Job Loss and Labor Market Transitions of Older Workers[1]

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Abstract

Despite the observed increase both of the frequency of job loss and early retirement, very little is known on how job displacement might affect the work-retirement decision. This is surprising especially for Europe where a number of countries have social insurance provisions for older involuntary unemployed workers. This paper studies the effect of job loss on labor market transitions for workers between 40 and 65 years old. The analysis is based on individual data from the European Community Household Panel (ECHP, 1994-2001) for Germany, Italy, Spain, and the UK, which differ in the institutions available in support of involuntary job loss for older workers. Estimating multivariate competing risk hazard models, the effect of displacement is identified separately for transitions in and out of subsequent employment and transitions to retirement, allowing for individual observed and correlated unobserved heterogeneity and taking into account the possible endogeneity of displacement. The results suggest that the relatively generous unemployment insurance and the provisions for early retirement, in Germany and Spain, offer a pathway to early withdrawal from the labor market through prolonged unemployment and higher exit rates to retirement. In contrast, in Italy and the U.K., displaced workers are more likely to be re-employed, but they exhibit higher exit rates from subsequent employment.

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1. Introduction

In recent years, there is evidence of an increase in the frequency of job loss among older workers both in the U.S. (Farber, 2004) and in Europe. This development has been associated with demand shifts, restructuring of traditional industries, import competition and out-sourcing of jobs. At the same time, labor force participation rates, especially for older men, have declined with a corresponding increase in early retirement. Despite the observed increase both of the frequency of job loss and early retirement, very little is known on how job displacement might affect the work-retirement decision.[2]

In theory, the direction of the effect is ambiguous. Experiencing a job loss may have considerable consequences because of the interruption of a long tenure job, which diminishes acquired firm-specific human capital, employment, and earning prospects. Indeed, studies focusing on workers of all ages find that job displacement leads to a reduction of future earnings (Jacobson et.al., 1993; Ruhm, 1991) and an increase of employment instability (Stevens, 1997), in the sense that the displaced have higher exit rates from subsequent employment.[3] Older displaced workers might in addition face difficulties to be re-employed due to discrimination by the employers, or their unwillingness to relocate geographically. However, job displacement might also affect the work-retirement decision on the opposite direction; reducing wealth and income, which might lead to an extension of the working life. Focusing on the employment and retirement following a late-career job loss in the U.S., Chan and Stevens (1999, 2001) show that a job loss for men may lead to longer labor-force participation. For women, the reduced earnings due to a job loss reduce the incentives to work. Ichino et.al.(2006), using administrative data from Austria, find that after a plant closure, initially the old have lower re-employment probabilities as compared to prime-age workers, but later they catch-up.

The lack of empirical evidence on the effect of job displacement for older workers is surprising especially in Europe where a number of countries have social insurance provisions for older involuntary unemployed workers, which might affect their retirement decisions by making retirement more attractive. Moreover, understanding the link between job displacement and retirement is important for policies promoting longer working lives, as a

[2] In what follows job loss and job displacement will be used interchangeably.
[3] For a survey on the effect of job displacement see Kletzer (1998). Kuhn (2002) contains an analysis of work displacement for prime age workers for a number of European countries.

response to the demographic changes that occur in European countries and the pressure they place on the social security systems. [4]

This paper contributes to the literature by investigating the effect of involuntary job loss on labor market transitions for older workers in a comparative setting for a number of European countries (Germany, Italy, Spain, U.K,) using individual data from the European Community Household Panel (ECHP, 1994-2001). The choice of countries is based on institutional variation regarding the provision of unemployment insurance and early retirement rules. In particular, in Germany and Spain, there are special institutions designed to assist older displaced, while in Italy, and the U.K., such institutions are not available, as described in Section 2.

The empirical analysis is based on a semi-parametric multivariate competing risk hazard model allowing for individual observed and correlated – across states –unobserved heterogeneity. Recognising the potential endogeneity of displacement, the econometric model is extended to a simultaneous estimation of the selection process into displacement and the transitions in and out of employment and retirement. An important feature of the econometric analysis is that it models explicitly the effect of displacement on the transition towards retirement. Contrary to previous studies, considering retirement as a distinct labour market state allows to distinguish between two competing explanations for the reason behind the lower re-employment probabilities of displaced workers. Lower re-employment probabilities might be observed because workers face difficulties to find a new job, or because they have no incentive to search actively for a new job. The latter might be the case in countries in which long unemployment benefit duration can be combined with early retirement provisions, so that displaced older workers can use insured unemployment as a pathway to retirement.

The findings suggest that in countries where unemployment might serve as a bridge to early retirement, such as Germany and Spain, older displaced are less likely to be re-employed and more likely to retire. Moreover, among those re-employed the displaced exhibit higher exit rates from subsequent employment.

The rest of the paper is organized as follows. Section 2 contains a brief discussion of the institutional features related to unemployment insurance and retirement rules in each country. Section 3 describes the data and provides a non-parametric analysis of labour market

[4] The literature on retirement has focused on the incentive structure of the pension systems in explaining the observed retirement patterns (e.g. Gruber and Wise, 1999; Meghir and Whitehouse, 1997). Rigidities in the labour market, such as the inability to choose flexible working hours, might also lead to early withdrawal from the labour force even if older workers might prefer to retire gradually (Hurd, 1996).

transitions. Section 4 presents the econometric model and Section 5 the results of the empirical analysis. Section 6 concludes the paper.

2. Institutional Features

The focus of this section is on institutions which are related to older unemployed, that is, unemployment benefits and early retirement schemes designed for those who lose jobs at old age.

In Germany, the legal retirement age is 60 after 180 contribution months if unemployed at the commencement of the pension and if unemployed for 52 weeks after completion of the age of 58.5 years of age. Alternatively, the requirement is to have worked part time for elder workers for 24 calendar months. The age limit for early pension for unemployed increased in the years 1997 to 2001 from 60 to 65 years. However, the pensions can be claimed after the completion of the age of 60 with the acceptance of pension reductions. The replacement rate for unemployment insurance recipients is 67 per cent of net earnings (60 per cent for beneficiaries without children). The duration of benefits is for 32 months for workers aged 54 and over.

In Italy there are no special benefits for older unemployed and early retirement. The legal retirement age is 63 for men and 58 for women. Early pension at the age of 54 and after 35 years of contributions, or after 36 years of contributions regardless of age (after 2008, at the age of 57 with 35 years of contributions or after 40 years of contributions regardless of age). Early retirement is possible for employees of companies in economic difficulties at the latest 5 years before normal retiring age. The replacement rate for the ordinary unemployment benefits is 30% of the average pay received during the last 3 months, and the duration is 180 days. The replacement rate for the special unemployment benefit for those in the building industry is 80% of previous earnings with duration of 90 days.

In Spain, there is no direct provision of early retirement for unemployed, although early retirement is possible at the age of 60 with an 8% reduction for every anticipated retirement year. With respect to benefits for older unemployed, under the Industrial Restructuring law workers are entitled to a form of benefit financed under the relevant restructuring plan. These benefits are of particular significance for workers aged at least 55 at the time of restructuring, who may draw them until they reach 65 years of age. The replacement rate for unemployment insurance recipients is 70 per cent for the first 180 days and 60 per cent afterwards. The duration of unemployment benefits received varies between 4 months and 2 years depending

on contribution period over preceding 6 years. For long-term unemployed aged 45 or more, there is a special 6-months benefit of 75-125 per cent of minimum wage.

In the UK there is no provision for early retirement and no benefits related to older unemployed. The standard unemployment insurance rate is a flat rate of about 80 euros per week for aged 25 or over, with duration up to 12 months limited to 182 days in any job-seeking period in October 1996. To summarize, in Germany, and Spain, there are special institutions designed to assist older displaced, while in Italy, and the UK such institutions are not available.

3. Data and Descriptive Analysis

The analysis is based on individual data from the European Community Household Panel (ECHP, 1994-2001). The ECHP is a survey based on a standardized questionnaire with annual interviews of a representative panel of households and individuals in each country, covering a wide range of topics including demographics, employment characteristics, education etc. In the first wave, a sample of some 60,500 nationally represented households - approximately 130,000 adults aged 16 years and over - were interviewed in the then 12 Member States. There are three characteristics that make the ECHP relevant for this study. That is, the simultaneous coverage of employment status, the standardized methodology and procedures yielding comparable information across countries and the longitudinal design in which information on the same set of households and persons is gathered.

In each wave, the ECHP contains monthly information on the labor market status of each individual during the previous year distinguishing between unemployment, inactivity, employment, and retirement. For the purpose of this study an inflow sample of non-employed is constructed, which consists of those individuals who exit employment into either unemployment or inactivity. Each non-employment spell can end by either returning to employment or by entering into retirement. Missing values of the monthly labor market status are imputed following Blau and Riphahn (1999) when the missing months are less or equal to three.[5] The analysis allows for multiple non-employment spells. The sample is restricted to

[5] The missing information is replaced with the value of the month before the missing when the values are the same before and after the missing month. With different values, the imputation depends on the number of missing months. Missing information is replaced with the value of the month after the missing month when the missing month is only one, the value of the month before the first missing month and the value of the month after the second missing month when the missing months are two, and the value of the month before the first missing month and the value of the months after the missing month for the other two, when the missing months are three.

males aged 40-64 years old at the time of the first interview who respond in at least two consecutive years of the survey. [6]

For each of non-employment spells an indicator of displacement is constructed using the information on the reason for leaving the previous job. The displaced are defined as those who were obliged to stop the previous job by the employer. The advantage of using survey data compared to administrative data is that the sample is more representative of the whole population of displaced workers. With administrative data displacement is defined using information on plant closures which excludes all involuntary job separations that occur on an individual basis. Moreover, with survey data a control group can be defined of those who voluntarily left their previous job (for a better job, marriage, child birth, looking after others, illness, etc.). However, using survey data has the disadvantage of relying on self-reported information for the reason of job separation, which might suffer from measurement error and being endogenous to labor market institutions. That is, quits might be reported as layoffs for the worker to be eligible for unemployment insurance, or layoffs to be reported as quits to avoid administrative burden on the side of the employer in countries with strict employment protection legislation. In addition, even in the case of plant closing, the workers who remain until the plant closes are selected non-randomly from the group of workers who were present when the firm's initial negative demand shocks arrived. This occurs as the firm learns which employees are likely to quit and alters its layoff policies accordingly (Pfann and Hamermesh, 2001).

Table 1 contains statistics of the sample by country. The first row shows the total number of individuals available for the analysis and the second row those who are non-employed at least once during the sampling period. The inflow sample of individuals in the analysis consists of those who have at least on flow into non-employment. These numbers vary from 244 individuals in Italy to 432 in Germany (row 3), while the number of spells varies from 456 in the U.K. to 1417 in Spain (row 4). After keeping those aged 40-64 and dropping those spells with missing information on displacement the remaining sample has 713 spells for Germany, 536 for Italy, 1294 for Spain, and 404 for the U.K.

Table 2 presents the transitions that occur in the sample. Non-employment spells might end either to employment or retirement, while some might last until the last observed month in the data and therefore treated as right censored. Around 60 per cent in Germany and 75 per cent in Italy, Spain, and the U.K. of the non-employment spells end by returning to

[6] The sample size for females was very small, so the analysis focuses on males. Pooling males and females would impose restrictions to the parameters of other characteristics which would be difficult to justify.

employment. The percentage of spells ending into retirement is between 5 to 7 per cent for Italy, Spain, and the U.K., while it is much higher (17.39 per cent) for Germany. For those being re-employed, about 60 per cent exit to non-employment in Germany and Italy, 73 per cent in Spain, and 40 per cent in the U.K.

Table 3 presents summary statistics of individual characteristics by displacement status. In Germany and the U.K more educated individuals are less likely to be displaced, but are more likely in Spain. Being older and married with fewer children is also associated with displacement. Displacement probability is higher for home owners and those with higher non-labor income in Germany and Spain, while it is lower in Italy and the U.K.

3.1 Empirical Hazard Estimates

Figure 2 shows the proportion of non-employed re-entering employment by displacement status. The cumulative proportion is based on the empirical hazard rates and is equal to one minus the survival rate. In Italy, and Spain, non-displaced workers return to employment faster than those having been displaced. For Germany, the difference between displaced and non-displaced appears to be small, as is the case for the U.K., although to the opposite direction. Figure 3 shows the cumulative proportion of re-employment for the displaced by age groups. In Germany, and Spain, there is a big difference across age groups in the proportion of displaced workers who return to employment. While for those aged 40-54 about 80 per cent eventually return to employment, it is only 40 per cent of those older displaced (aged 55+) who are re-employed. For Italy, the difference is smaller, while for the U.K. there are no such differences by age. Figure 4 depicts the proportion of workers who exit subsequent employment. It shows that in those countries (Italy, Spain) in which displaced are less likely to return to employment, those who do return exit employment at a lower rate. This lower exit from subsequent employment after displacement is shown in Figure 5 to be associated with those having been displaced between age 40 and 54.

These figures indicate that, for workers in Germany and Spain, displacement past a certain age (around 55 years old) is not "repaired". Younger displaced workers (aged 40-54) although they face more difficulties to be re-employed compared to non-displaced, they are less likely to exit from post-displacement employment, especially in Italy and Spain. The patterns in the U.K. are the opposite as displaced workers return to employment relatively

faster than non-displaced irrespective of age, and face less stable post-displacement employment.

Although differences in re-employment and subsequent employment hazards are useful as such, they are not informative on the transitions towards other states and in particular retirement. Distinguishing between different destination states is important for the understanding whether the low exit rates to employment for older displaced in Germany, Spain and Italy, is due to difficulties to find a job, or because of increasing exit rates towards retirement. This has direct policy implications for the necessary actions to increase the employment rates of older workers. Moreover, the observed lower exit rate from subsequent employment for displaced might be due to dynamic selection. Workers with higher employability are expected to leave non-employment faster and obtain more stable employment. To address these issues an adequate econometric model is needed, which is discussed in the next section.

4. Econometric Methodology

The analysis considers the effect of job loss on the transitions from non-employment (ne) and from subsequent employment (e) for those who are re-employed. Non-employed workers have the following options: remain non-employed, accept a job offer and be re-employed ($ne-e$), or retire ($ne-r$). We model the transitions from non-employment to employment and retirement in a competing-risk framework. Due to lack of sufficiently large sample we model the transition from subsequent employment (for those who are re-employed) in a single-risk framework. The econometric model is a multivariate mixed proportional hazard model. In line with most applications analyzing individual's labor market transitions and given the descriptive purpose of our study, a reduced-form approach is adopted.

Observations for individual who remain non-employed until the end of the observation period are treated as right-censored. Each hazard function is the product of the baseline hazard, which captures the time dependence in the hazard rate, and the systematic part which shifts the baseline hazard. The systematic part includes personal characteristics and economic variables which refer to the year the spell started, and therefore are fixed within a spell, but are allowed to vary across spells denoted as X_{jik}, where $j = ne, e$. Among the personal characteristics are age dummies, education dummies (defined using the ISCED classification),

whether or not the individual is married, the number of children, non-labor income based on capital and property income acting as a proxy for wealth, and a homeownership dummy. The main variable of interest is the dummy variable denoting whether a non-employed worker has been displaced or not. The economic variables include the regional unemployment rate at the time of entering non-employment or employment, respectively. The unobserved heterogeneity is represented by a scalar random variable ε_{ji}^{d}. This unobserved effect is assumed to be individual specific and common across different spells. Moreover, different unobserved effects are allowed to affect each transition. The hazard is conditioned on the X_{jik} variables, but for notational ease in what follows this conditioning becomes implicit.

The transition for person i for a spell k from state j to state s is defined as follows:

$$\theta_{jik}^{d}(t_k \mid \varepsilon_{ji}^{d}) = \lambda_{ji}^{d}(t_k)\exp(y_{jik}^{d}) \tag{1}$$

where $\lambda_{ji}^{s}(t_k)$ is the baseline hazard and $\exp(y_{jik}^{s})$ is the systematic part of the hazard. The baseline hazard has a semi-parametric representation using a piece-wise constant function with specified month intervals:

$$\lambda_{ji}^{s} = \exp\left(\sum\nolimits_{l} \lambda_{j,l}^{s} I_l(t)\right) \tag{2}$$

where the subscript $l = (1,2,3,4)$ denotes the month intervals and $I_l(t)$ are time-varying dummy variables which are one within the month intervals. These intervals are defined as, $l = 1$ for 1-6 months of duration, $l = 2$ for 7-12 months, $l = 3$ for 12-24 months, and $l = 4$ for more than 24 months. Since there is a constant included in the model the first interval is normalized to zero.

For the non-employment spell, where $j = ne$, the index y_{jik}^{s} is defined as:

$$y_{neik}^{s} = \beta_{0ne}^{s} + \beta_{1ne}^{s} X_{neik} + \delta_{1ne}^{s} D_k + \sum_{a=1}^{3} \delta_{2ne}^{s} I(a) D_k + \varepsilon_{nei}^{s} \tag{3}$$

For the employment spell y_{eik} is defined as:

$$y_{eik} = \beta_{0e} + \beta_{1e} X_{eik} + \delta_{1e} D_k + \sum_{a=1}^{3} \delta_{2e} I(a) D_k + \varepsilon_{ei} \tag{4}$$

Note that for the non-employment hazard in eq. (3) there are two destination states which are denoted with the superscript s and the coefficients are destination specific. For the employment hazard s denotes just a single state so it is dropped from eq. (4). The variable D_k is a dummy with the value of one for those who were involuntary displaced and zero otherwise. The specification includes a set of interaction of the displacement dummy with age

dummies denoted as $I(a)$. Given sample size constraints we allow for three age groups 40-55 ($a=1$), 56-60 ($a=2$), and 60-65 ($a=3$). For normalization we fix the coefficient of the last interaction to zero.

The contribution to the likelihood of a completed unemployment and employment spell conditional on the observed and unobserved characteristics is given by[7]

$$f_j^s(t_j \mid \varepsilon_j^s) = \theta_j^s(t_j \mid \varepsilon_j^s)\exp\left(-\int_0^{t_j}\theta_j^s(t_j \mid \varepsilon_j^s)dv\right) \tag{5}$$

while the contribution of a censored spell is given by

$$S_j^s(t_j \mid \varepsilon_j^s) = 1 - F_j^s(t_j \mid \varepsilon_j^s) = \exp\left(-\int_0^{t_j}\theta_j^s(t_j \mid \varepsilon_j^s)dv\right) \tag{6}$$

where F_j^s are distribution functions.

Let c_j^s be destination indicator variables for completed durations, that is, c_{ne}^e (c_{ne}^r) is a dummy variable which takes the value of one if the non-employment spell is completed with a transition into employment (retirement) and the value of zero if the spell is censored. Similarly, c_e for the employment hazard takes the value of one if the employment spell is completed and zero if it is censored. The likelihood for the non-employment spells can be written as:

$$L_{ne} = \int([f_{ne}(t_{ne} \mid \varepsilon_{ne}^e)]^{c_{ne}^e}[S_{ne}(t_{ne} \mid \varepsilon_{ne}^e)]^{1-c_{ne}^e})([f_{ne}(t_{ne} \mid \varepsilon_{ne}^r)]^{c_{ne}^r}[S_{ne}(t_{ne} \mid \varepsilon_{ne}^r)]^{1-c_{ne}^r})dG(\varepsilon_{ne}^e, \varepsilon_{ne}^r) \tag{7}$$

The likelihood for the employment spell is given by

$$L_e = \int[f_e(t_e \mid \varepsilon_e)]^{c_e}[S_e(t_e \mid \varepsilon_e)]^{1-c_e}dG(\varepsilon_e) \tag{8}$$

Therefore, the total contribution to the likelihood for each individual is given by

$$L = \int L_{ne}\, L_e\, dG(\varepsilon_{ne}^e, \varepsilon_{ne}^r, \varepsilon_e) \tag{9}$$

Following Heckman and Singer (1984), the unobserved heterogeneity distribution is defined as a discrete distribution with the support points denoted by ε_{jp}^s and the corresponding probability mass given by $\Pr(\varepsilon_j^s = \varepsilon_{jp}^s) = \pi_{jp}^s$, where P denotes the number of support points. Each unobserved factor is assumed to be time invariant, and individual specific for each destination state. That is, it is assumed to be the same across multiple spells of non-employment, or employment. However, as is discussed below, the unobserved factors are allowed to be different and correlated across non-employment and employment spells.

[7] In what follows the i and k subscripts are dropped.

Identification of a competing risk proportional hazard model has been shown by Heckman and Honore (1989). Van den Berg (2001) provides a detailed discussion of identification issues of the mixed proportional hazard model.

Assuming a discrete distribution with two points of support for each of $\varepsilon_{ne}^{e}, \varepsilon_{ne}^{r}$, and ε_{e}, and perfect correlation between them, the individual likelihood can be written as follows: [8]

$$L = (L_{ne}(H_{ne} \mid \varepsilon_{ne1}^{e}, \varepsilon_{ne1}^{r}) L_{e}(H_{e} \mid \varepsilon_{e1})) \cdot \pi_1 + (L_{ne}(H_{ne} \mid \varepsilon_{ne2}^{e}, \varepsilon_{ne2}^{r}) L_{e}(H_{e} \mid \varepsilon_{e2})) \cdot (1-\pi_1) \qquad (10)$$

where L_{ne} and L_{e} are defined in (7) and (8), respectively. Finally, the total likelihood is obtained by summing over all individual spells. In practice, unobserved heterogeneity is modeled by normalizing the first mass point to zero, since there is a constant in the specification, so that the estimated coefficient for the second mass point denotes deviation from the constant term.

4.1 Endogeneity of Displacement

In order to account for the possible endogeneity of displacement the model is extended to a simultaneous estimation of the selection process and the transitions out of non-employment and employment. The selection process is specified as a logit model:

$$P = \Pr(D_k = 1 \mid X_{ik}, \varepsilon_d) = \Lambda(y_{dik}) \qquad (11)$$

where $y_{dik} = \beta_{0d} + \beta_{1d} X_{dik} + \varepsilon_{di}$ and the contribution of each individual to the likelihood function can be written based on (9) as:

$$L = \int L_{ne} L_{e} P^{d} (1-P)^{1-d} \, dG(\varepsilon_{ne}^{e}, \varepsilon_{ne}^{r}, \varepsilon_{e}, \varepsilon_{d}) \qquad (12)$$

The joint distribution of the unobservables contains an additional component ε_d ,which captures the effect of unobserved factors that affect the probability to be displaced. Assuming a discrete distribution with two points of support the likelihood function is similat to (10). Identification of the model is achieved by the multiple spell framework through variation of the displacement indicator for the same individual across different observed spells.

5. Empirical Results

5.1 Displacement Effect

[8] In the empirical application with unrestricted correlation the empirical results implied perfect correlation, hence perfect correlation was imposed in the final estimation.

Table 4 presents estimates of the model in equation (12) which takes into account the endogeneity of benefits and correlated unobserved heterogeneity. The specification includes the dummy for displacement but restricts the coefficients of its interaction with age, δ_{2j}^{s}, to zero. Estimates from the first panel, for transitions from non-employment to employment, show that displaced workers are less likely to be re-employed in Germany, Italy and Spain compared to the non-displaced, although the effect is significant only for Spain at the 10 per cent level. The second panel of Table 4, for the transitions from non-employment to retirement, shows that displaced in Germany, Italy, and the U.K., are less likely to retire compared to non-displaced. The effect is significant at the 5 per cent level only for Germany. To the contrary, in Spain displaced workers are less likely to be re-employed and more likely to retire. The third panel of Table 4 contains the coefficient estimates for the transition out of subsequent employment. The displaced dummy is negative for Germany and Italy, while for Spain and the U.K. is positive and significant at the 5 per cent level for Spain.

5.2 Age Effect

Age seems to have an important effect on the transitions out of non-employment. Workers aged 40-54 are significantly more likely to be re-employed and less likely to retire in all countries compared to the reference group which includes those aged above 60. For the age group between 55-60 years old the effect differs across countries. In Germany and Spain, the exit rate to re-employment for those aged 55-60 is lower compared to the younger age group, and does not differ significantly compared to those above 60 years old. However, workers in the age group 55-60 are still less likely to exit to retirement. In Italy and the U.K., the opposite holds. Those aged 55-60 are more likely to be re-employed compared to the older workers, as is the case for the younger age group 40-54. These age effects seem to be correlated with the type of institutions that prevail in each country. In Germany and Spain, in which provision for early retirement for the unemployed is available around 60 years old with long duration of unemployment insurance, non-employed workers in the age group 55-60 postpone retirement remaining unemployed.

5.3 Displacement Effect by Age

To investigate whether these age patterns differ among displaced and non-displaced workers, the model is estimated allowing for an interaction effect of the displaced dummy with age, as is described in equations (3) and (4). Table 5 shows the coefficient estimates

from two different specifications. In the first panel, the displaced dummy is interacted with the age group 40-54, so the main effect refers to the displaced 55 years old and above. In the second panel, the displaced dummy is interacted with the age group 40-54 and 55-60.

In Germany and Spain, older displaced are less likely to be re-employed and more likely to retire compared to the non-displaced, following similar age patterns as of those described in Table 4. In particular, from the first panel of Table 5, the coefficient for the displaced workers (above 54 years old) is negative and significant for the transition to employment for both countries.[9] From the second panel, those displaced at or after age 60 are more likely to retire compared to those non-displaced. However, due to the small size of the sample at this age category the estimates are imprecise.[10] Finally, the exit rate from subsequent employment for those who are re-employed is higher for the older displaced in Spain.

Older displaced - above 55 years old – in Italy are less likely to exit non-employment both towards re-employment and retirement. Contrary to Germany and Spain, an increased exit rate of older workers towards retirement is not found for Italy. Finally, for the U.K. being displaced does not seem to have a significant effect on the exit rate from non-employment and subsequent employment.

These results suggest that, in Germany and Spain, older displaced are less likely to be re-employed and more likely to retire relative to non-displaced. In Italy and the U.K., although older displaced are less likely to exit to employment there is no significant effect of displacement on the exit to retirement. This difference in outcomes might be related to the different institutions that exist across these countries. In particular, the generous unemployment insurance with provisions for displaced workers that exist in Germany and Spain might explain the increased transition to early retirement of displaced workers. On the other hand, the lack of substantial insurance in Italy and the UK does not seem to create incentives for early exit from the labor force. The results for Italy might also indicate difficulties in the labor market for displaced workers which could be related to a combination of lack of occupational mobility and age discrimination. For the UK, the estimates are not precise due to small sample size.

Conclusion

[9] The interaction of the displacement dummy with the dummy for the age group 40-55 is positive, which suggests that younger displaced are more likely to be re-employed than older ones. This opposite effect of displacement by age leads to the insignificant effect of displacement in Table 4.

[10] Note that for Germany there is a significant negative effect on the exit to retirement for displaced aged 55-60 relative to the displaced above 60. This might be related to the early retirement at age 60 for the insured unemployed, which creates incentives for postponing retirement.

This paper investigates the effect of job displacement for workers aged 40-65 years old on labour market transitions in Germany, Italy, Spain, and the U.K., based on individual data from the European Community Household Panel (ECHP, 1994-2001). The findings suggest that in Germany and Spain older displaced are less likely to be re-employed and more likely to retire relative to the non-displaced. In Italy and the U.K., on the contrary, older displaced are less likely to be re-employed relative to the non-displaced, but there is no significant effect of displacement for older workers on the exit rate to retirement. Institutional differences might explain these results. Relatively generous unemployment benefits available for involuntary unemployed in Germany and Spain, with the possibility to retire as early as 60 years old (with a requirement to be at least 52 weeks unemployed after 58.5 years old in Germany), might create incentives not to return to employment for those below age 60, and for an early withdrawal from the labor market for those above 60. On the contrary, the option of early retirement does not exist in the U.K., while in Italy it is a possibility only for employees of companies in economic difficulties, with both countries offering less generous unemployment compensation compared to Germany and Spain. Displaced workers in Italy seem to face difficulties to be re-employed, possibly due to low occupational and geographic mobility, loss of firm specific human capital and age discrimination. Among those re-employed, the displaced in Germany and Spain exhibit also higher exit rates from subsequent employment.

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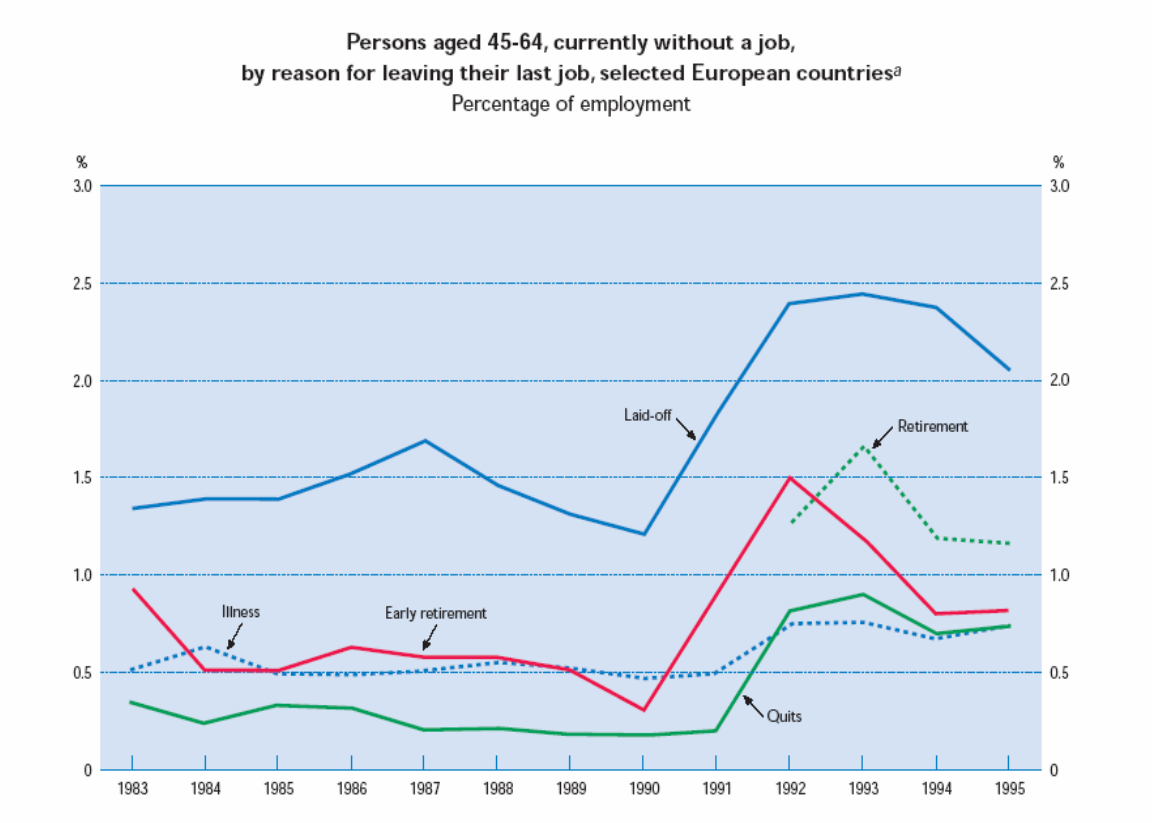
Figure 1. Non-Employed as Percentage of Employed by Reason of Leaving Last Job



a) Persons currently without a job refers to those currently unemployed or not in the labour force who left their job during the previous six months. Data are a weighted average for Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands and the United Kingdom. Data for retirement are unavailable prior to 1992.

Source: Unpublished data provided by EUROSTAT on the basis of the European Union Labour Force Survey.

Figure 2. Fraction Re-Employed by Displacement (all ages)

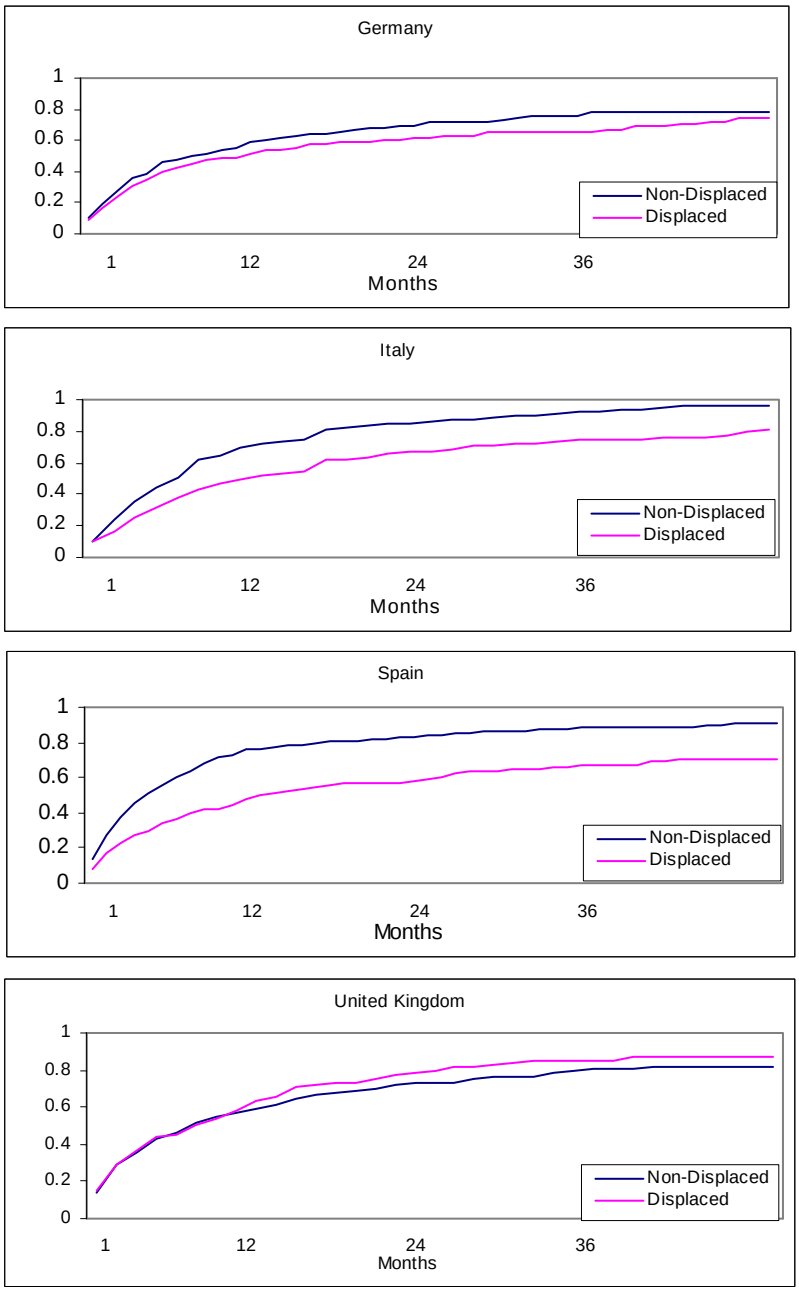


Figure 3. Fraction Re-Employed for Displaced by Age Groups

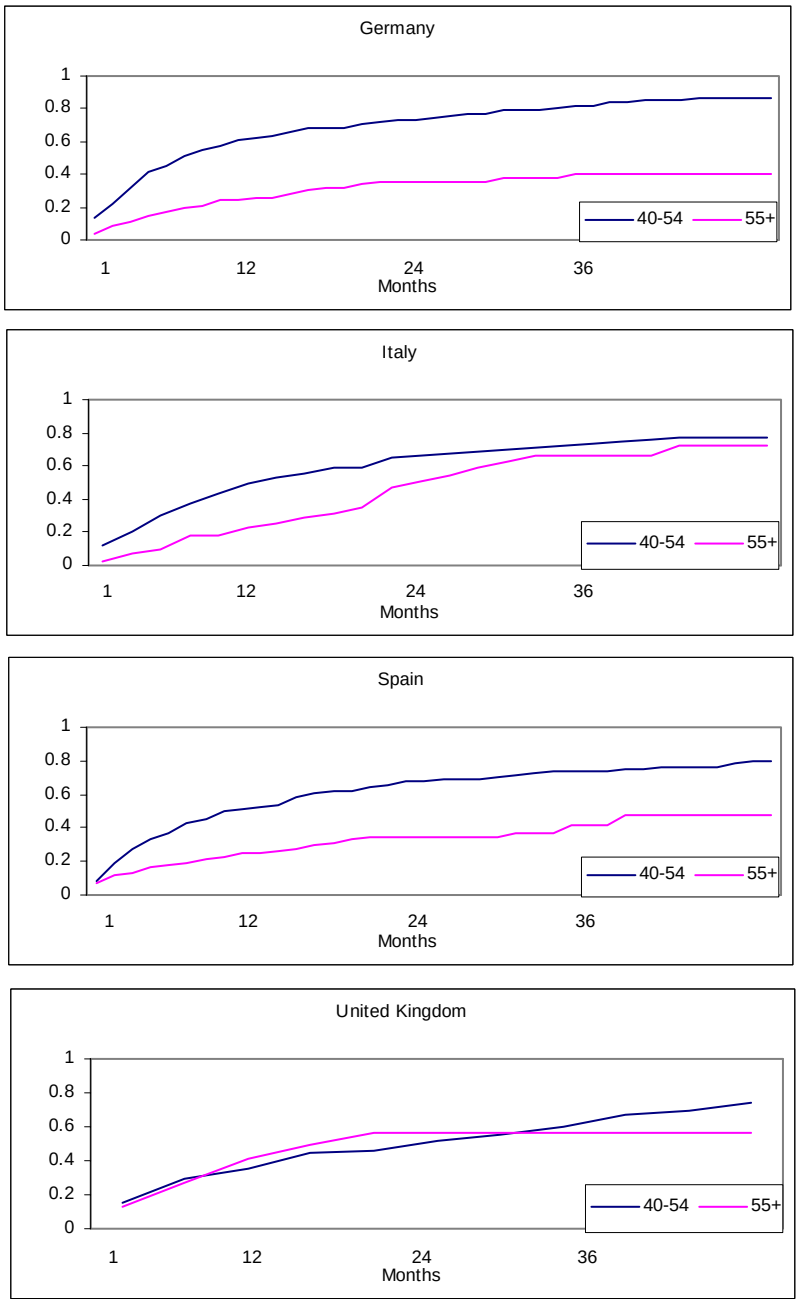


Figure 4. Fraction Re-Enter Non-Employment by Displacement (all ages)

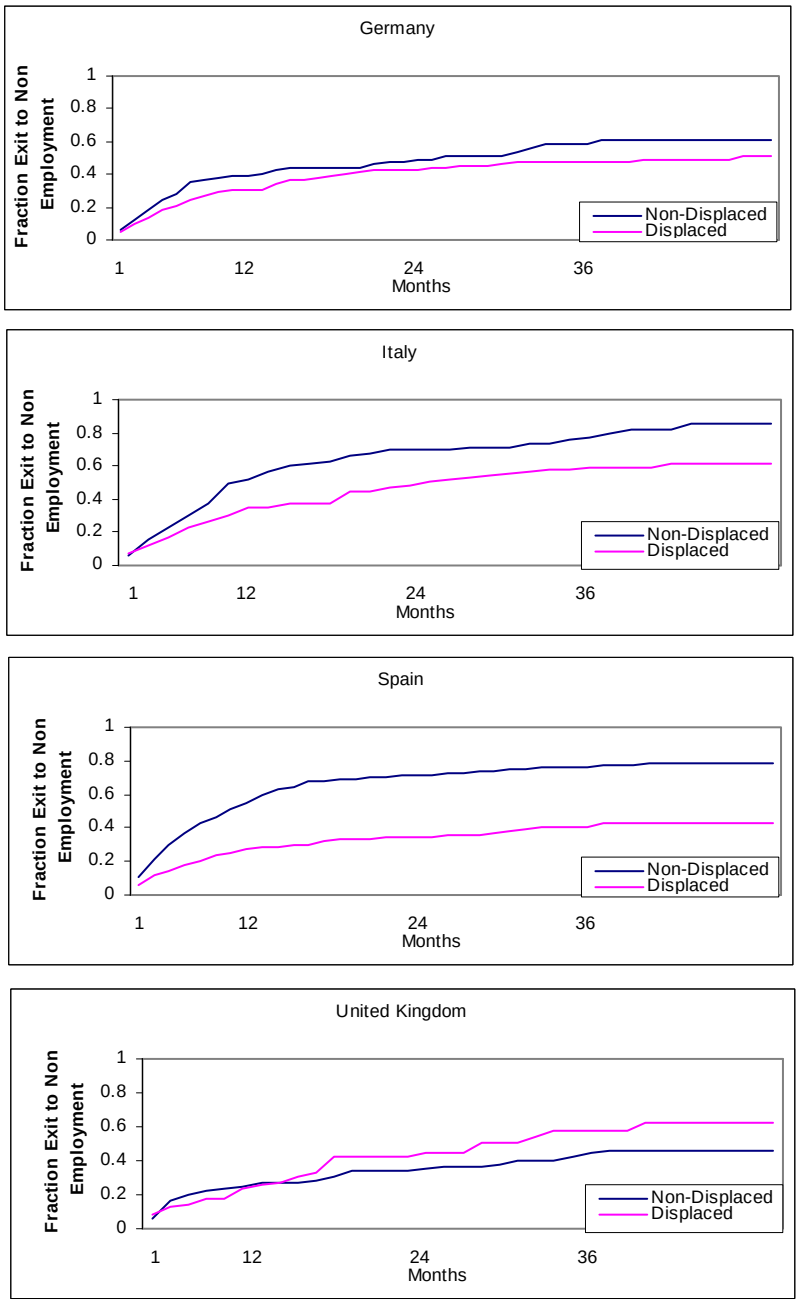


Figure 5. Fraction Re-Enter Non-Employment for Displaced by Age Groups

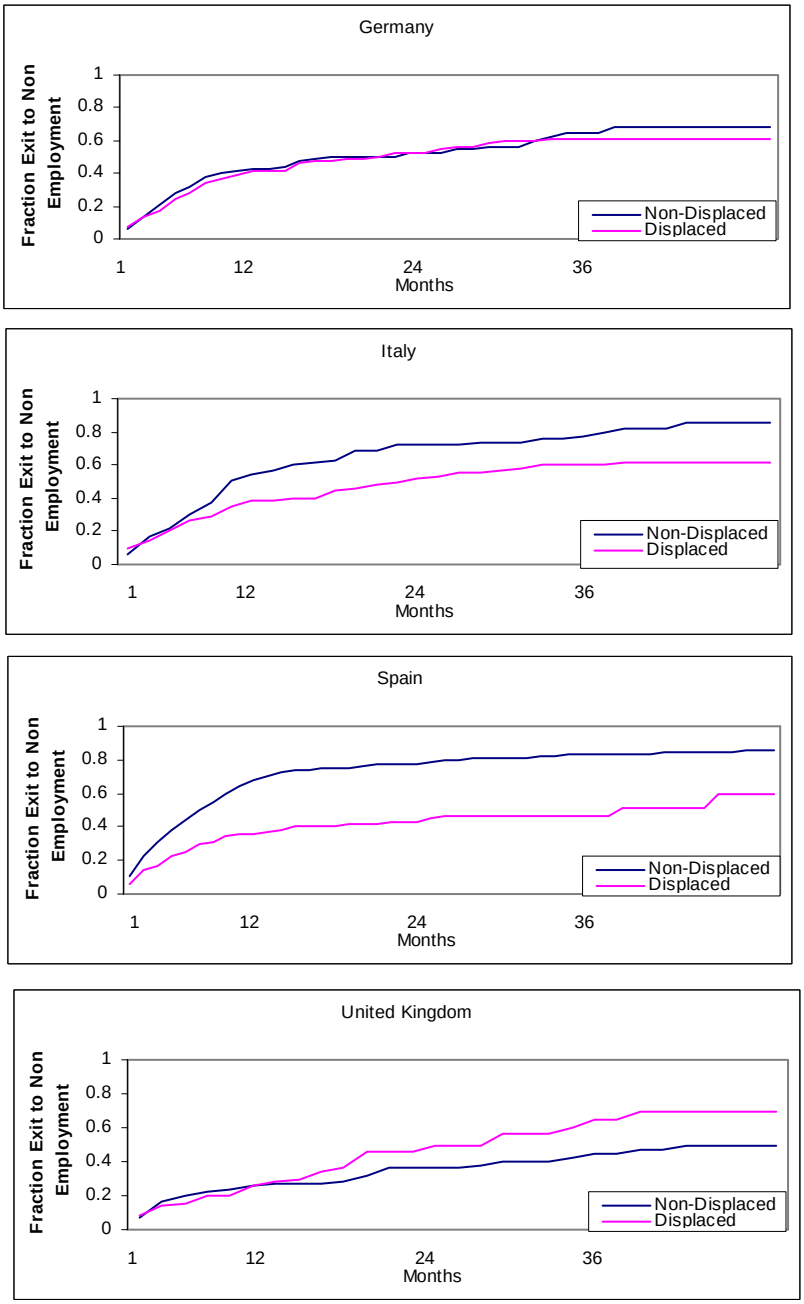


Table 1. Sample Statistics

	Germany	Italy	Spain	UK
# Individuals	7633	10740	10905	6006
# Individuals who are non-employed at least once	2559	3596	4595	1833
# Individuals with at least one flow into non-employment from employment	432	244	434	268
# spells	921	715	1417	456
#spells (aged 40-64) without missing information on characteristics	853	649	1374	431
# spells without missing information on displacement	713	536	1294	404

Table 2. Transitions in the Sample

	Non-Employment			Subsequent Employment	
	NE to E	NE to R	Cens	E to NE	Cens
Germany					
N	428	124	161	254	174
%	(60.03)	(17.39)	(22.58)	(59.35)	(40.65)
Italy					
N	406	38	92	262	144
%	(75.75)	(7.09)	(17.16)	(64.53)	(35.47)
Spain					
N	938	83	273	685	253
%	(72.49)	(6.41)	(21.10)	(73.03)	(26.97)
UK					
N	296	20	88	117	179
%	(73.27)	(4.95)	(21.28)	(39.53)	(60.47)

Note: NE denoted non-employment, E-Employment, R-Retirement, and Cens refers to censored spells.

Table 3. Means of Individual Characteristics by Displacement

	Germany		Italy		Spain		UK	
	Displ.	No-Displ.	Displ.	No-Displ.	Displ.	No-Displ.	Displ.	No-Displ.
High Education	0.226	0.273	0.020	0.021	0.130	0.037	0.319	0.396
Medium Education	0.589	0.577	0.163	0.159	0.126	0.054	0.147	0.097
Low Education	0.185	0.150	0.816	0.821	0.744	0.909	0.534	0.507
Age	50.78	50.29	49.47	48.61	51.31	49.51	48.19	49.97
Married	0.815	0.790	0.913	0.876	0.881	0.850	0.690	0.785
Number of Kids	0.431	0.464	0.770	0.921	0.670	0.892	0.690	0.722
Home Owner	0.437	0.386	0.597	0.691	0.867	0.827	0.776	0.781
Non-Labor Income	956.95	652.75	286.20	673.28	491.14	405.75	984.55	1759.87
Number of Spells	394	319	196	340	270	1024	116	288

Table 4. Competing Risk Hazard Estimates with Unobserved Heterogeneity and Selection

From Non-Empl. to Employment	Germany			Italy			Spain			UK		
	Coef.	s.e.		Coef.	s.e.		Coef.	s.e.		Coef.	s.e.	
Displaced	-0.099	0.105		-0.132	0.246		-0.211	0.110	*	0.050	0.132	
Age 40-54	1.038	0.455	**	0.987	0.367	***	0.758	0.149	***	0.937	0.284	***
Age 55-60	0.198	0.462		0.749	0.379	**	0.187	0.165		0.592	0.316	*
High Education	0.285	0.188		0.001	0.369		0.025	0.160		0.288	0.131	**
Secondary Education	0.157	0.166		-0.101	0.143		-0.174	0.148		0.125	0.203	
Married	-0.054	0.131		-0.023	0.185		0.083	0.113		0.161	0.148	
Number of Children	0.060	0.060		0.032	0.051		0.008	0.036		-0.050	0.059	
Non Labor Income	0.009	0.021		0.012	0.016		-0.020	0.012	*	0.032	0.019	*
Home Owner	0.189	0.107	*	0.022	0.112		0.091	0.095		0.282	0.164	*
Regional Unem. Rate	0.032	0.013	**	-0.003	0.006		0.002	0.007		-0.039	0.021	*
Duration 6-12 Months	-0.714	0.129	***	-0.329	0.126	**	-0.251	0.085	***	-0.479	0.154	***
Duration 12-24 Months	-1.220	0.160	**	-1.073	0.194	***	-1.223	0.139	***	-1.007	0.197	***
Duration 24+ Months	-2.047	0.241	***	-1.710	0.274	***	-1.465	0.169	***	-2.286	0.320	***
Mass Point 1	-3.963	0.519	***	-2.756	0.428	***	-3.232	0.235	***	-3.434	0.406	***
Mass Point 2	0.099	0.222		-0.425	0.289		0.774	0.109	***	0.229	0.289	

From Non-Empl. to Retirement	Germany			Italy			Spain			UK		
	Coef.	s.e.		Coef.	s.e.		Coef.	s.e.		Coef.	s.e.	
Displaced	-0.409	0.215	*	-0.839	0.803		0.118	0.291		-1.161	0.792	
Age 40-54	-2.799	0.384	***	-1.478	0.533	***	-4.168	0.511	***	-1.402	0.580	**
Age 55-60	-1.120	0.330	***	-0.743	0.496		-1.323	0.259	***	-0.964	0.672	
High Education	0.357	0.301		-0.343	1.114		-0.411	0.623		-0.483	0.617	
Secondary Education	0.336	0.265		-1.065	0.772		0.269	0.505		0.685	0.663	
Married	0.249	0.267		0.016	0.549		-0.050	0.384		0.514	0.656	
Number of Children	-0.465	0.239	*	-0.154	0.255		-0.498	0.250	**	-0.441	0.422	
Non Labor Income	0.004	0.040		0.023	0.051		-0.016	0.037		0.108	0.090	
Home Owner	0.382	0.202	*	1.302	0.559	**	0.165	0.428		0.272	0.731	
Regional Unem. Rate	-0.063	0.028	**	-0.075	0.019	***	0.028	0.021		0.106	0.075	
Duration 6-12 Months	1.207	0.313	***	0.577	0.394		1.181	0.328	***	0.941	0.510	*
Duration 12-24 Months	1.615	0.306	***	0.430	0.551		1.145	0.343	***	-0.540	0.819	
Duration 24+ Months	1.965	0.325	***	0.786	0.559		1.679	0.396	***	-0.657	0.840	
Mass Point 1	-3.697	0.592	***	-3.146	0.968	***	-4.150	0.745	***	-6.396	1.461	***
Mass Point 2	0.186	0.387		0.099	0.943		-1.162	0.537	***	0.661	1.209	

(Continues)

Table 4. Competing Risk Hazard Estimates with Unobserved Heterogeneity and Selection

From Employment to Non-Empl.	Germany			Italy			Spain			UK		
	Coef.	s.e.		Coef.	s.e.		Coef.	s.e.		Coef.	s.e.	
Displaced	-0.483	0.139	***	-0.326	0.194	*	0.487	0.108	***	0.236	0.209	
Age 40-54	-0.566	0.303	*	0.179	0.214		0.063	0.126		-0.129	0.313	
Age 55-60	-0.302	0.327		-0.063	0.225		-0.156	0.143		0.778	0.334	**
High Education	0.138	0.343		-0.104	0.329		-0.364	0.151	**	-0.116	0.185	
Secondary Education	0.062	0.296		-0.162	0.139		-0.432	0.146	***	-0.348	0.313	
Married	0.215	0.145		0.107	0.171		-0.140	0.121		-0.765	0.224	***
Number of Children	-0.008	0.074		-0.150	0.052	***	0.052	0.036		0.215	0.091	**
Non Labor Income	-0.089	0.024	***	0.286	0.112	**	0.035	0.011	***	-0.041	0.032	
Home Owner	0.410	0.138	***	-0.369	0.105	***	0.022	0.091		-0.340	0.260	
Regional Unem. Rate	-0.010	0.015		0.025	0.006	***	0.011	0.006	*	-0.072	0.034	**
Duration 6-12 Months	1.057	0.117	***	0.657	0.098	***	-0.021	0.078		-0.192	0.203	
Duration 12-24 Months	1.356	0.201	***	-0.829	0.225	***	-0.595	0.120	***	0.269	0.254	
Duration 24+ Months	1.403	0.261	***	-0.463	0.223	**	0.014	0.140		0.816	0.300	***
Mass Point 1	-2.983	0.498	***	-2.302	0.294	***	-2.620	0.215	***	-1.973	0.466	***
Mass Point 2	1.831	0.178	***	0.332	0.212		1.077	0.083	***	1.874	0.260	***
Probability	0.404		***	0.549		***	0.678		***	0.387		***
Log Likelihood	-6393.09			-6070.63			-16147.61			-2820.14		

Selection Equation	Germany			Italy			Spain			UK		
	Coef.	s.e.		Coef.	s.e.		Coef.	s.e.		Coef.	s.e.	
Age 40-54	0.273	0.472		0.931	0.855		-0.623	0.304	**	1.110	0.526	**
Age 55-60	0.477	0.475		-0.016	0.866		-0.140	0.332		-0.158	0.611	
High Education	-0.586	0.283	**	0.919	1.304		2.527	0.507	***	-0.334	0.264	
Secondary Education	-0.356	0.252		0.437	0.599		1.455	0.353	***	0.501	0.376	
Married	0.160	0.215		1.607	0.821	*	0.679	0.278	**	-0.423	0.277	
Number of Children	-0.019	0.107		-0.575	0.316	*	-0.121	0.106		-0.158	0.117	
Non Labor Income	-0.022	0.035		0.047	0.065		-0.086	0.030	***	-0.032	0.038	
Home Owner	0.320	0.174	*	-1.374	0.744	*	0.062	0.263		0.117	0.318	
Regional Unem. Rate	0.027	0.021		0.016	0.032		-0.050	0.017	***	-0.108	0.043	**
Mass Point 1	-0.808	0.619		-4.192	1.283	***	0.350	0.553		-0.522	0.685	
Mass Point 2	0.709	0.374	*	4.981	0.637	***	-3.491	0.444	***	-0.091	0.484	

Notes: Estimations are performed separately by country including year dummies. In each transition two mass points are allowed for the unobserved heterogeneity distribution. Since there is a constant in the model the first mass point is normalized to zero, so that the estimated coefficient for the second mass point denotes deviation from the constant term.

Table 5. Competing Risk Hazard Estimates (Displacement and Age Interactions)

	Germany		Italy		Spain		UK	
	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.
NE to E								
Displaced	-0.529	0.210 **	-0.349	0.338	-0.466	0.207 **	-0.151	0.393
Displaced*(Age 40-54)	0.551	0.236 **	0.252	0.280	0.332	0.223	0.272	0.417
NE to R								
Displaced	-0.406	0.235 *	-1.486	0.831 *	0.049	0.301	-1.077	0.796
Displaced*(Age 40-54)	0.032	0.469	1.363	0.731 *	0.898	0.952		
E to NE								
Displaced	0.134	0.436	-0.150	0.299	0.402	0.186 **	0.057	0.319
Displaced*(Age 40-54)	-0.654	0.452	-0.196	0.257	0.114	0.201	0.721	0.347 **
Log Likelihood	-6388.04		-6066.03		-16143.72		-2817.94	

	Germany		Italy		Spain		UK	
	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.
NE to E								
Displaced	-1.306	1.123	0.392	0.748	-0.436	0.358	-0.034	0.656
Displaced*(Age 40-54)	1.327	1.128	-0.509	0.721	0.175	0.368	0.099	0.671
Displaced*(Age 55-60)	0.811	1.143	-0.872	0.763	-0.208	0.426	-0.252	0.820
NE to R								
Displaced	0.746	0.620	0.044	1.054	0.310	0.366	-1.251	0.810
Displaced*(Age 40-54)	-1.129	0.746	-0.174	0.987	0.687	0.980		
Displaced*(Age 55-60)	-1.325	0.665 **	-2.458	1.199 **	-0.475	0.497		
E to NE								
Displaced	-0.888	0.830	-1.271	0.516 **	1.543	0.292 ***	0.787	0.853
Displaced*(Age 40-54)	0.358	0.834	0.892	0.473 *	-1.172	0.308 ***	-0.937	0.880
Displaced*(Age 55-60)	1.087	0.855	1.322	0.473 ***	-1.732	0.366 ***	0.675	1.147
Log Likelihood	-6383.54		-6053.01		-16126.61		-2817.96	

Notes: The specification in the top panel allows for an interaction of displacement with the age group (40-54), while the one in the lower panel allows for an interaction with age groups (40-54) and (55-60). Both models are estimated taking into account unobserved heterogeneity and selection for displacement. The other coefficients are not reported as they are similar with the ones in Table 4.