Wage changes through job mobility in Europe: A multinomial endogenous switching approach

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Abstract

This paper presents evidence on the relationship between job mobility and wage mobility for some European countries using the European Community Household Panel (1994-2000). While much of the earlier research uses least-squares regression to predict wages for individuals with different work experiences, we find that it is important to take account of possible non-random selection into job movers and job stayers and into voluntary and involuntary movers. In this paper we focus on the effects of a spell of unemployment on subsequent wages and we estimate them through a multinomial endogenous switching model composed of two selection equations and three wage equations. Our results indicate that job mobility through unemployment has negative returns in all the analysed economies. Relative to stayers, these losses range from 6% in Germany and Portugal to 10% in France and Spain.

Keywords: wage mobility, job mobility, unemployment, endogenous switching, multinomial probit, wage penalties
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1 INTRODUCTION

One question that remains already not totally understood is the relationship between job mobility and wage mobility as it is not clear what is the effect of different work experiences over individual wages and their relative position on the wage distribution. Firstly, to study individual wage behaviour it is important to distinguish between job movers and job stayers because depending on the wage setting mechanism both groups may experience very different earnings dynamics. But then a second issue arises as job change can take place for different reasons. In general terms, we could assume that job separation can be voluntary or involuntary. Obviously, one would expect to observe different wage patterns depending on the type of job separation. This paper attempts to offer new empirical evidence on the relationship between job mobility and wage mobility trying to overcome some shortcomings found in previous literature. To accomplish this aim we propose to estimate a multinomial endogenous switching model. Using the European Community Household Panel (1994-2000) we study the cases of Spain, Germany, Portugal and France.

Overall, our results point to important differences in wage behaviour between different types of job movers. One of the main conclusions of this paper is that job mobility may generate important returns but can also suppose costs for the worker. When job mobility is voluntary, job change can be the quickest way in which workers advance in their careers and move up in the wage structure. In other cases, however, job mobility implies relative costs for workers and these costs may have permanent effects on their future income. These costs arise mainly when job change implies an intermediate spell of unemployment. In this sense, this study points out that it is important to distinguish between voluntary and involuntary job changes in both modelling job mobility behaviour and the determination of wage gains associated with job changing activities.

This paper can be related to two different branches of empirical studies. Some previous studies examine job mobility in order to test different hypothesis related to human capital models, search models and matching models. Other branch of the literature is eminently empirical and studies the returns or costs from job mobility focusing on workers who have experienced a spell of unemployment. This previous literature has shown that there can be important differences in wage variations depending on the type of separation from previous job. For instance, previous studies show that in the United States involuntary job separation leads to wage losses of order of magnitude between 10% and 20%. Furthermore, in some cases these real wage losses may become permanent future rent losses (Kletzer, 1996; Jacobson, Lalonde, and Sullivan, 1993; Stevens 1997; Seninger, 1997). However, the common finding in those studies focused on the impact over wages of job mobility without an intermediate period of unemployment is that job mobility in this case leads to wage gains that range between 10% and 20% (Keith and McWilliams, 1997; Mincer, 1993).

It is worth noting that many empirical papers do not explicitly take into account the unobservable differences between movers and stayers and only a few earlier studies refer to the analysis on wage gains and their relation to job mobility considering this self-selection problem (Antel, 1986; Topel, 1991; Mincer, 1993; Bartel and Rojas, 1981; Holmlund, 1991). However,

with the exception of Antel (1986) these studies do not distinguish between voluntary and involuntary job separations at the time of calculating average mobility returns or at the time of modelling job mobility. Some studies that focus on the effect of unemployment on re-employment wages try to overcome the self-selection problem by restricting the sample of unemployed workers to displaced workers[1] (Rhum, 1991; Jacobson, LaLonde and Sullivan, 1993; Stevens, 1997; Carneiro and Portugal, 2003). Nevertheless, even in this case the issue of selectivity bias merits some attention. The problem arises when workers who advance that the firm will close or make some employment re-structuring are more likely to take action to avoid unemployment and get an alternative employment in time. Those who are successful will presumably have more valuable skills and will suffer smaller wage losses as a result of job change than those who pass through the state of unemployment. On the other hand, the majority of papers interested on the effect of unemployment on re-employment wages, given the characteristics of their database, cannot identify the cause of the unemployment and therefore their results suffer form selection bias.

Existing research has focused on the US case but evidence on European countries is still relatively sparse. Recently, some papers have investigated whether comparable costs to involuntary job mobility exist in the European labour markets (Saint Paul and Rosolia, 1998; Burda and Mertens, 2001; Carneiro and Portugal, 2003; Lefranc, 2003). However, available evidence is not comparable among European countries due to differences in the econometric specification and in the type of the data used. Hence, whether these returns or costs to job mobility in Europe are important remains an opened question. For example, in Lefranc (2003) wage losses are compared among individuals from France and the US and, although the unemployment rate in France is clearly superior, the quantity of re-employment wage losses are only slightly superior in the US. Saint Paul and Rosolia (1998) study wage losses in Spain and conclude that though the unemployment rate is superior in Spain the estimated wage losses are significantly superior to those obtained in other countries with lower unemployment rates such us France, Germany and the US.

Henceforth, one novel feature of the present study lies in the econometric approach chosen as we specify a multinomial switching regression model which allows us to jointly estimate a trivariate selection process that controls for the type of transition and three wage equations that explain wage behaviour conditional on each type of transition. The fundamental econometric problem arising in this type of studies is due to the fact that the earnings of each individual are only observed in one state, either as an involuntary job mover, voluntary job mover or as a stayer. In this framework, it is possible that each group is a non-random sample of workers and the process that explains the type of transition they have can be correlated with observed and unobserved characteristics of the individual. This inconsistency problem is overcome by estimating separated earnings equations for *stayers*, *voluntary* and *involuntary movers* with the appropriate corrections. These estimates are then used to obtain worker's earnings in the three potential labour states. By comparing potential wages in each state, we are able to measure the returns from job mobility and the costs from having a spell of unemployment compared to staying at the job or compared to having a job-to-job transition.

[1] Displacement can be defined as an involuntary separation of workers from their jobs due to exogenous reasons, mainly firm downsizing and closing.

In this paper we address the following questions: first, what are the losses derived from having a spell of unemployment. Second, do these losses depend on the type of job change? Moreover, while looking at the effects of involuntary job mobility on wages we investigate if we need to control by non-random selection or unobserved heterogeneity in order to measure wage costs from involuntary job mobility.

Our main empirical findings are, firstly, that exogenous model underestimates the wage penalties derived from a spell of unemployment relative to both voluntary job mobility and job stability and, secondly, that the return from job mobility depends on the composition of job movers. Specially, involuntary job mobility exerts negative returns in all countries and these costs are much higher when we use voluntary job movers as the comparison group. Relative to stayers, these losses range from 6% in Germany and Portugal to 10% in France and Spain. Moreover, voluntary job mobility exerts positive returns to the worker relative to involuntary job mobility and job stability.

The remainder of the paper is organised as follows. Section 2 presents a brief overview of the theoretical models that relate job mobility and wage mobility on one hand and involuntary job mobility and wage penalties on the other. Section 3 discusses the data while Section 4 outlines the methodology employed. Empirical results and diagnostics are reported in Section 5 while in Section 6 we present our main conclusions.

2 THEORETICAL BACKGROUND

There exist several models analysing the determinants of job mobility and the subsequent effect of such mobility on the earnings of an individual over time. Basically, it is possible to distinguish three main theoretical approaches, the job search approach, the human capital approach and the job matching approach. These models usually describe the labour market as characterised by some degree of individual and job heterogeneity or imperfect information.

In Burdett (1978), there exists a distribution of productivity and wages, reflecting the worker's different ability to perform tasks in each of the jobs available. The worker may be seen as entering the labour market with a stock of human capital, which remains constant over time, and firms differ in the level of productivity they can extract from the worker. Once employed, the individual is able to continuing searching. Each firm the worker approaches offers the wage that is related to his productivity within the firm. Some wage offers will be larger than the current wage and others will be lower than the wage currently earned. The more intensely the worker search, the higher is the arrival rate of wage offers. If the worker successfully identifies a job offering a higher wage, he will have an incentive to switch jobs if the present value of earnings stream in the alternative job exceeds the one associated with the current job, after allowing for any costs incurred when switching jobs. This simple search approach therefore predicts that mobility exerts a positive effect on lifetime earnings.

If we allow this model to consider on-the-job training, worker's productivity will not be constant while employed in a particular job. One of the main elements of the theory of human capital is that productivity increases with tenure on a job as a result of the accumulation of specific human capital. Rising productivity then gives the potential for on-the-job wage growth as the firm and the worker share the return generated by specific human capital investments. This is commonly observed in the positive association between wages and job tenure. In the

version of the training approach considered by Mortensen (1988), an individual may be willing to accept a pay cut when switching jobs in order to receive a higher rate of wage growth in the new job. The idea is that when a worker switches jobs, the specific human capital accumulated at the previous one is lost because such firm specific skills are non-transferable and their contribution to the worker's productivity is permanently lost when employment with the firm is finished. Thus, the worker remains just with his stock of general human capital to carry into the new job. Moreover, it is also often argued that unemployment results in the depreciation of general, transferable work skills, and that this depreciation may accelerate as the unemployment spell lengthens (Pissarides, 1992). These two aspects of the reduction in human capital resulting from unemployment both indicate lower worker productivity and therefore a lower wage on re-employment.

The assumptions of on-the-job search and on-the-job wage growth explain the positive relation between job mobility and wage mobility but they also help to explain changes in the reservation wage strategy of unemployed workers that imply real wage losses after a spell of unemployment. García-Pérez and Rebollo (2004) present a stationary job search model with on-the-job search and on-the-job wage growth. Unemployed workers with high probability of getting high wage offers while employed will be willing to accept low wage offers to end up the spell of unemployment. Therefore, workers adjust their reservation wages and may incur in wage losses in relation with their labour expectations. In this model, high wage workers may experience larger wage penalties after the unemployment spell.

García-Pérez (2001) considers a non-stationary job search model and departs from the model of Van den Berg (1990) by introducing the possibility of firing. He finds a strong time-dependence of reservation wages. Lower reservation wages is the main determinant of the change in the hazard rate during the first four months of the spell of unemployment. After these months, acceptance probabilities move to one and the main determinant of the hazard is the job offer arrival rate. In this context, wage losses are related to the spell of unemployment itself and its duration, at least for the first months of the unemployment spell.

Therefore, search and human capital models suggest there are some characteristics that explain the job mobility behaviour of workers such as labour market experience, search intensity, tenure, ability or productivity. If any of these characteristics are not observable then the predictions on wage return from job mobility will be biased. For instance, if high productivity workers have larger probabilities of getting offers from other firms, they will tend to have higher wages and to change jobs more frequently. If we compare wage behaviour of this type of workers with job stayers, which are less productive, then, we will tend to overestimate the wage return from moving.

A different approach is found in Altonji and Shakatoko (1987). These authors consider that the relation between tenure, wage dynamics and mobility does not respond to a rational approach but to an econometric problem. They argue that there may be unobserved heterogeneity due to the fact that *job movers* and *job stayers* have different propensities to change jobs. For instance, stable workers may have the chance of investing in specific human capital whereas *job movers* do not. Then, wages in the same job may increase even faster than between jobs, and therefore, job mobility exert negative returns compare to staying at the job.

Relative to involuntary job movers from these models we have that low quality workers will tend to have larger probabilities of experiencing spells of unemployment and lower rates of

wage growth on-the-job. Therefore, if we do not considered the unobserved heterogeneity we could overestimate the wage penalty associated to the spell of unemployment.

In the matching approach (Jovanovic, 1979) the most important assumption is that there may initially be uncertainty over a worker's actual productivity within a particular job. As job tenure is accumulated, additional information is revealed relating to the worker's actual productivity on that job. Introducing these assumptions has the implication that mis-matches may occur in the labour market where workers are initially not employed in the jobs in which they are most productive. Job mobility then provides the mechanism for the market to move towards an efficient allocation of resources where workers locate themselves in the jobs that maximise their productivity. Therefore, job match quality at a specific point in time partly depends on career decisions made by the individual up to the time of observation. At the same time, the individual's career history signals to the employer the quality of previous and current matches. As match quality partly determines wages, the dependence of the match on past career decisions causes a potential endogeneity problem relevant for empirical analysis. Bad matches favour the probability of job mobility and simultaneously determine low tenure and low wages. If job mobility is characterized by workers with bad matches and this information is used by the employer, job movers will have lower wages at the new job. If the workers who stay in the same job are the good matches and the ones who move are the bad matches, estimating the wage return from moving using as a comparison group the stayers, will tend to underestimate the returns from job mobility.

Job matching theory also helps to explain how unemployment experience will affect subsequent wages. According to this approach, a worker changes jobs and incurs in an unemployment spell required for job search only to improve his position. Where a good match is achieved between a worker and a job, the resulting productivity is reflected in the wage. Good matches are durable, resulting in the observed correlation between wages and tenure. When an employment relationship is terminated, by either side, because of the poor quality of the match, future earnings will be enhanced if a better match is located. To the extent that unemployment allows improved sorting of works among jobs, higher earnings may be expected. For instance, Topel and Ward (1992) and Loprest (1992) highlight the importance of job-to-job mobility to early career wage growth, estimating that job changes account for roughly one-third of total wage growth during the first ten years in the market.

A completely different scenario is suggested by Lazear (1986). He argues that rival firms may spot high wage productivity workers and compete for them. If this is the case, job mobility will be more common in good quality matches and therefore we will overestimate the return from job mobility. However, this scenario seems plausible only for a particular segment of the labour market.

In line with the approach of imperfect information, some models (Lockwood, 1991; Blanchard and Diamond, 1994), are based on the fact that at the time of hiring a worker, the employer can only have a limited knowledge of that worker's productivity and he will therefore look for signals that may convey information on this. It is possible that an employer will use an employee's unemployment history as a negative signal (*scarring hypothesis)*, and therefore he will offer lower wages to workers with a history of unemployment, at least initially. This type of models establishes that unemployment experience have a significant effect on future labour market behaviour if unemployment occurs frequently. The initial wage penalty should be

eroded over a relatively short period if the new worker proves to be of higher productivity that the employer initially inferred from his unemployment history. Gibbons and Katz (1991) argue that employers have an incentive to lay off poor quality matches. If an individual has been laid off, this could signal to a future employer that the employee was a *poor quality* match at the last job. Hence, a layoff could have a negative effect on subsequent wages. If job changers are adversely selected, that is, they belong to a group of *poor* matches, we could underestimate the effect of job change on wages.

Obviously, none of these theoretical approaches is able to provide an exhaustive explanation of empirical evidence of modern labour markets. The basic conclusion for all them, although each theoretical framework emphasizes some relevant issues, is that to estimate wage costs from involuntary job mobility it is necessary to pay attention to unobserved factors that may over or underestimate this cost. Summarizing, these models point to several mechanism that can explain the fall on re-employment wages: the lost of specific human capital, the loss of a high quality match between the worker and the firm and the depreciation of specific and general workers skills during the spell of the employment.

3 THE DATA

Our empirical analysis is based on data from the European Community Household Panel. We use seven waves, from 1994 to 2000, for the following European countries: Spain, Germany, Portugal and France. This survey is the most appropriate for our objective because it offers homogeneous information for the different European countries considered in this paper. This allows us the direct comparison of the results obtained and to arrive at conclusions on the differences between the labour markets of the analysed economies.

The ECHP is based on a survey that is annually made to a sample of households. It has a panel dimension so it allows following the history of individuals during the life of the survey. Individuals' personal, labour and economic information is obtained together with some characteristics of the household. Most of the variables describe the individual's and household's situation at the moment of the interview or refer to the current month of the interview. However, some variables related to individual and household annual earnings refer to the previous year. Other important characteristic is that the individual is requested to indicate labour earnings, among other sources.

Individual labour history is available through a retrospective report of monthly labour force status. The duration of the unemployment spell used in this paper is obtained from this monthly description of the labour situation of individuals. Moreover, we combine the monthly labour situation and the data on annual earnings to calculate monthly wages.[2] If the individual has only one job during the year, the monthly wage is the ratio between annual labour earnings and the number of months being employed. If the worker has two different employment spells we combine the information on annual earnings with the wage declared at the time of the interview

[2] Information on hours worked is also available but it restricts the sample very much so we use the monthly wage as the endogenous variable. Previous works show that wage losses based on monthly wage are bigger that those based on hourly wage. This could be due to changes in monthly hours.

to obtain the monthly wage.[3] We use the CPI of each country to obtain real monthly wages, which are all them expressed in Euros (Base 1993).

There exist three types of workers: *stayers*, *voluntary movers* and *involuntary movers*. The stayers are those workers that remain at the same job between two consecutive interviews. The voluntary character of the job separation is not explicitly reported so we require and *ad hoc* definition. We consider as voluntary movers all the job changes characterized by the absence of an unemployment spell in between the two jobs.[4] Equivalently, involuntary movers are workers that experience a spell of unemployment between two jobs.

Operationally, a job separation occurs every time an individual is observed finishing a particular job. In most of the empirical literature, job separation variables are broadly defined whenever an individual is observed to have different employers at two consecutive or non-consecutive interviews and they cannot identify wages at the moment of moving to another job, that is, accepted wages. But the point at which wages are measured is relevant to correctly measure the costs from having a spell of unemployment specially because there may be on-the-job wage growth. Given the way we construct the data, we are able to get wages that proxy the idea of accepted wages.

We start off by taking a look at the main sample characteristics of our data for the three types of workers: involuntary movers, voluntary mover and stayers. Table 1 shows these main sample characteristics for these three types of workers. *Level of studies* consists of three dummy variables that classify the levels of studies in superior, medium and primary. *Gender* is a dummy variable that takes value 1 if the worker is a woman; *Marital Status* takes value one if the worker is single and zero if she is married, divorce or widow; *Other unemployment experience* takes value one if before the previous job the individual experienced an spell of unemployment; *Tenure* in previous job is measured in months and has been divided into four categories.

We can find in Table 1 important differences between the three subsamples used: *stayers*, *voluntary movers* and *involuntary movers*. Firstly, women, young workers and those with primary studies have higher probabilities of being involuntary movers. Tenure for the movers is mainly lower than 24 months and involuntary job movers tend to have even lower tenures. This is especially relevant in Spain and France where more than 60% of unemployed workers had been employed less than 12 months. This is clearly related with the fact that a high percentage of these jobs had temporary contracts and had previous experiences of unemployment. On the contrary, stayers are basically workers with long tenures.

The ratio of *on-the-job search*[5] is higher for involuntary movers and the majority of workers had a *full time job*. Those with a partial time job are more common in the group of involuntary movers. Finally, the majority of involuntary movers considered in the sample experience spells of unemployment shorter or equal to six months.

[3] This method can introduce measurements errors in wages but given the aim of this paper we consider important to include in the sample those individuals with more than one employment spells during a year.

[4] Obviously, in this way we are considering as voluntary some cases where the job change is induced by the employer. For example, if the employer announces in advance to the worker that he will be layoff, forcing him to search on-the-job and he finds another job before being fired.

[5] *On-the-job search* is a dummy variable that takes value one if the employed individual declares to be looking for another job at the time of the interview. This variable is not available for Germany.

In Table 2 we present the sample mean of current wages for each type of worker. As can be seen, on average terms voluntary movers and stayers have higher wages than involuntary movers.[6] On the other hand, this finding is consistent with the view that there could be a self-selection process. Individuals who profit by staying with the same employer choose to do so if they can, while others face alternative wage structures and act accordingly. Therefore, high wage workers change job less frequently than low wage workers.

The last column computes the wage gap of job movers, voluntary and involuntary, relative to stayers. The wage gap between involuntary job movers and job stayers is negative and ranges from 23.18% in Germany to 38.65% in Spain. The wage gap between voluntary job movers and job stayers is also negative but clearly lower and ranges from 1.92% of Germany to 21.95% in Spain. From the data we can conclude that in Spain and Portugal job mobility seem to have important costs in terms of wages, being these costs higher when having a spell of unemployment. In France and Germany wage penalties are mainly important for unemployed workers. However, this measure of the wage gap does not reflect the net cost that a spell of unemployment has on worker wages neither the return from job mobility. This cost or return can be higher or lower than the one estimated from wage differentials because wage dynamics may be different between individuals. Moreover, the sample of workers who experience voluntary and involuntary job mobility could be a non random sample of the pull of workers, and thus their mean wage may not represent the one a random worker who experiences a job change, but rather the expected wage conditional on voluntary or involuntary changing jobs.

4 MODEL SPECIFICATION

The effect of having a spell of unemployment before current job can be empirically analysed using the following augmented Mincerian earning model as specified in Jacobson, LaLonde and Sullivan (1993).

$$W = \alpha + \beta x + \delta \upsilon + \lambda d \ + u \tag{1}$$

where w represents the current wage, X includes some observed exogenous regressors and υ represent some unobservable components. Finally, d is a dummy variable that takes value 1 if the individual experiences a job change and zero otherwise and u denotes the conventional regression error term.

The problem here, however, is that applying OLS to equation (1) will not produce an unbiased estimate of λ if the unobservable component υ is correlated with the dummy variable d. This would be the case if, for example, the unobservable component υ includes unobserved aspects of the individual's ability that simultaneously leads to higher wages and a higher probability of experiencing job changes. In this case the type of transition is said to be *endogenous*. Moreover, this endogeneity does not only bias the conventional estimate of the parameter λ, but also the

[6] This situation holds also for wages before and after the transition. This lower *previous wage* for job movers is related to the fact that younger workers with lower tenure and other unemployment experiences mainly compose this group and it shows that it is relevant to control by previous labour situation to analyse the effect of unemployment on re-employment wages.

estimates of the marginal effects of the other wage determinants that are correlated with the unobserved variables.[7]

Other important shortcoming of the approach just presented is that we are assuming that the observables have the same marginal effects on wages independent of the type of worker considered.[8] This assumption imposes a restriction on the model which can also bias the results. In order to address these problems, we propose to analyse wage differentials by estimating an endogenous switching regression model.

The endogenous switching model may be related to non-random sample and endogenous treatment. In this framework, the source of endogeneity is the existence of unobservable variables that influence the type of transition made by the worker and are correlated with the unobservables of the wage equation. For instance, models of human capital predict that workers with less specific human capital will be more likely to voluntary move and at the same time these workers will have less tenure and lower wages. Similarly, workers with less ability will have lower observed wages and a higher probability of being fired from their job and therefore experiencing a spell of unemployment. This introduce a bias on the estimated effects of unemployment on wages, since the counterfactual –the wage the individual would have experienced had they stayed at the job–, is not observed. In summary, in models involving endogenous switching, conventional least squares methods will spuriously attribute unobservable influences to the observable variables, including the switching variable.

We consider a situation where for each sampled observation only one among the J dependent variables W_j – wages- is observed. Specifically, the observations on our dependent variable can be classified into three regimes, *involuntary movers, voluntary movers* and *stayers* respectively, which are generated by different probability laws:

$$W_j = X_j \beta_j + u_j \text{, j=1,2,3} \tag{2}$$

Where W_j represents potential wages for worker on state j. Wages, however, are only observed in one of the three possible states. The selection mechanism is described through a latent variable model that describes the propensity to be in one of the possible J states. As it is common in the latent variable approach, it is not possible to observe I_j but only its realization:

$$I = k \Leftrightarrow I_k > \max\left\{I_j\right\}, \text{j=1,2,3} \tag{3}$$

that is, the worker will be observed in state k if the total value associated with this state is greater than the value in every other possible state. The latent variable model may be interpreted from a reduced form approach, where supply and demand side effects mix and cannot be disentangle. This implies that the behaviour of the worker and the functioning of the labour market jointly generate what we observe, I_j. The estimated coefficients of the explanatory

[7] Some papers, for instance Arulampalam (2001), estimate wage penalties using panel data methods and therefore they can not measure the wage penalty in the re-employment wage neither use as a comparison group the voluntary job movers.

[8] That is to say that the return from tenure is the same for a voluntary mover than for an involuntary mover. However, we could think that a voluntary mover changes to a job with similar characteristics to the previous one and therefore he can transfer to his new job some of the human capital skills acquired in the previous job.

variables therefore capture the joint effect of genuine preferences of the worker and the employer's preferences as regards worker's characteristics. And therefore we have that:

$$W = W_k, \text{ if } I_k = Max\{I_j\}, j = 1,2,3 \quad (4)$$

We assume that I_j depends on observable and unobservable variables:

$$I_j = Z_j\gamma_j + \varepsilon_j \quad (5)$$

where Z_j represents a vector of individual specific explanatory variables that describes the determinants of the selection process, γ_j is the corresponding vector of unknown parameters to be estimated and ε_j is the random component of the selection equation.

The above discrete model can easily be estimated using multinomial logit model, which has the advantage of greater simplicity, but imposes very strong restrictions on the errors structure of the selection process. In fact, the multinomial logit model is based on the assumption that errors are independently distributed with type I extreme value distribution function, which implies the implicit assumption of Independence of Irrelevant Alternatives (IIA)[9]. This is unlikely to be true if certain characteristics of the labour market states make two of them closer, that is, more similar than the third one. This is not happening in the case of the Multinomial Probit model. Henceforth we have decided to estimate the selection process using a multinomial probit, which assumes that the error terms ε_j are distributed as a trivariate normal with covariance matrix Σ, in which any term outside the main diagonal can be different from zero.

4.1 Identification and estimation in the multinomial probit model

The trivariate probit model assumes that individuals select one of the three mutually exclusive alternatives. The identification problem arises from the fact that it is not possible to get unique maximum likelihood estimates of the parameters of the multinomial probit, Σ and γ. Dansie (1985) gives the first systematic explanation of the identification problem in multinomial probit models. The first source of identification problem is that the observed choices are only informative on the differences of the utilities (latent variables) and not on the utilities themselves. This means that all the probabilities that enter the likelihood function can be written in difference terms without altering the value of the likelihood function.

In our three-choice model, we chose as a reference alternative j=3, which in our case corresponds with the group of *stayers*. Thus, we will have two selection equations:

$$I_l^* = I_l - I_3 = Z_l\gamma_l^* + \varepsilon_l^* \quad (6)$$

where $\gamma_l^* = \gamma_l - \gamma_3, \varepsilon_l^* = \varepsilon_l - \varepsilon_3$, *l=1,2*. As a consequence, the relevant distribution of the disturbances is a bivariate one, which is normal with zero mean and covariance matrix Σ^*:

[9] This means that the utilities deriving from the three choices are mutually uncorrelated for the same individual, that is, the fact of getting a higher propensity of being in state *k* does not tell anything about the propensity of being in any other state.

$$\Sigma^* = \begin{pmatrix} \sigma_{11}^* & \sigma_{12}^* \\ \sigma_{12}^* & \sigma_{22}^* \end{pmatrix} \tag{7}$$

with $\sigma_{12}^* = Cov\left(\varepsilon_1^*, \varepsilon_2^*\right)$.

Given the lack of information on the scale of the variance in this matrix, it is necessary to impose a restriction on Σ^*, and only two out of the three parameters of the bivariate covariance matrix are identified. The usual way of imposing this identification restriction is to standardize it in order to have the first utility disturbance with unite variance.

4.2 The likelihood function

Given the fact that we are interested in estimating jointly the wage equations and the selection process, the likelihood function has to add the information relative to the wage process and to take account of the endogeneity of the selection process. The estimation strategy used is the following. We estimate the endogenous switching model by full maximum likelihood[10] because this method is more efficient than the two step estimation method proposed by Heckman (1979).[11] The likelihood function to be estimated has the following form:

$$\begin{aligned} & L\left(\beta_{j*}, \gamma_j, \sigma_{u_{j*}}^2, \sigma_{\varepsilon_j}^2, \sigma_{\varepsilon_j \varepsilon_k}, \sigma_{u_j \varepsilon_{j*}} \mid W, X, Z, I^*\right) = \\ & = \prod_{\substack{I_1^*>0 \\ I_0^*>0}} \left[\left(\varphi\left(W_0\right) \Phi\left(I_1^*>0, I_0^*>0 / W_0\right)\right)^{c_0} \left(\Phi\left(I_1^*>0, I_0^*>0 / W_0\right)\right)^{1-c_0} \right] \\ & \prod_{\substack{I_2^*>0 \\ I_0^*\le 0}} \left[\left(\varphi\left(W_1\right) \Phi\left(I_2^*>0, I_0^*\le 0 / W_1\right)\right)^{c_1} \left(\Phi\left(I_2^*>0, I_0^*\le 0 / W_1\right)\right)^{1-c_1} \right] \\ & \prod_{\substack{I_1^*\le 0 \\ I_2^*\le 0}} \left[\left(\varphi\left(W_2\right) \Phi\left(I_2^*\le 0, I_1^*\le 0 / W_2\right)\right)^{c_2} \right] \end{aligned} \tag{8}$$

Where the term $\varphi(W_j)$ describes the density function of wages ($j=0,1,2$) and $\Phi(I^*/W_j)$ the cumulative distribution function of the bivariate selection process conditional on wages. Moreover, in order to use all the information available on the data we also take into account the contribution of the censored and missing observations on wages. Some missing observations emerged because we know the worker has changed job but we can not observe his wage at the following job. Censored observations are related to the fact that the individual is still unemployed at the time of the interview. Therefore, as shown in expression (8), the likelihood function has three main parts and each part has two components. The first component describes

[10] An alternative is to estimate the model by simulated maximum likelihood. There is a study (Weeks, 1997) which shows that simulated maximum likelihood (SML) when applied to a multinomial probit model with only individual characteristics exhibited considerable bias. Difficulty was encountered in the estimation of both mean equation and covariance parameters.

[11] The two-step estimators are never fully efficient in the sense that they never attain the Cramer-Rao lower bound. The efficient estimator is the full information maximum likelihood, which estimates the earnings and type of transition equations jointly.

the contribution of the uncensored observations to the likelihood (c_j) and the second component the contribution of censored or missing observations to the likelihood (1-c_j).

To test for the endogeneity of the switching model the parameters of interest are the covariances of the error term of each wage equation with the error term of the selection equation. If these covariances are different from zero, then the selection process is not exogenous and the estimation of the wage equations by OLS would give inconsistent estimators. The covariance of the errors of the selection equations informs us about the adequacy of using the multinomial probit model to describe the selection process.

From the estimation of this model we obtain unconditional and conditional wage predictions. The unconditional prediction is defined as the average predicted value of the wage rate for all individuals in the sample. The conditional wage prediction represents the mean predicted wage for each worker type. For each worker we have observed one wage and we have to estimate the potential or counterfactual wages on the other two labour states.

To illustrate the way we compute the relative wage return or cost from job instability, we describe the expected wages for the group of *involuntary movers*:

$$E\left(W_0 / I_1^* > 0, I_0^* > 0\right) = X_0\beta_0 + \frac{\sigma_{u_0}}{\left(1-\rho^2_{\varepsilon_1^*\varepsilon_0^*}\right)}\left(\theta_{10}\lambda_1 + \theta_{00}\lambda_0\right) \tag{9}$$

where θ_{00} and θ_{01} are functions of the correlations between the error terms of the wage and the selection equations:

$$\theta_{00} = \left(\rho_{u_0\varepsilon_0^*} - \rho_{u_0\varepsilon_1^*}\rho_{\varepsilon_1^*\varepsilon_0^*}\right), \theta_{01} = \left(\rho_{u_0\varepsilon_1^*} - \rho_{u_0\varepsilon_0^*}\rho_{\varepsilon_1^*\varepsilon_0^*}\right) \tag{10}$$

If the selection process is not endogenous then these correlations between the error term of the wage and the error term of the selection equation will be zero and therefore the estimated parameters θ_{00} and θ_{01} will also be zero.

The terms λ_0 and λ_1 control for the bivariate process that describes the probability of being an involuntary mover.

$$\lambda_0 = \phi\left(\frac{\gamma_0^* z}{\sigma_{\varepsilon_0^*}}\right)\left(1-\Phi\left(\frac{-\gamma_0^* z}{\sigma_{\varepsilon_0^*}}\right)\right)^{-1}, \lambda_1 = \phi\left(\frac{\gamma_1^* z}{\sigma_{\varepsilon_1^*}}\right)\left(1-\Phi\left(\frac{-\gamma_1^* z}{\sigma_{\varepsilon_1^*}}\right)\right)^{-1} \tag{11}$$

Therefore the cost related to job instability can be obtained by taking the differences between the wage equations for the observed state and each of the counterfactuals, which can be computed in the same way.

5 ESTIMATION RESULTS

This study looks at the effects of involuntary job mobility on individual real wages by estimating a multinomial endogenous switching regression model composed by two selection equations and three wage equations.

The variables considered in the selection equation control for the observed heterogeneity that influences the type of transition and are based on the theoretical predictions presented in Section 2. For instance, theoretical models give some insight on the effects of tenure, wages, labour market experience, search intensity and productivity on the probability of being a job mover, all variables considered in our analysis. As it is common in the literature, the marginal productivity of workers is proxy by the *level of studies*, the general capital skills by *age* and specific capital skills by *tenure*. Finally search models predict a negative relationship between wages and job mobility as the acceptance probability decreases with worker's reservation wage, which is proxies by his current wage.

Empirical research has suggested that the best predictor of an individual's future risk of unemployment is his past history of unemployment (Arulampalam, 2001). To test this assumption we include as a regressor in the selection equation *other unemployment experiences*. Therefore we will expect that individuals with other unemployment experiences will have a higher probability of having more spells of unemployment.

The wage equations include the usual set of control variables that explain current wages. In particular traditional human capital variables such as age and level of studies are present in these equations. Besides, we also control by some characteristics of the current job such as type of occupation, type of contract and whether the job is part-time or full time[12].

When comparing wages it is important to define the point at which the wage information is measured. The length of separation and also the time in employment up to the point of wage measurement are important as both will affect the measurement of the wage change associated with separation. Hence, for involuntary and voluntary job movers we use accepted wages and in the wage equation for involuntary movers we introduce as a regressor the duration of the unemployment spell. With this specification we can investigate whether current wages are negatively related to unemployment duration. Non-stationary search models (see García Pérez, 2003) predict that reservation wages decreases with the spell of unemployment and human capital models state that an unemployed individual losses general human capital skills. Thereby, both models predict a negative correlation between accepted wages and the length of the unemployment spell.

To identify the model in another way than through the normality assumption on the error terms we need various exclusion restrictions. In the wage equations we exclude the following variables: *On-the-job search*, *Marital Status*, the presence of *Children younger than 15 years old, Household income and Full time job in previous job*. In the selection equation *Full time job* refers to the previous job while in the wage equation *Full time job* refers to the current job.

5.1 The probability of having a spell of unemployment

Table 3 presents the estimation results for the selection equation. As we have taken the group of stayers as the reference category the first selection equation describes the determinants of the probability of being an involuntary job mover instead of being a stayer and the second selection equation describes the probability of being a voluntary job mover instead of being a stayer.

[12] The majority of papers that study wage losses after a spell of unemployment focus on workers in full time jobs. However, as Farber (1993) shows, a significant portion of full time workers returns to part time job and we think this fact should be considered in the present analysis as a source of the costs from the unemployment period.

Table 4 reports the correlation coefficients of the selection equation and Tables 5 and 6 display the results of the estimation of the two selection equations for the exogenous and endogenous multinomial switching regression model. In order to compare the results obtained from the exogenous and the endogenous model we will provide both estimation results but we will focus on those results we find more relevant given the aim of the paper.

An inspection of the correlation coefficient of the multinomial probit reported in Table 4 shows the relevance of the multinomial probit model to correctly estimate the probability of voluntary and involuntary job mobility. The economic interpretation of this parameter is not clear cut as they represent the correlation between the error terms of the selection equations for the involuntary and voluntary movers previously normalized with respect to the group of stayers. For all the countries analysed except Germany, this correlation is positive and statistically significant. This fact indicates that the worker differentiate the alternative of being an involuntary mover and the alternative of being a stayer. Moreover, he also finds different the alternative of being a voluntary mover with respect to being a stayer. In other words, when job stability and involuntary job mobility are considered different alternatives, voluntary job mobility is also considered very far related to job stability. In Germany an opposite result is found but the parameter is not statistically significant.[13]

The sign of the different coefficients of both selection equations are as expected. For instance, we obtain a non-linear relationship between *age* and the probability of changing job involuntary in all the countries. Involuntary job mobility relative to staying at the job increases with age until around 35-40 years old and then starts decreasing. When we focus on job movers we obtain that involuntary job mobility decreases with age until reaches a maximum of around 30 years old where it starts increasing.

The level of studies helps also to explain job mobility behaviour. When we focus on unemployed versus stable workers all the countries show the same result: the higher the level of studies, the lower the probability of having a spell of unemployment. However the relation between the level of studies and voluntary job mobility differs between the countries and this fact may imply differences in the nature of this type of transition. In Spain and Portugal, the level of studies is negatively correlated with voluntary job mobility, though in Portugal *secondary studies* is not statistically significant. While in Germany and France the results show that as stated in job search models, those workers with superior studies have the highest probability of changing job voluntarily[14]. In all countries is found that the probability of changing job with an intermediate spell of unemployment is higher for low educated workers.

Our results ratified the scarring effect of unemployment mentioned in previous work as the estimated parameter of *other unemployment experience* is positive and statistically significant in the first selection equation. This implies that workers with unemployment experience previous to the current job have a higher probability of repeating a spell of unemployment. This effect does not arise for voluntary job movers as the parameter associated to this variable is not statistically significant in Germany, Portugal and France. On the contrary in Spain workers with previous experiences of unemployment have larger probabilities of being a voluntary job mover.

[13] Some cautions are in order with this result because the specification of the selection equations for Germany is slightly different as the variable *on-the-job search* is not available in the data for this country.
[14] This result could be due to differences in the arrival rate of job offers while employed. In a parallel paper we define a job search model where we can test this idea.

Again we consider this result as a signal of the different nature of the voluntary job mobility in this country.

As expected, *On-the-job search* is positively correlated with the probability of changing jobs, both involuntary and voluntary but the effect is stronger for unemployed workers. From search models we know that the search activity is positively related to job-to-job transitions while from job matching models the relation could be the opposite because a worker searches when there is some kind of mismatch at current job and therefore the worker also faces a higher probability of entering into a spell of unemployment. *Tenure* in previous job is also relevant to explain the propensity of being a job mover and as human capital and matching models predict, the probability of changing jobs is higher the lower is the tenure of the worker. This relation holds for voluntary and involuntary job movers though if we compare these two types of workers we observe that except for Spain, workers with tenure lower than 24 months have the highest probability of having a spell of unemployment relative to voluntarily changing job.[15]

Finally, *previous wages* also explain the type of transition and we obtain that, except for Germany, low wage workers face a larger probability of having a spell of unemployment while for voluntary job movers this variable is only relevant in Spain.

Therefore the characteristics that explain the probability of experiencing an involuntary job separation seem to be pretty similar among the countries analysed. Some differences arise when we study voluntary job movers especially for Spain. We find these differences may be important as they may reflect the different nature of the voluntary job change. In fact, in Spain and Portugal, voluntary and involuntary job movements seem to be more similar alternatives than in Germany and France.

5.2 The wage equations

In order to show the biases derived when we estimate the wage equation omitting the selectivity problem we present the results for the multinomial exogenous and endogenous switching model. We have estimated three wage equations, one for each labour state, to allow for heterogeneity of the marginal effects of observables variables on the worker's current wage. The results are reported in Tables 6, 7 and 8. The comparison of the estimated coefficients for variables such as age, level of studies, previous wage or tenure between the wage equations shows that it is relevant to specify different wage equations because the marginal effects of the observables on current wages depend on the type of transition[16]. The current wage of job movers depends positively on previous wages but it is also clearly related to personal and labour characteristics of the worker.

Women earn lower wages, being this gap higher for voluntary job movers in Spain and Portugal and for involuntary job movers in Germany and France. Except for Germany, we find a non-linear relation between *age* and current wages and a positive relation between the *level of studies* and wages. These results are consistent with the theoretical models as *age* proxies total

[15] This conclusion is derived from the comparison of the coefficients of the tenure dummies in both selection equations.

[16] This approach is especially relevant for the variable *previous wage* as we consider that the wage previously earned proxies worker's reservation wage. For voluntary job movers and job stayers, this assumption does not cause any problem but for unemployed people the reservation wage tend to be lower than the previous wage. Therefore to impose equality of this coefficient could determine a form of misspecification.

labour market experience and *level of studies* proxies productivity. Therefore both variables simultaneously determine worker's reservation wage and signal worker's skills to the employer.

Interesting results are obtained for the variable *tenure in previous job* when we compare the results derived from the exogenous model with the endogenous one. Firstly, it is important to take account of the different nature of this variable between job movers and job stayers. For job stayers, *previous tenure* describes the tenure on the current job at the time the wage change is measured, while for the group of job movers this variable describes the tenure of the worker at the time of that job change. In the exogenous models the effect of tenure in previous job on wages is positive and statistically significant. As we are conditioning on *age,* this result would imply that among workers with similar amount of labour market experience, those who have spent more time with their current employer tend to have higher earnings. However in the endogenous switching model, tenure in previous job is only statistically significant for job stayers showing that long tenure stable workers tend to have higher wages. This difference evidences that the exogenous models are biased due to the existence of unobserved heterogeneity. The observed positive relation between current wages and tenure in previous job obtained in the exogenous model is spurious.

We have estimated the wage equation controlling by previous wage and we treat this variable as a proxy of the worker's reservation wage. The inclusion of this variable requires some comments. Previous studies estimate wage penalties from a spell of unemployment using wage change as the endogenous variable. However we have used wage levels for several reasons. First, using wage change as an endogenous variable is equivalent to restrict the coefficient of the previous wage to one on the wage equation specified in levels. While this assumption may be reasonable for job stayers, this could be too restrictive for job movers and, as shown in Tables 6 and 7, this seems to be the case. On the other hand, with the selection equation we are already controlling by unobserved variables related both to individual and job effects, which may bias the coefficient of the previous wage. As expected, in all cases, previous wage is positively correlated to current wages, though this relation is stronger for job stayers.

The length of the unemployment spell also explains the behaviour of current wages though this relation is not lineal. In Spain, Germany and France, wages start decreasing with unemployment duration and at certain point, around six months, it starts increasing. In Portugal the effect seems slightly different and wages only decreases after certain some months of unemployment.

5.3 Wage losses from unemployment

Once we have estimated the model taking into account the self-selection problem we can obtain predicted wages for involuntary job movers and their predicted counterfactuals, which is the wage that involuntary job movers would have earned having stayed at the job or having experienced a job-to-job transition. Hence, we can study if, as most of the theoretical model predicts, involuntary job mobility implies negative wage mobility in the wage distribution and if these wage penalties are homogenous among different types of individuals.

We first present the results for the correlation structure of the error terms and the likelihood ratio test for the endogenous switching model with respect to the exogenous switching model, which is the restricted case. These results are presented in Table 9. For the correlation terms, the first row represents the estimated parameter and the second its p-value. The likelihood ratio test

together with the correlations parameters[17] tell us that there is evidence of non-random selection and hence, if we omit the effect of unobservables, predicted wages for movers and stayers would be inconsistently estimated and equivalently the penalty from involuntary job moving[18].

In Table 10 we present predicted wages for involuntary job movers for sample means in each group of workers. In order to evaluate the importance of the non-random selection problem we show wage returns derived from an exogenous and an endogenous switching model. The results in this table confirm that if we do not control by self-selection we will underestimate the wage penalty derived from unemployment and this bias seems to be larger when voluntary job movers are the control group. The results reported do not allow us to define a range of countries by wage losses as they depend on the group we are comparing on. Only we can state that independently of the reference group, French workers have larger wage penalties than in the rest of countries. Wage penalties for Germany and Portugal are pretty similar. In Spain, wage penalties are larger than in Germany and Portugal when we take stayers as a reference group. On the contrary these wage losses are lower when they are measured relative to voluntary job movers.

One interesting result is that in all countries estimated wage differentials are larger when we take voluntary job movers as the comparison group. This fact implies that, on average, job-to-job transitions exert positive returns to workers in the four economies analysed[19]. In France and Spain workers that suffer a spell of unemployment earn around 11% less than in the case they had stayed at the job while in Germany this relative loss is around 8% and in Portugal a bit lower, around 7%.

Some interesting results emerge when we analyse these wage penalties by some personal and labour characteristics. These results are displayed in Table 11. For example, if job tenure contributes to the accumulation of specific human capital or seniority rights, wage losses when compared to job stayers should be positively associated to tenure. This is the result found in Portugal where wage losses relative to stayers move from around 1% for workers with tenure lower than 24 months to 14% for workers with tenure larger than four years. In Spain, France and Germany we obtain a similar result but only when the comparison group is voluntary job movers. We could assume that these wage losses are also related to the accumulation of specific human capital as the voluntary job movers have been able to carry them on the new job. In fact, these wage penalties can be associated with the loss of specific human capital as we have already controlled for the unobserved heterogeneity effect.

Concerning the age of the worker, the results show that independently of the comparison group, wage losses are the largest for older workers. The size of wage penalties differs among workers

[17] These correlations do not have a clear interpretation as in the bivariate switching regression model. This is due to the fact that we have estimated the selection equations in a difference form. For instance, recall that the correlation coefficient has the following expression:

$\rho_{u_0\varepsilon_0^*} = corr(u_0, \varepsilon_0^*) = corr(u_0, \varepsilon_0 - \varepsilon_1)$,

and therefore we can not identify separately the original correlations $corr(u_0, \varepsilon_0)$ and $corr(u_0, \varepsilon_1)$.

[18] Not all the correlation terms are statistically significant. However this does not mean that the endogenous model should be rejected. A log-likelihood ratio test on all the correlations elements would have more power than the t-test used on individual coefficient estimates.

[19] In fact, in Spain job movers have wages that are around 13% higher than involuntary job movers and 2% higher than stayers. In Germany these quantities are 43% and 15%, in Portugal 31% and 7% and in France 35% and 15% respectively.

with different level of studies and simultaneously depends on the type of transition. When we compare involuntary job movers with job stayers we observe that workers with secondary and primary studies suffer the highest wage penalties. This finding is consistent with the argument that more educated workers have more transferable human capital. However, involuntary job movers with primary studies suffer the lowest wage penalties relative to having a job-to-job transition. This last result is related to the way low educated workers tend to move up on the wage distribution and evidence that these workers tend to experience wage losses even when having job-to-job transitions[20].

We next examine how wage losses vary according to the position of the worker on the wage distribution. Interestingly, the relationship between this variable and the wage penalty from unemployment depends on the reference group. If we measure the wage penalty of the involuntary job mover relative to staying at the job we have that workers with high wages in the previous job seem to experience the largest wage penalty, ranging from 32% in Spain to 42% in France. This result seems to be consistent with the findings of Burda and Mertens (2001) who reported that German workers located on the upper quartile of the wage distribution experienced larger wage losses. However, in Germany and Portugal this group of workers experience the lowest wage penalties when we take voluntary job movers as the counterfactual case.

As signalling and non-stationary job search models state, unemployment duration also plays an important role in determining the size of the wage penalty. We observe that in Spain, Germany and France wage penalties increase with the length of the spell of unemployment during the first year of the spell, -though only slightly in Germany-, and afterwards they tend to decay. On the contrary, in Portugal wage penalties start decreasing at around the six month of unemployment but they keep increasing afterwards.

Finally we have estimated the endogenous switching model controlling by the type of contract in current job using the subsample of workers who offers information on this variable. We have distinguished two categories, fixed contract and temporary contract and we have interacted this variable with the variable indicating whether the job is full or part-time. Results are displayed on Table 12 where we present wage losses for full time and part-time workers in previous job. As expected, large wage losses relative to stayers are found when the workers changes from a full time job to part-time job. Also, and except for Portugal, wage losses relative to stayers are larger when we compare workers in temporary jobs to workers in jobs with permanent contracts. On the second half of Table 12 we report wage losses of workers who were in part-time jobs. In this case we find relative wage gains when we compare involuntary job movers with stayers. This wage gains arise when the worker gets a full time job and they decrease when he enters into a job with a temporary contract.

6 Conclusion

In this paper we have analysed the relationship between job mobility and wage mobility and we have tried to measure how painful is unemployment in terms of relative wage costs for the worker in Spain, Germany, Portugal and France. For this purpose we have estimate a multinomial endogenous switching regression model composed by two selection equations and

[20] For instance, in Spain, Germany and Portugal low educated workers when having a job-to-job transitions experience wage losses relative to stayers of around 10%, 9% and 8% respectively.

three wage equations, one for each labour market state. From this estimation we have derived potential wages and the subsequent wage losses when a worker experiences a spell of unemployment relative to having a job-to-job transition and relative to staying at the same job.

The findings of this research suggest some conclusions that can be grouped into two main categories. First, from the econometric point of view, we have showed that the multinomial probit model is the proper option to describe the probability of being on one of the possible labour states analysed: *stayers, voluntary job movers, involuntary job movers*. We have also showed that to control for selectivity problems is important if we are interested in measuring the effects of unemployment on re-employment wages. Indeed we have shown that if we do not control by selectivity we may underestimate wage losses after a period of unemployment. In fact we have observed that the effect of *tenure in the previous job* is positive and statistically significant for job movers only in the exogenous model while in the endogenous model this variable lacks of statistical significance.

Second, the empirical results revealed that wage losses exist in the four countries analysed and these wage losses are larger when the voluntary job movers are the comparison group. This result are interesting because, as theoretical models predict, it shows that the returns from job-to-job transitions are positive relative to involuntary job movers and, what is more relevant, relative to job stayers in the four countries analysed. We have obtained that French workers tend to experience the largest wage penalties, independently of the reference group. German and Portuguese workers reported similar wage penalties. They are lower than those suffered by Spanish workers when stayers are the reference group but larger when these losses are measure relative to voluntary job movers.

The results also indicate that the process of wage mobility in the labour market is characterised by some degree of variability among different types of workers and that on average, the type of transition have a clear effect on the position of the worker on the wage distribution. Our results also provide useful indicators of the factors responsible of observed wage losses as significant differences are found when we measure wage penalties by different observed personal and labour characteristics. For example, as signalling and non-stationary job search models predict wage penalties increase with the length of the spell of unemployment. Part of the wage losses must be also related to the loss of specific human capital. The initial position on the wage distribution is also relevant as workers with high wages in previous job seem to experience larger wage losses relative to stayers. This may be due to some kind of wage rigidity on the low quartiles of the wage distribution. On the contrary, when wage losses are measure relative to voluntary job movers, the relation changes and low wage workers experience larger wage losses. Workers with a high level of studies experiences the largest wage loss relative to staying at the job while low educated workers have the largest wage penalties relative to having a job-to-job transition.

Finally, we have also found that wage gains from involuntary job changes may also arise but this happens when workers move from part time to full time jobs. Interestingly, these wage gains are lower when the new job implies a temporary contract. Equivalently wage loses are larger when a worker enters into a temporary job.

7 Bibliography

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Table 1: Sample Characteristics

.	Spain	Germany	Portugal	France
	Involuntary Job Movers			
Woman	46.57%	41.67%	51.67%	53.76%
Superior Studies	16.18%	16.03%	5.21%	19.44%
Medium Studies	21.82%	60.77%	11.45%	34.32%
Age (18-30)	43.06%	28.12%	41.83%	45.43%
Age (30-45)	36.66%	40.06%	33.72%	38.44%
Tenure (<12)	76.05%	40.91%	57.15%	67.43%
Tenure (12-24)	11.93%	33.02%	15.27%	13.96%
Tenure (24-48)	7.08%	16.98%	19.92%	14.11%
Previous Unempl. Spells	87.62%	60.12%	63.76%	74.56%
Full time job	83.43%	84.65%	89.70%	71.99%
On the job search	43.95%	-	22.59%	47.04%
Unempl. Dur. (<3)	37.31%	43.76%	41.40%	48.12%
Unempl. Dur. (3-6)	45.20%	41.48%	41.18%	32.10%
N (%)	25.33%	26.46%	25.48%	15.39%
	Voluntary Job Movers			
Woman	30.48%	39.25%	34.00%	41.45%
Superior Studies	23.55%	29.39%	6.89%	32.55%
Medium Studies	19.14%	55.20%	12.40%	32.55%
Age (18-30)	40.81%	29.75%	54.82%	34.66%
Age (30-45)	44.58%	55.73%	30.63%	47.31%
Tenure (<12)	56.80%	29.39%	45.33%	29.98%
Tenure (12-24)	17.38%	29.57%	17.15%	13.58%
Tenure (24-48)	12.97%	18.81%	15.59%	23.65%
Previous Unempl. Spells	48.07%	17.81%	28.85%	13.65%
Full time job	90.43%	88.53%	95.10%	88.76%
On the job search	19.65%	-	10.41%	26.93%
N (%)	8.43%	6.62%	9.49%	5.18%
	Stayers			
Woman	34.08%	40.51%	43.00%	44.56%
Superior Studies	34.82%	25.66%	10.87%	29.08%
Medium Studies	20.47%	57.93%	13.39%	38.57%
Age (18-30)	17.14%	14.69%	25.79%	13.80%
Age (30-45)	49.23%	47.61%	43.29%	48.75%
Tenure (<12)	1.93%	0.00%	1.75%	0.04%
Tenure (12-24)	7.89%	12.98%	7.91%	5.39%
Tenure (24-48)	16.23%	23.83%	18.41%	16.81%
Previous Unempl. Spells	7.14%	1.16%	4.38%	2.65%
Full time job	95.65%	90.18%	96.17%	90.75%
On the job search	5.90%	-	2.31%	4.52%
N (%)	66.24%	66.93%	65.03%	79.43%

Table 2: Wages by type of worker

		Current Wage	Wage gap of involuntary job movers
Spain	Involuntary Movers	1130	-
	Voluntary Movers	1405	-19.46%
	Stayers	1780	-36.51%
Germany	Involuntary Movers	1442	-
	Voluntary Movers	1841	-23.18%
	Stayers	1877	-23.17%
Portugal	Involuntary Movers	566	-
	Voluntary Movers	646	-12.36%
	Stayers	821	-31.11%
France	Involuntary Movers	1295	-
	Voluntary Movers	1975	-34.42%
	Stayers	2203	-41.21%

Table 3: Selection Equation: Correlation term

	Spain	Germany	Portugal	France
$\rho_{\varepsilon_1^* \varepsilon_0^*}$	0.79	-0.06	0.83	0.44
	(0.00)	(0.46)	(0.00)	(0.01)

* The first row represents the estimated parameter and the second row its p-value

Table 4: Selection Equation: Involuntary job movers-job stayers

	Exogenous switching				Endogenous Switching			
	Spain	Germany	Portugal	France	Spain	Germany	Portugal	France
Constant	2.91	-0.43	1.06	1.30	2.88	-0.36	1.01	1.08
	(0.00)	(0.13)	(0.00)	(0.00)	(0.00	(0.18	(0.00)	(0.01)
Sex	-0.07	-0.11	0.02	-0.08	-0.06	-0.11	0.05	-0.04
	(0.04)	(0.00)	(0.29)	(0.04)	(0.05)	(0.00)	(0.13)	(0.23)
Age	-6.99	-6.80	-3.82	-6.37	-7.01	-6.82	-3.32	-7.86
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Age squared	8.73	9.99	5.07	7.62	8.81	9.97	4.03	10.11
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
On-the-job search	0.51	-	0.71	0.88	0.52	-	0.49	0.85
	(0.00)	-	(0.00)	(0.00)	(0.00)	-	(0.00)	(0.00)
Tenure (>48)	-2.11	-1.13	-1.83	-2.15	-2.10	-1.15	-1.86	-2.09
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tenure (24-48)	-1.56	-0.46	-1.25	-1.61	-1.55	-0.49	-1.37	-1.57
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Children (<15)	0.15	0.03	0.02	0.11	0.15	0.02	0.00	0.13
	(0.00)	(0.26)	(0.29)	(0.01)	(0.00)	(0.30)	(0.47)	(0.01)
Other Household Income	0.04	0.05	-0.05	0.05	0.04	0.05	-0.03	0.06
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Full time job	0.07	-0.20	-0.10	0.06	0.06	-0.20	-0.03	0.07
	(0.09)	(0.00)	(0.08)	(0.18)	(0.12)	(0.00)	(0.31)	(0.17)
Civil status	-0.01	0.13	0.01	0.17	-0.01	0.13	-0.01	0.20
	(0.41)	(0.01)	(0.42)	(0.00)	(0.44)	(0.00)	(0.42)	(0.00)
Superior Studies	-0.30	-0.38	-0.18	-0.05	-0.31	-0.37	-0.28	-0.14
	(0.00)	(0.00)	(0.02)	(0.18)	(0.00)	(0.00)	(0.00)	(0.01)
Secondary Studies	-0.10	-0.18	-0.09	0.05	-0.10	-0.17	-0.12	0.04
	(0.01)	(0.00)	(0.07)	(0.17)	(0.01)	(0.00)	(0.01)	(0.24)
Previous Wage	-0.27	0.03	-0.09	-0.13	-0.27	0.03	-0.06	-0.12
	(0.00)	(0.21)	(0.01)	(0.00)	(0.00)	(0.24)	(0.05)	(0.01)
Previous Unemp. Experience	0.90	1.49	0.86	0.74	0.92	1.50	0.63	0.90
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

*Time dummies are included in the estimation.
* The first row represents the estimated parameter and the second row its p-value

Table 5: Selection Equation: Voluntary job movers-job stayers

	Exogenous switching				Endogenous Switching			
	Spain	**Germany**	**Portugal**	**France**	**Spain**	**Germany**	**Portugal**	**France**
Constant	1.76	-1.32	0.11	0.33	1.62	-1.33	0.53	-0.76
	(0.00)	(0.01)	(0.41)	(0.31)	(0.00)	(0.01)	(0.11)	(0.10)
Sex	-0.20	-0.08	-0.29	-0.11	-0.21	-0.08	-0.14	-0.10
	(0.00)	(0.05)	(0.00)	(0.01)	(0.00)	(0.06)	(0.01)	(0.02)
Age	-3.61	4.21	-1.01	-2.03	-3.13	3.60	-2.13	1.08
	(0.02)	(0.02)	(0.19)	(0.22)	(0.04)	(0.03)	(0.04)	(0.34)
Age squared	2.89	-7.78	-1.55	1.26	2.16	-6.80	0.76	-3.40
	(0.12)	(0.00)	(0.29)	(0.36)	(0.20)	(0.00)	(0.33)	(0.16)
On-the-job search	0.27	-	0.32	0.81	0.25	-	0.30	0.53
	(0.00)	-	(0.00)	(0.00)	(0.00)	-	(0.00)	(0.00)
Tenure (>48)	-2.25	-0.95	-1.74	-2.04	-2.24	-0.93	-1.81	-1.60
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tenure (24-48)	-1.52	-0.58	-1.21	-1.52	-1.51	-0.60	-1.37	-1.24
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Children (<15)	0.10	-0.07	0.00	0.05	0.09	-0.07	0.00	0.03
	(0.01)	(0.09)	(0.48)	(0.18)	(0.02)	(0.08)	(0.46)	(0.32)
Other Household Income	0.02	-0.03	0.04	0.03	0.01	-0.03	0.02	0.00
	(0.08)	(0.01)	(0.03)	(0.00)	(0.10)	(0.01)	(0.16)	(0.36)
Full time job	0.10	-0.13	0.06	0.05	0.10	-0.03	0.05	0.13
	(0.06)	(0.06)	(0.29)	(0.24)	(0.05)	(0.34)	(0.25)	(0.05)
Single	-0.04	-0.02	-0.05	0.12	-0.05	-0.03	-0.07	0.01
	(0.20)	(0.38)	(0.21)	(0.02)	(0.19)	(0.30)	(0.09)	(0.42)
Superior Studies	-0.22	0.15	-0.10	0.02	-0.21	0.12	-0.24	0.00
	(0.00)	(0.02)	(0.18)	(0.40)	(0.00)	(0.05)	(0.00)	(0.49)
Secondary Studies	-0.13	0.00	-0.12	0.06	-0.13	-0.01	-0.13	0.02
	(0.00)	(0.47)	(0.05)	(0.15)	(0.00)	(0.47)	(0.01)	(0.34)
Previous Wage	-0.15	-0.01	-0.06	-0.07	-0.14	-0.01	-0.05	-0.02
	(0.00)	(0.40)	(0.13)	(0.07)	(0.01)	(0.42)	(0.14)	(0.38)
Previous Unemp. Experience	0.32	0.00	-0.07	0.13	0.27	0.19	0.16	-0.05
	(0.03)	(0.49)	(0.22)	(0.45)	(0.05)	(0.14)	(0.10)	(0.34)

*Time dummies are included in the estimation.

* The first row represents the estimated parameter and the second row its p-value

Table 6: Wage equation for involuntary job movers

	Exogenous Model				Endogenous Model			
	Spain	**Germany**	**Portugal**	**France**	**Spain**	**Germany**	**Portugal**	**France**
Constant	3.52	5.52	1.90	4.37	3.58	5.56	1.85	4.42
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Sex	-0.11	-0.22	-0.10	-0.21	-0.11	-0.23	-0.08	-0.20
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)
Age	1.84	-1.41	1.40	2.31	1.67	-1.62	1.38	2.20
	(0.00)	(0.21)	(0.07)	(0.11)	(0.00)	(0.19)	(0.09)	(0.15)
Age^2	-2.30	-0.32	-1.85	-2.68	-2.05	1.62	-1.69	-2.55
	(0.00)	(0.43)	(0.07)	(0.16)	(0.00)	(0.25)	(0.10)	(0.17)
Superior Studies	0.13	0.00	0.32	0.17	0.12	-0.02	0.29	0.15
	(0.00)	(0.49)	(0.00)	(0.01)	(0.00)	(0.42)	(0.00)	(0.02)
Secondary Studies	0.00	0.06	0.05	0.02	0.00	0.06	0.05	0.02
	(0.45)	(0.21)	(0.18)	(0.34)	(0.44)	(0.24)	(0.20)	(0.34)
Full time job	0.38	0.18	0.29	0.37	0.38	0.19	0.28	0.37
	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)
Unemp. Duration	-0.14	-0.07	0.03	-0.18	-0.14	-0.06	0.03	-0.18
	(0.00)	(0.30)	(0.32)	(0.04)	(0.00)	(0.33)	(0.29)	(0.03)
Unemp. Duration^2	0.04	0.06	-0.03	0.08	0.04	0.05	-0.03	0.08
	(0.00)	(0.11)	(0.11)	(0.02)	(0.00)	(0.13)	(0.09)	(0.02)
Previous Wage	0.39	0.26	0.61	0.28	0.38	0.26	0.61	0.27
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Medium skill	0.08	0.09	-0.01	0.05	0.08	0.04	-0.01	0.05
	(0.00)	(0.01)	(0.43)	(0.15)	(0.00)	(0.28)	(0.41)	(0.17)
High skill	0.36	0.19	0.13	0.45	0.36	0.26	0.12	0.44
	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)
Tenure (>48)	0.07	0.12	0.04	0.22	0.02	-0.08	-0.07	0.04
	(0.02)	(0.00)	(0.23)	(0.01)	(0.41)	(0.26)	(0.36)	(0.42)
Tenure (24-48)	0.02	0.05	0.00	0.16	-0.01	-0.12	-0.07	0.26
	(0.24)	(0.14)	(0.46)	(0.16)	(0.44)	(0.05)	(0.32)	(0.26)

*Time dummies are included in the estimation.

* The first row represents the estimated parameter and the second row its p-value

Table 7: Wage equation for voluntary job movers

	Exogenous Model				Endogenous Model			
	Spain	**Germany**	**Portugal**	**France**	**Spain**	**Germany**	**Portugal**	**France**
Constant	3.91	2.94	2.78	4.18	4.12	3.13	2.97	4.76
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Sex	-0.21	-0.09	-0.19	-0.11	-0.20	-0.10	-0.17	-0.11
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
Age	2.39	-0.08	2.75	-1.75	2.10	-0.44	2.63	-2.57
	(0.00)	(0.48)	(0.00)	(0.18)	(0.01)	(0.39)	(0.00)	(0.08)
Age^2	-2.85	-0.32	-3.34	3.01	-2.43	0.22	-3.04	4.19
	(0.01)	(0.43)	(0.00)	(0.12)	(0.02)	(0.46)	(0.00)	(0.05)
Superior Studies	0.17	0.01	0.42	0.27	0.17	0.00	0.42	0.25
	(0.00)	(0.45)	(0.00)	(0.00)	(0.00)	(0.50)	(0.00)	(0.00)
Secondary Studies	0.08	-0.04	0.08	0.09	0.08	-0.05	0.08	0.08
	(0.01)	(0.20)	(0.02)	(0.03)	(0.01)	(0.20)	(0.02)	(0.04)
Full time job	0.35	0.12	0.29	0.29	0.34	0.12	0.28	0.29
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.02)	(0.01)	(0.00)
Previous Wage	0.33	0.60	0.44	0.42	0.32	0.60	0.42	0.38
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Medium skill	0.05	0.09	0.10	-0.04	0.04	0.09	0.10	-0.03
	(0.09)	(0.01)	(0.00)	(0.22)	(0.10)	(0.02)	(0.00)	(0.25)
High skill	0.32	0.19	0.22	0.17	0.32	0.19	0.23	0.18
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Tenure (>48)	0.14	0.12	0.03	0.18	0.12	0.13	0.00	0.12
	(0.00)	(0.00)	(0.14)	(0.00)	(0.24)	(0.26)	(0.49)	(0.15)
Tenure (24-48)	0.02	0.05	0.04	0.04	0.00	0.05	0.02	0.00
	(0.29)	(0.14)	(0.08)	(0.22)	(0.49)	(0.36)	(0.44)	(0.49)

*Time dummies are included in the estimation.

* The first row represents the estimated parameter and the second row its p-value

Table 8: Wage equation for Stayers

	Exogenous Model				Endogenous Model			
	Spain	**Germany**	**Portugal**	**France**	**Spain**	**Germany**	**Portugal**	**France**
Constant	0.02	0.05	0.34	0.47	0.00	0.05	0.18	0.41
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Sex	-0.05	-0.02	-0.02	-0.01	-0.05	-0.02	-0.02	-0.01
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Age	0.26	-0.16	0.04	0.10	0.25	-0.15	0.10	0.12
	(0.01)	(0.01)	(0.27)	(0.08)	(0.01)	(0.02)	(0.05)	(0.05)
Age^2	-0.22	0.16	-0.06	-0.12	-0.21	0.17	-0.13	-0.13
	(0.04)	(0.03)	(0.19)	(0.08)	(0.06)	(0.03)	(0.04)	(0.06)
Superior Studies	0.03	0.01	0.04	0.03	0.03	0.01	0.04	0.02
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)
Secondary Studies	0.02	0.00	0.02	0.01	0.02	0.00	0.02	0.01
	(0.00)	(0.11)	(0.00)	(0.00)	(0.00)	(0.15)	(0.00)	(0.00)
Full time job	0.04	0.03	0.01	0.02	0.04	0.03	0.02	0.02
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Previous Wage	0.87	0.92	0.95	0.94	0.87	0.92	0.95	0.94
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Medium skill	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.01
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
High skill	0.06	0.04	0.03	0.04	0.06	0.04	0.03	0.04
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tenure (>48)	0.01	0.00	-0.01	-0.02	0.00	0.02	0.10	0.02
	(0.11)	(0.16)	(0.00)	(0.00)	(0.46)	(0.00)	(0.00)	(0.01)
Tenure (24-48)	0.00	0.00	-0.01	-0.01	-0.01	0.01	0.09	0.03
	(0.47)	(0.15)	(0.02)	(0.06)	(0.30	(0.03)	(0.00)	(0.00)

*Time dummies are included in the estimation.

* The first row represents the estimated parameter and the second row its p-value

Table 9: Likelihood ratio test and correlation coefficients

	Spain	Germany	Portugal	France
Likelihood ratio test[21]	19.38	44.96	149.36	83.59
$\rho_{u_0\varepsilon_0^*}$	0.31 (0.07)	-0.64 (0.18)	0.30 (0.23)	0.28 (0.34)
$\rho_{u_0\varepsilon_1^*}$	0.10 (0.29)	0.38 (0.04)	0.20 (0.29)	0.32 (0.06)
$\rho_{u_1\varepsilon_0^*}$	0.17 (0.14)	0.43 (0.34)	0.37 (0.04)	0.59 (0.00)
$\rho_{u_1\varepsilon_1^*}$	-0.01 (0.48)	-0.19 (0.44)	-0.05 (0.46)	-0.15 (0.30)
$\rho_{u_2\varepsilon_0^*}$	0.07 (0.20)	0.11 (0.16)	-0.78 (0.00)	-0.09 (0.14)
$\rho_{u_2\varepsilon_1^*}$	-0.01 (0.49)	-1.82 (0.00)	-0.85 (0.00)	-0.82 (0.00)

Table 10: Wage penalties for involuntary job movers

		Spain	**Germany**	**Portugal**	**France**
	Counterfactual				
Exogenous Switching	Voluntary job movers	-7.91%	-3.20%	-6.09%	-10.75%
	Stayers	-7.40%	-5.92%	-5.90%	-10.27%
Endogenous Switching	Voluntary job movers	-16.44%	-19.37%	-20.34%	-32.43%
	Stayers	-10.58%	-7.90%	-6.75%	-10.72%

[21] The value of the chi-squared is 12.59 with a confidence level of 95% and 10.64 with a confidence level of 90% with 6 degrees of freedom.

Table 11 Wage penalty for involuntary job movers by observed characteristics

		Spain	Germany	Portugal	France
Tenure in previous job	**Counterfactual**				
Tenure <24 months	Voluntary job movers	-15.48%	-15.01%	-18.61%	-30.76%
	Stayers	-10.85%	-8.16%	-1.49%	-10.57%
Tenure 24-48 months	Voluntary job movers	-16.36%	-23.53%	-24.73%	-34.38%
	Stayers	-10.36%	-8.83%	-13.41%	-13.52%
Tenure >48 months	Voluntary job movers	-23.12%	-23.41%	-23.19%	-35.69%
	Stayers	-8.81%	-7.42%	-14.22%	-1.32%
Age	**Counterfactual**				
25 years	Voluntary job movers	-15.12%	-16.90%	-18.39%	-33.12%
	Stayers	-11.41%	-1.76%	-6.36%	-13.79%
35 years	Voluntary job movers	-16.81%	-18.96%	-21.96%	-28.04%
	Stayers	-8.57%	-6.08%	-3.33%	-7.63%
45 years	Voluntary job movers	-17.89%	-19.08%	-23.42%	-32.43%
	Stayers	-9.37%	-8.15%	-3.64%	-6.60%
55 years	Voluntary job movers	-18.36%	-17.65%	-22.87%	-44.61%
	Stayers	-13.57%	-9.00%	-7.14%	-10.72%
Unemployment Duration	**Counterfactual**				
3 Months	Voluntary job movers	-12.38%	-19.04%	-20.18%	-29.92%
	Stayers	-6.24%	-6.65%	-5.36%	-7.63%
6 Months	Voluntary job movers	-17.15%	-19.82%	-19.57%	-34.17%
	Stayers	-11.34%	-7.55%	-4.64%	-13.23%
12 months	Voluntary job movers	-20.54%	-18.07%	-20.32%	-35.51%
	Stayers	-14.97%	-7.53%	-5.53%	-15.00%
18 months	Voluntary job movers	-21.65%	-13.19%	-22.65%	-32.96%
	Stayers	-16.16%	-0.10%	-8.29%	-11.63%
Studies	**Counterfactual**				
Superior Studies	Voluntary job movers	-18.55%	-23.72%	-28.70%	-35.57%
	Stayers	-3.80%	-9.73%	-1.36%	-1.76%
Secondary Studies	Voluntary job movers	-20.90%	-14.12%	-21.21%	-32.87%
	Stayers	-13.55%	-2.56%	-5.81%	-12.38%
Primary Studies	Voluntary job movers	-14.56%	-23.21%	-18.92%	-28.64%
	Stayers	-12.16%	-9.90%	-8.91%	-13.57%
Previous Wage (quartiles)	**Counterfactual**				
Q_{75}	Voluntary job movers	-13.22%	-25.71%	-13.32%	-37.09%
	Stayers	-32.92%	-21.38%	-18.78%	-42.45%
Q_{50}	Voluntary job movers	-14.96%	-19.50%	-18.65%	-34.92%
	Stayers	-21.48%	-7.89%	-8.45%	-29.72%
Q_{25}	Voluntary job movers	-16.43%	-12.29%	-22.33%	-32.84%
	Stayers	-10.03%	-1.05%	-0.36%	-15.49%

Table 12: Wage penalties for Involuntary job movers by type of contract

		Spain	Germany	Portugal	France
	Counterfactual				
Previous Job=Full time					
Permanent Contract-Full time job	Voluntary job movers	-3.75%	-2.45%	-6.30%	-35.92%
	Stayers	-7.45%	-9.61%	-8.96%	-9.12%
Temporary Contract-Full time job	Voluntary job movers	-5.36%	-4.75%	-14.38%	-35.43%
	Stayers	-9.59%	-15.49%	-8.48%	-12.49%
Part-time job	Voluntary job movers	-8.46%	-10.78%	-11.78%	-41.55%
	Stayers	-35.83%	-25.37%	-29.50%	-26.41%
Previous Job=Part time					
Permanent Contract-Full time job	Voluntary job movers	-3.25%	16.63%	2.16%	-35.19%
	Stayers	8.80%	30.02%	0.53%	9.87%
Temporary Contract-Full time job	Voluntary job movers	-4.88%	13.89%	9.92%	-34.70%
	Stayers	6.29%	21.58%	2.16%	5.80%
Part-time	Voluntary job movers	-7.98%	6.72%	7.41%	-40.88%
	Stayers	-24.55%	-7.41%	-22.15%	-23.09%