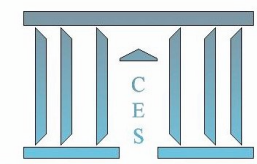
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State dependence and labour market transitions in the European Union

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Abstract

Using conditional dynamic multinomial logit models that allow to disentangle between state dependence and unobserved heterogeneity, this article proposes an empirical analysis of labour market mobility in the European Union based on EU-SILC data. It shows that the role of true state dependence varies a lot across social groups (according to age, sex and education) and across countries. In particular, state dependence can be related for the different social groups and country groups studied to various structural explanations in terms of institutional arrangements (education and retirement policies, leave policies, childcare policies, labour market policies…) and/or to employers' behaviour.

Key words

Labour market mobility, state dependence, unobserved heterogeneity, European Union, inequalities, institutions

JEL codes

J60, J62, J64, J68

1- The issue of state dependence in labour market transitions

Labour market mobility appears like a key issue to understand labour market dynamics and countries' outcomes in terms of unemployment. Since the 1980s it has been related to the debate about the so-called "Eurosclerosis"[1]: in that perspective, European countries would be characterized by lower flows on the labour market in comparison with the US that would increase unemployment persistence. Various explanatory frameworks have been proposed to account for that lower mobility that put forward the consequences of some labour market institutions (especially firing costs and employment protection –see Bentolila and Bertola, 1990) on workers' and employers' behaviour. Several empirical studies show that the situation has changed since the end of the 1990s (and before the 2008 recession), with an increasing trend in labour market turnover and especially in probabilities of outflows from unemployment (Boeri and Garibaldi, 2009; Ward-Warmedinger, Macchiarelli, 2013). That trend concerns all Euro zone countries, as well as Sweden and Denmark, but is stronger in the Nordic countries (Ward-Warmedinger, Macchiarelli, 2013). According to Boeri and Garibaldi (2009) it should be explained by institutional changes and labour market policy reforms (lower employment protection, activation). As far as mobility is concerned, another related issue in times of labour market deregulation deals with the increasing share of atypical contracts (temporary jobs, part-time work…)[2], and the potential consequences of these statuses on workers' future labour market prospects: are they a stepping stone or a trap for careers (Booth *et al*, 2002; Magnac, 2000)? Negative effects on future job prospects or wages could explain the existence of a job satisfaction gap between fixed-term contract and permanent contract workers in the EU, as well as global negative trends in European workers' satisfaction between 2000 and 2005, as stated by Boeri and Garibaldi (2009). Lower protection and increased mobility would therefore have a counterpart in terms of job satisfaction.

But these questions are particularly challenging from a methodological point of view. Indeed, to proceed to international comparisons or to identify aggregate trends over time, transitions might be approached in a descriptive way. But in order to conclude to some effects of a given labour market state on future flows or employment histories, one has to disentangle between "true" state dependence and unobserved heterogeneity. According to Heckman (1981), if an individual who has experienced an event in the past is found more likely to experience this event in future, this might receive two different explanations. If experiencing an event alters preferences, prices or constraints relevant to future choices or outcomes, then "true past dependence" (also called "structural" past dependence) is at work. But if individuals differ in certain unobserved characteristics that influence their probability to experience the event (whatever the time period, and independently of their past experience of the event), it is a case of "spurious" past dependence. In other words, previous experience appears to be a

[1] For labour market issues this terminology was first used by Giersch (1985).

[2] Between 1995 and 2007, in the EU 15, the share of temporary jobs in total employment increased from 11.5% to 14.6%, and the share of part-time work also increased from 15.6% to 20.3%.

determinant of future event only because it is a proxy of some persistent unobservables. That distinction is crucial for interpretation and policy conclusions.

Different methods have been developed to treat such an unobserved heterogeneity: according to Heckman (1981) a first order Markov model gives the best description of the error process resulting from heterogeneity in a discrete time setting. Panel data discrete choice models have been developed by several authors, using different estimation strategies (Magnac, 2000; Honoré and Kyriazidou, 2000). Other methodologies apply to the case of a continuous time setting (Magnac, 2000).

Having identified state dependence empirically, interpretation is not straightforward. Heckman (1981) suggests that structural state dependence may be generated by different types of models and its meaning vary according to the context. For instance, one can make the hypothesis that individuals are randomly assigned in different states, but that time spent in a given state increases the costs to leave it (either because there are some rewards for staying, or because institutions modify preferences). But models of decision making under imperfect information can also generate state dependence. If an individual maximizes his/her utility over the remaining horizon, given information and constraints at present, and if transitions probabilities are uncertain, then being in a state may bring some information or lead to some costs that alter the set of opportunities or the information available. As a consequence the outcomes of the decision process will influence his/her future decisions. Finally, Heckman shows that even a decision model under perfect foresight can be brought into sequential form so that past outcomes of the choice process may determine future outcomes. In the case of labour market transitions, several mechanisms are likely to alter the set of opportunities of individuals: past employment (or non-employment) affects human capital accumulation and therefore future choices; labour market status may also influence social networks, and thus information about available jobs… Some mechanisms can also play on the employers' side, in particular if labour market status is perceived as a (good or negative) signal of workers' ability or effort. Institutions and policies (such as unemployment insurance, invalidity benefits, parental leaves, pensions rules…) affect the costs and gains of staying in a given status or alternatively to make a transition to another one. But they can also influence employers' incentives to maintain employees in a given type of contract (for instance part-time, or temporary contracts, if they are subsidized or less costly to end) or to transform it. In the present paper our hypothesis will be that institutions and policies may influence state dependence and especially its variability across groups and countries. Therefore we can expect some heterogeneity of structural state dependence by social groups (age, gender, but also education levels, as social and labour market policies include some targeting), and also across countries.

There is a growing literature on labour market transitions and mobility using individual workers' data[3]. Nevertheless, most analyses are conducted at the national level, and

[3] Another approach to labour market mobility at the micro-level is based on firm-level data (Haltiwanger *et al*, 2008). But it does not enable to follow individual trajectories on the labour market.

comparative studies are relatively scarce. Existing research reveals a strong heterogeneity of individual transitions probabilities across countries, with higher labour market flows in Nordic and Anglo-saxon countries (European Commission, 2009; Erhel, Guergoat-Larivière, 2013; Ward-Warmedinger, Macchiarelli, 2013). Besides, that literature also emphasizes that some individual characteristics are correlated with transitions rates. In general, low skilled and senior workers (as well as women and youth to a lower extent) appear disadvantaged in terms of labour market transitions: they show a lower probability to make a favourable transition (towards employment), and a higher probability of transiting towards inactivity or unemployment. The relative role of these individual characteristics is also found to be heterogeneous across countries (Erhel, Guergoat-Larivière, 2013).

These studies are descriptive and do not disentangle unobserved heterogeneity from state dependence. Such a correction is only used in national studies that confirm the existence of "true" state dependence for some labour market statuses: according to Magnac (1997), using French data, state dependence is the highest for the unemployed or inactive. Being unemployed or inactive lowers the probability to make a favourable transition (towards employment). Several articles using methodologies that correct for unobserved heterogeneity focus on temporary contracts to identify a potential "stepping stone" effect. The conclusions are not clear-cut: the "stepping-stone" effect is identified for the Netherlands (Zijl *et al.*, 2011), but is not confirmed or very weak in France (Magnac, 2000; Givord and Wilner, 2009). Using German data, Caliendo and Uhlendorff (2008) find strong true state dependence in three labour market states (self-employment, wage employment and non-employment), and a high cross-mobility between non-employment and wage employment. The issue of part-time and its consequences for mobility are not analyzed in that literature, despite its growing importance in Europe, especially for women. These analyses correcting for unobserved heterogeneity on national data also confirm the heterogeneity of labour market mobility by social groups: for instance, Magnac (1997) using French data finds a gender difference in the probability to get a permanent labour contract (whatever the initial state the probability is lower for women). But youth are less concerned by state dependence in their access to stable employment. Beck and Kamionka (2012) also provide evidence of heterogeneity in labour market mobility by occupational groups, using French data.

Our paper focuses on heterogeneity in state dependence across social groups and countries. It aims at filling two research gaps that are present in that literature. First, it proposes a comparative approach on a European harmonized dataset (EU-SILC), but goes further that existing studies in the identification of state dependence by introducing some correction for unobserved heterogeneity using a conditional dynamic multinomial logit model. This allows for a discussion of the links between institutions and structural state dependence. Second, it considers transitions between unemployment, employment and inactivity, but also between part-time, full-time and non-employment, and therefore addresses the issue of part-timers' labour market mobility[4].

[4] Temporary contracts are not considered in that paper because of some limitations of data availability but also because a comparative perspective on temporary contracts is limited by some important differences in national regulations.

Section 2 presents the data from EU-SILC database and some descriptive statistics about labour market transitions in the EU. Section 3 details the methodology used to disentangle unobserved heterogeneity and state dependence. Section 4 presents the main results of cross-country comparison and of comparisons between social groups.

2- Data : *EU-SILC* panel and individual labour market histories

-EU-SILC panel and the construction of labour market transition variables

Our analysis uses micro-data from the *EU-Survey on Income and Living Conditions* (*EU-SILC*). This database provides information on income, poverty and labour market outcomes of individuals from all European countries. Data are available from 2003 to 2011 for a growing number of countries. Two datasets are proposed: a cross-sectional database and a longitudinal database that is a rotational panel of four years.

Our analysis uses the longitudinal component of *EU-SILC* for years 2006 to 2009. More precisely, it relies on the monthly calendar available in the dataset: we use variables PL210A to PL210L that give the main activity of the respondent from January (PL210A) to December (PL210L). These variables distinguish between nine possible statuses: [1] employee (full-time), [2] employee (part-time), [3] self-employed (full-time), [4] self-employed (part-time), [5] unemployed, [6] retired, [7] student, [8] other inactive and [9] compulsory military service[5]. This variable is self-defined and refers to the monthly activity status over the so-called *"income reference period"* that is in EU-SILC database the year before the survey. Using EU-SILC panel for years 2006 to 2009, we thus study labour market statuses and transitions from 2005 to 2008[6].

From these monthly data, we build a variable that gives the labour market status of each individual on a quarterly basis. To do so, we select the four variables corresponding to the main activity of the respondent in January (PL210A), April (PL210D), July (PL210G) and October (PL210J). That choice to work on quarterly data enables to keep a larger sample of countries in our final dataset since some of them do not provide monthly data.

We end up with 2,723,916 observations of individuals who have at least 4 (and maximum 16) observations according to our quarterly variable on labour market status[7]. Our sample is limited to individuals from 15 to 62, from 28 countries, namely the 27 EU-countries except Germany plus Iceland and Norway.

[5] In 2009, Eurostat created twelve other variables with slightly different answering categories, coded from PL211A to PL211L. Since we do not use all categories and rather aggregate them into larger ones, this does not impact our analysis.

[6] Data are released until 2011 (panel from 2008 to 2011 that gives information on monthly labour market status from 2007 to 2010) but we decide to focus on years 2005 to 2008 because of the impact the crisis could have on state dependence, which is behind the scope of this article.

[7] Details about the number of observations (total by gender, age, education levels and country groups) are provided in appendix (table A1).

The labour market status quarterly variable is used to build our dependent variable.

Two models are estimated, that correspond to different definitions of labour market situations, based on the aggregation of original variables' categories (PL210A to PL210J). Two options are used alternatively in the article for the definition of labour market statuses. We either distinguish:

- between Employment, Unemployment and Inactivity or
- between Full-time employment, Part-time employment, Unemployment and Inactivity.

In the first case, Employment, Unemployment and Inactivity are defined as follows:

- Employment (full-time or part-time, employee or self-employed) corresponds to categories [1+2+3+4] of the initial *EU-SILC* PL210A to PL210Lvariables;
- Unemployment includes[5] ;
- Inactivity [6+7+8+9].

In the second case, Full-time employment, Part-time employment, Unemployment and Inactivity are defined as follows:

- Full-time employment (employee or self-employed) corresponds to categories [1+3] of the initial *EU-SILC* PL210A to PL210Lvariables;
- Part-time employment (employee or self-employed) includes [2+4] ;
- Unemployment includes[5] ;
- Inactivity [6+7+8+9].

The empirical analysis focuses on labour market transitions, defined in accordance to these two definitions of labour market statuses: either between employment, unemployment and inactivity, or between full-time employment, part-time employment, unemployment and inactivity.

Using these two definitions, we run an analysis of labour market transitions separately for each country and for various social groups according to their age, education level and gender. Results are presented for youth (15-30 years old), middle-aged people (31-49), seniors (50-62) (variable RX010), men, women (variable RB090), as well as for low-educated (ISCED 0-2), middle-educated (ISCED 3-4) and high-educated people (ISCED 5-6) according to the ISCED 2007 classification from UNESCO (variable PE040).

-The heterogeneity of transitions across social groups and countries

Computing descriptive transition matrices by age, gender and education level shows important heterogeneity across social groups and countries, in particular in their probability to stay unemployed or inactive over a three months horizon.

Indeed the majority of "transitions" correspond to persistence in the initial labour market status (employment, unemployment and inactivity; see tables 1 and 2). Without any control for individual characteristics (observable or unobservable), it seems that the probability of staying unemployed or inactive (transition from U to U or I to I) increases along with age

Stable employment[8] concerns more the median age group (31-49), and is the lowest for youth. Transition matrices also show that the more educated the less likely individuals are to stay unemployed or inactive. The higher educated also experience the highest share of stable employment.

Finally, differences between men and women do not seem very striking though women are slightly more likely to stay unemployed or inactive than men. Using the second definition of labour market statuses that distinguishes between full-time and part-time employment (see table 2), women are at the same time less likely to stay in full-time employment and more likely to stay in part-time employment compared to men. Women also experience fewer transitions from part-time to full-time employment.

Looking at situations where individuals experience a change in labour market status shows that probabilities of outflows from unemployment to employment are higher for youth, higher educated and men. Transitions from unemployment to inactivity are more frequent for women and for seniors than for other categories.

According to descriptive transition matrices by country (see table A1 in appendix), countries with the lowest shares of unemployed remaining in unemployment after three months are Cyprus, Finland, Norway, Sweden and the UK : between 60 and 70% of the unemployed stay in unemployment. These countries are also characterised by high shares of transitions from unemployment towards employment (20% or more). This group contrasts with France, Belgium, Ireland, Lithuania, Latvia, Malta, Portugal, Rumania and Slovakia where the share of unemployed staying in unemployment exceeds 80%, and where outflows to employment are limited (between 10 and 15%). Inactivity appears highly persistent on a short term horizon: the share of individuals staying in inactivity exceeds 90% in all countries except Sweden and Iceland. Sweden and Finland are also characterized by higher transition rates from inactivity to employment, while these transitions are very limited in some Southern and Eastern countries (Cyprus, Greece, Portugal, Czech Republic, Hungary, Slovenia and Slovakia) but also in France, the UK and Luxembourg. Transitions from part-time to full-time employment are higher in Nordic and Eastern countries (Finland, Iceland, Norway, the Czech Republic, Estonia, Latvia and Slovenia) whereas they are rare in the Netherlands, France and the UK.

[Insert tables 1 and 2]

[8] Stability refers here to labour market status. But the individual might have changed job, or even experienced unemployment within the three months.

3-Methodology

Our goal is to analyse labour market transitions by controlling for state dependence and unobserved heterogeneity. To do so, we implement a methodology suggested by Honoré and Kyriazidou in 2000.

3.1 Estimation

Magnac (2000) proposes a method to estimate a multinomial logit which enables to disentangle state dependence and unobserved heterogeneity without time-varying explanatory variables. In the vein of Magnac, Honoré and Kyriazidou (2000) propose a model which enables to introduce time-varying explanatory variables that better applies to our case, since it allows taking into account the incidence of unemployment variations over labour market transitions. In this paper, we use the estimator proposed by Honoré and Kyriazidou (2000) and computed by Aeberhardt and Davezies (2012) to estimate the following model:

$$P(y_{it} = m / x_{it}, \alpha_i, y_{it-1} = j) = \frac{\exp(x_{it}\beta_m + \alpha_{mi} + \gamma_{jm})}{\sum_{h=0}^{M-1} \exp(x_{it}\beta_h + \alpha_{hi} + \gamma_{jh})} \quad (1)$$

Where y_{it} is the 3- or 4- category quarterly employment status of individual *i* at time *t* derived from the monthly calendar available in EU-SILC, α_{mi} are the fixed effects, x_{it} is our only time-varying regressor, *i.e.* unemployment rate for individual *i* at time *t* (x_{it} is the same for all individuals within each country). Introducing national quarterly unemployment rates into the model reduces heterogeneous effects the economic cycle may have in the different European countries considered here. In order to control for seasonality, we also add quarterly dummies. We have also run this model using bi-annual and annual data (by taking respectively only two or one point instead of four each year) and results stay the same.

γ_{jm} are our parameters of interest representing the feedback effect of alternative *j* at *t-1* followed by alternative *m* at *t*. In this model we can only identify $M^2-(2M-1) = 3^2-(2*3-1) = 4$ parameters for the 3-category employment status and $4^2-(2*4-1) = 9$ parameters for the 4-category employment status. With 3 statuses, Employment=0, Unemployment=1 and Inactivity=2. State 0 is chosen as reference so that we can only estimate the feedback effects $\gamma_{11}, \gamma_{12}, \gamma_{21}$ and γ_{22}, and β_1 and β_2. In this case, $\beta_0 = \gamma_{00} = \gamma_{01} = \gamma_{10} = \gamma_{02} = \gamma_{20} = 0$. With 4 statuses, Full time employment=0, Part time employment=1, Unemployment=2 and Inactivity=3. The choice of employment and full-time employment as the reference is motivated by the fact that we want to focus on problems of persistence on European labour markets –either in non-employment or in atypical jobs like part-time employment- and to study their heterogeneity across social groups and countries. In the paper, we consider all transitions for which a parameter is estimated by the model (transitions from unemployment, inactivity and part-time) but we particularly focus on γ_{11} and γ_{22} for the 3 category

employment status, and γ_{11}, γ_{22} and γ_{33} for the 4 category employment status, *i.e.* the probability of staying in the same state relatively of moving to state 0. These probabilities are the highest for each status of origin, and illustrate the issue of labour market status persistence since they measure the relative probability of *staying* in a given labor market status from one period to the next (for instance in unemployment, inactivity or part-time employment). At the global European level, we estimate these parameters for men and women, for different age groups (15-30, 31-49, 50-62) and for different education levels (ISCED 0-2, ISCED 3-4, ISCED 5-6). Then in a second step we calculate them by country groups: as the number of observations for some countries does not allow to get reliable results, we divide our sample of countries into five groups: a Nordic group, a Continental group, a Southern group, an Eastern group[9], and a liberal group, which consists of a single country, the UK. This division is quite standard in empirical comparative literature and can be founded theoretically on the varieties of capitalism framework (see for instance Amable, 2003). Finally, we also run the estimations by social group and country group, to see how gender, age or education levels differences vary across country groups[10].

3.2 Odds Ratios

Since we want to analyse labour market transitions and differences in terms of state dependence across social groups and countries, we build on our model's results to compute odds-ratios. We can than compare directly each estimated feedback parameter between countries (choosing one country as the reference) or between social groups (choosing one group as the reference). Following equation (1) we have for group 1 (P_1 refers to group 1 and P_2 refers to group 2[11]) the probability to be in state *m* relative to state *0* in period *t* conditionally to be in state *j* in period *t-1*:

$$\frac{P_1(y_{it}=m/x_{it},\alpha_i,y_{it-1}=j)}{P_1(y_{it}=0/x_{it},\alpha_i,y_{it-1}=j)}=\frac{\dfrac{\exp(x_{it}\beta_m+\alpha_{mi}+\gamma_{jm})_1}{\sum_{h=0}^{M-1}\exp(x_{it}\beta_h+\alpha_{hi}+\gamma_{jh})_1}}{\dfrac{\exp(x_{it}\beta_0+\alpha_{0i}+\gamma_{j0})_1}{\sum_{h=0}^{M-1}\exp(x_{it}\beta_h+\alpha_{hi}+\gamma_{jh})_1}}$$

Where subscript 1 refers to group 1 for all parameters,

[9] The Nordic group includes Denmark, Finland, Iceland, Norway, and Sweden. The Continental group includes Austria, Belgium, France, Ireland, Luxembourg, and the Netherlands. The Southern group includes Cyprus, Greece, Italy, Malta, Portugal and Spain. The Eastern group includes Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Rumania, Slovakia and Slovenia.

[10] All estimation techniques and details can be found in Aeberhardt and Davezies, 2012.

[11] In our analyses groups are either countries or social groups (women, men, youth, middle-aged people, seniors, low-educated, middle-educated and high-educated people).

$$\Leftrightarrow \frac{P_1(y_{it}=m/x_{it},\alpha_i,y_{it-1}=j)}{P_1(y_{it}=0/x_{it},\alpha_i,y_{it-1}=j)}=\frac{\exp(x_{it}\beta_m+\alpha_{mi}+\gamma_{jm})_1}{\exp(x_{it}\beta_0+\alpha_{0i}+\gamma_{j0})_1}=\exp(x_{it}\beta_m+\alpha_{mi}+\gamma_{jm})_1$$

when we suppose that $\alpha_{0i}=0$ for any group.

For group 2, we have the same results for the same probability:

$$\frac{P_2(y_{it}=m/x_{it},\alpha_i,y_{it-1}=j)}{P_2(y_{it}=0/x_{it},\alpha_i,y_{it-1}=j)}=\exp(x_{it}\beta_m+\alpha_{mi}+\gamma_{jm})_2$$

If we calculate the odds ratio (OR) between P_1 and P_2, we have:

$$\mathrm{OR}=\frac{P_1(y_{it}=m/x_{it},\alpha_i,y_{it-1}=j)}{P_1(y_{it}=0/x_{it},\alpha_i,y_{it-1}=j)}\Big/\frac{P_2(y_{it}=m/x_{it},\alpha_i,y_{it-1}=j)}{P_2(y_{it}=0/x_{it},\alpha_i,y_{it-1}=j)} \qquad (2)$$

$$=\frac{\exp(x_{it}\beta_m+\alpha_{mi}+\gamma_{jm})_1}{\exp(x_{it}\beta_m+\alpha_{mi}+\gamma_{jm})_2}$$

As we do not know the fixed effects α_{mi}, it is a priori difficult to estimate (2). Fortunately, as

$$\mathrm{OR}_1=\frac{P_1(y_{it}=m/x_{it},\alpha_i,y_{it-1}=j)}{P_1(y_{it}=0/x_{it},\alpha_i,y_{it-1}=j)}\Big/\frac{P_1(y_{it}=m/x_{it},\alpha_i,y_{it-1}=0)}{P_1(y_{it}=0/x_{it},\alpha_i,y_{it-1}=0)}=\exp(\gamma_{jm})_1$$

And

$$\mathrm{OR}_2=\frac{P_2(y_{it}=m/x_{it},\alpha_i,y_{it-1}=j)}{P_2(y_{it}=0/x_{it},\alpha_i,y_{it-1}=j)}\Big/\frac{P_2(y_{it}=m/x_{it},\alpha_i,y_{it-1}=0)}{P_2(y_{it}=0/x_{it},\alpha_i,y_{it-1}=0)}=\exp(\gamma_{jm})_2$$

We have

$$\mathrm{OR}=\frac{OR_1}{OR_2}=\frac{P_1(y_{it}=m/x_{it},\alpha_i,y_{it-1}=j)}{P_1(y_{it}=0/x_{it},\alpha_i,y_{it-1}=j)}\Big/\frac{P_2(y_{it}=m/x_{it},\alpha_i,y_{it-1}=j)}{P_2(y_{it}=0/x_{it},\alpha_i,y_{it-1}=j)}=\exp\left((\gamma_{jm})_1-(\gamma_{jm})_2\right)$$

So that we can estimate the Odds ratios between group 1 and group 2 directly with the feedback parameters γ_{jm}.

In practice for our comparisons by gender, age and education we take men, middle aged and medium levels of education as a reference (i.e. group 2). For cross-country comparisons, the UK, which can be considered as the most unregulated labour market in Europe, builds the reference. This allows comparing other country groups to a case in which labour market transitions are less constrained by labour market and social policies.

3.3 Confidence Intervals

In order to calculate confidence intervals for odds ratios, we take directly the numbers of individuals who transit from state j to state m and from state j to state 0 without controls. Indeed, we know that

$$OR = \frac{P_1\left(y_{it} = m / y_{it-1} = j\right)}{P_1\left(y_{it} = 0 / y_{it-1} = j\right)} \Bigg/ \frac{P_2\left(y_{it} = m / y_{it-1} = j\right)}{P_2\left(y_{it} = 0 / y_{it-1} = j\right)} = \frac{n_{jm}^1}{n_{j0}^1} \Bigg/ \frac{n_{jm}^2}{n_{j0}^2}$$

Where n_{jm}^i is the number of individuals for group *i* who transit from state *j* to state *m*. A confidence interval for this ratio is:

$$CI = \log(OR) \pm t * \sqrt{\frac{1}{n_{jm}^1} + \frac{1}{n_{j0}^1} + \frac{1}{n_{jm}^2} + \frac{1}{n_{j0}^2}}$$

In our case, we calculate as lower limit (LL):

$$LL = \log\left(\exp\left((\gamma_{jm})_1 - (\gamma_{jm})_2\right)\right) - t * \sqrt{\frac{1}{n_{jm}^1} + \frac{1}{n_{j0}^1} + \frac{1}{n_{jm}^2} + \frac{1}{n_{j0}^2}}$$

And as upper limit (UL):

$$UL = \log\left(\exp\left((\gamma_{jm})_1 - (\gamma_{jm})_2\right)\right) + t * \sqrt{\frac{1}{n_{jm}^1} + \frac{1}{n_{j0}^1} + \frac{1}{n_{jm}^2} + \frac{1}{n_{j0}^2}}$$

If 1 is comprised in the interval [LL,UL] at confidence level 1-α, we do not reject the null hypothesis.

4. Results

State dependence in European labour markets is analysed by looking at differences between both social groups and countries. In a first step, we look at average differences in Europe according to gender, age and education level. In a second step, we analyse and discuss differences in terms of state dependence between different groups of countries (Nordic countries, continental countries, Southern countries, Eastern countries and the UK). Finally, in a last step, we look at differences between social groups in each group of countries in order to compare the relative role of socio-economic characteristics in these five groups. We try to relate the results and the observed heterogeneity of state dependence in unemployment, inactivity and part-time to some institutions and policies that may explain it. We go further than existing paper on labour market transitions in Europe, since we estimate "true" state dependence and not only transition probabilities. Nevertheless, given the nature of our model, we cannot derive any causality link between institutions and labour market mobility outcomes.

Using EU-SILC longitudinal database, two sets of labour market statuses and transitions are studied: on one hand, transitions between employment, unemployment and inactivity and on the other hand, transitions between full-time employment, part-time employment unemployment and inactivity. In the first sub section below (at the European level) we analyse both sets successively and in the following subsections we focus only on the second set of estimations (with four labour market statuses).

4.1. The role of individual characteristics to explain transitions on the labour market: results for the EU as a whole

In our first set of conditional dynamic multinomial logits, the reference status that is used as both transitions' starting point and destination is employment. Table 3 thus illustrates transition patterns between unemployment and inactivity over a three months period, in comparison to employment. We run a regression for each social group (15-30, 31-49, 50-62, men, women, low-educated, middle-educated and high-educated people) and compare the results according to gender (women compared to men), to age (youth and senior people compared to the intermediate 31-49 age group) and to education (low and high educated people compared to people with medium levels of education). We use data from all countries so that these results are global average results for the EU.

[Insert table 3 here]

After controlling for individual (including unobserved) heterogeneity, women experience a higher state dependence than men in inactivity, but their probability of staying unemployed is relatively lower than for men. This result contrasts with more descriptive results that do not correct for unobserved heterogeneity according to which the share of unemployed women staying in unemployment is slightly higher than for men (Erhel and Guergoat-Larivière, 2013). Gender differences in unemployment persistence therefore seem influenced by

individual preferences and unobserved heterogeneity, whereas "true state dependence" in unemployment is relatively lower for women than for men, although the difference is very small. As far as inactivity is concerned, persistence appears higher for women, even after correction for unobserved heterogeneity, which might be related to the different functions of inactivity by gender and the general determinants of female labour force participation: many factors might contribute to these gender differences, including social norms (Uunk *et al*, 2005), childcare policies or fiscal policies (Thévenon, 2013). In some countries, leaving inactivity towards employment might be costly for mothers of young children as it induces some extra-expenditures for childcare, loss of some allowances that are specific to women (parental leave allowances for instance), which might not be compensated by labour income. In the same perspective, the results show that when women are inactive their relative probability to move towards unemployment is lower than men's. According to our estimations, differences by age groups are very large for persistent inactivity and transitions between unemployment and inactivity. Inactive youth are less likely than their elders aged 31-49 to stay inactive (rather than shifting to employment) but they are also more likely to leave inactivity towards unemployment. When they are unemployed, they are less likely to withdraw from the labour market and become inactive. Results are the opposite for senior workers, whose probabilities of staying inactive or shifting from unemployment towards inactivity are higher than for "prime-age workers" (31-49). Finally, we find a slightly higher probability of staying unemployed after three months rather than shifting to employment for both youth and seniors, in comparison to the intermediate age group. For youth that result also differs from approaches that do not correct for unobserved heterogeneity according to which the probability of remaining unemployed linearly increases with age (Erhel and Guergoat-Larivière, 2013). It might be explained by employers' behaviour that regards unemployment as a bad signal, or to the time needed to get information about available jobs when entering the labour market. On the whole seniors are more concerned by structural state dependence in unemployment and inactivity, which might be related to pensions but also to age conditions in unemployment insurance (longer coverage for seniors exists in many countries).

The decomposition by education levels reveals interesting features for the persistence in unemployment. Indeed, on average in Europe, estimated structural state dependence in unemployment appears slightly lower for highly educated (ISCED 5-6), but also for the lower educated (ISCED 0-2), in comparison to medium education levels (ISCED 3-4) while more descriptive analyses generally point out that the probability of staying in unemployment decreases with education level. Again, this means that unobserved heterogeneity is at stake when looking at unemployment short run persistence by education levels in a descriptive way. Our results suggest that the gap in transition rates between the lower educated and the medium skilled would not result from different consequences of unemployment status itself for these two categories, but rather from unobserved characteristics. Focusing on "true" state dependence suggests, on the contrary, that experiencing unemployment would be on average in Europe less costly for both lower and higher skilled compared to medium skilled. This is confirmed when looking at transitions from unemployment to inactivity after correcting for unobserved heterogeneity: lower educated are less likely to experience this transition (rather

than shifting to employment) than the medium skilled. However, we will see in the last section that this average result may hide some heterogeneity between groups of countries[12].

State dependence in inactivity is almost identical between the lower educated and the medium levels of education and slightly lower for higher educated than for medium educated meaning that higher educated are on average in Europe slightly more likely to move towards employment. Finally, the probability of making a transition from inactivity to unemployment is lower for low skilled than for medium skilled whereas higher skilled have a higher chance of getting unemployed when they are initially inactive.

[Insert table 4 here]

Table 4 presents the results of our second set of conditional dynamic multinomial logits. In this case, the reference status that is used as both transitions' starting point and destination is full-time employment. The results thus display the relative probabilities of staying part-time employed or unemployed or inactive or moving between these three states (in each case rather than shifting to full-time employment) in the EU over a three months period, according to some individual characteristics.

Most results commented above (based on the first set of labor market statuses) are confirmed when employment is decomposed between full-time and part-time. In particular unemployment persistence appears higher for seniors in comparison to intermediate age group, and lower for low skilled and high skilled group in comparison to medium skilled. The results for youth and for women in terms of unemployment persistence are not significant. State dependence in inactivity is higher for women and for seniors (in comparison to men and to the intermediate age group respectively), whereas it is lower in relative for youth, low qualified and high qualified (relatively to prime-age workers and people with medium level of qualification) meaning that experiencing inactivity would be relatively less costly in terms of switching to full-time employment for youth, low and high skilled people.

That second decomposition of labor market statuses allows for analysis of the role of part-time across the different social groups. The probability of staying in part-time after three months is higher for women than for men, but the probability of leaving part-time towards inactivity is lower for women than for men. Part-time is therefore more persistent for women, but seems to protect them from leaving the labor market and becoming inactive. This gender difference may be explained by different factors: moving from part-time to full-time employment might be costly for women, depending on childcare policies or fiscal policies. According to European Commission, the tax burden for moving to part-time towards a full-time job is close to 50% in a number of European countries (Belgium, Italy, Germany, Slovenia, Denmark…[13]). In some countries (Netherlands, UK), childcare is mainly available on a part-time basis, for less than 30 hours a week[14] . Besides, if part-time is a "choice", then

[12] This can be related to the fact that some social groups are overrepresented in some countries (table A1 in appendix displays the number of observations for each social group in each country group).
[13] European Commission, 2013, table 4
[14] European Commission, 2013, figure 3

women in part-time may invest less in their human capital and lower their chances to get a full-time job (that are on average higher qualified jobs).

In terms of age groups, youth experience less persistence in part-time than the intermediate age group whereas the probability of staying in part-time employment is slightly higher for seniors. The probability of transition from part-time job towards unemployment is lower for youth than for medium aged group, whereas probabilities of transition from part-time towards inactivity are higher for both youth and seniors (relatively to medium age group).

All in all, youth experience lower persistence in part-time employment, in relation to a higher probability of shifting either to full-time employment or inactivity. It thus seems that mobility between part-time and full-time employment on one hand and part-time and inactivity on the other hand are more representative of youth' trajectories compared to the intermediate age group. Part-time employment might be a way for youth to accumulate working experience and increase their human capital before finding a full-time job (or going back to studies).

Seniors have higher probabilities to move from unemployment and inactivity towards part-time than the intermediate age group. After controlling for unobserved heterogeneity, it seems that at the end of the working life part-time does not protect from inactivity, but could be favorable to exiting non-employment. We can also notice that seniors, when they are initially employed part-time or unemployed or inactive are more likely than prime-age workers to experience any kind of transition within or between these three states rather than shifting to full-time employment.

Differences by education levels are also important. State dependence in part-time is higher for highly educated than for medium levels, and lower for the lower educated. In comparison with medium levels of education, probabilities to make a transition from unemployment or inactivity to part-time are lower for the low educated and higher for the highly educated group. For part-timers the probability to flow into non employment (unemployment or inactivity) is lower for both low and high levels of education in comparison to the medium ones.

It thus seems that, after correcting for other individual characteristics, including unobserved heterogeneity, people in Europe with low education levels when they are initially employed part-time or unemployed or inactive are on average more likely than people with intermediate education levels to shift to full-time employment rather than experiencing any kind of transition within or between these three states. Specificities in unemployment or inactivity persistence for this particular group would therefore not be related to higher structural state dependence in these statuses, but rather to unobserved heterogeneity. However, we will show that this average result hide some discrepancies across country groups.

On the other hand, we can notice that highly educated people when they are initially in part-time employment are more likely to stay in part-time and less likely to shift to non-employment (rather than to full-time employment) compared to people with medium level of education. This may be related to the fact that part-time work is more often a choice for highly educated people compared to people with medium level of education. Part-time for

higher educated remains quite rare and corresponds more often "good quality" part-time in the public sector (education, health and social services…) or in big companies where flexible working time arrangements are available (Sandor, 2011). However, when they are initially unemployed or inactive, they are less likely to move to part-time rather than to full-time employment.

4.2. Transition patterns across five groups of countries

To analyze the heterogeneity of transitions across countries in Europe, we consider five countries or groups of countries: the UK, a Nordic group, a Continental group, a Southern European and an Eastern European group. These groups are consistent with existing literature on labour market comparisons and diversity in capitalism, which emphasizes the existence of diverse institutional settings that may influence economic outcomes[15]. For the interpretation of cross-country estimations of our two models (including three and four labour market statuses) we take the UK as a reference. As explained in the methodological part, it can indeed be considered as the less regulated labour market in Europe.

The results of our dynamic multinomial regressions indicate that Nordic countries are characterized by a lower state dependence in unemployment, in comparison to the UK. On the contrary, continental and eastern countries exhibit higher unemployment persistence. The coefficient for southern countries does not significantly differ from the UK[16]. These results are consistent with recent literature on labour market flows in Europe: in the years before the crisis, labour market mobility has generally increased in Europe, and countries characterized by higher outflows from unemployment include not only the UK and Nordic countries, but also Spain and Portugal. On the contrary, persistent unemployment remains important in continental and eastern Europe (Ward-Warmedinger, Macchiarelli, 2013). These results remain true after correcting unobserved heterogeneity, although differences in coefficients are not very high: in eastern and continental countries, probabilities to remain unemployed after three months are only 1.7 times and 1.5 higher than in the UK (respectively). That result can be related to the difficulties to establish empirically some links between institutions (such as unemployment benefits, employment protection legislation, job creation programmes…) and unemployment persistence or unemployment inflows/outflows. For instance, Boeri and Garibaldi (2009) find a significant effect of institutional variables on the global level of labour market mobility in the EU, but not on flows in and out of unemployment[17].

As far as inactivity is concerned, state dependence appears higher than in the UK for all groups except the Nordic group. Differences across countries in state dependence levels are more important for inactivity than for unemployment: probabilities of remaining inactive after

[15] Estimations were also run by country but for the smallest countries the number of observations does not allow us to obtain reliable results.
[16] The coefficient is significant in the three labour market statuses model at the 5% level, indicating a slightly lower state dependence in southern countries, but the difference with the UK is very small.
[17] With the exception of EPL for regular employment that significantly reduces outflows from unemployment to employment (Boeri and Garibaldi, p 435).

three months is more than four times higher in Eastern countries than in the UK, and three times higher in the continental group. Such a difference in the magnitude of cross- country heterogeneity may indicate that institutions play a more important role in explaining persistent inactivity: inactivity includes a variety of situations ranging from retirement, or studies, or withdrawal of the labour market after child birth or after a period of compensated unemployment to invalidity. All these situations are strongly influenced by national regulations and policies (pension system, invalidity benefits rules, parental leave regulations, unemployment benefits duration… see Biegert, 2011). The situation of continental and eastern countries would thus be explained by stronger support for inactive individuals, fewer incentives to go back to the labour market and a somehow stronger substitution between unemployment and inactivity (see Amable *et al*, 2007) (especially in Southern countries where unemployment benefits are limited both in terms of amount and duration).

Turning to part-time, state dependence is higher in all country groups than in the UK, and appears particularly strong in continental countries: the probability to stay in part-time over a three months period is five times higher than in the UK. That result cannot be explained by the part-time rate, which is quite similar in the UK, in the nordic and continental group[18]. The high persistence of part-time in continental countries has to be explained by specific institutional features and labour market characteristics: in countries like France, Belgium, the Netherlands… part-time is quite important in the public sector (administration, but also education, health and social services) and offers quite good conditions for workers (flexibility in working hours, wages, right to return to full-time work), whereas protection is lower for part-timers in the UK (Rubery, 2012). But high persistence might also indicate difficulties to move from part-time to full-time in these countries: an indicator of these difficulties is the involuntary part-time rate, which is higher in all country groups than in the UK[19]. More generally it could indicate that the British labour market penalizes less workers on atypical employment in their labour market mobility: Booth et al (2002) also found show that state dependence in temporary employment is relatively low in the UK.

Considering other cases than persistence also reveals differences across countries. Being initially unemployed, the probability of outflow from unemployment to inactivity is higher in continental and eastern countries than in the UK, whereas the difference is not significant for nordic and southern countries. The same pattern is found for the probability of making the reverse transition (from inactivity to unemployment). Mobility within non employment appears therefore higher in continental and eastern countries, which could relate to some specific institutions (rules of unemployment insurance, parental leave arrangements…).

Part-timers have a higher probability to make a transition to unemployment or inactivity in all country groups, in comparison to the UK. For individuals initially unemployed, probabilities to be in part time employment three months later (rather than in full time employment) are

[18] 24% on average in the continental group, 22% in the nordic group, 24% in the UK in 2008 (LFS, Eurostat data)

[19] According to the LFS (2009), involuntary part-time is particularly high in southern and eastern countries (over 30% of part-time employment), as well as in some continental countries (France, Ireland), whereas it appears more limited in the UK (14%).

lower in the Nordic group than in the UK, and not significantly different for Southern countries. In these groups of countries, part time employment (rather than full time employment) would thus be less favorable to exiting unemployment. On the contrary, probabilities of outflows from unemployment to part time are higher in the continental and eastern group than in the UK. Transitions from inactivity to part time employment are more likely in southern, continental and eastern countries than in the UK, and the difference between UK and the Nordic group is not significant. On the whole, these results indicate that part time employment contributes more to the mobility between non -employment and employment in the continental, southern and eastern group, than in the UK and in the nordic countries. In these last countries, flexibility of working time arrangements within employment seems therefore higher, which is also consistent with a lower state dependence in part-time (see above): such flexibility comes from the labour market and the diversity of contractual arrangements in the UK, whereas in the Nordic countries (especially Sweden) it is a negotiated and protected flexibility (Anxo *et al*, 2007).

[Insert table 5 here]

[Insert table 6 here]

4.3. The role of socio-economic factors across country groups

In the following subsection, the conditional dynamic multinomial logistic models (including three and four labour market states) are run by country groups and for the same socio-economic characteristics as above: by gender, by age and by education level. The results for the variable including four labour market states are included in the text, and the ones for unemployment/inactivity/employment are presented in appendix. The coefficients in the tables correspond to the difference in transition probabilities between social groups for the different countries: we first compare women to men, then youth and seniors to the intermediate age group, and finally low and high educated to medium levels of education. These results allow us to compare the role of individual characteristics across country groups, having corrected for unobserved heterogeneity.

For women, state dependence in unemployment and in inactivity appears higher than for men in the UK, in eastern and nordic countries. But it is lower than for men in southern and continental groups, even if the difference is very low in the case of continental countries. For the UK, eastern and nordic countries, the results are in line with more descriptive analyses that do not correct for unobserved heterogeneity, and usually observe a disadvantage for women in exiting from unemployment or inactivity to employment (and especially full time employment). But for southern and continental countries, women's disadvantage disappears when unobserved heterogeneity is taken into account. This should mean that, other observable and unobservable characteristics being equal, women are less penalized in getting a job when unemployed or even inactive in both groups of countries. This might be explained by different

perceptions of female non-employment by employers in countries with more traditional gender values[20].

State dependence in part time is higher for women than for men in nordic, southern and eastern countries, but the gender gap is reversed in continental countries and in the UK: for this last country, the difference is important, with women having half less chances than men to stay in part time employment over a three months period. This result suggests that there would be no specific disadvantage for women to being in part time in the UK and in continental countries, once other individual characteristics are taken into account.

[Insert table 7 here]

Concerning unemployment persistence, differences by age groups are relatively similar in most countries: in comparison to the intermediate age group, youth generally show lower probabilities to remain unemployed, whereas state dependence is higher for seniors. Differences are generally less important for seniors: some differences between seniors and the intermediate age group are not significant, or seem sensitive to the specification of the labour market status variable (for instance in the case of seniors in southern and eastern countries). Southern countries appear like an exception to this age pattern in unemployment persistence, since the results show a higher state dependence in unemployment for younger people. These results confirm the deteriorated situation of young people on the labour market in southern countries that are characterized by high unemployment and high share of atypical jobs for this age group (Scarpetta *et al.*, 2010).

When they are initially inactive, seniors display higher probabilities to remain outside the labour market in all countries, whereas the situation is more heterogeneous for youth: in the UK and in southern or continental countries, youth are more likely to be still in inactivity after three months, contrary to nordic and eastern countries. National policies and institutions generally support seniors when they are inactive (through specific pensions arrangements or invalidity schemes), but incentives for youth are more complex. On the one hand a policy goal is to increase the education level and to encourage studies, on the other hand youth do generally not receive any benefit if they are inactive, not in studies, and not looking for a job. This difference in policies by age group are also visible in the relative probabilities of making transitions between unemployment and inactivity: once unemployed, probabilities of outflows from unemployment to inactivity are higher for seniors, and lower for youth, in comparison to the intermediate age group. The reverse pattern is found for transitions from inactivity to unemployment (higher probability for youth, lower for seniors, except in the UK).

Concerning state dependence in part time, the results by age are heterogeneous across country groups. In comparison to the intermediate age group, part time is more likely to be persistent over a three months horizon for both youth and seniors in eastern and continental countries. In nordic countries and in the UK, state dependence in part time appears higher for seniors, but

[20] Some existing literature has shown some links between gender values and labour market outcomes by gender (Fortin, 2005). Southern and continental countries are characterized by rather traditional gender values, in comparison to Nordic and liberal protestant countries. Eastern European countries combine the former communist ideology of gender equality and more traditional values.

lower for younger people. In southern countries, state dependence is higher for youth, and lower for seniors. Outflows from part time to unemployment or inactivity are generally more important for seniors, and less for youth.

[Insert table 8 here]

Turning to educations levels, the results show some cross country heterogeneity in the functioning of the labour market. In particular, average results presented in section 4.1 concerning the effect of education levels on labor market transitions and state dependence must be nuanced regarding the results found by country groups. In eastern and southern countries state dependence in unemployment (and inactivity in the case of the southern group) is indeed weaker for lower educated than for the medium levels of education. This result suggests that unobserved heterogeneity plays a bigger role in explaining labor market trajectories of low educated people compared to medium levels of education in these countries: once unobserved heterogeneity is taken into account, education level would not be a good predictor of state dependence in unemployment (and inactivity in the case of southern countries). On the contrary, in the UK, in continental and nordic countries, the lower educated have a higher probability to remain unemployed or inactive, in comparison to the medium education levels. Difference between lower educated and medium levels is particularly strong in the UK for unemployment persistence.

The results comparing the situation of higher educated to medium levels of education contrast with descriptive statistics and also reveals some heterogeneity across country groups: their probability of remaining unemployed after three months (if initially unemployed) is higher than for medium education levels in the UK, nordic, continental and eastern countries, whereas it appears lower in southern countries. When they are initially inactive, their probability of staying in inactivity is higher than for medium levels of education in all country groups except eastern countries. This might be related to the time horizon: in most country groups, matching and recruitment processes might be longer for highly qualified. But it could also indicate that inactivity or unemployment (at least in some country groups) are perceived as negative signals by the employers in the case of the higher educated, inducing higher persistence.

Concerning part time employment, the results are heterogeneous across countries. In nordic and eastern countries the lower educated are less likely than the medium levels of education to stay in part time employment, whereas such state dependence is stronger for low educated in continental countries and in the UK. The higher educated are more likely to stay in part-time after three months, except in UK and in continental countries.

[Insert table 9 here]

To conclude, estimations that disentangle state dependence and unobserved heterogeneity bring some interesting results on differences in terms of mobility on the labour market

between social groups and between European countries. Our analysis sometimes challenges results derived from more descriptive approaches. The role of *true* state dependence namely the effect of being in a given status on the labour market on the probability of staying in this status or moving to another status varies a lot across social groups and countries. Women experience on average in Europe lower state dependence in unemployment than men but have a higher state dependence in inactivity and part-time employment. Results by age groups are rather in line with structural patterns at the beginning and at the end of working life (outflows from inactivity for youth and higher state dependence in unemployment and inactivity for seniors). Differences in terms of education levels are strongly contrasted across country groups (with a specific position of Southern countries). Two surprising results emerge: on one hand, in some countries lower educated people experience less state dependence in unemployment meaning that experiencing unemployment would be less costly for them compared to medium skilled; on the other hand, in most country groups, higher educated people experience higher state dependence in unemployment that may be related to relatively longer recruitment processes for highly qualified workers. More generally, our results confirm that true state dependence can be related for the different social groups and country groups studied to structural explanations in terms of institutional arrangements (education and retirement policies, leave policies, childcare policies, labour market policies…) and/or to employers' behaviour.

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Tables

Table 1- Transition matrices between employment, unemployment and inactivity for different social groups

15-30

Status in t-1 \ Status in t	E	U	I
E	95.24	2.13	2.63
U	17.52	77.95	4.53
I	4.64	1.58	93.78

ISCED 0-2

Status in t-1 \ Status in t	E	U	I
E	95.94	2.04	2.02
U	12.70	82.81	4.49
I	2.36	1.02	96.62

Men

Status in t-1 \ Status in t	E	U	I
E	97.79	1.20	1.00
U	16.53	79.92	3.56
I	3.79	1.31	94.90

31-49

Status in t-1 \ Status in t	E	U	I
E	98.17	1.11	0.72
U	16.60	79.85	3.55
I	5.15	1.67	93.18

ISCED 3-4

Status in t-1 \ Status in t	E	U	I
E	97.53	1.16	1.31
U	16.34	79.07	4.59
I	3.78	1.19	95.03

Women

Status in t-1 \ Status in t	E	U	I
E	96.85	1.31	1.84
U	13.97	80.64	5.39
I	3.14	1.04	95.82

50-62

Status in t-1 \ Status in t	E	U	I
E	97.20	0.96	1.84
U	10.00	83.88	6.12
I	1.33	0.47	98.20

ISCED 5-6

Status in t-1 \ Status in t	E	U	I
E	98.31	0.72	0.97
U	20.44	75.24	4.32
I	6.78	1.53	91.69

Note: E, U and I respectively stand for employment, unemployment and inactivity.
Reading note: 80.64% of women who were in unemployment at time t-1 were still unemployed at time t.
Source: EU-SILC, 2006-2009, authors' calculations.

Table 2- Transition matrices between full-time employment, part-time employment, unemployment and inactivity for different social groups

15-30

Status in t-1 \ Status in t	FT	PT	U	I
FT	95.12	0.76	2.01	2.11
PT	7.92	82.29	3.05	6.74
U	14.62	2.90	77.95	4.53
I	3.50	1.14	1.58	93.78

ISCED 0-2

Status in t-1 \ Status in t	FT	PT	U	I
FT	95.60	0.78	1.94	1.67
PT	4.73	88.70	2.58	3.98
U	9.97	2.73	82.81	4.49
I	1.63	0.73	1.02	96.62

Men

Status in t-1 \ Status in t	FT	PT	U	I
FT	97.66	0.38	1.12	0.84
PT	8.18	84.59	2.96	4.27
U	14.29	2.24	79.92	3.56
I	2.99	0.80	1.31	94.90

31-49

Status in t-1 \ Status in t	FT	PT	U	I
FT	97.82	0.55	1.03	0.60
PT	4.86	91.68	1.73	1.72
U	13.14	3.46	79.85	3.55
I	3.38	1.76	1.67	93.18

ISCED 3-4

Status in t-1 \ Status in t	FT	PT	U	I
FT	97.27	0.53	1.10	1.09
PT	5.19	89.99	1.69	3.13
U	13.43	2.92	79.07	4.59
I	2.69	1.09	1.19	95.03

Women

Status in t-1 \ Status in t	FT	PT	U	I
FT	96.24	0.93	1.25	1.58
PT	4.23	91.35	1.54	2.88
U	10.35	3.62	80.64	5.39
I	2.03	1.11	1.04	95.82

50-62

Status in t-1 \ Status in t	FT	PT	U	I
FT	96.90	0.62	0.90	1.58
PT	3.87	91.15	1.37	3.62
U	7.75	2.25	83.88	6.12
I	0.81	0.52	0.47	98.20

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Status in t-1 \ Status in t	FT	PT	U	I
FT	97.92	0.61	0.66	0.81
PT	5.34	91.11	1.22	2.33
U	16.24	4.20	75.24	4.32
I	4.74	2.04	1.53	91.69

Note: FT, PT, U and I respectively stand for full-time employment, part-time employment, unemployment and inactivity. Reading note: 97.66% of men who were in full-time employment at time t-1 were still in full-time employment at time t.
Source: EU-SILC, 2006-2009, authors' calculations.

Table 3-Relative transition probabilities between unemployment and inactivity

	Women compared to men	Youth compared to midlife	Seniors compared to midlife	Lower educated compared to medium levels of education	Higher educated compared to medium levels of education
U to U	0,9875**	1,0609***	1,0705***	0,8347***	0,9176***
U to I	0,9905	0,6627***	1,1721***	0,8374***	0,9547
I to U	0,9002***	1,3516***	0,9251***	0,6538***	1,0897**
I to I	1,1022***	0,7057***	1,2618***	1,0075*	0,9806**

Note: Results are based on equation (2), in which men, medium aged and medium skilled are taken as group 1 and other groups as group 2. Figures in the table represent the relative probability of staying in the initial status or making a transition, rather than making a transition towards employment (reference). U unemployment; I inactivity. ***: p<0.01; **: p<0.05; *: p<0.1

Table 4-Relative transition probabilities between unemployment, inactivity, and part-time

	Women compared to men	Youth compared to midlife	Seniors compared to midlife	Lower educated compared to medium levels of education	Higher educated compared to medium levels of education
PT to PT	1,1836***	0,6821***	1,069***	0,8963***	1,0807***
PT to U	0,9879	0,6875***	1,0523	0,9103*	0,8756**
PT to I	0,9148***	1,0948***	1,4614***	0,9093***	0,9313*
U to PT	0,9903	0,8459***	1,0986***	0,8337***	1,2254***
U to U	0,9947	1,0063	1,0457***	0,7913***	0,9633***
U to I	0,9834	0,7201***	1,2448***	0,7738***	0,9799
I to PT	0,9594	1,0956***	1,4496***	0,9126***	1,1185***
I to U	0,907***	1,3989***	1,0237	0,6421***	1,0741**
I to I	1,1229***	0,8842***	1,5543***	0,9809***	0,9791***

Note: Results are based on equation (2), in which men, medium aged and medium skilled are taken as group 1 and other groups as group 2. Figures in the table represent the relative probability of staying in the initial status or making a transition, rather than making a transition towards full-time employment (reference). PT part-time employment; U unemployment; I inactivity.

Table 6 Differences in transition probabilities by country groups (ref: UK; PT-FT-U-I)

	Nordic	South	Conti	Eastern
PT to PT	1,163***	2,574***	5,22***	2,035***
PT to U	2,042***	2,886***	3,239***	3,811***
PT to I	1,438***	1,716***	2,899***	2,226***
U to PT	0,633***	0,919	1,586***	1,322***
U to U	0,845***	0,991	1,545***	2,050***
U to I	0,917	1,139	2,283***	2,470***
I to PT	0,977	1,446***	2,296***	1,991***
I to U	0,840**	0,885	1,481***	2,033***
I to I	0,873***	1,968***	3,371***	4,734***

Note: UK is taken as a reference. Results are based on equation (2), in which UK is taken as group 1 and other groups of countries – one after the other – as group 2. Figures in the table represent the relative probability of staying in the same status or making a transition, rather than making a transition towards full-employment (reference). PT part-time employment; U unemployment; I inactivity.

Table 7-Differences in transition probabilities by gender in five country groups (FT-PT-U-I)

	Nordic	South	Conti	Eastern	UK
PT to PT	1,503***	1,387***	0,911***	1,046***	0,475***
PT to U	1,742***	1,111*	1,085	0,691***	1,395*
PT to I	1,132**	0,611***	1,213***	0,975	0,908
U to PT	1,538***	1,026	1,111*	0,931	0,587**
U to U	1,516***	0,815***	1,021*	1,319***	1,296***
U to I	1,482***	0,658***	1,008	1,255***	1,612***
I to PT	1,09*	1,011	1,201***	1,07*	0,678***
I to U	1,043	0,889***	1,123**	0,982	0,92
I to I	1,277***	0,909***	0,985***	1,457***	1,317***

Note: Results are based on equation (2), in which men are taken as group 1 and women as group 2. For each group of countries, figures in the table represent the relative probability of staying in the initial status or making a transition, rather than making a transition towards full-time employment (reference). PT part-time employment; U unemployment; I inactivity.

Table 8-Differences in transition probabilities by age in five country groups (FT-PT-U-I)

	Nordic		South		Conti	
	youth/mid	senior/mid	youth/mid	senior/mid	youth/mid	senior/mid
PT to PT	0,385***	1,806***	1,371***	0,706***	1,066***	1,43***
PT to U	0,561***	1,845***	0,792***	0,604***	0,885	1,24***
PT to I	0,882*	1,545***	2,326***	1,877***	0,881*	2,011***
U to PT	0,697***	1,083	1,055	0,811**	1,156**	1,982***
U to U	0,95	1,063*	1,261***	0,905***	0,931***	1,412***
U to I	0,556***	1,273**	1,045	1,155***	0,754***	2,191***
I to PT	1,262***	1,082	1,594***	1,334***	0,978	3,346***
I to U	0,973	1,166	2,119***	0,698***	1,251***	1,825***
I to I	0,803***	1,286***	1,525***	1,426***	1,639***	3,391***

	Eastern		UK	
	youth/mid	senior/mid	youth/mid	senior/mid
PT to PT	1,255***	1,086***	0,515***	1,893***
PT to U	0,986***	1,171**	0,370***	3,153***
PT to I	1,367***	1,234***	0,664***	0,772**
U to PT	1,144**	1,176**	0,299***	0,767
U to U	0,833***	0,988	0,506***	2,048***
U to I	0,689***	0,995	0,686*	0,851
I to PT	1,093*	1,167***	0,809**	1,317***
I to U	1,377***	0,855**	1,971***	1,885***
I to I	0,819***	1,164***	1,223***	0,871***

Note: Results are based on equation (2), in which medium aged are taken as group 1 and youth or seniors as group 2. For each group of countries, figures in the table represent the relative probability of staying in the initial status or making a transition, rather than making a transition towards full-time employment (reference). PT part-time employment; U unemployment; I inactivity.

Table 9-Differences in transition probabilities by education level in five country groups (FT-PT-U-I)

	Nordic		South		Conti	
	Low/medium	High/medium	Low/medium	High/medium	Low/medium	High/medium
PT_PT	0,594***	1,224***	1,093***	1,211***	1,390***	0,788***
PT_U	1,677***	1,223	0,882*	0,916	1,392***	0,935
PT_I	1,369***	0,922	0,607***	1,113	0,755***	1,130**
U_PT	0,577***	0,787*	1,392***	1,729***	1,119*	1,095
U_U	1,500***	1,162***	0,860**	1,018	1,206***	1,197***
U_I	0,729***	0,751**	0,835***	1,671***	1,183***	1,086
I_PT	0,836***	0,964	1,19***	2,194***	1,054	1,102*
I_U	1,462***	1,456***	0,621***	1,326***	1,015	1,201***
I_I	1,509***	1,227***	0,781***	1,472***	1,089***	1,361***

	Eastern		UK	
	Low/medium	High/medium	Low/medium	High/medium
PT_PT	0,637***	1,989***	1,854***	0,786***
PT_U	0,639***	0,562***	1,212	1,411
PT_I	0,908*	0,877*	2,150***	1,078
U_PT	0,687***	2,751***	3,520***	1,203
U_U	0,735***	1,360***	8,138***	3,785***
U_I	0,712***	0,979	4,392***	1,706***
I_PT	0,884**	1,779***	1,13	0,908
I_U	0,602***	1,246***	0,343***	2,000***
I_I	1,066***	0,909***	2,152***	1,128***

Note: Results are based on equation (2), in which medium skilled are taken as group 1 and high or low skilled as group 2. For each group of countries, figures in the table represent the relative probability of staying in the initial status or making a transition, rather than making a transition towards full-time employment (reference). PT part-time employment; U unemployment; I inactivity.

Appendix

Table A1-Number of observations by gender, age, education level and country group

	Continental	Eastern	Nordic	Southern	UK	TOTAL
Women	287224	593068	95184	382468	50348	1408292
Men	266012	552584	95236	362056	39736	1315624
Youth	131500	328572	48468	186956	17472	712968
Midlife	247052	445752	79708	323040	41080	1136632
Seniors	163488	348552	58496	219904	29952	820392
Lower educ	152408	225336	40164	340316	12408	770632
Medium educ	240628	728748	87272	257688	49112	1363448
Higher educ	152652	188220	60780	137396	26828	565876
Total	553236	1145652	190420	744524	90084	2723916

The Nordic group includes Denmark, Finland, Iceland, Norway, and Sweden. The Continental group includes Austria, Belgium, France, Ireland, Luxembourg, and the Netherlands. The Southern group includes Cyprus, Greece, Italy, Malta, Portugal, Spain. The Eastern group includes Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Rumania, Slovakia, Slovenia.

Table A2-Differences in transition probabilities by gender in five country groups (E-U-I)

	Nordic	South	Conti	Eastern	UK
U to U	1,296***	0,803***	0,967***	1,421***	1,203***
U to I	1,363***	0,742***	0,786***	1,326***	1,351***
I to U	0,964	0,835***	1,011	1,02	0,997
I to I	1,277***	0,974***	0,728***	1,458***	1,202***

Note: Results are based on equation (2), in which men are taken as group 1 and women as group 2. For each group of countries, figures in the table represent the relative probability of staying in the initial status or making a transition, rather than making a transition towards employment (reference). U unemployment; I inactivity.

Table A3-Differences in transition probabilities by age in five country groups (E-U-I)

	Nordic		**South**		**Conti**	
	youth/mid	senior/mid	youth/mid	senior/mid	youth/mid	senior/mid
U to U	0,913**	1,027	1,355***	1,06***	0,954***	1,272***
U to I	0,454***	1,18	0,876**	1,092	0,708***	1,396***
I to U	0,766**	1,059	2,049***	0,677***	1,256***	1,168**
I to I	0,509***	1,273***	1,096***	1,08***	1,551***	1,539***

	Eastern		**UK**	
	youth/mid	senior/mid	youth/mid	senior/mid
U to U	0,871***	0,925***	0,668***	1,77***
U to I	0,709***	1,007	1,209	1,57***
I to U	1,534***	0,855**	1,505***	0,983
I to I	0,804***	1,074***	1,117***	1,22***

Note: Results are based on equation (2), in which medium aged are taken as group 1 and youth or seniors as group 2. For each group of countries, figures in the table represent the relative probability of staying in the initial status or making a transition, rather than making a transition towards full-time employment (reference). U unemployment; I inactivity.