif (2004): The Gender Gap in Wage Returns on Job Tenure and Experience, mimeo

Schnberg, U. (2004): Wage Growth due to Human Capital Accumulation and Job Search: A Comparison between the United States and Germany, mimeo

Topel, R. H. and M. P. Ward (1992): Job Mobility and the Careers of Young Men, Quarterly Journal of Economics, vol. 107(2): 439-479

Winter-Ebmer R. and J. Zweimuller (1999): Firm-Size Wage Differentials in Switzerland: Evidence from Job-Changers, American Economic Review, vol. 89(2): 89-93

Figure 1: **Log-wage by potential experience**

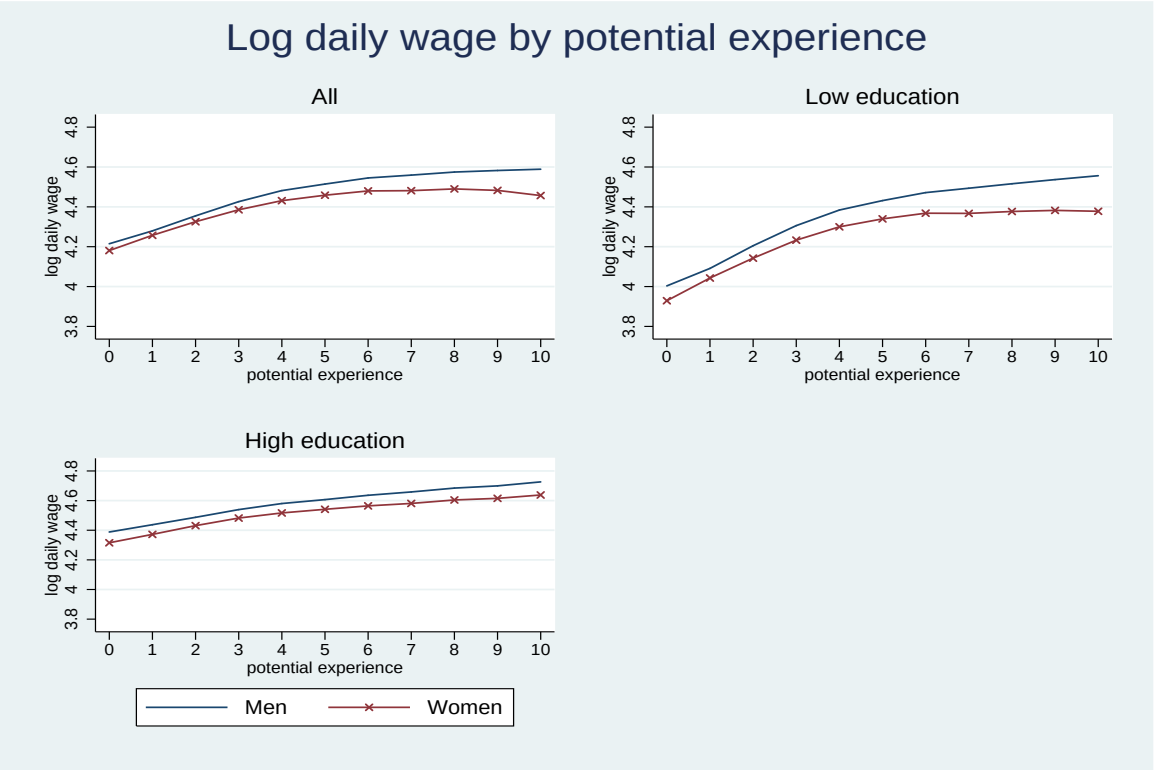

Figure 2: **Log-wage growth by potential experience**

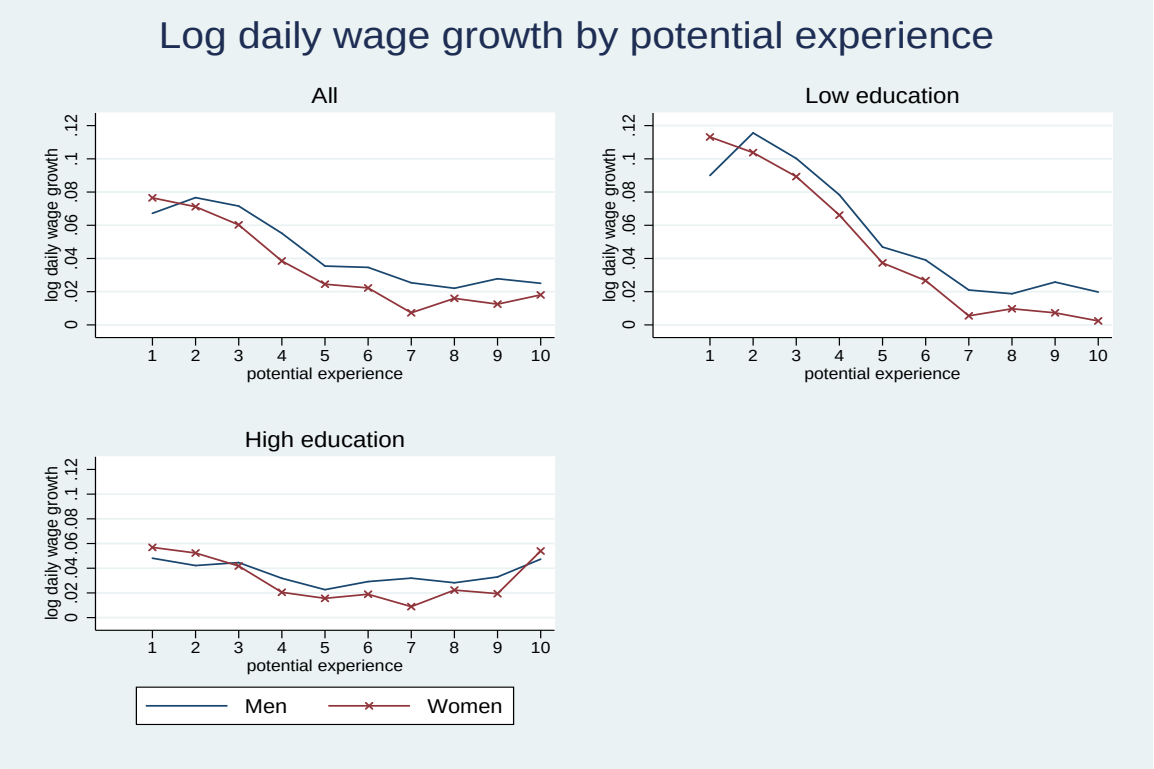

Figure 3: **Cumulative number of firm changes by potential experience**

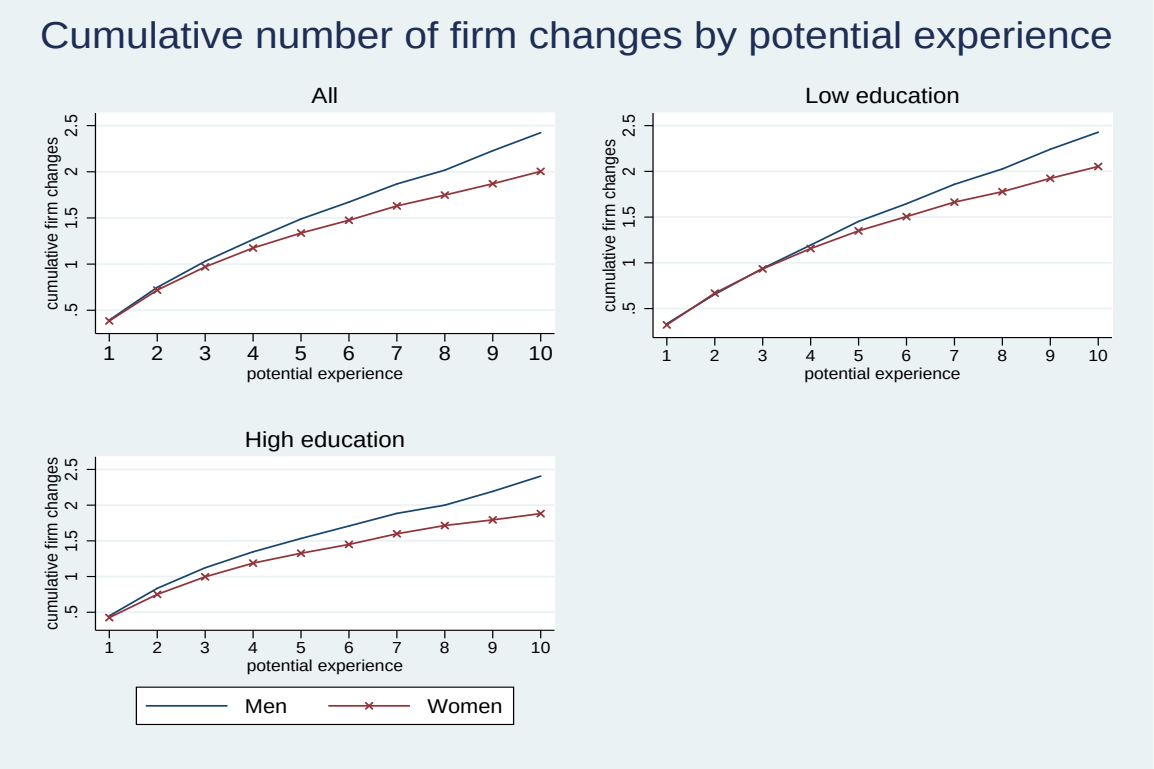

Figure 4: **Average number of firm changes by potential experience**

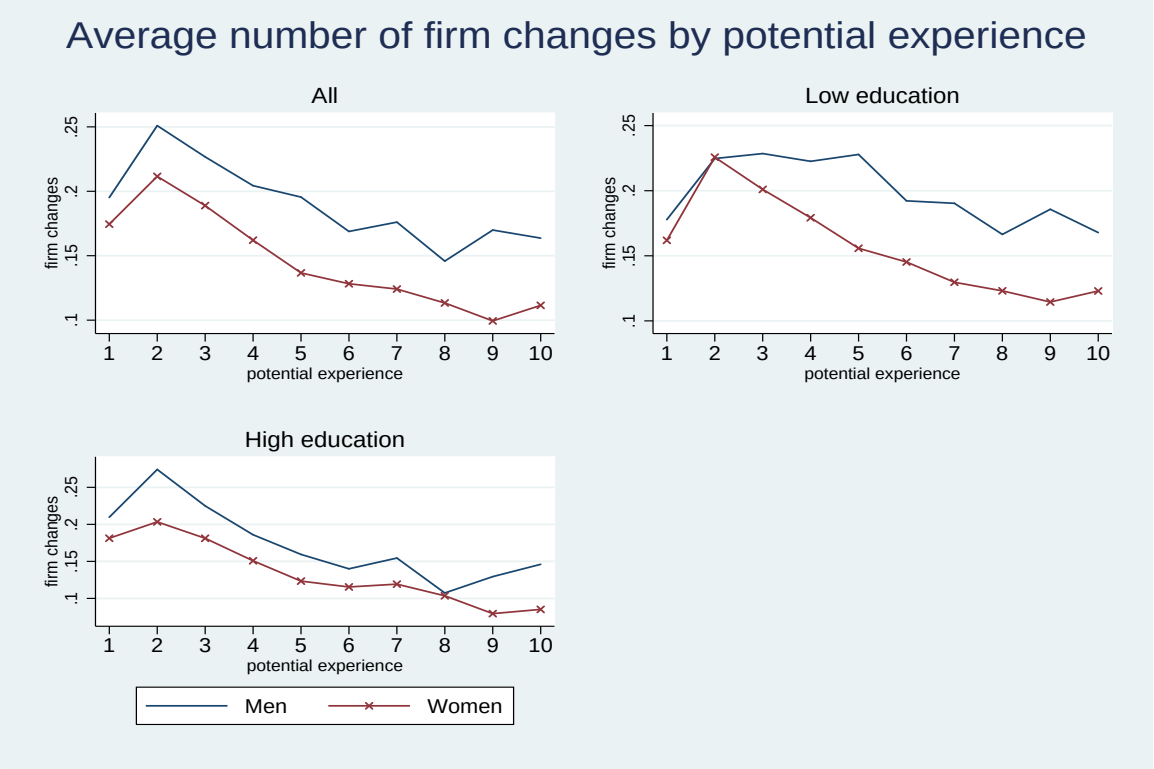

Figure 5: **Wage growth within and between firm by potential experience**

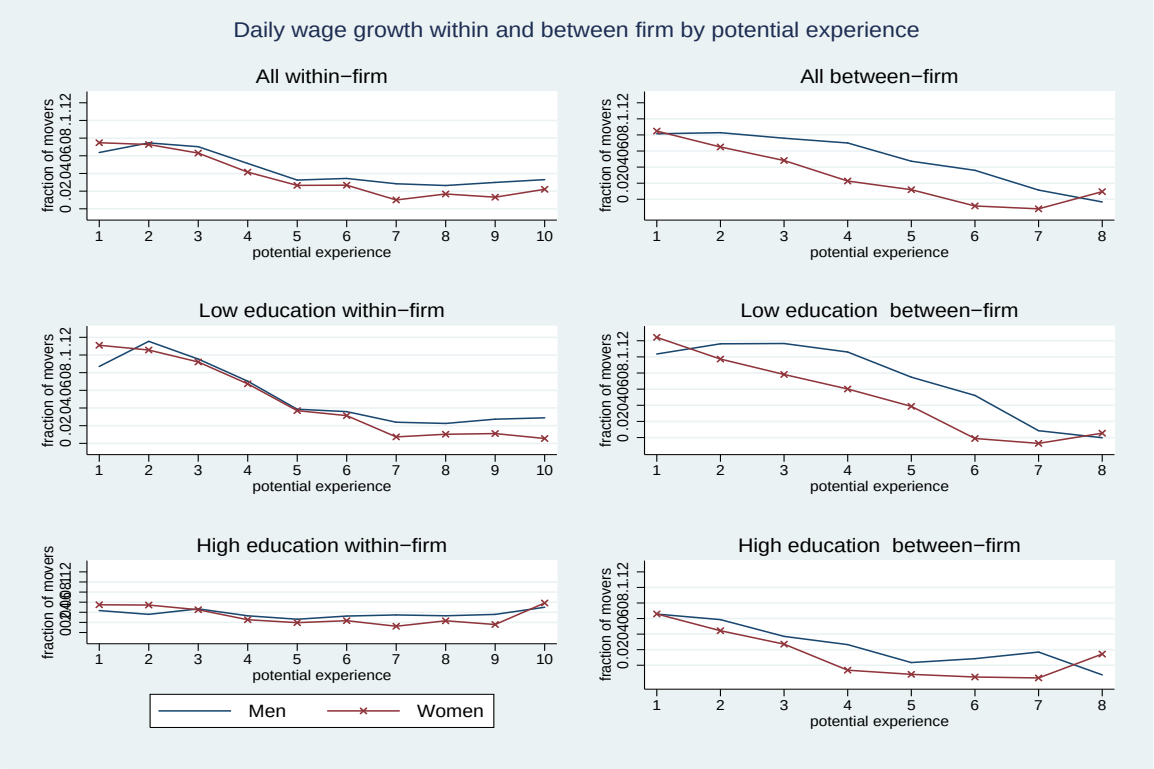

TABLE 1

Mean log wage growth in real daily wages with and without change of firm

	Male	Female	Difference Male - Female
Panel A: All			
Within Job (1)	0.0534 (0.0006)	0.0495 (0.0007)	0.0039** (0.0009)
Between Job (2)	0.0597 (0.0022)	0.0400 (0.0028)	0.0196** (0.0037)
Difference (2)-(1)	0.0063** (0.0016)	-0.0095** (0.0020)	
Panel B: Low education			
Within Job (1)	0.0688 (0.0009)	0.0668 (0.0012)	0.0020 (0.0015)
Between Job (2)	0.0799 (0.0032)	0.0581 (0.0047)	0.0218** (0.0058)
Difference (2)-(1)	0.0111** (0.0024)	-0.0088** (0.0034)	
Panel C: High education			
Within Job (1)	0.0372 (0.0008)	0.0382 (0.0009)	-0.0010 (0.0031)
Between Job (2)	0.0387 (0.0031)	0.0274 (0.0034)	0.0114* (0.0047)
Difference (2)-(1)	0.0015 (0.0022)	-0.0109** (0.0025)	

Note: Standard errors in parenthesis. Symbols: ** significant at 1% level; * significant at 5% level.

TABLE 2

Raw and regression-adjusted log wage growth gender differentials

	All		Low education		High education	
	No controls	All controls	No controls	All controls	No controls	All controls
Female	-0.0068**	-0.0095**	-0.0056**	-0.0074**	-0.0010	-0.0122**
	(0.0008)	(0.0009)	(0.0012)	(0.0014)	(0.0010)	(0.0011)
Potential experience		-0.0005*		0.0022**		-0.0015**
		(0.0003)		(0.0004)		(0.0004)
Tenure		0.0047**		0.0040**		0.0058**
		(0.0008)		(0.0012)		(0.0012)
$Tenure_{t-1}$		-0.0042**		-0.0028*		-0.0057**
		(0.0009)		(0.0012)		(0.0013)
$Blue\text{-}collar_{t-1}$ (reference)		-		-		-
$White\text{-}collar_{t-1}$		0.0144**		0.0067**		0.0153**
		(0.0010)		(0.0025)		(0.0012)
$Apprentice_{t-1}$		0.1099**		0.1149**		0.1267**
		(0.0015)		(0.0020)		(0.0037)
Firm size $_{t-1}$: 0-4 (reference)		-		-		-
Firm size $_{t-1}$: 5-14		0.0028*		0.0042*		-0.0003
		(0.0013)		(0.0018)		(0.0018)
Firm size $_{t-1}$: 15-99		-0.0043**		-0.0089**		-0.0013
		(0.0012)		(0.0018)		(0.0017)
Firm size $_{t-1}$: 100+		-0.0090**		-0.0120**		-0.0085**
		(0.0013)		(0.0023)		(0.0017)
First contract: permanent (reference)		-		-		-
First contract: apprenticeship		-0.0015		-0.0044*		0.0037
		(0.0011)		(0.0018)		(0.0019)
First contract: fixed term		0.0058**		-0.0012		0.0083**
		(0.0009)		(0.0022)		(0.0010)
Observations	126094	126094	58748	58748	67346	67346
Number of individuals	29528	29528	12102	12102	17426	17426

Note: Sample of individuals from the INPS administrative records for the period between 1985 and 1997. Dependent variable is the difference in log real daily wage between t and t-1. Where indicated other controls include 1-digit industry dummies and 20 regional dummies at t-1, and yearly dummies. Huber-White heteroskedasticity robust standard errors adjusted in order to take into account the presence of multiple observations for each individual shown in parentheses. Symbols: ** significant at 1% level; * significant at 5% level.

TABLE 3

Log wage growth gender differentials with and without firm change

	All		Low education		High education	
	No controls	All controls	No controls	All controls	No controls	All controls
Female	-0.0039**	-0.0061**	-0.0020	-0.0023	0.0010	-0.0103**
	(0.0008)	(0.0009)	(0.0014)	(0.0014)	(0.0010)	(0.0011)
Change of firm	0.0063**	0.0092**	0.0111**	0.0144**	0.0015	0.0030
	(0.0021)	(0.0023)	(0.0030)	(0.0032)	(0.0029)	(0.0032)
Female×change of firm	-0.0160**	-0.0193**	-0.0198**	-0.0288**	-0.0124**	-0.0112**
	(0.0034)	(0.0033)	(0.0054)	(0.0052)	(0.0045)	(0.0043)
Potential experience		-0.0006*		0.0021**		-0.0015**
		(0.0003)		(0.0004)		(0.0004)
Tenure		0.0050**		0.0052**		0.0050**
		(0.0010)		(0.0014)		(0.0015)
$Tenure_{t-1}$		-0.0044**		-0.0037**		-0.0051**
		(0.0010)		(0.0014)		(0.0015)
$Blue\text{-}collar_{t-1}$ (reference)		-		-		-
$White\text{-}collar_{t-1}$		0.0145**		0.0064*		0.0153**
		(0.0010)		(0.0025)		(0.0012)
$Apprentice_{t-1}$		0.1100**		0.1150**		0.1267**
		(0.0015)		(0.0020)		(0.0037)
Firm size $_{t-1}$: 0-4 (reference)		-		-		-
Firm size $_{t-1}$: 5-14		0.0028*		0.0041*		-0.0003
		(0.0013)		(0.0018)		(0.0018)
Firm size $_{t-1}$: 15-99		-0.0043**		-0.0091**		-0.0013
		(0.0012)		(0.0018)		(0.0017)
Firm size $_{t-1}$: 100+		-0.0088**		-0.0120**		-0.0084**
		(0.0013)		(0.0023)		(0.0017)
First contract: permanent (reference)		-		-		-
First contract: apprenticeship		-0.0015		-0.0041*		0.0036
		(0.0011)		(0.0019)		(0.0019)
First contract: fixed term		0.0059**		-0.0007		0.0083**
		(0.0009)		(0.0022)		(0.0010)
Observations	126094	126094	58748	58748	67346	67346
Number of individuals	29528	29528	12102	12102	17426	17426

Note: Sample of individuals from the INPS administrative records for the period between 1985 and 1997. Dependent variable is the difference in log real daily wage between t and t-1. Where indicated other controls include 1-digit industry dummies and 20 regional dummies at t-1, and yearly dummies. Huber-White heteroskedasticity robust standard errors adjusted in order to take into account the presence of multiple observations for each individual shown in parentheses. Symbols: ** significant at 1% level; * significant at 5% level.

TABLE 4

Log wage growth gender differentials controlling for individual fixed-effects

	OLS	Fixed Effects	OLS	Fixed Effects
	No controls	No controls	All controls	All controls
Panel A: All				
Female	-0.0039**		-0.0061**	
	(0.0008)		(0.0009)	
Change of firm	0.0063**	0.0124**	0.0092**	0.0091**
	(0.0021)	(0.0020)	(0.0023)	(0.0021)
Female×change of firm	-0.0160**	-0.0275**	-0.0193**	-0.0257**
	(0.0034)	(0.0033)	(0.0033)	(0.0031)
Observations	126094	126094	126094	126094
Number of individuals	29528	29528	29528	29528
Panel B: Low education				
Female	-0.0020		-0.0023	
	(0.0014)		(0.0014)	
Change of firm	0.0111**	0.0186**	0.0144**	0.0162**
	(0.0030)	(0.0028)	(0.0032)	(0.0031)
Female×change of firm	-0.0198**	-0.0342**	-0.0288**	-0.0355**
	(0.0054)	(0.0051)	(0.0052)	(0.0048)
Observations	58748	58748	58748	58748
Number of individuals	12102	12102	12102	12102
Panel C: High education				
Female	0.0010		-0.0103**	
	(0.0010)		(0.0011)	
Change of firm	0.0015	0.0053	0.0030	-0.0001
	(0.0029)	(0.0027)	(0.0032)	(0.0030)
Female×change of firm	-0.0124**	-0.0200**	-0.0112**	-0.0156**
	(0.0045)	(0.0042)	(0.0043)	(0.0041)
Observations	67346	67346	67346	67346
Number of individuals	17426	17426	17426	17426

Note: Sample of individuals from the INPS administrative records for the period between 1985 and 1997. Dependent variable is the difference in log real daily wage between t and t-1. Where indicated controls include potential experience at time t, tenure in the firm at time t and a time t-1, occupation dummies, firm size categories dummies, 1-digit industry dummies and 20 regional dummies at t-1, dummies for type of first contract, and yearly dummies. Huber-White heteroskedasticity robust standard errors adjusted in order to take into account the presence of multiple observations for each individual shown in parentheses. Symbols: ** significant at 1% level; * significant at 5% level.

TABLE 5

Gender differential in quantile regressions of log wage growth with firm change

	All		Low education		High education	
	No controls	All controls	No controls	All controls	No controls	All controls
Panel A: 0.25 percentile						
Female	0.0070	-0.0059	0.0043	-0.0098	0.0172**	-0.0046
	(0.0045)	(0.0054)	(0.0061)	(0.0088)	(0.0055)	(0.0063)
Panel B: 0.50 percentile						
Female	-0.0155**	-0.0175**	-0.0163**	-0.0285**	-0.0084	-0.0157**
	(0.0036)	(0.0034)	(0.0056)	(0.0058)	(0.0044)	(0.0047)
Panel C: 0.75 percentile						
Female	-0.0463**	-0.0441**	-0.0473**	-0.0499**	-0.0367**	-0.0424**
	(0.0050)	(0.0043)	(0.0088)	(0.0075)	(0.0064)	(0.0057)
Observations	23226	23226	10998	10998	12228	12228
Number of individuals	14198	14198	6251	6251	7947	7947

Note: Sample of individuals from the INPS administrative records for the period between 1985 and 1997. Dependent variable is the difference in log real daily wage between t and t-1 for periods in which the individual changes firm. The coefficients shown are obtained from a quantile regression of changes in log wages on a female dummy and, where indicated, a set of other control variables. The controls include potential experience at time t, tenure in the firm, occupation dummies, firm size categories dummies, 1-digit industry dummies and 20 regional dummies at t-1, dummies for type of first contract, and yearly dummies. Note that here standard errors are not adjusted to take into account the presence of multiple observations for each individual shown in parentheses. Symbols: ** significant at 1% level; * significant at 5% level.

TABLE 6

Gender differential according to positive and negative log wage growth with firm change

	All		Low education		High education	
	No controls	All controls	No controls	All controls	No controls	All controls
Panel A: negative changes in log wage						
Female	0.0176**	0.0077	0.0045	0.0068	0.0103*	0.0219**
	(0.0036)	(0.0041)	(0.0066)	(0.0058)	(0.0052)	(0.0045)
Observations	9561	9561	4156	4156	5405	5405
Number of individuals	6594	6594	3360	3360	4106	4106
Panel B: positive changes in log wage						
Female	-0.0341**	-0.0339**	-0.0306**	-0.0398**	-0.0306**	-0.0319**
	(0.0033)	(0.0035)	(0.0050)	(0.0054)	(0.0043)	(0.0047)
Observations	13665	13665	6842	6842	6823	6823
Number of individuals	9363	9363	5426	5426	5326	5326

Note: Sample of individuals from the INPS administrative records for the period between 1985 and 1997. Dependent variable is the difference in log real daily wage between t and t-1 for periods in which the individual changes firm. The coefficients shown in Panel A (Panel B) are obtained from a regression of negative (positive) changes in log wages on a female dummy and, where indicated, a set of other control variables. The controls include potential experience at time t, tenure in the firm, occupation dummies, firm size categories dummies, 1-digit industry dummies and 20 regional dummies at t-1, dummies for type of first contract, and yearly dummies. Huber-White heteroskedasticity robust standard errors adjusted in order to take into account the presence of multiple observations for each individual shown in parentheses. Symbols: ** significant at 1% level; * significant at 5% level.

TABLE 7

Determinants of log wage growth with firm change

	All			Low education			High education		
Female	-0.0242**	-0.0253**	-0.0076	-0.0331**	-0.0362**	-0.0147	-0.0199**	-0.0211**	-0.0078
	(0.0037)	(0.0037)	(0.0054)	(0.0058)	(0.0059)	(0.0089)	(0.0047)	(0.0047)	(0.0068)
Change of industry		-0.0201**	-0.0190**		-0.0351**	-0.0328**		-0.0070	-0.0036
		(0.0034)	(0.0041)		(0.0052)	(0.0060)		(0.0045)	(0.0057)
Female×change of industry			-0.0029			-0.0078			-0.0086
			(0.0072)			(0.0118)			(0.0090)
Change of occupation		0.0596**	0.0670**		0.0933**	0.1028**		-0.0034	-0.0041
		(0.0047)	(0.0058)		(0.0067)	(0.0080)		(0.0067)	(0.0084)
Female×change of occupation			-0.0206*			-0.0292*			0.0018
			(0.0088)			(0.0126)			(0.0119)
Change of firm size		0.0038	0.0106*		0.0132**	0.0185**		-0.0076	-0.0008
		(0.0034)	(0.0043)		(0.0050)	(0.0061)		(0.0047)	(0.0061)
Female×change of firm size			-0.0193**			-0.0170			-0.0170
			(0.0069)			(0.0107)			(0.0090)
Observations	23226	23226	23226	10998	10998	10998	12228	12228	12228
Number of individuals	14198	14198	14198	6251	6251	6251	7947	7947	7947

Note: Sample of individuals from the INPS administrative records for the period between 1985 and 1997. Dependent variable is the difference in log real daily wage between t and t-1 for periods in which the individual changes firm. Other control variables include potential experience at time t, tenure in the firm, occupation dummies, firm size categories dummies, 1-digit industry dummies and 20 regional dummies at t-1, dummies for type of first contract, and yearly dummies. Huber-White heteroskedasticity robust standard errors adjusted in order to take into account the presence of multiple observations for each individual shown in parentheses. Symbols: ** significant at 1% level; * significant at 5% level.

TABLE 8

Determinants of log wage growth with firm change according to average premium for change in industry, occupation and firm size

	All			Low education			High education		
Female	-0.0242**	-0.0164**	-0.0102**	-0.0331**	-0.0133*	-0.0052	-0.0199**	-0.0174**	-0.0132**
	(0.0037)	(0.0034)	(0.0036)	(0.0058)	(0.0053)	(0.0058)	(0.0047)	(0.0045)	(0.0046)
Change of industry premium		0.4886**	0.4879**		0.5132**	0.4408**		0.4766**	0.5246**
		(0.0414)	(0.0465)		(0.0527)	(0.0614)		(0.0613)	(0.0699)
Female×change of industry premium			0.0401			0.3379**			-0.1834
			(0.0896)			(0.1154)			(0.1252)
Change of occupation premium		0.7698**	0.8194**		0.7993**	0.8361**		0.7926**	0.8606**
		(0.0214)	(0.0256)		(0.0264)	(0.0306)		(0.0514)	(0.0611)
Female×change of occupation premium			-0.1372**			-0.1185**			-0.1517*
		(0.0358)	(0.0371)			(0.0456)			(0.0689)
Change in firm size premium		0.5404**	0.5783**		0.7806**	0.8242**		0.4809**	0.5260**
		(0.0234)	(0.0274)		(0.0489)	(0.0559)		(0.0291)	(0.0347)
Female×change in firm size premium			-0.1261**			-0.2136*			-0.1331*
			(0.0453)			(0.0995)			(0.0535)
Observations	23226	23226	23226	10998	10998	10998	12228	12228	12228
Number of individuals	14198	14198	14198	6251	6251	6251	7947	7947	7947

Note: Sample of individuals from the INPS administrative records for the period between 1985 and 1997. Dependent variable is the difference in log real daily wage between t and t-1 for periods in which the individual changes firm. Other control variables include potential experience at time t, tenure in the firm, occupation dummies, firm size categories dummies, 1-digit industry dummies and 20 regional dummies at t-1, dummies for type of first contract, and yearly dummies. Huber-White heteroskedasticity robust standard errors adjusted in order to take into account the presence of multiple observations for each individual shown in parentheses. Symbols: ** significant at 1% level; * significant at 5% level.

TABLE 9

Determinants of log wage growth with firm change according to average premium for change in industry, occupation and firm size

	All			Low education			High education		
Female	-0.0242**	-0.0167**	-0.0028	-0.0331**	-0.0136*	0.0053	-0.0199**	-0.0178**	-0.0075
	(0.0037)	(0.0034)	(0.0043)	(0.0058)	(0.0053)	(0.0072)	(0.0047)	(0.0045)	(0.0056)
Change of industry premium		0.4897**	0.4898**		0.5132**	0.4440**		0.4774**	0.5246**
		(0.0414)	(0.0465)		(0.0527)	(0.0614)		(0.0613)	(0.0699)
Female×change of industry premium			0.0511			0.3374**			-0.1698
			(0.0895)			(0.1156)			(0.1251)
Change of occupation premium		0.7728**	0.8225**		0.8011**	0.8371**		0.7943**	0.8627**
		(0.0215)	(0.0256)		(0.0264)	(0.0307)		(0.0513)	(0.0611)
Female×change of occupation premium			-0.1362**			-0.1185**			-0.1508*
			(0.0357)			(0.0456)			(0.0687)
Positive change in firm size premium		0.4905**	0.5666**		0.7232**	0.8237**		0.4315**	0.5106**
		(0.0297)	(0.0355)		(0.0625)	(0.0726)		(0.0377)	(0.0465)
Female×positive change in firm size premium			-0.2461**			-0.4291**			-0.2195**
			(0.0617)			(0.1358)			(0.0747)
Negative change in firm size premium		0.6332**	0.6116**		0.8964**	0.8481**		0.5599**	0.5573**
		(0.0413)	(0.0500)		(0.0895)	(0.1033)		(0.0482)	(0.0604)
Female×negative change in firm size premium			0.0530			0.1427			-0.0147
			(0.0787)			(0.1842)			(0.0892)
P-value positive change=negative change		[0.0065]	[0.4853]		[0.1289]	[0.8547]		[0.0397]	[0.5617]
P-value (positive change + female×positive change) = (negative change + female×negative change)			[0.0001]			[0.0047]			[0.0086]
Observations	23226	23226	23226	10998	10998	10998	12228	12228	12228
Number of individuals	14198	14198	14198	6251	6251	6251	7947	7947	7947

Note: Sample of individuals from the INPS administrative records for the period between 1985 and 1997. Dependent variable is the difference in log real daily wage between t and t-1 for periods in which the individual changes firm. Other control variables include potential experience at time t, tenure in the firm, occupation dummies, firm size categories dummies, 1-digit industry dummies and 20 regional dummies at t-1, dummies for type of first contract, and yearly dummies. P-values resulting from a test of equality of coefficients shown in square brackets. Huber-White heteroskedasticity robust standard errors adjusted in order to take into account the presence of multiple observations for each individual shown in parentheses. Symbols: ** significant at 1% level; * significant at 5% level.