Geographic Labour Mobility and Unemployment Insurance in Europe[1]

Konstantinos Tatsiramos

IZA - Institute for the Study of Labor
Schaumburg-Lippe-Str. 5-9, 53113 Bonn, Germany
Phone: +49 (228) 3894-161; Fax: +49 (228) 3894-510; E-Mail: tatsiramos@iza.org

Abstract

Conventional wisdom suggests that the generous provision of UI in Europe can account for the low regional mobility rates. Emphasizing the disincentive effect, this hypothesis ignores that UI might have also a positive effect, by relaxing liquidity constraints in the presence of mobility and search costs. The paper investigates empirically the effect of UI on geographic labour mobility for 5 European countries. Overall, the findings suggest that receiving benefits is not associated with lower mobility, and they indicate that the effects might vary depending on the institutional characteristics and the incentive structure of the UI system of each country.

Keywords: Mobility; Unemployment Insurance

JEL Classification: J61; C23; C25

1. Introduction

In the process of European economic and monetary integration, geographic labour mobility has increased its importance as a mechanism to absorb regional shocks. This is the case because policy instruments such as inflation differentials and exchange rate realignments are not available for adjustment of shocks in a monetary union. Attaining higher geographic mobility is also considered as one of the ways to achieve the objective of full employment in Europe, as set out at the "Lisbon Strategy" (European Commission, 2001).

Despite the increased importance of geographic labour mobility, it is a stylised fact that regional mobility rates within European countries are low. In particular, internal mobility rates in 1995 measuring the ratio of gross flows to population were about 0.6 per cent in Spain, 1.2 per cent in Germany, 1.5 per cent in France, while they were much higher, around 2.4 per cent, in the U.K. and the U.S. (OECD, 2000). Adjustment to regional shocks in Europe has been mainly achieved through changes of unemployment and participation rates and less through geographic mobility (Decressin and Fatas, 1995; Jimeno and Bentolila, 1998). In contrast, in the U.S., regional labour mobility accounts for a large part of regional adjustment to regional shocks (Blanchard and Katz, 1992).

Although the low mobility of workers across European countries can be attributed to cultural and linguistic differences, these differences are not able to explain the low regional mobility rates within countries. Alternative explanations are focusing on institutional characteristics, which is believed they reduce the incentives to move (e.g., Bertola and Ichino, 1995). These characteristics are typically linked to the Unemployment Insurance (UI) system, wage coordination and employment protection legislation (see also Bertola, 1999). The generosity of the UI system, in particular, has been argued that can explain the low regional mobility in Europe, as insured workers have a lower incentive to move to regain employment

(Hassler, Mora, Storesletten and Zilibotti, 2005).

The hypothesis that unemployment insurance deters mobility and that its generosity can account for the low regional mobility in Europe is a priori ambiguous and has not been established empirically. On the one hand, generous UI might lead to stronger geographic attachment as the opportunity cost of rejecting a job offer is lower, the unemployed adjust their reservation wages more slowly and exert less search effort. On the other hand, generous UI can relax liquidity constraints with a positive effect on mobility, in the presence of mobility and search costs. The purpose of this paper is to investigate empirically the extent to which UI affects geographic labour mobility in Europe employing individual data from the European Community Household Panel (ECHP) for Denmark, France, Germany, Spain, and the United Kingdom (U.K.). The analysis is based on binary choice models taking into account individual unobserved heterogeneity. To address the endogeneity of UI receipt with unobserved characteristics both correlated random effects and fixed effects models are estimated, which differ in their assumptions about the correlation of the unobserved effect with the individual observed characteristics.

Previous literature has mainly focused on the relation between labour market status and geographic mobility showing that the unemployed are more likely to move in comparison to the employed (see Da Vanzo (1978) for the U.S., Pissarides and Wadsworth (1989) for the U.K., Antolin and Bover (1997) for Spain, and reviews of the literature on Greenwood, 1997 and Herzog, Schlottmann, Boehm, 1993). However, there is no evidence based on micro data on the effect of UI receipt on the probability to move to obtain employment.

The rest of the paper is organised as follows. Section 2, discusses the theoretical framework, while Section 3 describes the data. The econometric methodology is presented in Section 4, and the results of the empirical analysis in Section 5. Finally, the paper concludes with a summary of the findings.

2. Theoretical Framework

The standard result from the theory of job search suggests that UI reduces the search effort exerted by benefit recipients and increases their reservation wages, lowering the probability to find and accept a job (Lippman and McCall, 1979; Mortensen, 1977). This disincentive effect of UI has been also considered to affect geographic mobility through the stronger geographic attachment that the lower employment prospects might create. Hassler, Mora, Storesletten and Zilibotti (2005), argue that the variation in the UI generosity between Europe and the U.S. is able to explain the differences in the mobility rates, with Europe being characterised by more generous benefits and lower mobility.

However, theoretical arguments have been developed questioning the conventional wisdom regarding the disincentive effects of UI. These arguments suggest that, by relaxing liquidity constraints, the increased expenditures allowed when receiving benefits may increase the productivity of the search process (e.g. Barron and Mellow, 1979; Tannery, 1983; Ben-Horim and Zuckerman, 1987). This can enhance employment opportunities at the local, but more importantly at the national level, where search costs are higher. In a standard framework in which the decision to move depends on comparing the expected utility gains by moving with mobility costs, the effect of UI is ambiguous. On the one hand, benefits reduce the opportunity cost of rejecting a job offer, which makes the unemployed rejecting more often by choosing a higher reservation wage. On the other hand, higher benefits relax the liquidity constraints, which impede mobility, making recipients more likely to accept a job offer which requires a move.

In the macro literature, liquidity constraints in the presence of imperfect financial markets can affect the mobility choice as the incurred mobility costs translate directly into lower consumption (Bertola, Foellmi and Zweimüller, 2006). If marginal utility is declining,

then current consumption is more valued than the future gains from higher wages; hence the worker will move less than with complete capital markets. Intuitively, larger wage gains are required to trigger forward-looking mobility decisions by workers who finance mobility out of current consumption. Therefore, receiving UI and being able to smooth consumption and finance mobility costs might be seen as a way to correct financial market imperfections, and thus, being beneficial for mobility in the presence of liquidity constraints.

The direction for the effect of other individual characteristics on the decision to move is based on established hypotheses in the literature. That is, more educated workers are expected to exhibit higher mobility due to the different costs they face in their mobility decision as a result of higher general skills, adaptability and possibly previous experience of mobility (Wasmer, Fredriksson, Lamo, Messina, Peri, 2006). Older workers are considered to be less likely to move as they face a shorter time horizon in which they can benefit from the labour market opportunities in the destination region (Goss and Paul, 1986). Family and social ties also increase mobility costs lowering mobility probabilities (Spilimbergo and Ubeda, 2004; Belot and Ermisch, 2006). Finally, home ownership is associated with transaction costs, which lowers the likelihood to move (Hughes and McCormick, 1981; Henley, 1998).

3. Data

The empirical analysis is based on individual data from the eight waves of the ECHP for the years 1994-2001. The ECHP is a survey based on a standardised questionnaire that involves annual interviewing of a representative panel of households and individuals in each country covering a wide range of topics: demographics, employment characteristics, housing, education, income, 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 features that make the ECHP relevant for this study.

Namely, the simultaneous coverage of employment status and housing situation, the standardised 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. The advantage of using the ECHP, in addition to providing longitudinal data, is that individuals, who move, form or join new households, are followed up at their new location within the country. These features allow a European cross-country comparative study of geographic mobility.

The information on geographic mobility is based on the questions in the survey about the year and the month of moving in the current address, and the geography of the move. That is, whether it is a move to the current address from another place within the locality or area, or a move from another area of the country. Due to the low inter-regional mobility observed in most European countries, both intra and inter-regional moves are considered in this study. However, both types of move can be related to different reasons, such as housing, personal, or job related reasons. Given the focus of the paper on geographic labour mobility, a clear distinction is made between these different reasons by defining a mover as an individual who has moved within or outside his/her locality or area starting a new job. The dependent variable is therefore binary, taking the value of 1 if an individual has moved obtaining a new job within the year between two consecutive waves, and 0, otherwise. It is also important to distinguish between the causes and the consequences of a move. Being unemployed or married may result in a change of residence, but can also be the consequence of a change of residence. Therefore, the information for the explanatory variables is obtained from the wave preceding the year of the move.

The sample consists of individuals who are labour force participants aged 20-64. Participants are considered to be those who are either employed or not employed, but they are looking for a job. The countries studied are Denmark, France, Germany, Spain, and the

United Kingdom. The choice of countries is based on availability of sufficient regional mobility and on differences in the rules regarding UI provision. Due to low regional mobility rates in Europe, extending the econometric analysis to other countries in the ECHP was not possible. A description of the features of the UI system in each of these countries is provided in the Appendix.

Table 1 contains the descriptive statistics of the sample. Regarding the labour market status, individuals in Spain exhibit the highest unemployment rate, 20.9 per cent, and those in the U.K. the lowest, 5.5 per cent. Moreover, among the unemployed the share of recipients varies from 77.5 per cent in Denmark, 59.3 per cent in Germany and 55.6 per cent in France, to 29.7 per cent in the U.K. and 22.8 per cent in Spain. This variation of benefits receipt is due to the various eligibility criteria that apply to each country. Education varies also across countries, with Spain having the highest share of low educated, while Denmark and the U.K. have the highest share of individuals completed higher education. Home ownership reflects the situation in the housing market of each country, with Spain and the U.K. having the highest ownership rates, while Germany has the highest share in the rental market.

[Insert table 1 here]

Table 2 shows mobility rates by country. Columns (1), (3), and (4), are constructed using the ECHP for different definitions of mobility, while Column (2), shows the gross flows of regional mobility for each country using data from the OECD (2000). The two sources of mobility rates are not perfectly comparable since they are based on different definitions and refer to different years in some cases. Nevertheless, it appears that the mobility rates obtained from the ECHP follow the same pattern with the aggregate flow data in Column (2). That is, mobility rates are lower in Spain, with Denmark and the U.K. exhibiting the highest mobility rates. However, as discussed above, due to the low inter-regional mobility rates experienced by these countries, the empirical analysis is focused on both intra and inter-regional moves

conditional on having started a new job, as they appear in Column (4).

[Insert table 2 here]

Table 3 presents the mobility rates by country and by individual characteristics. In all countries, the unemployed exhibit higher mobility rates relative to the employed. Within the unemployed, mobility rates for recipients are higher relative to the non-recipients in France, Germany, and Spain, they are about the same in Denmark, and they are lower in the U.K. Regarding the other individual characteristics, younger and higher educated exhibit higher mobility rates, while married, those having children and the home owners have lower mobility rates. Finally, mobility rates do not seem to differ between males and females.

[Insert table 3 here]

These patterns are in line with the expected effect of individual characteristics on mobility rates as discussed in section 2. Interestingly, if anything, the recipients exhibit higher mobility rates compared to the non-recipients, even in countries in which traditionally the UI system is considered to be relatively generous such as, in Germany. However, individuals differ in many respects which might be correlated with the unemployment status and benefit receipt. Therefore, any conclusions can only be drawn after estimating a properly specified econometric model, which takes into account both the observed and the unobserved individual heterogeneity.

4. Empirical Methodology

The econometric model is a discrete choice model in which the dependent variable y_{it} is binary, where $i = \{1, 2, ...N\}$ refers to the individual and $t = \{1, 2...T\}$ refers to the year. Assuming the existence of an underlying response variable y_{it}^* the decision rule can be specified as

$$y_{it}^* = I(X_{it}\beta + u_{it} \geq 0) \tag{1}$$

where X_{it} is the vector of individual and household characteristics, and β is a vector of unknown parameters to be estimated. The unobserved term u_{it} is decomposed into a time-invariant term, c_i, and a time-variant term ε_{it}.

In practice, y_{it}^* is unobserved. What is observed is a dummy variable y_{it} which equals to 1 whenever $y_{it}^* \geq 0$, and to zero, otherwise. The latent variable y_{it}^* can be thought as the expected gain from moving in order to obtain a new job during the time period $[t-1, t]$ compared to not moving. When the expected gain is positive then a move is observed, so that, $y_{it} = 1$.

In general, one might suspect that c is not independent of whether an unemployed receives benefits or not. Since in most cases the benefits receipt depends on the length of the previous employment experience, it might be the case that workers with higher attachment to the labour market are also more likely to be recipients. To address this endogeneity issue two different models are estimated, which differ in their assumptions about the correlation of the unobserved effect c_i with the individual characteristics.

The first model assumes that the time-variant term ε_{it} is iid normal and that X_{it} is strictly exogenous with respect to this unobservable (conditional on c_i). Following Chamberlain (1980), the time-invariant term c_i is allowed to be correlated with some elements of X_{it} by assuming that it follows a conditional normal distribution with linear expectation and a constant variance (Correlated Random Effects). A Mundlak (1978) version of this model assumes that $c_i \mid X_{it} \sim$ Normal $(\psi + \overline{X_i}\xi, \sigma_\alpha^2)$, where $\overline{X_i}$ is the average of X_{it}, with $t = 1,...T$, and σ_α^2 is the variance of α_i in the equation

$$c_i = \psi + \overline{X_i}\xi + \alpha_i \tag{2}$$

In the second model, assuming that the unobserved individual characteristics are fixed for each individual, conditioning on a minimum sufficient statistic such as, the sum of the outcomes of y_{it}, it is possible to obtain a consistent estimator for β without any assumptions about how c_i is related to X_{it} (Conditional Fixed Effects). If the probability to move, given the observed and unobserved characteristics, follows a logistic distribution then conditioning the likelihood of a sequence of moves for an individual on the total number of periods that the individual has moved results in eliminating c_i. The panel logit model is given by

$$\Pr(y_{it} = 1 \mid X_{it}, c_i) = \frac{e^{c_i + X_{it}\beta}}{1 + e^{c_i + X_{it}\beta}} \tag{3}$$

In this case the sum of the number of '1' outcomes for an individual is a sufficient statistic for c_i. For example, if T=2, then the probability of observing the sequence (1,0) is given by

$$\Pr(y_{i0} = 1, y_{i1} = 0 \mid y_{i0} + y_{i1} = 1, X_{it}, c_i) = \frac{1}{1 + e^{(X_{i2} - X_{i1})'\beta}} \tag{4}$$

Maximising this conditional version of the likelihood function using the subset of observations where $y_{i0} + y_{i1} = 1$ provides with unbiased and consistent estimates of β (Chamberlain, 1980). In an analogous to the linear first difference estimator, the CFE estimator uses the differences in the values of X over time to identify the probability of observing the sequence (1,0) versus (0,1). Note that observations such that $y_{i0} = y_{i1}$ are uninformative for β since they can be rationalized by any values of c_i even though the X's are changing. Since the identification of the parameter vector is based on changes over time of the characteristics, the CFE model can identify only time-varying covariates. Also, the estimation is based on the sub-sample of those individuals who experience a move within the panel, which results in a reduction of the sample size. Similarly with the CRE model, the time-variant term ε_{it} is assumed to be independent of the covariates.

5. Results

Both Correlated Random Effects (CRE) and Conditional Fixed Effects (CFE) models are estimated separately for each country for the total sample and by sex. Estimation performed on the pooled country sample imposes restrictions to the coefficients which are rejected based on a standard likelihood-ratio test. For both models, the specification includes two dummies which distinguish the unemployed to benefit recipients and non-recipients. Other regressors include individual and household characteristics, such as age, sex, the level of education based on the (ISCED) classification, the type of housing tenure, a dummy for being married, and the number of children. Regional and wide economic effects are captured by including year and regional dummies and the regional unemployment rate. A detailed description of the variables can be found in Table A2.

5.1 Correlated Random Effects

Table 4 presents the coefficients estimates from the CRE model for the total sample of labour market participants, which consists of the employed and the unemployed looking for a job. The results suggest that the unemployed who are non-recipients of benefits are more likely to move for a new job compared to the reference group of employed. This effect is significant in all the countries considered in the study. The effect for recipients appears to be also positive and significant for Denmark, France and Spain, while it is not significantly different from zero for Germany and the U.K. Similar results are obtained when estimating the model separately for males and females in Table 5. The results for the other individual characteristics suggest that those with higher education, who are younger, not married, and live in a rented accommodation, are more likely to move. These findings are in line with the existing literature on the determinants of geographic mobility and the hypothesis outlined in section 2.

[Insert table 4 here]

11

The specification in Tables 4 and 5 allows the individual time-varying characteristics to be correlated with the unobserved term as specified in section 4. For instance, receiving benefits might be associated with individual characteristics which are unobserved such as, labour market attachment, which renders benefit receipt to be endogenous. Controlling for such correlation by the inclusion of the mean values of these characteristics, relaxes the assumption of exogeneity of benefits with respect to these unobserved individual effects. The coefficients of the mean values of these characteristics suggest a significant correlation in some cases. In relation to benefits, in particular, recipients in Germany are associated with a positive effect on mobility, while non-recipients are less likely to move with a larger effect for the U.K. In all cases, conditional on the observed characteristics, the variance of the unobserved effect is significant suggesting the presence of individual characteristics, which are persistent over time affecting the decision to move.

[Insert table 5 here]

5.2 Conditional Fixed Effects

Relaxing the imposed parametric assumptions of the CRE model on the way the unobserved individual effect is related to the observed individual characteristics, the estimates of the CFE model in Table 6 show results which are similar with the CRE model. Both recipients and non-recipients are significantly more likely to move compared to the employed, except for the recipients in Germany and the U.K. where the effect is not significant. Also, the estimates of the CFE model by sex, in Table 7, show that there are no significant gender differences. The similarity of the results across the two models indicates the importance of considering the CRE model instead of a standard random effect model in this analysis. The advantage of the CRE model is that time invariant characteristics can be identified and it does not require to condition on a statistic, which leads to a reduction in the sample size.

[Insert table 6 here]

[Insert table 7 here]

5.3 Unemployed Sample

So far the analysis was based on a sample including both the unemployed and employed workers imposing the restriction of a common effect of individual characteristics for both groups. Moreover, such effects are more likely to be identified through the employed group. Considering a sample which consists of only the unemployed, it is possible to relax these assumptions and directly test the effect of receiving benefits on the probability to move for a new job. Table 8 shows that, in the sample of unemployed, recipients are significantly more likely to move compared to non-recipients in Denmark, France and Spain, while the effect is not significantly different from zero for the recipients in Germany and the U.K. These results are based on the CRE model on the pooled sample of males and females. Due to limited sample sizes, a distinction by sex is not allowed by the data in all cases and estimating a CFE model is not feasible. However, the male dummy for all the countries is not significant. Also, based on the similarity of the results for the total sample of employed and unemployed between the CRE and the CFE models in Tables 4 and 6, relying only on estimates from the CRE model provides convincing evidence.

[Insert table 8 here]

5.4 Predicted Probabilities

To obtain a size of the effect of benefits on the likelihood to move, the predicted probabilities are computed based on the estimates from the CRE model and they are presented in Table 9. The first row refers to the predicted probability for an individual based on the total sample of employed and unemployed, setting the individual characteristics at their mean value. The second row computes the predicted probability for the average individual for the sample of unemployed. Since the model includes a number of dummy variables and the mean values are

not very intuitive, the predicted probabilities are also obtained for a reference person. The reference person is defined as a non-recipient, 30-45 years old, with secondary education, married with average number of kids who lives in a rented house. The predicted probabilities for the average individual are ordered similarly with the raw data in Table 2, except for the U.K., in which possibly due to the small sample size the predicted probabilities are relatively low. The last part of Table 9 shows that in all countries recipients exhibit higher mobility rates compared to non-recipients with the difference being larger for Denmark and France, followed by Spain.

[Insert table 9 here]

5.5 Discussion

Overall, the findings suggest that receiving benefits is not associated with lower mobility. They also indicate that the effect might vary depending on the institutional characteristics of each country. In countries with relatively generous benefits such as Denmark, France and to some extent Spain, the effect of receiving benefits on the probability to move is positive and significant. For the U.K., which provides the least generous benefits, the effect although it is positive is nonetheless not significant. The link between the generosity of UI and labour market outcomes for the unemployed is also indicated by Tatsiramos (2006) looking at the effect of UI receipt on subsequent employment stability.

Related work by Ahn, dela Rica, Ugidos (1999) on the willingness to move for work in Spain, finds no significant difference on migration willingness between recipients and non-recipients. Pedersen and Smith (2002), for Denmark, find an insignificant negative effect of the net compensation rate in unemployment on the willingness to move. However these findings do not rely on actual migration choice. Goss and Paul (1990), using information on unemployment benefits and actual individual migration for a sample of heads of households from the PSID for the U.S., they also do not find a significantly different effect between

recipients and non-recipients on the probability to move.

To interpret the results and the observed differences across countries, it is important to note that the generosity of the benefits does not only matter for the recipients, but has an indirect effect on the non-recipients through the entitlement effect (Mortensen, 1977). That is, in countries in which UI is relatively generous, non-recipients will have an incentive to find a job so that they will become eligible for benefits upon future job separation. This will also have an effect on geographic mobility decisions of non-recipients and the effect will be larger the less tight are the eligibility criteria. Another dimension which is important is the incentive structure of the UI system. In France, for instance, there is a decline of benefits at every 4 months of remaining in unemployment. This might increase the incentives to find a job for the recipients, but might also reduce the entitlement effect for non-recipients. Another important dimension is related to the strictness of search effort requirements imposed by the UI system. The lack of such incentive structure in Germany might be able to explain the insignificant effect of receiving benefits, as the moral hazard effect might be higher for recipient, so that they are less likely to find a job. On the other hand, the entitlement effect for non-recipients will be also higher, which might increase their job finding rates and consequently their mobility rates. Finally, the extent to which UI raises moral hazard issues might vary across countries depending on the degree of public-spiritedness (Algan and Cahuc, 2006). For instance, the positive effect for recipients in Denmark, despite the very generous replacement rates, might be related to the attitudes of individuals towards the government and the public systems.

Conclusion

Conventional wisdom suggests that the generous provision of UI in Europe can account for the low regional mobility rates, emphasizing the disincentive effect of UI. However, focusing

only on the lower incentives to move for regaining employment, which is induced by UI, ignores the hypothesis that UI might also have a positive effect on mobility by relaxing liquidity constraints in the presence of mobility and search costs. This paper investigates empirically this theoretical ambiguity and contributes to the scarce evidence of the effect of unemployment benefits on actual geographic labour mobility in Europe.

The analysis is based on individual data from the ECHP for Denmark, France, Germany, Spain, and the United Kingdom, estimating binary choice models which take into account individual unobserved heterogeneity. The findings suggest that receiving benefits is not associated with lower mobility, and they indicate that the effects might vary depending on the institutional characteristics of each country. That is, in countries with relatively generous benefits such as Denmark, France and to some extent Spain, recipients of UI are significantly more likely to move compared to non-recipients. In countries which provide less generous benefits such as the U.K., or generous but with a relatively weak incentive structure, such as Germany, recipients do not differ significantly on their likelihood to move. To address the endogeneity of UI receipt both correlated random effects and fixed effects models are estimated, which differ in their assumptions about the correlation of the unobserved effect with the individual characteristics. The results are robust to these different model specifications across countries.

References

Ahn N, de la Rica S, Ugidos A (1999) Willingness to move for work and unemployment duration is Spain. *Economica* 66:335-357

Algan Y, Cahuc P (2006) Civic attitudes and the design of labor market institutions: which countries can implement the Danish flexicurity Model? IZA Discussion Paper No. 1928

Antolin P, Bover O (1997) Regional migration in Spain: the effect of personal characteristics and of unemployment, wage and house price differentials using pooled cross sections. *Oxford Bulletin of Economics and Statistics* 59 (2):215-235

Atkinson A, Micklewright J (1991) Unemployment compensation and labor market transitions: a critical review. *Journal of Economic Literature* 29(4):1679-1727

Barron J, Mellow W (1979) Search effort in the labour market. *Journal of Human Resources* 14(4):389-404

Belot M, Ermisch J (2006) Friendship ties and geographic mobility: evidence from the BHPS. IZA Discussion Paper No. 2209

Ben-Horim M, Zuckerman D (1987) The effect of unemployment insurance on unemployment duration. *Journal of Labor Economics* 5(3):386-390

Bertola G, Foellmi R, Zweimüller J (2006) *Income Distribution in Macroeconomic Models*. Princeton University Press

Bertola G, Jimeno JF, Marimon R, Pissarides C (2000) EU Welfare Systems and Labour Markets: Diverse in the Past, Integrated in the Future? In: Bertola G, Boeri T, Nicolleti G (eds) *Welfare and Employment in a United Europe*. MIT Press, Cambridge

Bertola G (2000) Labor markets in the European Union. ifo Studien 1:9-122

Bertola G, Ichino A (1995) Wage Inequality and Unemployment: US vs. Europe. In: Bernanke B, Rothemberg J (eds) *NBER Macroeconomic Annual*. MIT Press, Cambridge

Blanchard O, Katz L (1992) Regional evolutions. *Brookings Papers on Economic Activity* 1:1-74

Chamberlain G (1980) Analysis of covariance with qualitative data. *Review of Economic Studies* 47(1):225-238

Da Vanzo J (1978) Does unemployment affect migration? Evidence from micro data. *Review of Economics and Statistics* 60(4):504-514

Decressin J, Fatas A (1995) Regional labor market dynamics in Europe. *European Economic Review* 39(9):1627-55

European Commission (2001) High Level Task Force on Skills and Mobility, Final report, Brussells

Goss E, Paul C (1986) Age and work experience in the decision to migrate. *Journal of Human Resources* 21(3):397-405

Goss E, Paul C (1990) The impact of unemployment insurance benefits on the probability of migration of the unemployed. *Journal of Regional Science* 30(3):349-358

Greenwood MJ (1997) Internal migration in developed countries. In: Rosenzweig MR, Stark O (eds), *Handbook of Population and Family Economics*, Elsevier North-Holland, Amsterdam 647-720

Hassler J, Mora J, Storesletten K, Zilibotti, F (2005) A positive theory of geographical mobility and social insurance. *International Economic Review* 46(1):263-303

Henley A (1998) Residential mobility, housing Equity and the labour market. *Economic Journal* 108(2): 414-427

Herzog HW Jr, Schlottmann AM, Boehm TP (1993) Migration as spatial job-search: a survey of empirical findings. *Regional Studies* 27(4):327-340

Hughes G, McCormick B (1981) Do council house policies reduce migration between regions? *Economic Journal* 91:919-937

Jimeno JF, Bentolila S (1998) Regional unemployment persistence (Spain, 1976-1994). *Labour Economics* 5(1):25-51

Lippman SA, McCall JJ (1979) *Studies in the Economics of Search*. North Holland, Amsterdam

Mortensen D (1977) Unemployment insurance and job search decisions. *Industrial and Labor Relations Review* 30(3):505-517

Mundlack Y (1978) On the pooling of time series and cross-sectional data. *Econometrica* 46(1): 69-86

Nickell SJ, Layard R (1999) Labor market institutions and economic performance. In: Ashenfelter O, Card D (eds) *Handbook of Labor Economics,* vol. 3. North-Holland, Amsterdam 3029-3084

OECD (1996) *Employment Outlook*, OECD, Paris

OECD (2000) *Employment Outlook*, OECD, Paris

Pedersen P, Smith N (2002) Unemployment traps: do financial disincentives matter? *European Sociological Review* 18(3):271-288

Pissarides C, Wadsworth J (1989) Unemployment and the inter-regional mobility of labour. *Economic Journal* 99:739-755

Spilimbergo A, Ubeda LA (2004) Family attachment and the decision to move by race. *Journal of Urban Economics* 55(3):478-497

Tannery F (1983) Search effort and unemployment insurance reconsidered. *Journal of Human Resources* 18(3):432-440

Tatsiramos K (2006) Unemployment insurance in Europe: unemployment duration and subsequent employment stability. IZA Discussion Paper No. 2280

Wasmer E, Fredriksson P, Lamo A, Messina J, Peri G (2006) The Macroeconomics of Education. In: Brunello G, Garibaldi P, Wasmer E (eds) *Education and Training in Europe*. Oxford University Press

Wooldridge JM (2002) *Econometric Analysis of Cross Section and Panel Data*. MIT Press, Cambridge

Appendix

The Unemployment Insurance System

Table A1 shows the main characteristics of the UI system in each country. There are mainly two schemes of unemployment benefits, unemployment insurance, and unemployment assistance. Unemployment insurance is the main scheme under which those who are eligible receive compensation in the event of entry into unemployment. Eligibility is based upon previous employment and contribution histories, which implies that it does not cover all the unemployed. Unemployment assistance is not available in all countries. It is generally means tested and it is usually available for those who exhaust unemployment insurance and those who are not eligible. No distinction is made between unemployment insurance and assistance as such information is not available in the data. Following Bertola, Jimeno, Marimon and Pissarides (2000), the European countries can be classified as follows: 1) the Nordic (Denmark) and the Continental countries (France, and Germany) which provide generous benefits, 2) the Anglo-Saxon countries (e.g. United Kingdom) which provide flat rate payments with relatively short duration, and 3) the southern European countries (e.g. Greece, Italy, and Spain) which have welfare states that were developed recently and provide limited unemployment insurance, although Spain resembles more to the Continental countries.

In particular, for the U.K., the flat rate corresponds to a replacement rate of about 30 per cent, which is about half to one-third of the replacement rate in France, Germany, and Spain. Duration of UI varies by employment record (France, Germany and Spain), and/or by age (France and Germany). France has the highest UI benefit duration (up to 60 months) but the payment is decreasing at every 4 months period, while Denmark has the highest replacement rate, 90 per cent, of the reference earnings.

[Insert table A1 here]

[Insert table A2 here]

Table 1. Descriptive Statistics by Country

	Denmark	France	Germany	Spain	U.K.
Labour Market Status					
Employed	0.919	0.913	0.842	0.791	0.945
Unemployed	0.081	0.087	0.158	0.209	0.055
Share of Unemployed - Recipients	0.775	0.444	0.407	0.228	0.297
Share of Unemployed - Non-Recipients	0.225	0.556	0.593	0.772	0.703
Mean Age	40.68	39.95	39.10	37.99	38.74
Education					
Third Level	0.390	0.262	0.219	0.229	0.385
2nd Level of Secondary	0.406	0.445	0.575	0.210	0.150
Less than 2nd Level	0.204	0.293	0.206	0.561	0.464
Married	0.602	0.650	0.683	0.640	0.612
Number of Children	0.814	0.901	0.760	0.742	0.706
Home Owner	0.765	0.604	0.404	0.823	0.798
Male	0.523	0.546	0.539	0.617	0.532
Sample Size	15,685	32,438	41,411	36,702	27,326

Source: ECHP (1994-2001), Author's calculations.

Table 2. Mobility rates by country (various definitions)

	Inter-regional	Gross flows	Inter-regional with new job	Inter&Intra-regional with new job
Denmark	2.00 (313)	-	0.56 (88)	1.59 (250)
France	1.44 (468)	1.49	0.31 (101)	0.85 (275)
Germany	0.64 (265)	1.24	0.18 (75)	1.09 (452)
Spain	0.40 (148)	0.60	0.12 (43)	0.82 (300)
United Kingdom	3.38 (924)	2.30	0.76 (208)	1.97 (539)

Notes: Intra and Inter-regional mobiltiy rates are averages calculated from ECHP. Gros flows refer to the ratio of gross flows to population (1995 for France and Italy, 1993 for Germany, 1994 for Spain, and 1998 for the UK) obtained from Table 2.12, OECD (2002).

Table 3. Mobility rates by country and characteristics

	Denmark	France	Germany	Spain	U.K.
Labour Market Status					
Employed	1.20	0.72	0.97	0.65	1.91
Unemployed	3.78	2.20	1.72	1.45	3.07
Unemployed - Recipients	3.76	2.56	1.87	1.66	2.69
Unemployed - Non-Recipients	3.86	1.92	1.62	1.38	3.23
Age Group 20-24	6.82	4.49	2.78	1.59	6.49
Age Group 25-29	3.72	2.12	2.14	1.83	3.52
Age Group 30-44	1.48	0.64	0.97	0.68	1.44
Age Group 45-54	0.38	0.14	0.50	0.20	0.56
Age Group 55-64	0.17	0.04	0.16	0.06	0.27
Education					
Third Level	1.19	1.36	0.82	0.81	2.28
2nd Level of Secondary	1.89	0.69	1.18	0.87	2.94
Less than 2nd Level	1.78	0.62	1.14	0.80	1.40
Married	0.72	0.44	0.65	0.46	1.05
Non-Married	2.92	1.61	2.04	1.45	3.43
With Children	1.33	0.70	0.96	0.69	1.59
Without Children	1.82	1.01	1.21	0.93	2.24
Home Owner	0.88	0.43	0.37	0.59	1.39
Renter	3.93	1.48	1.58	1.88	4.28
Male	1.62	0.85	1.11	0.82	2.04
Female	1.56	0.84	1.06	0.81	1.90

Source: ECHP (1994-2001), Author's calculations.

Table 4. Random Effect Probit Estimates

	Denmark		France		Germany		Spain		U.K.	
	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.
Labor Market Status										
Unemployed										
With Benefits	0.635	0.142	0.463	0.133	0.021	0.099	0.470	0.122	0.006	0.192
Without Benefits	0.441	0.232	0.327	0.132	0.297	0.100	0.295	0.087	0.306	0.139
Education										
High Education	0.092	0.092	0.305	0.072	0.193	0.075	-0.016	0.064	0.271	0.051
Medium Education	0.076	0.082	-0.023	0.069	0.141	0.057	-0.110	0.063	0.260	0.063
Age Groups										
Age 20-24	1.137	0.131	1.192	0.117	0.622	0.084	0.710	0.110	1.022	0.084
Age 25-29	0.807	0.118	0.835	0.107	0.506	0.073	0.813	0.103	0.740	0.081
Age 30-44	0.583	0.107	0.508	0.102	0.269	0.067	0.489	0.097	0.443	0.075
Male	0.017	0.063	0.107	0.053	0.078	0.043	0.121	0.052	0.023	0.044
Family Characteristics										
Married	-0.140	0.154	-0.215	0.139	0.090	0.109	-0.978	0.136	-0.142	0.110
No. of Kids	-0.096	0.085	-0.033	0.070	-0.064	0.061	-0.039	0.070	0.033	0.061
Home Owner	-0.532	0.120	0.262	0.111	-0.295	0.114	-0.207	0.098	-0.147	0.090
Reg. Un Rate	0.023	0.040	-0.046	0.027	-0.032	0.013	0.011	0.017	-0.001	0.009
Mean Un w. Benefits	-0.662	0.258	-0.112	0.234	0.511	0.150	-0.160	0.248	0.046	0.351
Mean Un w/o Benefits	-0.664	0.536	-0.415	0.233	-0.286	0.159	-0.222	0.139	-1.113	0.333
Mean Married	-0.057	0.176	0.116	0.150	-0.434	0.122	0.781	0.145	-0.007	0.122
Mean No. of Kids	0.065	0.092	0.005	0.076	0.092	0.066	0.049	0.075	-0.086	0.067
Mean Home Owner	0.130	0.143	-0.736	0.130	-0.251	0.125	-0.334	0.117	-0.409	0.108
Constant	-2.733	0.272	-2.609	0.304	-2.498	0.160	-2.859	0.282	-3.592	0.227
Sigma	0.414	0.090	0.275	0.112	0.405	0.063	0.313	0.109	0.355	0.068
Observations	15,685		32438		41411		36702		27326	
Groups	4,101		7715		9840		10409		6624	
Log-Likelihood	-1,109.92		-1,347.52		-2,257.11		-1,549.21		-2,150.04	

Notes: Estimations are performed for each country separately including regional and year dummies. The mean values are defined for the time-varying covariates.

Table 5. Random Effect Probit Estimates by Sex

	Denmark Coef.	s.e.	France Coef.	s.e.	Germany Coef.	s.e.	Spain Coef.	s.e.	U.K. Coef.	s.e.
Labor Market Status					**MALE**					
Unemployed										
With Benefits	0.487	0.225	0.429	0.218	-0.123	0.133	0.405	0.143	0.059	0.226
Without Benefits	0.972	0.395	0.354	0.236	0.246	0.146	0.232	0.125	0.463	0.189
Sigma	0.473	0.110	0.453	0.108	0.307	0.105	0.236	0.065	0.359	0.093
Observations	8202		17697		22338		22652		14531	
Groups	2106		4109		5127		5981		3362	
Log-Likelihood	-577.72		-744.95		-1,246.45		-963.21		-1,180.63	
Labor Market Status					**FEMALE**					
Unemployed										
With Benefits	0.757	0.186	0.534	0.176	0.210	0.153	0.682	0.236	-0.089	0.378
Without Benefits	0.172	0.311	0.366	0.165	0.345	0.140	0.397	0.130	0.162	0.214
Sigma	0.309	0.163	0.218	0.032	0.491	0.075	0.450	0.143	0.348	0.102
Observations	7483		14741		19073		14050		12795	
Groups	1995		3606		4713		4428		3262	
Log-Likelihood	-520.89		-586.14		-998.08		-572.03		-957.92	

Notes: Estimations are performed for each country separately by sex including regional and year dummies. The estimates for the other covariates are not reported.

Table 6. Conditional Fixed Effect Logit Estimates

	Denmark		France		Germany		Spain		U.K.	
	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.
Labor Market Status										
Unemployed										
With Benefits	1.048	0.275	0.946	0.269	0.010	0.203	0.968	0.271	-0.162	0.402
Without Benefits	0.867	0.419	0.906	0.191	0.489	0.197	0.851	0.185	0.525	0.262
Age	0.274	0.219	0.328	0.150	0.046	0.123	0.809	0.177	-0.534	0.117
Age^2/100	-0.192	0.272	-0.554	0.252	-0.193	0.182	-1.075	0.268	0.154	0.178
Family Characteristics										
Married	-0.214	0.307	-0.851	0.262	0.080	0.217	-1.891	0.294	-0.122	0.196
No. of Kids	-0.132	0.179	-0.177	0.126	-0.132	0.128	-0.317	0.165	0.005	0.106
Home Owner	-0.809	0.201	0.572	0.170	-0.370	0.217	-0.138	0.176	-0.240	0.140
Reg. Un Rate	0.077	0.108	-0.031	0.038	-0.003	0.026	-0.007	0.024	0.002	0.022
Observations	1348		2169		2455		1693		2997	
Groups	286		451		480		347		575	
Log-Likelihood	-425.29		-675.24		-779.69		-493.72		-852.27	

Notes: Estimations are performed separately by country. Only time-varying covariates are identified. A Wald-test for the difference of the coefficients for the unemployed with and without benefits is significant only at the 10% level for Germany.

Table 7. Conditional Fixed Effect Logit Estimates by Sex

	Denmark		France		Germany		Spain		U.K.	
	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.
Labor Market Status					*MALE*					
Unemployed										
With Benefits	1.116	0.485	0.548	0.444	-0.262	0.274	0.930	0.330	-0.128	0.464
Without Benefits	1.506	0.697	0.607	0.310	0.482	0.302	0.611	0.269	0.648	0.341
Observations	661.000		1124.000		1330.000		971		1513	
Groups	143.000		230.000		258.000		201		293	
Log-Likelihood	-201.180		-348.170		-414.430		-288.58		-443.67	
Labor Market Status					*FEMALE*					
Unemployed										
With Benefits	1.085	0.340	1.106	0.344	0.390	0.312	1.050	0.475	-0.202	0.825
Without Benefits	0.397	0.566	1.110	0.247	0.501	0.263	1.063	0.259	0.378	0.414
Observations	687		1045		1125		722		1484	
Groups	143		221		222		146		282	
Log-Likelihood	-219.36		-321.22		-358.96		-201.74		-406.12	

Notes: Estimations are performed separately by country. Only time-varying covariates are identified. A Wald-test for the difference of the coefficients for the unemployed with and without benefits is significant only for males at the 10% level for Germany.

Table 8. Probit Estimates for Unemployed

	Denmark		France		Germany		Spain		U.K.	
	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.
Labor Market Status										
Unemployed										
Receiving Benefits	0.532	0.262	0.650	0.176	0.042	0.126	0.323	0.148	0.306	0.267
Education										
High Education	0.338	0.243	0.137	0.165	0.520	0.158	0.157	0.114	0.611	0.222
Medium Education	0.270	0.199	-0.171	0.141	0.283	0.106	-0.048	0.105	0.551	0.247
Age Groups										
Age 20-24	1.082	0.382	0.713	0.232	0.620	0.167	0.614	0.202	1.680	0.431
Age 25-29	0.966	0.340	0.433	0.229	0.615	0.154	0.812	0.192	1.230	0.447
Age 30-44	0.454	0.308	0.211	0.219	0.388	0.144	0.482	0.188	0.709	0.443
Male	0.077	0.172	-0.016	0.129	0.094	0.089	0.115	0.088	0.127	0.184
Family Characteristics										
Married	-0.896	0.410	-0.376	0.326	0.340	0.234	-1.417	0.230	-0.708	0.561
No. of Kids	0.390	0.218	-0.048	0.156	-0.026	0.120	-0.111	0.124	0.418	0.240
Home Owner	-0.328	0.312	0.511	0.257	-0.134	0.248	-0.052	0.177	0.461	0.330
Reg. Un Rate	-0.034	0.068	-0.067	0.071	-0.043	0.026	0.058	0.029	0.022	0.037
Mean R. Benefits	-0.860	0.399	-1.184	0.383	-1.032	0.656	-0.492	0.362	-1.041	0.661
Mean Married	0.430	0.430	0.385	0.341	0.603	0.604	1.399	0.241	0.707	0.608
Mean No. of Kids	-0.244	0.230	-0.022	0.169	-0.687	0.281	0.068	0.130	-0.745	0.286
Mean Home Owner	0.181	0.367	-0.987	0.307	-0.994	0.400	-0.475	0.206	-1.042	0.401
Constant	-2.347	0.679	-1.665	0.753	-2.425	0.314	-3.464	0.479	-4.648	0.789
Sigma	0.388	0.509	0.232	0.106	0.227	0.057	0.235	0.077	0.227	0.094
Observations	1269		2813		6551		7681		1500	
Groups	783		1576		3133		4038		1024	
Log-Likelihood	-170.50		-256.60		-526.70		-515.31		-137.58	

Notes: Estimations are performed for each country separately including regional and year dummies on the sample of the unemployed. The mean values are defined for the time-varying covariates.

Table 9. Predicted Probabilities from the CRE Probit Model

	Denmark	France	Germany	Spain	U.K.
Predicted Probability at Mean Values of Observed Characteristics	0.839	0.350	0.657	0.429	0.531
Reference Person	2.679	0.187	1.090	0.225	0.949
Labour Market Status					
Unemployed - Recipients	8.877	0.700	1.142	0.837	0.986
Unemployed - Non-Recipients	6.213	0.490	2.157	0.520	1.957
Age Group 20-24	7.899	1.281	2.416	0.429	3.580
Age Group 25-29	4.291	0.490	1.897	0.567	1.951
Age Group 45+	0.685	0.035	0.545	0.047	0.281
Education					
Third Level	2.762	0.490	1.224	0.297	0.982
Lower Level	2.252	0.200	0.768	0.310	0.484
Single	3.564	0.353	0.876	2.862	1.366
Married					
With 1 Child	2.579	0.185	1.051	0.218	0.975
With 2 Children	2.095	0.167	0.900	0.193	1.067
With 3 Children	1.690	0.150	0.768	0.170	1.167
Home Owner	0.427	0.333	0.339	0.087	0.784
Female	2.569	0.133	0.911	0.157	0.899

Note: The reference group is an employed, aged 30-44, single, without children, who lives in a rented house.

Table A1. Unemployment Benefits in Selected European Countries.

	Schemes	Employment/contributions conditions	Payment rate	Duration (months)
Denmark	Insurance	52 weeks in 3 years	90% of reference earnings	1+3 years
France	Insurance	4 months in last 18 months	40% to 57% decreasing at 4 monthly intervals	4-60 months depending on age
Germany	Insurance	12 months in 3 years	60% of net earnings for singles and 67% with children	12-64 months depending on age and contribution history
	Assistance	Received UI during last year or being in need	53% of net earnings for single and 57% with children	Unlimited - renewable every year
Spain	Insurance	12 months in 6 years	70% of earnings in first 180 days and 60% afterwards	4-24 months depending on contribution history
U.K.	Insurance	Contributions paid in one of the 2 tax years on which the claim is based amounting to at least 25 times the minimun contribution for that year	Flat rate (65-83 Euros per week) depending on age	182 days
	Assistance	Means Tested	Flat rate (99-130 Euros per week) depending on age	Unlimited

Source: European Commission Missoc 1994.

Table A2. Description of Variables	
Labour Market Status	
Unemployed	Dummy equals 1 if unemployed and looking for a job, and 0 if employed
Recipient	Dummy equals 1 if unemployed with benefits, and 0 if otherwise
Non-Recipient	Dummy equals 1 if unemployed without benefits, and 0 if otherwise
Education Levels	
Higher level	Dummy for having finished higher education
Medium level	Dummy for having finished second level of secondary education
Lower level	Dummy for having finished less that second level of secondary education
Married	Dummy for being married
Home Ownership	Dummy for owning a house
Reg. Un. Rate	Regional unemployment rate