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# Transitions in the EU labour market

## Structure, crisis and recovery

LSE Consulting

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## 1. ABSTRACT

This paper provides an in-depth examination of labour market transitions in the EU over the period 2004-16, drawing on EU-Labour Force Survey (EU-LFS) and EU-Survey on Income and Living Conditions (EU-SILC) data. Building on the earlier work of Ward-Warmedinger and Macchiarelli (2014), our analysis offers a detailed insight on how well European economies have recovered from the crisis and whether, and to what extent, their labour markets have returned to their pre-crisis path. In particular, we analyse labour market transitions (a) across the three key labour market statuses of employment, unemployment and inactivity, providing aggregate break-downs by country, age-groups, gender and individual's level of education based on the EU-LFS, and (b) for a more detailed set of statuses that includes, in addition, part-time and full-time dependent employment and self-employment, based on the EU-SILC. Our analysis examines both short term (year-on-year) transitions and the long-run dynamics (steady-state equilibrium) implied by these transitions. We subsequently develop country-specific measures of transition rates and a synthetic index of mobility in order to draw comparisons across countries and over time, as well as examine how country-specific patterns relate to key institutional characteristics, both micro-economic (e.g., EPL) and macro-political (e.g., welfare regimes). This offers a granular overview of labour market trends by country and for the EU as a whole, allowing us to draw conclusions about the functioning of labour markets in Europe with regard to their flexibility (speed/extent of transitions and extent of mobility across jobs[1]) and how this evolved over time since the crisis.

## 2. INTRODUCTION

The proposed Research Note provides an update on Labour Market Transitions in the EU since the financial crisis, offering an examination of EU-Labour Force Survey (EU-LFS) and EU-Survey on Income and Living Conditions (EU-SILC) data. We compare for some indicators the results before the crisis, also building on the existing pre-crisis results in Ward-Warmedinger and Macchiarelli (2014), in order to get insights on how well European economies have recovered from the crisis and whether and to what extent their labour markets have reached their pre-crisis fluidity. In particular, we analyse year-on-year labour market transitions and their evolution over the years 2004-16, across (a) three key labour market statuses (employment, unemployment and inactivity), providing

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[1] Following common practice, we refer to job-to-job mobility as labour market churn. When examining transitions across occupations, we refer to these instead as occupational mobility.

aggregate break-downs by country, age-groups, gender and individual's level of education based on the EU-LFS, and (b) a more detailed set of statuses that includes, in addition, part-time and full-time dependent employment and self-employment, based on the EU-SILC. Our analysis examines both short-term (year-on-year) transitions and the long-run dynamics (steady-state equilibrium) implied by these transitions. Following this, we develop country-specific measures of transition rates and a synthetic index of mobility (between three statuses: employment, unemployment, inactivity) in order to draw comparisons across countries and over time. For the discussion and further analysis of the results, we complement these data with qualitative and macro-quantitative information about the different countries of the EU, allowing us to split the countries into different groupings corresponding to different social systems. This allows us to analyse aggregate labour market changes (changes in participation, unemployment and inactivity rates; changes in part-time and temporary employment; etc.) to offer an overview of labour market trends by country and for the EU as a whole, as well as to draw conclusions about the functioning of labour markets in Europe with regard to their flexibility (speed/extent of transitions and extent of mobility/churn) and how this evolved over time since the crisis.

## 3. RELEVANT LITERATURE

A number of papers have focused on establishing the persistence of both unemployment incidence and duration using longitudinal data with a relatively short time horizon (Boeri and Garibaldi, 2009; Petrongolo and Pissarides, 2008; Brandolini *et al.,* 2006 for Europe; Vanhala, 2009; Elsby *et al.*, 2009 for OECD countries).[2] These papers document an increase in labour market mobility across employment, unemployment and inactivity during the last two decades before the crisis, with differences in the extent of mobility across countries being attributed to institutional factors such as labour and product market regulation, active labour market policies, and union density. Boeri and Garibaldi (2009) asked, for instance, why the decrease in unemployment does not show up as increased satisfaction in the labour market, a result attributed to the increased risk of job loss as the result of higher labour market turnovers. Elsby *et al.* (2009) questioned instead the validity of the assumption of the usual steady state decomposition for unemployment which forms the basis of a number of theoretical models. In particular, they calculated the relative contributions to unemployment using a neat decomposition based on the identity describing the dynamics of unemployment in which inflow and outflow rates are separable. In the same vein, Vanhala (2009) argued that European

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[2] See, *inter alia*, Fujita and Ramey (2006); Shimer (2005; 2011) for the US.

countries generally have low unemployment inflow and outflows rates which contributed to high rates and unemployment persistence. Petrongolo and Pissarides (2008) identified the relative role of inflow and outflow rate from unemployment in explaining labour market dynamics and conclude that the relative contribution of each depends on labour market institutions. Finally, Brandolini *et al.* (2006) emphasised the need to acknowledge the group of non-participants (or *potentially* unemployed) when looking at labour market dynamics; accordingly the distinction provided for by the ILO definition of unemployment is only "artificial" and indeed non-participants and unemployed do not differ substantially in their job search activity.[3]

The contribution of flows into and out of unemployment to the cyclicality of unemployment has attracted a great deal of attention in the analysis of labour market dynamics since the crisis (Shimer, 2012). Recent articles have mainly found a relatively equal contribution of inflows and outflows to the unemployment stock (Elsby et al. 2009; Fujita and Ramey 2009). Fujita and Ramey (2009), as well as Fujita (2011), find evidence for differences in the timing of these effects, with the effect of the inflow rate being more prevalent during the early phase of a recession and the effect of the outflow rate being more important in the middle of a downturn. Yet, these studies have generally focussed on the US labour market and relied on aggregate data, thus neglecting potential composition effects, i.e. differences in the socio-demographic structure of the employed and unemployed. An exception to this is the recent study by Daouli et al. (2015) for Greece, which has found that the cyclicality in the relative importance of inflows and outflows over the business cycle varies with individual-level heterogeneity. For example, although the unemployment inflows in Greece are phenomena that mostly interest female workers, in the post-2008 period the relative position of male workers has worsened. On the other hand, although the unemployment outflows are a phenomenon that concerns primarily male unemployed individuals, in the post-2008 period the relative position of females has improved. Moreover, younger workers face increased risk of moving from employment to unemployment both in the pre-crisis and the crisis periods, while the relative risk for younger (15-24) and older (45-54) workers has increased in the crisis years.

Despite this broad literature, comprehensive analyses of labour market transitions across the EU member states are limited and thus also limited is the evidence-base concerning

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[3] While this is beyond the scope of this note, one could break down the inactivity further. For example by singling out the group of marginally attached workers (those willing to work, but not actively looking for a job). In general, this group is more attached to the labour market than others. This should be reflected in their transition rates. Some recent work on the issue using the Hornstein-Kudlyak-Lange Non-Employment Index is available in the Labour Market and Wage Developments in Europe Annual Report (LMWD, 2017). Source : https://publications.europa.eu/en/publication-detail/-/publication/2df2eaca-b3b0-11e7-837e-01aa75ed71a1/language-en.

the cyclicality of these transitions (especially in relation to the recent crisis), their differentiation across types of workers, the possible differences in transition dynamics and long-term trends (equilibria) across countries and country groups and, ultimately, their link to labour market flexibility and their contribution to attaining high levels of employment and employment participation. In this study we examine these issues through an extensive analysis of available data from the EU LFS and EU-SILC databases. Drawing on these, we perform a micro-data based analysis of the labour market transitions in a large number of European countries and investigate how these transitions have been affected by the recent financial and economic crisis, by providing an assessment of labour market transitions at the pre-crisis plateau (2004/08), during the crisis' early phase and in the crisis' peak (2009/13) and ensuing recovery (2014/16) (see Figure 1 in the next section).

A focus on the behaviour of labour market transitions around periods in which actual unemployment has risen or fallen sharply may inform on the factors behind shifting mobility flows, as well as other factors contributing to periods of prolonged economic slowdown and/or unemployment persistence (i.e. *hysteresis*). The results can also have implications for the active labour market policies' effectiveness, not least in the context of current economic conditions and the radical structural reforms taking place, particularly in some countries (Ward-Warmedinger and Macchiarelli, 2014).

## 4. DATA

The analysis uses complementarily two sources of individual-level micro-data covering all EU countries available: the first is the Eurostat Labour Force Survey (EU-LFS); the second is the Eurostat Survey on Income and Living Conditions (EU-SILC). The issue of statistical matching of the EU-LFS and the EU-SILC has been discussed in the past by the Eurostat and others (see for instance Leulescu et al., 2013). There is a consensus that the EU-LFS/EU-SILC can potentially be a good complement for the specific purpose of analysing labour market trends as both surveys are accessible at Eurostat level; they cover all member states; they refer to the same population; and contain a set of common variables at individual and household level (Leulescu et al., 2013). On the other hand, sample size and sampling design issues make each of the two datasets more advantageous for different aspects of analysis.

In our particular case, the EU-LFS data offer more accurate measures of employment, unemployment and inactivity with fine detail on individual characteristics due to their labour market focus; in turn, the EU-SILC data, due to their longitudinal design and better information on recall questions, are more suitable for more detailed analyses of

changes in labour market status with regard to the sector and type of jobs (e.g., part-time versus full-time). Consequently, in our exercise, the former data are used for the more general purpose of analysing trends in key labour market indicators and in the analysis of flows/transitions across the three key labour market statuses (employment, unemployment, inactivity). For these analyses, we use the annual files of the EU-LFS, relying on retrospective questions about each individual's labour market status one year ago. Our sample consists of individuals in their working age (aged 15 to 64).[4] The EU-SILC data provide instead longitudinal information, following individuals over time, based on a rotating panel of longitudinal data for 4 sub-samples. The EU-SILC provides the longest time series of comparable and consistently defined individual-level data for income and living conditions available for the EU, with extensive detail on labour market variables, including employment status, working arrangements, hours of work, as well as various individual and family demographic characteristics (i.e. gender, age, education, job type etc.).[5] Drawing on the longitudinal information, we use these data to examine labour market transitions/flows across an extended list of employment statuses (including part/full-time employment and self-employment) as well as mobility across occupations.

For the discussion and further analysis of the results, we complement these data with qualitative and macro-quantitative information about the different countries of the EU, allowing us to split the countries into different groupings corresponding to different social systems. Data quality/availability issues necessitate that some countries are excluded from parts of the analysis: this is both for sample-size reasons (e.g., Luxemburg), data coverage issues (e.g., data for Malta become available from 2009 onwards), and data availability issues (e.g., some variables are not recorded for countries such as Germany, the UK and Ireland).

In the light of these limitations, the UK, Germany (DE), and Ireland (IE) are excluded from the analysis owing to a lack of data.[6] The remaining countries are weighted as follows:[7]

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[4] Evidently, this demographic includes people with very different intensities of labour market attachment. For example, people in the 55+ age group may have options for early retirement schemes; while those under 25 may withdraw from the labour market for educational reasons. We examine this issue of differentiation of transitions on the basis of age (as well as other individual characteristics such as gender and levels of education) later in this report.

[5] Germany is covered by EU-SILC but their longitudinal microdata are not disseminated according to the EC Regulation no. 223/2009.

[6] Due to missing data, some countries are also excluded when computing aggregated results. Based on the LFS, data are not available for Germany, the UK and Ireland on the overall sample, for France, Austria and Spain for the 2004-2005 period, for Sweden for the 2004-2006 period, for Bulgaria and Netherlands for the 2004-2007 period, for Malta for the 2004-2008 period respectively.

[7] Country weighting in each country grouping is based on GDP.

*Central Eastern*, including Bulgaria (BG), Czech Republic (CZ), Estonia (EE), Croatia (HR), Latvia (LV), Lithuania (LT), Hungary (HU), Poland (PL), Romania (RO), Slovakia (SK) and Slovenia (SI);

*Nordics*, including the Netherlands (NL), Finland (FI), Denmark (DK) and Sweden (SE);

*Continental*, including Belgium (BE), France (FR), Luxemburg (LU) and Austria (AT);

*Mediterranean*, including Greece (GR), Spain (ES), Italy (IT), Cyprus (CY), Portugal (PT), Malta (MT).

The grouping above clusters countries according to social policy models, drawing on the definition of Boeri (2002), Sapir (2006) and Macchiarelli and Ward-Warmedinger (2014).[8]

Our analysis covers the period prior to the crisis (2004/2008) and up to 2016. For much of the analysis, we focus on three sub-periods, i.e. between 2004/08, 2009/13 and 2014/16. In doing so, we update the work of Ward-Warmedinger and Macchiarelli (2014), who analyse labour market transitions in the EU for the ten years preceding the Great Recession (1998-2008). Looking at 2004-2008 as a reference pre-crisis period is motivated by the idea that the slack in real economic activity affected the EU labour markets with some lag, with the worsening of unemployment figures starting mainly from 2009; this is the case since the impact on labour market is typically perceived on average later than the shock in real activity (e.g., GDP; see NBER, 2008). The sub-periods we derive are consistent with the peak-trough dates (i.e. turning points) we obtain by using a simple dating procedure on the EU individual unemployment rates (Table 1A). In choosing the dates of business-cycle turning points, we follow standard procedures and chronologically identify the dates of peaks and troughs that frame economic recession or expansion. For instance, the period from a peak to a trough is a recession and the period from a trough to a peak is an expansion (see Figure 1).

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[8] The latter definition differs from the one used in Macchiarelli and Ward-Warmedinger (2013) in that it does not classify countries according to euro area membership or not.

**Figure 1 – Unemployment rate in the EU**



*Source:* Eurostat data

## 5. METHODS

### *Transition probabilities*

From the EU-LFS, we construct raw probabilities of moving or remaining in any labour market status, together with an index of mobility (Shorrocks, 1987). Particularly, we consider nine possible transition probabilities across the statuses of employment, unemployment and out of the labour market (inactivity). The (*ex-post*) probability of remaining in any particular labour market status is defined on the basis of the number of individuals being in that particular status *A* in both years *(t)* and *(t+1)*, as a percentage of the number of individuals in the same status *A* in year *(t)*. Conversely, the probability of moving from one labour market status to another is defined as the ratio of the probability of remaining in any labour market status *A*, as defined previously, over the probability of an individual in status *B* in period *(t)* turning to status *A* in period *(t+1)*.

More formally, the probability of moving across *n = 3* labour market statuses between year *(t)* and year *(t+1)* is thus a (3 x 3) matrix in which each individual element ($P_t^{AB}$) records the transition probability, with *A, B* = employment (*E*), unemployment (*U*), or inactivity (*I*):

$$P_t^{AB} = \Pr\left\{S_{t+1} = B \big| S_t = A\right\} = \frac{AB_{t,t+1}}{A_t} \tag{1}$$

In other words, the probability of a transition from an origin state *A* to a destination state *B* is given by the number of workers making that transition over a given period,

divided by the stock of individuals in the origin state at the start of that period. For example, if we denote the number of employed workers *E* in a given year *(t)* who are unemployed *U* in the subsequent year *(t + 1)* by $EU_t$, the associated transition rate equals:

$$P_t^{EU} = \frac{EU_{t,t+1}}{E_t} \qquad (2)$$

## Long-term equilibrium and counterfactual analysis

The derived set of transition probabilities can be utilized further to analyse their implied long-run dynamics. Specifically, by applying the observed transitions onto the initial labour market state (i.e., on the initial shares of employment, unemployment and inactivity) iteratively over a sufficiently long time-window (say, over 20 or more years), we can arrive at the equilibrium values of employment, unemployment and inactivity implied by the observed transition dynamics. As it is standard in the literature, this is referred to as the steady-state or *ergodic* distribution. Drawing on this, we further implement a counterfactual analysis which allows us to analyse how the transition dynamics of each country affect their long-run equilibrium. In our exercise, we limit this analysis to a small selection of countries (namely, Greece and Sweden) and a group of countries (namely, the Nordic group), which we use as 'benchmarks'. Using the transition dynamics observed in these selected 'benchmark' cases, we calculate a 'counterfactual' equilibrium for each country in our sample that would occur if the transition dynamics of the 'benchmark' case were applied on the actual (observed) initial labour market state of each country. While speculative, calculating the difference between 'actual' and 'counterfactual' equilibrium provides us with an assessment of the difference in equilibrium employment, unemployment and inactivity in each country that is uniquely attributable to the distance between the transition dynamics of this country and the transition dynamics observed in the reference country (Greece, Sweden, or the Nordics, in our exercise).

## Decomposition of unemployment

The link between variation in unemployment and its constituent flows is formalized by the decomposition of unemployment into inflows and outflows. This means that a change in the unemployment stock is due either to people entering the unemployment pool or to people exiting the pool. Formally, the change in unemployment across two periods *(t)*

and *(t+1)* is equal to the difference between the ins and outs of unemployment, and can be expressed as:

$$\Delta U_{t+1} = \left( EU \right)_{t,t+1} + \left( IU \right)_{t,t+1} - \left( UE \right)_{t,t+1} - \left( UI \right)_{t,t+1} \tag{3}$$

The law of motion for unemployment can also be expressed in terms of flow transition rates. Recalling equation (1), the gross flow between an origin state *A* and a destination state *B* is associated with the flow transition rate by the relation:

$$AB_{t,t+1} = P_t^{AB} * A_t \tag{4}$$

Thus, equation (3) becomes:

$$\Delta U_{t+1} = P_t^{EU} E_t + P_t^{IU} I_t - (P_t^{UE} + P_t^{UI}) U_t \tag{5}$$

While in the present work we are not going to focus on the decomposition in equation (5), such an expression implies that the link between the observed transitions into and out of the labour market and the aggregate employment/unemployment/inactivity figures is anyway straightforward, as transitions into (out of), e.g., unemployment, are positively (negatively) correlated with the flows into (out of) this state.

## *Labour market mobility*

Based on the decomposition outlined before, we finally construct, for each country (*j*), a measure of mobility using Shorrocks' (1987) mobility index, which is defined as:

$$M_{jt} \; = \; \frac{[n - trace(P_{jt}^{AB})]}{n-1} \tag{6}$$

where *n* is the number of states (in this case: employment, unemployment and inactivity) and trace is the trace of a 3-by-3 square transition matrix *P* defined to be the sum of the elements on the main diagonal. By definition, the mobility index is bounded between [0,1], where a value of zero implies no probability of leaving any labour market status and a value of one implies full mobility.

At this stage, it should be noted that flows from and into the labour market are very different between them. In fact, people moving from inactivity to unemployment are different from people moving from inactivity to employment, as the former re-enter the labour market but do not find a job immediately. In this vein, distinguishing between flows into and out of inactivity can be retained in the probability of *successfully* re-

entering the labour market (Marston, 1976; Theeuwes *et al.*, 1990; Macchiarelli and Ward-Warmedinger, 2014). The latter is defined as:

$$SL_{jt} = \frac{P_{jt}^{IE}}{P_{jt}^{IE} + P_{jt}^{IU}} \tag{7}$$

which is the percentage of people *successfully* entering the labour market ($P_{jt}^{IE}$), i.e. flows from inactivity to employment, as a percentage of the number of people entering the labour market as a whole.

Analogously, as noted by Macchiarelli and Ward-Warmedinger (2014), people leaving unemployment to get back into employment are different from those who, once separated from their job, stop searching for a new one (i.e. they move from unemployment into inactivity). Thus, *unsuccessful* labour market exits are computed as:

$$FL_{jt} = \frac{P_{jt}^{UI}}{P_{jt}^{UI} + P_{jt}^{UE}} \tag{8}$$

which is the percentage of people withdrawing from the labour market, as a percentage of people generally leaving unemployment (moving either back into employment or inactivity).[9]

The deriving country- and period-specific measures of mobility and/or labour market transitions are subsequently depicted visually with the use of graphs, maps and tables, allowing us to present in a comparative way both changes over time within countries and cross-country differences/heterogeneity in a static sense. Finally, we draw on the country distinctions described above to draw conclusions about how the observed patterns (both static and dynamic) may link to specific institutional or other characteristics on the national political economies of the EU28.

## 6. MAIN FINDINGS

### *Transition probabilities*

Table 1 provides a snapshot of average transition probabilities, over time and across countries, between the three core labour market statuses during the period 2004-2016 for all country groupings, and for the three sub-periods considered. Starting with the information concerning stability (diagonal elements), the table shows that the

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[9] It should be noted, however, that *unsuccessful* labour market outcomes may not represent labour market withdrawals *per sé*, as flows into inactivity also capture shifts into retirement or education.

(weighted) average probability of being employed in year t-1 and year t is quite high and broadly similar across country groups: 94% on average in Central Eastern countries; around 93% in Continental and Mediterranean countries; and around 89% in Nordic countries.[10] Importantly, this probability seems to change little over time (e.g., during/after the crisis). While this is in part an issue of scale (even in deep crisis, most people do remain in employment), it also clearly suggests that much of the unemployment movement during the crisis period had to do with other types of labour market flows, such as transitions from unemployment to employment (declining job-finding rates) and transitions from inactivity to unemployment (the so-called 'added worker effect'). In turn, the probability of remaining unemployed shows much more variation (and is of course lower): it is around 66% in Central Eastern European countries; around 62% in Continental countries; but sizeably lower at around 37% in the Nordic countries; and much higher in the Mediterranean countries (over 70% in the post-2009 years).[11] By comparison, the probability of remaining inactive is much higher across country groups – typically at between 94-95% in the Central Eastern, Continental and Mediterranean countries, and at slightly below 90% in the Nordic countries.

Concerning the transition dynamics (off-diagonal elements), we also observed some differences across groups. From Table 1, the probability of moving from unemployment to employment is lowest in the Mediterranean countries, especially during and after the crisis; it is around 25-30% in the Central Eastern European and Continental countries; and it is sizeably higher, at 35% post-crisis, in the Nordic countries. In the Central Eastern, Mediterranean and Continental countries this probability is much lower than the probability of remaining in unemployment, compared to Nordic countries. In the case of Nordic EU countries, the picture is consistent with relatively fast hiring and firing dynamics, compared to other EU social models. Inversely, the probability of transition from unemployment to inactivity is much higher in the Nordic countries (between 22% and 47% – compared to below 10% in all other groups).[12]

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[10] While it is tempting to interpret this as the probability of *remaining* employed in two consecutive periods, we note that the data used here provide information only for the start and end of each annual period considered. As a result, while we know for an individual with EE status that they were employed at the time of the survey in year t and one year before in t-1, we do not know whether that individual was employed for this entire period. It is possible – especially in labour markets with high prevalence of seasonal employment and short term contracts – that an individual may switch labour market status (even several times !) over a year.

[11] Those results are broadly consistent with Macchiarelli and Ward-Warmedinger (2014), where it is shown that the probability of remaining in unemployment is about 40% in both Denmark and Sweden.

[12] It is possible that these differences reflect institutional differences in the process of retirment. Examining these in detail is however beyond the scope of the present analysis.

**Table 1: Transition probabilities**

| | | Labour market status year t | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Central Eastern | | | Nordics | | | Continental | | | Mediterranean | | |
| | | **2004-2008** E | U | I | E | U | I | E | U | I | E | U | I |
| Labour market status | year t-1 | E | | | | | | | | | | | |
| | | E | **0.936** | 0.028 | 0.036 | **0.898** | 0.016 | 0.086 | **0.933** | 0.033 | 0.034 | **0.936** | 0.032 | 0.032 |
| | | U | 0.282 | **0.624** | 0.094 | 0.211 | **0.318** | 0.471 | 0.321 | **0.597** | 0.083 | 0.314 | **0.588** | 0.098 |
| | | I | 0.045 | 0.021 | **0.934** | 0.102 | 0.020 | **0.878** | 0.038 | 0.013 | **0.949** | 0.035 | 0.025 | **0.940** |
| | | *2009-2013* E | U | I | E | U | I | E | U | I | E | U | I |
| | | E | **0.927** | 0.037 | 0.036 | **0.893** | 0.027 | 0.081 | **0.923** | 0.041 | 0.035 | **0.914** | 0.054 | 0.031 |
| | | U | 0.252 | **0.697** | 0.051 | 0.375 | **0.356** | 0.269 | 0.308 | **0.594** | 0.097 | 0.214 | **0.704** | 0.082 |
| | | I | 0.032 | 0.017 | **0.952** | 0.094 | 0.028 | **0.878** | 0.044 | 0.021 | **0.936** | 0.024 | 0.031 | **0.945** |
| | | *2014-2016* E | U | I | E | U | I | E | U | I | E | U | I |
| | | E | **0.945** | 0.024 | 0.031 | **0.888** | 0.032 | 0.079 | **0.920** | 0.043 | 0.037 | **0.930** | 0.044 | 0.026 |
| | | U | 0.280 | **0.666** | 0.054 | 0.345 | **0.430** | 0.226 | 0.280 | **0.639** | 0.080 | 0.208 | **0.712** | 0.080 |
| | | I | 0.031 | 0.014 | **0.954** | 0.109 | 0.037 | **0.855** | 0.040 | 0.020 | **0.940** | 0.021 | 0.031 | **0.948** |

*Note: E=employed; U=unemployed; I=inactive so that EE = remains in employment between one year and the next; UU = remains in unemployment, II = remains in inactivity. Observations are weighted according to the labour force share (15-64) in each country over the aggregate. Elements showing a probability of remaining in the same labour market state (employment, unemployment and inactivity) are in bold.*

*Sources: EU-LFS microdata, authors' computations.*

## *Transition probabilities over time*

Comparisons of labour transition probabilities over time show that in the Central Eastern, Nordics and Mediterranean countries the number of people remaining in unemployment has increased between the crisis (2009-13) and the pre-crisis (2004-08) periods, whereas it has remained broadly stable in Continental countries (Table 1).[13] For Nordic countries, of those individuals unemployed in period t-1, the percentage remaining unemployed in period t increased from 32% to 36% between the pre-crisis and the crisis periods. For Central-Eastern countries the same number increased instead from 62% to 70%.[14] The same number increased in the Mediterranean countries, from 59% to 70%. By contrast, the probability of remaining inactive increased over the crisis period in the Central Eastern, while it remained broadly stable in Mediterranean and Nordic countries. It decreased slightly in Continental countries. Finally, the probability of remaining in employment decreased – as would be expected – in all country groups. However, there are again differences in the scale of the decline: measured in terms of percentage points, the decline in the Mediterranean countries is twice as large as in the Central Eastern and Continental countries and four times as large as in the Nordic countries. In all cases, the size of the observed changes is lower than the observed rise in unemployment, reflecting the fact that – despite the existence of a significant number of lay-offs – the main part of the unemployment increase is accounted for by a sharp reduction in hiring rates (rise in unemployment persistence) and secondarily from an increase in flows from inactivity into unemployment (added worker effect).

Turning to changes between the crisis period (2009-13) and the last part of the sample (2014-16), the transitions show lower unemployment persistence in Central Eastern EU countries. The remaining countries display higher unemployment persistence.

Looking at the peak to trough transitions based on the results in Table 1A, we are able to identify some clear developments across the selected Mediterranean and Central Eastern countries, with much of the variation being evident in the probability to remain unemployed over time (see Figure 3). Those countries have been selected on the basis of the largest peak-to-trough movements in unemployment persistence.[15]

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[13] The probability of remaining in unemployment has increased in Czech Republic, Hungary, Poland, Romania and Slovakia over the last decade, but has fallen in the Baltic countries (Estonia, Latvia and Lithuania). In Latvia and Lithuania the fall in the probability of remaining in unemployment was accompanied by a higher probability of transiting from unemployment to inactivity over time, while for Estonia this probability remained roughly similar across time.

[14] Macchiarelli and Ward-Warmedinger discuss how changes in the institutional arrangements and labour market composition (also in the light of labour market migration to Western Europe stemming from the EU accession in 2004) have contributed to this high number pre-crisis.

[15] The remainder of the results are available upon request from the authors.

During the period 2014-16, the probability to remain in inactivity has not changed significantly in any of the country groupings, apart from the Nordic countries. The probability to remain in employment has increased noticeably only in Central Eastern countries, and to a lesser extent in Mediterranean countries.

**Figure 3: Changes in the persistence of employment, unemployment and inactivity for selected EU countries**

(*Pre-crisis = 100*)
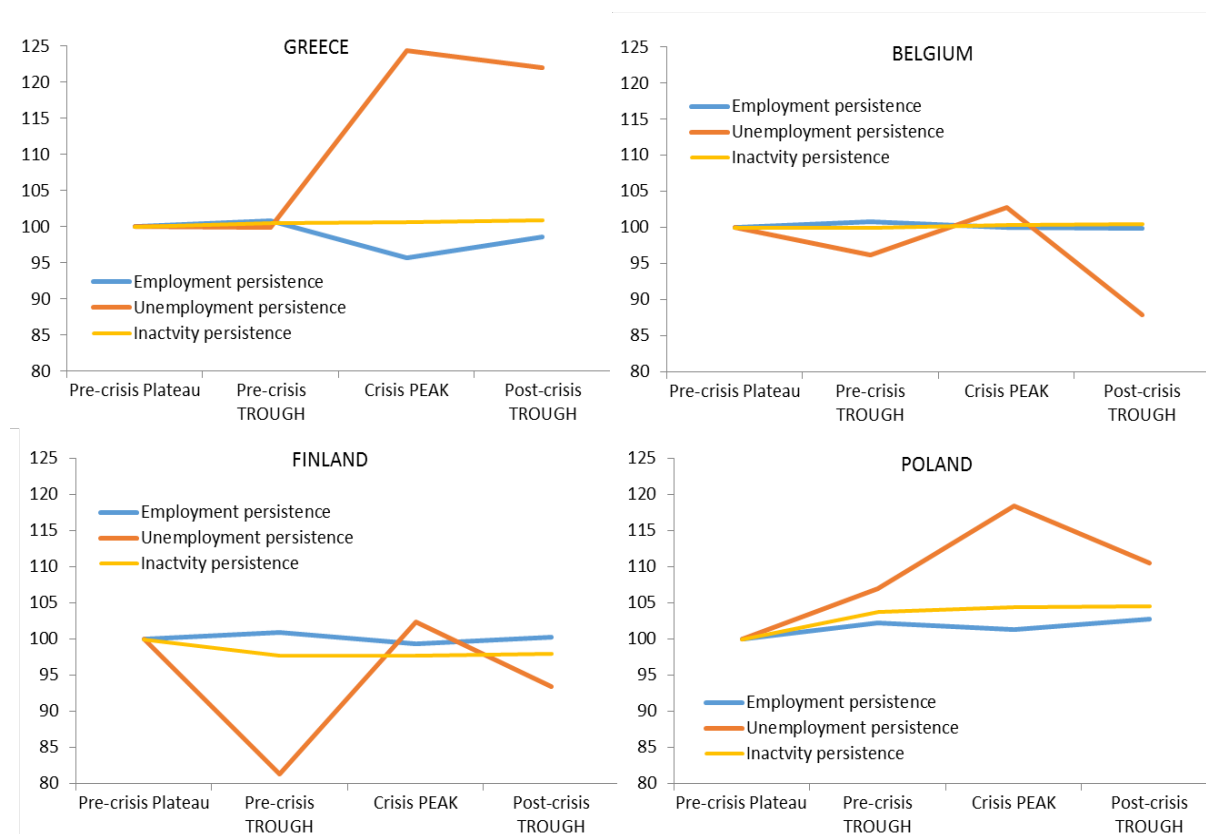


*Sources: EU-LFS microdata, authors' computations.*

Turning to the transitions between different labour market statuses in Figure 4 (calculated as the difference between the weighted average transition for a country grouping/sub-period, compared to the previous sub-period), unemployment-to-employment flows have increased by about 15 percentage points over the crisis in Nordic European countries (see Figure 4), while they declined by 3 p.p. in Central Eastern countries and more strongly in Mediterranean countries.[16] Flows in the opposite direction (i.e. employment to unemployment) have increased by 3 p.p. in Mediterranean countries, while it remained broadly stable in all remaining countries.

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16 Country-specific results point to the fact that flows from employment to unemployment or inactivity do not vary much across countries, whereas movements from unemployment to employment or inactivity as well as transitions from inactivity to employment show more pronounced cross-country variation.

**Figure 4: Changes in transition probabilities over time**

a)  Crisis (2009-13) minus pre-crisis (2004-08)
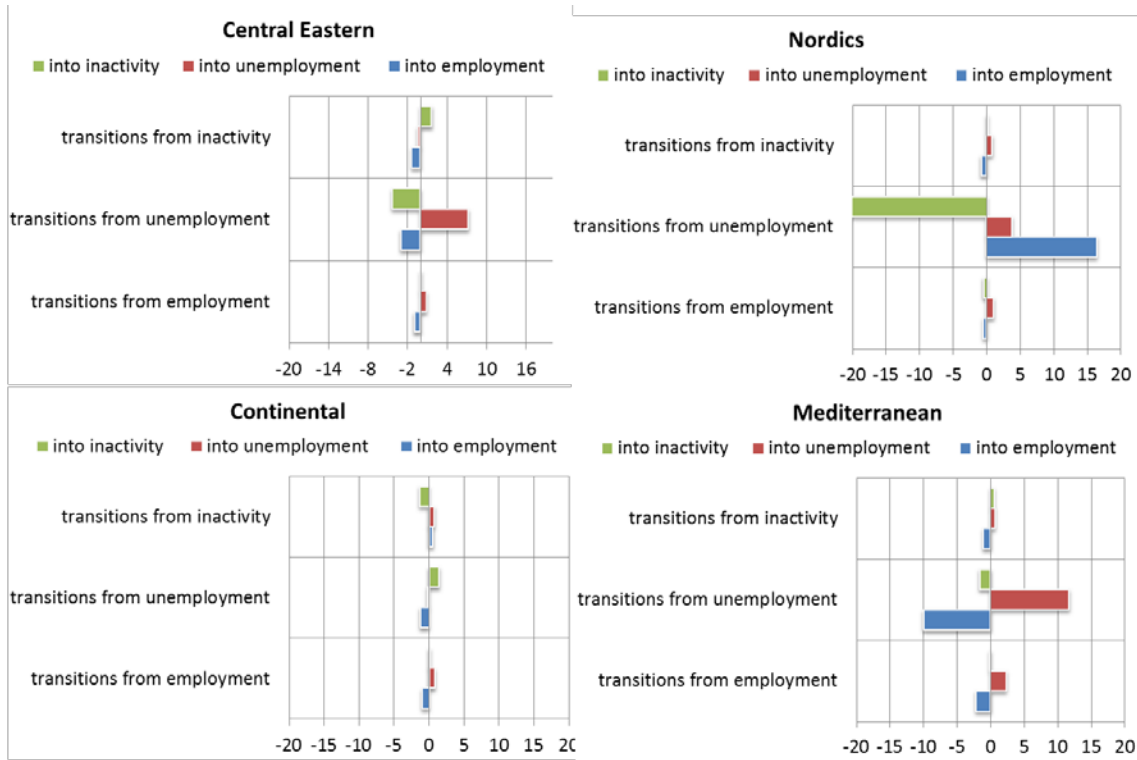


b)  Recovery (2014-16) minus crisis (2009-12)
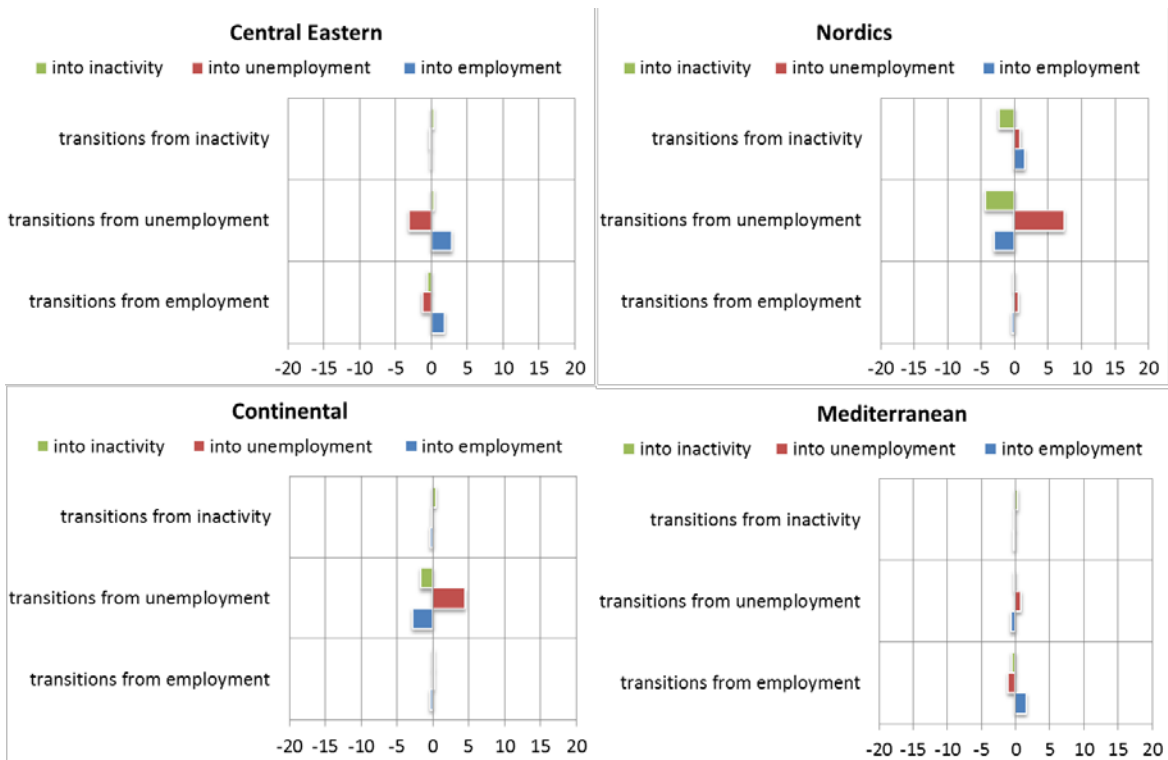


*Sources:* EU-LFS microdata, authors' computations.

The figures also show that changes from unemployment to inactivity have overall not changed as much since 2014 in Continental and Mediterranean countries, whereas they decreased in Central Eastern countries (by 4.5 p.p.) and in the Nordics (by almost 20 p.p.). Finally, the figure suggests that transitions from inactivity into employment have remained broadly constant in all countries. Turning to the 2014-16 period, the transitions from unemployment to inactivity have decreased in Nordic countries and, to a lesser extent, in Continental countries.

**Table 2: Successful and unsuccessful labour market outcomes**

|  | Central Eastern | Nordics | Continental | Mediterranean |
|---|---|---|---|---|
| *Successful labour market entries* | | | | |
| 2004-2008 | 0.683 | 0.836 | 0.741 | 0.580 |
| 2009-2013 | 0.653 | 0.769 | 0.677 | 0.433 |
| 2014-2016 | 0.687 | 0.748 | 0.670 | 0.411 |
| *Unsuccessful labour market exits* | | | | |
| 2004-2008 | 0.250 | 0.691 | 0.205 | 0.237 |
| 2009-2013 | 0.168 | 0.418 | 0.240 | 0.275 |
| 2014-2016 | 0.162 | 0.395 | 0.223 | 0.278 |

*Note:* Following Theeuwes *et al.* (1990) a successful labour market entry is computed as the percentage of people *successfully* entering the labour market as a percentage of the total number of people entering the labour market. Analogously, an unsuccessful labour market outcome is the percentage of people withdrawing from the labour market, as a percentage of people leaving unemployment (see also Macchiarelli and Ward-Warmedinger, 2014)*.

*Sources:* EU-LFS microdata, authors' computations.

Looking at the percentage of people entering successfully the labour market (*successful labour market entries*) – which are transitions from inactivity to employment as a share of the sum of transitions out of inactivity – we find that this percentage has decreased in Central Eastern countries (from 68% to 65%), the Nordics (from 83% to 77%), Continental and Mediterranean countries (from 74% to 68% and from 58% to 43%, respectively) over the crisis period. At the same time, however, the percentage of *unsuccessful labour market exits – i.e.* the percentage of people transitioning from unemployment to inactivity as a share of all transitions out of unemployment – has strongly decreased in Central Eastern countries (from 25% to 17%) as well as in the Nordic countries, whereas it has increased in all other countries, particularly in the Continental European countries (by about 3.5 p.p.), with the strongest increase recorded in Mediterranean countries (about 4 p.p.). Over the 2014-16 period, the probability of successfully entering the labour market returned to crisis levels only in Central Eastern European Countries and in the Nordic countries (excluding the Netherlands). The same probability has remained broadly stable in Continental Europe, whereas it worsened further in the Mediterranean countries. Unsuccessful labour market exits have nevertheless decreased in the Nordic and Continental EU countries, whereas

they remained broadly stable in the Central Eastern and Mediterranean countries. In Mediterranean countries, in particular, while the probability of leaving the labour market has not changed much since the crisis, the likelihood for a person from outside the labour market to join employment has decreased. All in all, the 2014-16 can hardly be dubbed "recovery" for some countries as those years have not necessarily yet determined an inversion of the crisis' trend, with countries being far away from the levels of successful and unsuccessful labour market outcomes observed before the crisis.

## *Labour mobility*

Figure 5 provides a summary measure (the Shorrocks' index explained earlier) of labour market mobility. Importantly, the index summarizes the extent of the transitions between different economic activity statuses (employment, unemployment and inactivity).[17]

The mobility index reflects an increase in labour market churning over the crisis period in Nordic and Continental countries. On the contrary, the Shorrocks' summary index for the period 2009-13 reveals a decrease in labour market mobility compared to the pre-crisis both in the Mediterranean and the Central Eastern European countries. The drop in mobility since the crisis may suggest instead a less efficient matching of individuals with jobs, as evidenced by the increase in the probability to remain in unemployment.[18] For Mediterranean countries, a lower mobility over time analogously reflects an increase in the likelihood to remain unemployed over time. In Nordic and Continental countries, mobility increased over the crisis period, essentially as the result of a fall in the probability of remaining in employment, unemployment and inactivity overall.[19]

Looking at the results in Figure 5, labour markets in Spain, the Netherlands, Estonia Luxembourg, together with Finland, Denmark and Sweden, are more flexible on average. For the latter mobility is twice as high relative to Greece, Bulgaria, the Slovak Republic, Poland, Latvia, Hungary, Croatia, Italy, Belgium, and Slovenia. A group of countries

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[17] As summarized before, the Shorrocks' index is a proxy index for mobility. For example, with respect to the results in Tables 2 and 3, the decrease in state persistence over time (i.e. the reduction of the elements on the main diagonal from 1998-2003 to 2004-2008) implies an increase in the mobility index across the two sub-periods.

[18] Mobility clearly depends on the level of unemployment. In country with high employment you would also expect low mobility between states (as those not in employment are probability really those with the least attractive characteristics). This interpretation is different for a country with low employment as it could point to rigidities or disincentives to work. Note also that high transitions should not necessary be good as in a highly segmented labour market dominated by short term contracts, this may mean that individuals regularly switch between employment and unemployment (eg Spain or France).

[19] In Figure 1A (Annex), we decompose the changes in the overall mobility index by country groupings through the contribution of mobility by individual charateristics.

reporting intermediate mobility is represented instead by the Czech Republic, Lithuania, Austria, Finland, France, Cyprus and Portugal. Spain, Cyprus and Romania recorded the highest drops in mobility since the crisis.

**Figure 5: Mobility index in the EU**
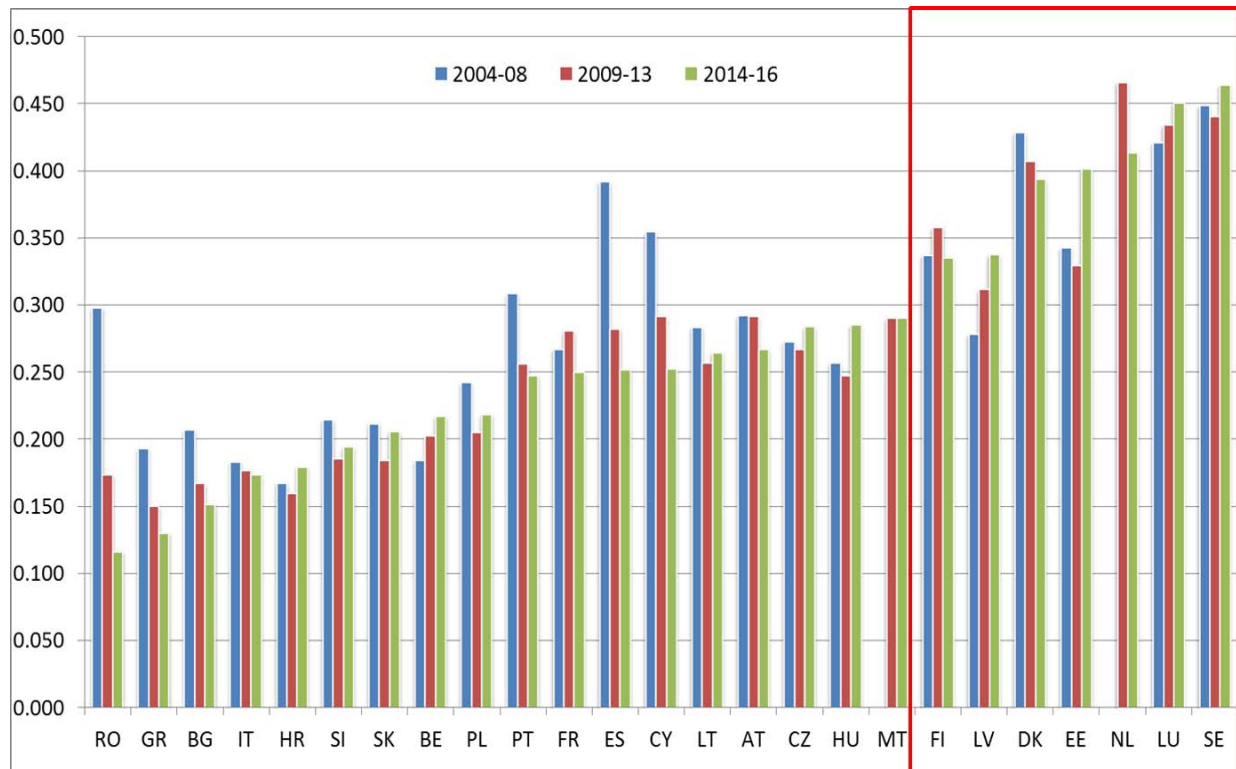


*Sources:* LFS microdata, authors' computations.

## *Transition probabilities over time and across individual characteristics*

It is possible to look deeper into these transitions/flows and mobility and examine how they differ across key individual characteristics, i.e., for different groups of workers. We do this in Figure 6, where we plot the labour market inflows and outflows by groups of worker and by looking at individual transition probabilities.

As can be seen there, the reduction in people leaving the labour market in Central Eastern European countries over the crisis was mainly driven by females, the low educated and the 55 to 64 age group. At the same time, during the crisis, these countries experienced on average a reduction in people leaving inactivity and going back
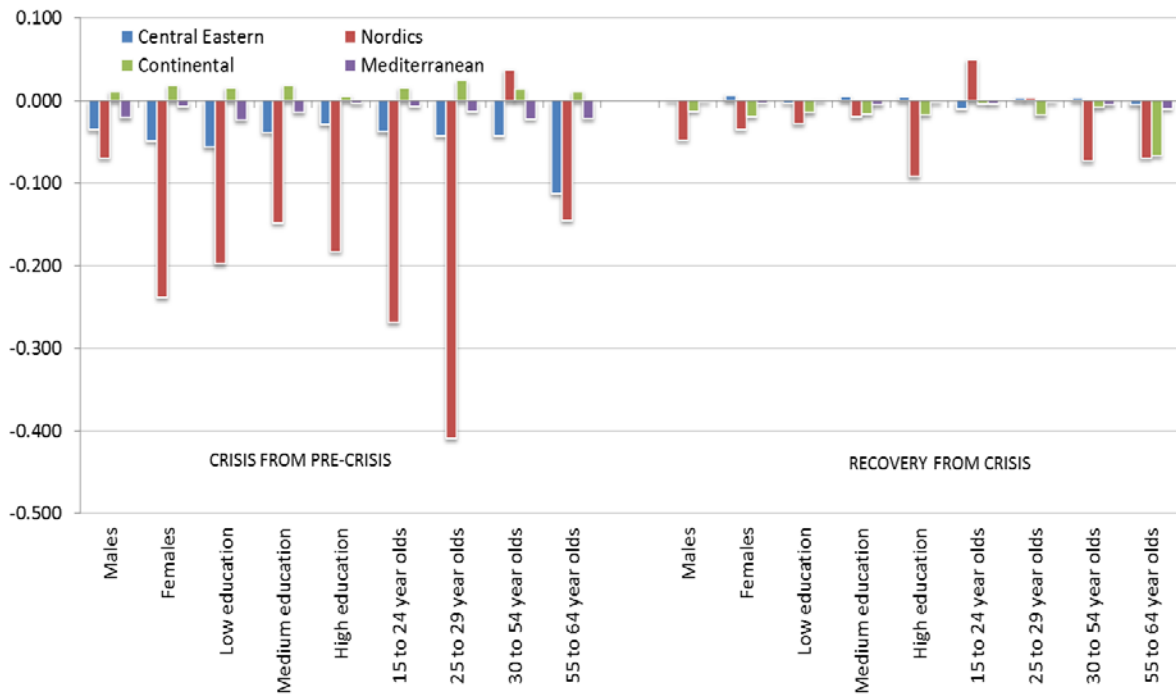
to the labour market, mainly driven by people between the ages of 25 and 29, males and high educated people.[20]

In Nordic countries, the increase in the unemployment to inactivity and, *vice versa* inactivity to employment flows, is mostly driven by people between the ages of 25 and 29. For Continental countries, the number of people transitioning from unemployment to inactivity has overall remained steady during the crisis on average. The probability of moving from inactivity to employment in Continental countries decreased overall during the crisis period, driven by the 25-29-year-olds. Finally, for Mediterranean countries, the small fall in the probability of transitioning from unemployment to inactivity is found to be quite even across the board, whereas the decrease in flows in the opposite direction is mainly driven by males, highly educated workers and young workers (15-29-year-olds).
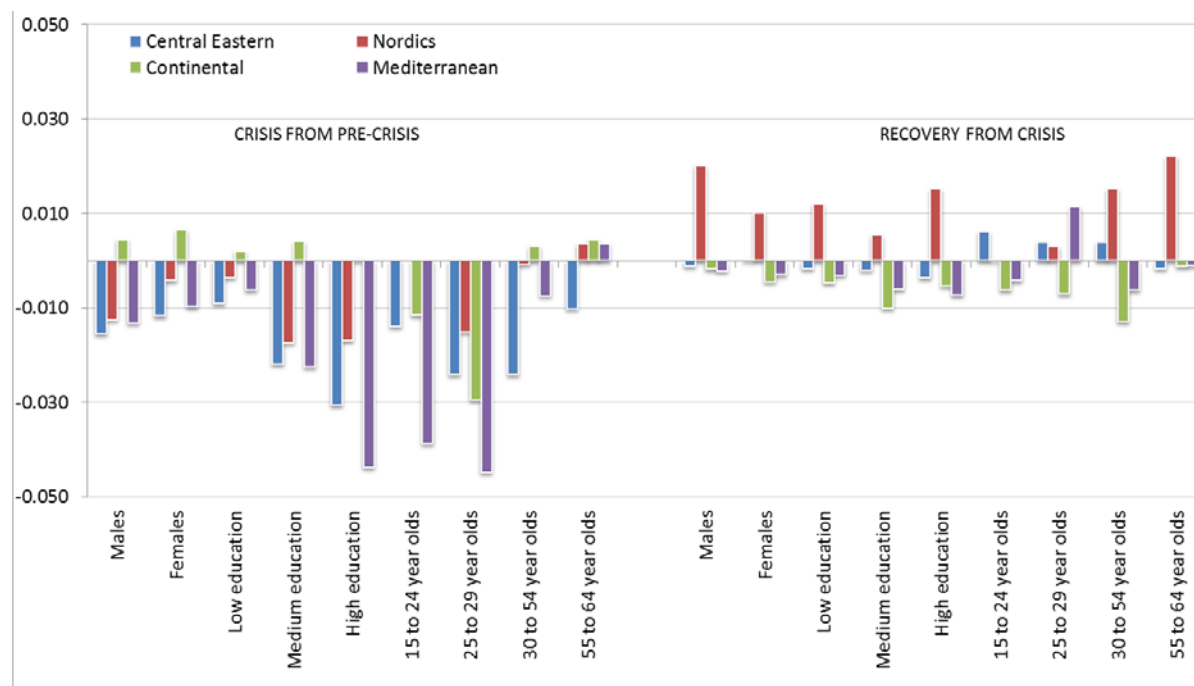
**Figure 6: Changes in the probability in and out of inactivity**

a) Changes in the probability of moving from unemployment to inactivity



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b) Changes in the probability of moving from inactivity to employment



*Note:* The left part of each chart presents the percentage change in unemployment to inactivity flows by different workers groups. Bars refer to a weighted country grouping average (Central-Eastern, Nordics, Continental, Mediterranean), where observations are weighted according to the proportion in each country over the aggregate.

*Sources:* LFS microdata, authors' computations.

Looking at the recovery, the larger movement in the unemployment to inactivity flows is recorded for the highly educated workers in the Nordic EU Countries. Nordic countries are also the ones recording the higher inactivity to employment back flows during the recovery period. In Continental and Mediterranean countries, the picture is consistent with the results in Table 2, with inactivity to employment flows not having changed significantly from the crisis or even slightly decreased.

Our analysis thus far covers the period up to 2016, the latest year for which EU-LFS microdata are available. To take a look at more recent developments, we can look at aggregate labour market transitions as reported by EUROSTAT (LFS longitudinal data), covering the period up to Q4 2017.[21] Those transitions are calculated differently from the one considered in the present study as they record the number of people leaving employment entering unemployment and viceversa, out of the actual unemployment rate. They nevertheless give us some indication of labour market mobility more recently, that complements our previous analysis. We present this information, comparing changes in transitions between 2017 and 2016, in Figure 7. Orange bars

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[21] The use of this data is also important to us given the recent efforts of Eurostat to provide timely statistics on labour market transitions.

present the percentage change in employment to unemployment transitions (as a fraction of the unemployment rate). Blue bars record flows in the opposite direction. Those changes are calculated as 2017 (last quarter) minus 2016.

As observed, the transitions as a percentage of the unemployment rate have increased overall during the last year in all countries, with the exception of Estonia. Transitions in the opposite direction (where available), have, on the contrary, not changed during the last year (hence a difference of zero), with very few exceptions, including Slovakia, Italy, Estonia and Bulgaria, for which those transitions have fallen.

**Figure 7: Difference in the transitions (%unemployment rate) between 2017 and 2016**
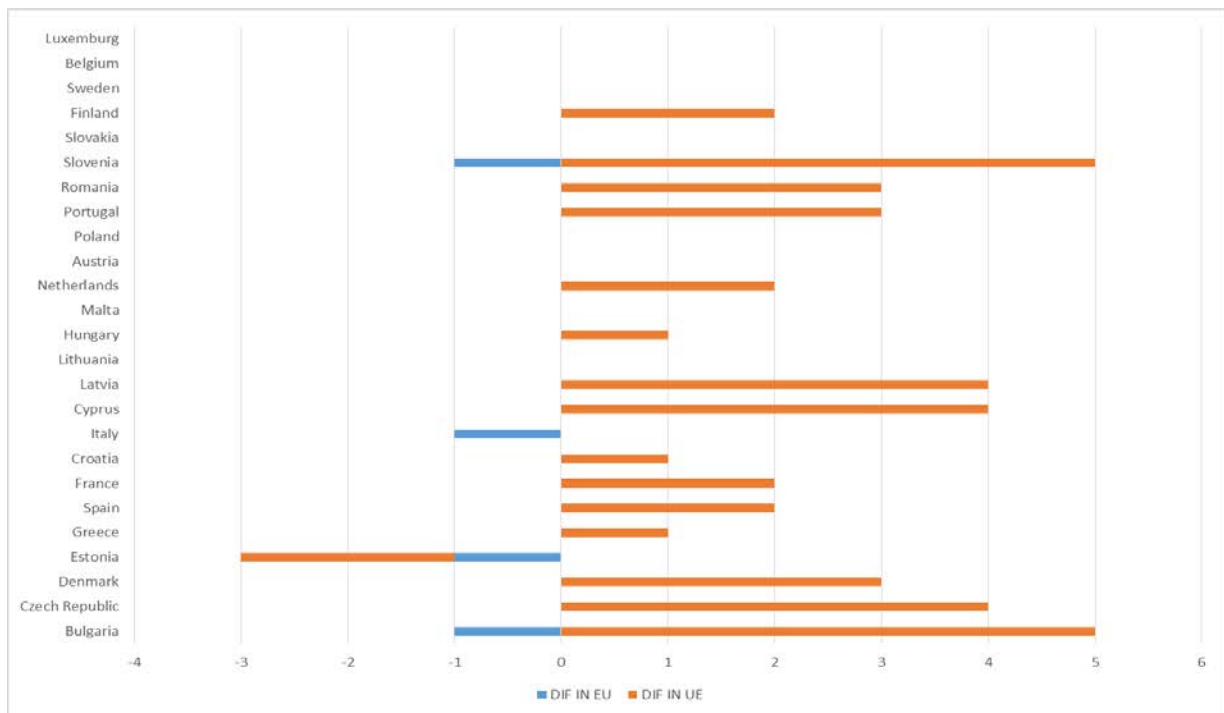


*Note:* The orange bars present the percentage change in employment to unemployment transitions (as a fraction of the unemployment rate). Blue bars record flows in the opposite direction. Those changes are calculated as 2017 (last quarter) minus 2016.

*Sources:* EUROSTAT website data (labour market transitions - LFS longitudinal data)

### Labour mobility by worker group

Decomposing the results for mobility by worker group shows that the chance of unemployed youths finding a job is in all countries much higher than for older groups. Analogously, the probability to remain in unemployment is found to increase with age and is highest for individuals with lower educational attainment. In particular, the overall findings in Table 3 can be summarized as follows:

○ Unemployment persistence increases with age and with education. The opposite holds true for the probability of finding a job. A pattern by gender is also

observed, with female workers normally displaying higher unemployment persistence and lower probability of finding a job.

- The crisis has made it harder to find a job and increased the unemployment persistence for all worker groups in Continental and Mediterranean countries.

- Such a pattern is less visible in the Nordics. In the latter group, the probability of finding a job has increased across the board with the recovery in 2014-16.

**Table 3: Mobility index over time and across individual characteristics**

|  |  | Central Eastern | Nordics | Continental | Mediterranean |
|---|---|---|---|---|---|
| Total | 2004-2008 | **0.252** | 0.218 | 0.261 | **0.267** |
|  | 2009-2013 | 0.212 | **0.437** | **0.273** | 0.219 |
|  | 2014-2016 | 0.217 | 0.414 | 0.251 | 0.205 |
| Males | 2004-2008 | **0.249** | 0.206 | 0.255 | **0.265** |
|  | 2009-2013 | 0.210 | **0.412** | **0.260** | 0.208 |
|  | 2014-2016 | 0.212 | 0.387 | 0.243 | 0.197 |
| Females | 2004-2008 | **0.258** | 0.230 | 0.268 | **0.273** |
|  | 2009-2013 | 0.217 | **0.461** | **0.288** | 0.231 |
|  | 2014-2016 | 0.224 | 0.440 | 0.260 | 0.215 |
| Low-education | 2004-2008 | **0.224** | 0.197 | 0.228 | **0.245** |
|  | 2009-2013 | 0.192 | **0.423** | **0.237** | 0.202 |
|  | 2014-2016 | 0.188 | 0.409 | 0.216 | 0.184 |
| Medium-education | 2004-2008 | **0.276** | 0.237 | 0.285 | **0.305** |
|  | 2009-2013 | 0.225 | **0.466** | **0.301** | 0.253 |
|  | 2014-2016 | 0.225 | 0.430 | 0.270 | 0.236 |
| High-education | 2004-2008 | **0.347** | 0.246 | 0.348 | **0.371** |
|  | 2009-2013 | 0.299 | **0.476** | **0.354** | 0.301 |
|  | 2014-2016 | 0.303 | 0.452 | 0.329 | 0.288 |
| 16-24 year olds | 2004-2008 | **0.330** | **0.635** | 0.393 | **0.352** |
|  | 2009-2013 | 0.293 | 0.588 | **0.395** | 0.296 |
|  | 2014-2016 | 0.301 | 0.549 | 0.380 | 0.292 |
| 25-29 year olds | 2004-2008 | **0.384** | **0.608** | 0.476 | **0.412** |
|  | 2009-2013 | 0.341 | 0.569 | **0.472** | 0.366 |
|  | 2014-2016 | 0.359 | 0.580 | 0.446 | 0.367 |
| 30-54 year olds | 2004-2008 | **0.257** | 0.460 | **0.472** | **0.275** |
|  | 2009-2013 | 0.212 | **0.471** | 0.446 | 0.238 |
|  | 2014-2016 | 0.222 | 0.450 | 0.288 | 0.226 |
| 55-64 year olds | 2004-2008 | **0.265** | 0.307 | 0.209 | **0.218** |
|  | 2009-2013 | 0.191 | **0.406** | **0.225** | 0.199 |
|  | 2014-2016 | 0.179 | 0.351 | 0.186 | 0.178 |

*Notes:* Measures are based on the Shorrocks' mobility index (mobility is higher the closer the index is to 1). Observations are weighted according to the GDP share in each country over the aggregate. Highest mobility indexes for each sub-category across the periods are in bold.

*Sources:* LFS microdata, authors' computations.

The mobility index also confirms that, in Continental countries, mobility was particularly high for people below 54 and highly educated people, and has overall increased over the crisis, as the result of a lower likelihood to remain in employment, unemployment and inactivity.

**Figure 8: Mobility index by worker group**

*(2004-08)*



*(2014-16)*
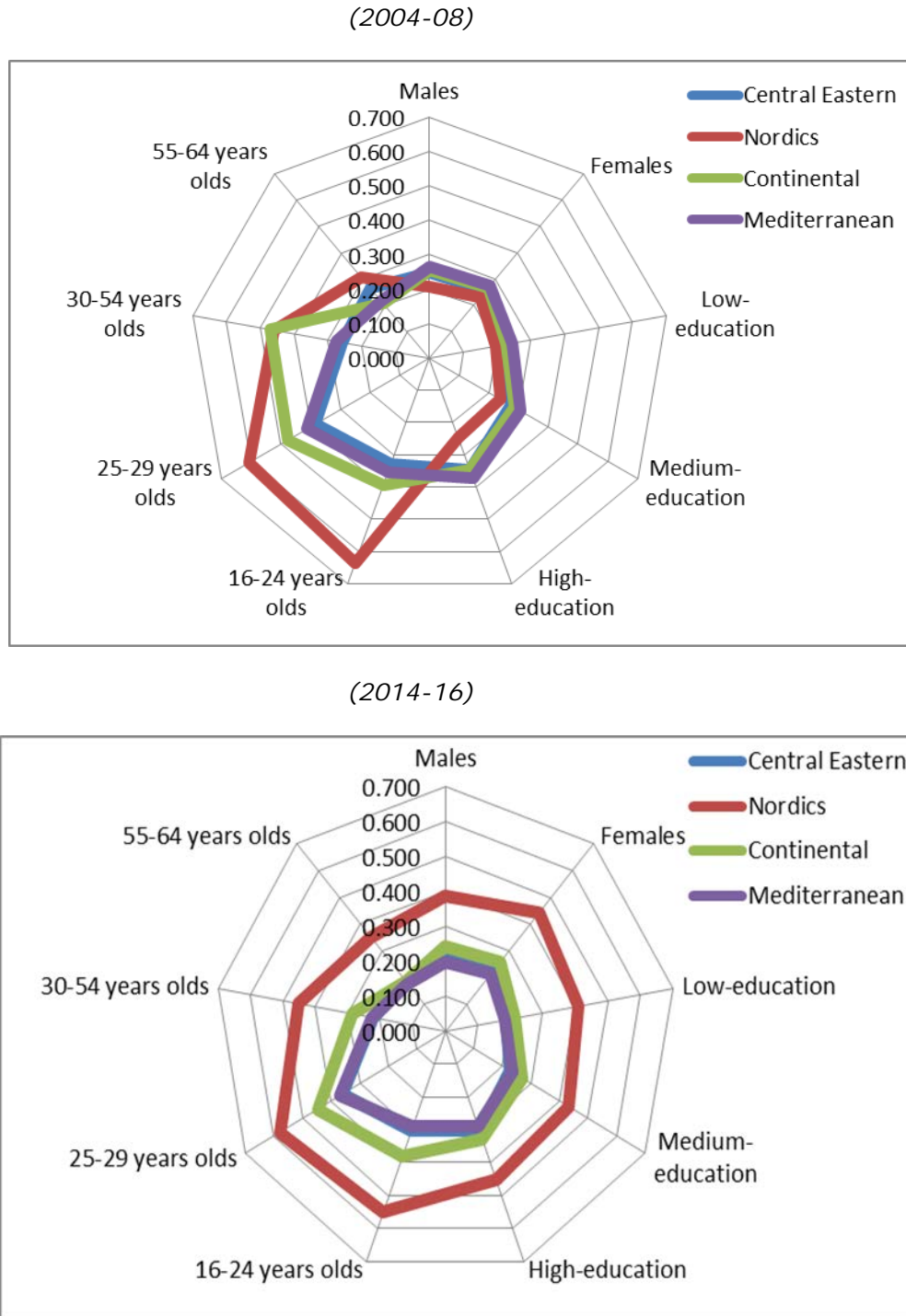


*Sources:* LFS microdata, authors' computations.

From Table 3, in Nordic countries, people between the ages of 16-24 are the most mobile on average albeit their mobility has decreased over time, particularly during the crisis. Such behaviour is always driven by a lower probability of remaining in employment, unemployment and inactivity compared to Continental and Mediterranean countries (see Table 2A - Annex). In Nordic countries, highly educated individuals generally display both a higher probability of remaining in employment and a lower probability of remaining in unemployment and inactivity over time, while female workers display a lower probability of remaining in both employment and unemployment over time[22] (Table 2A). In Central Eastern European countries mobility is higher for females, highly educated people and workers between the ages of 25 and 29, though this pattern has overall decreased over time. In these countries, the higher mobility of women is driven by a lower probability of remaining in employment and unemployment over time. Highly educated individuals in the Central Eastern EU countries are more mobile through a lower probability over time of remaining in inactivity and unemployment.

Table 3 also shows that on average highly educated individuals and people between the ages of 25-29 are the most mobiles across labour market statuses. Moreover, while for Denmark, Sweden, the Continental and Mediterranean counties mobility of all worker groups has increased over the last decade (particularly for females), there is no clear pattern for the disaggregated Central Eastern European countries (Table 2A).

Decomposing the changes in the mobility index by worker groups finally suggests that labour markets have started to pick up again on average starting from 2013, with positive developments in mobility being largely evident across the board. The decomposition of the mobility index also makes clear the drop in mobility started in 2007 with some pattern evident in some countries. For instance, part of the drop in Continental and Mediterranean countries is explained by a fall in the mobility of the 55-64-year-olds (possibly also explained by retirement patterns).

The mobility index by worker groups suggests an overall increase of mobility in the Nordics since the crisis but not elsewhere (Figure 8). Although examining this in much depth is beyond the scope of this analysis, from Table 1 we can deduct that this is probably related to the increase in flows from employment into unemployment as well as from inactivity into both unemployment and employment.

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[22] It should be noted, however, that successful exits of females from unemployment into employment are typically lower than those of males. This is because females also have a higher probability of moving from unemployment into inactivity compared to males.

## *Job stability and labour market churn*

As was shown earlier, the analysis of labour market transitions returns a rather high persistence of employment statuses (employment-to-employment transitions) for all countries/country groups and years/periods. Of course, this measure of employment persistence may be masking a potentially significant amount of labour market churn (job-to-job moves), as it incorporates both cases where individuals have remained in the same job between periods t and t+1 (job stability) and cases where individuals have been employed in both periods but have changed jobs (churn).[23] To examine the relative size of these two components, we implement in this sub-section a decomposition of the overall proportions of employment persistence into these two components. We start by presenting year-on-year results selectively for some exemplary cases, being predominantly interested in depicting the range of experiences with regard to job stability and labour market churn over time across the EU than in providing a full analysis of these. Subsequently, we present the two components for each of the EU countries but aggregated over periods.

**Figure 9: Employment persistence, job stability and LM churn in selected countries.**



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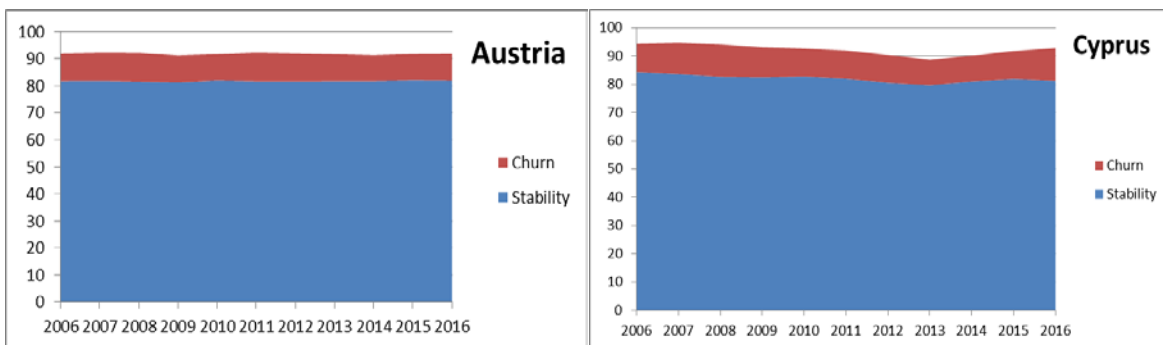
[23] We separate between job-stability and 'churn' on the basis of an individual's job tenure. Specifically, individuals who are employed in both periods but report that they are with the same employer as one year ago, are classified into the 'job-stability' category. All other individuals who were in employment in both periods are included in the 'churn' category, as they have self-reportedly changed employer but not employment status.
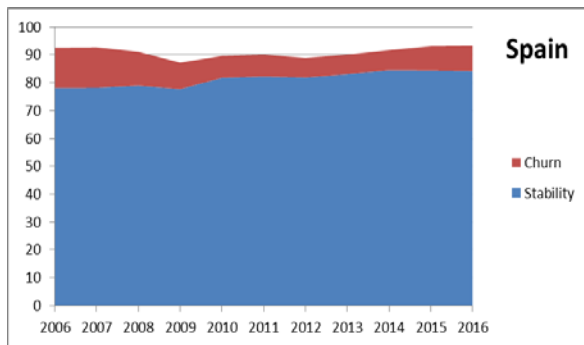
Spain

Starting with the year-to-year analysis, Figure 9 depicts the evolutions of total employment persistence and its two components for the three cases of Austria, Cyprus and Spain. Austria represents the case of a country where both churn and stability have remained rather constant throughout the period. Similar are the cases of Belgium, Italy, Malta and Poland. Cyprus represents instead a case where stability fluctuated with the crisis, but churn remained rather constant – similarly with Greece, Portugal and to a lesser extent Estonia. Last, Spain represents a case where overall employment stability remained rather constant but where labour market churn showed sizeable fluctuations with the crisis (in the case of Spain, from 14.4% in 2006/07 to 7% in 2012/13). All in all, these patterns suggest that the degree of job-stability and labour market churn, as well as their dynamics over the economic cycle, have not been uniform across countries.

**Figure 10: Employment persistence, job stability and labour market churn by period**



Churn and job-stability, pre-crisis
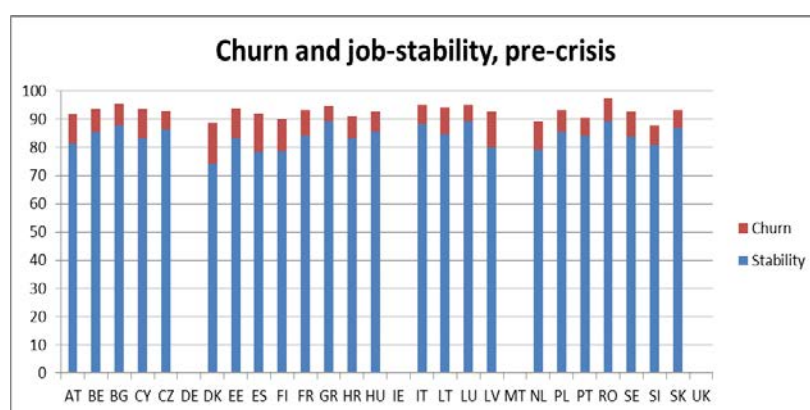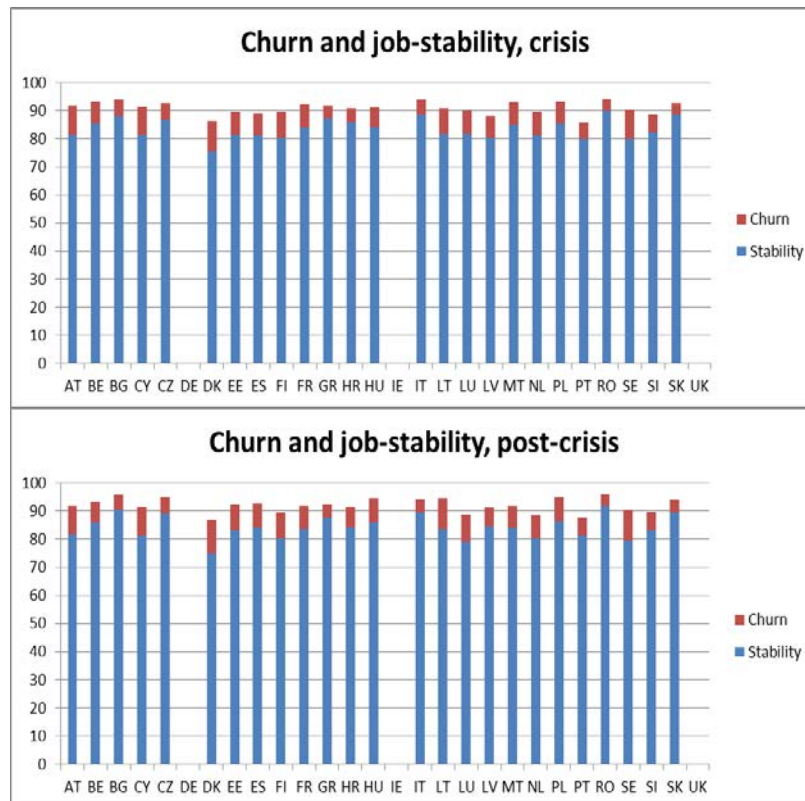
*Sources:* LFS microdata, authors' computations.

In Figure 10, we depict the components of job-stability and labour market churn for each country across the three periods. As can be seen, and as was noted earlier, overall employment persistence has remained quite high across periods. The degree of labour market churn seems to have declined in most countries during the crisis period and to have recovered only partially post-crisis. Heterogeneity across countries also seems to have declined during the crisis, especially in the degree of labour market churn, but it has increased again post-crisis. Post-crisis, countries such as Slovakia, Italy, Greece and Romania emerge as the ones with the lowest rates of labour market churn, although in all cases the overall degree of employment persistence (and thus also the degree of job-stability) is amongst the highest.

### *Decomposing employment categories*

By looking at the extent of transitions between part-time, full-time and self-employment, we notice a high state persistence of the occupation type, by conditioning on the number of hours or employment status – be it employed or self-employed. This persistence was accentuated during the crisis.

# Figure 11: Changes in transition probabilities over time by part-time/full-time self-employed

a) Crisis (2009-13) minus pre-crisis (2004-08)
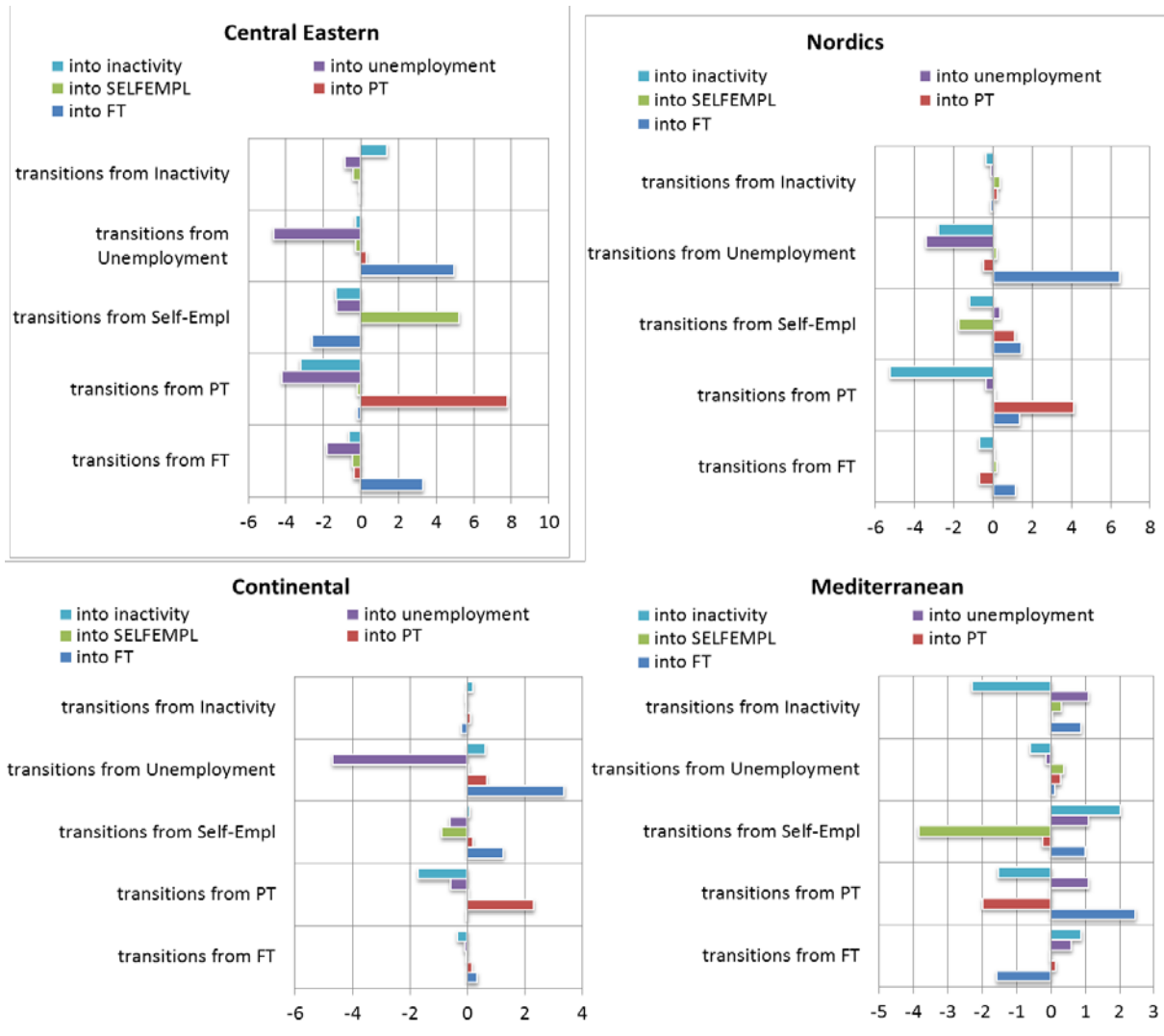
b) Recovery (2014-16) minus crisis (2009-12)
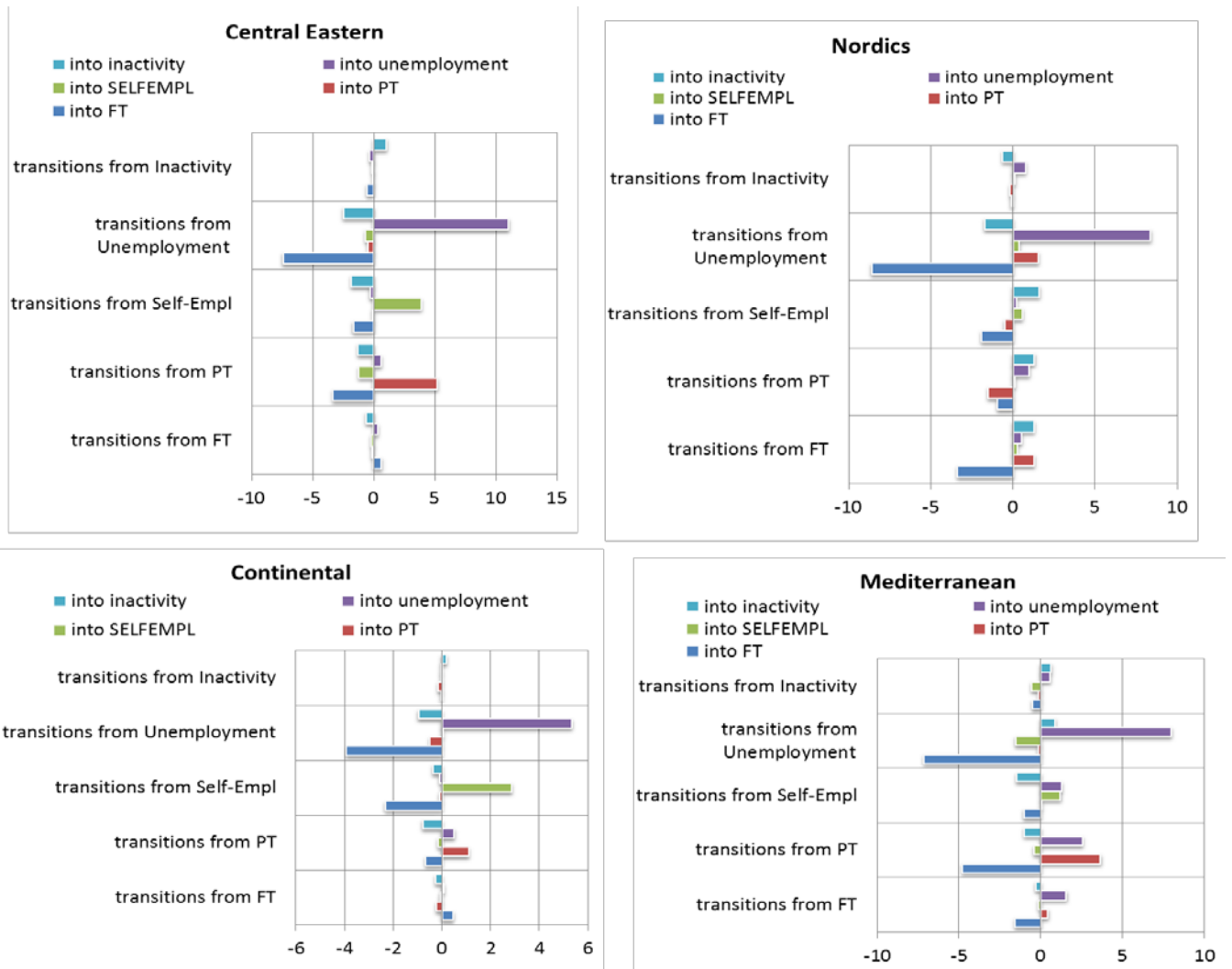


*Sources:* EU-LFS microdata, authors' computations. FT = Full-time ; PT = Part-time

In the order, part-time workers have the highest probability to move into unemployment and inactivity. These are followed by full-time workers and self-employed. This trend was accentuated during the crisis, particularly in some country groupings. Interestingly, part-timers have a higher probability than self-employed to move into full-time jobs.

During the crisis, unemployed workers had a higher probability to find a full-time job, rather than a part-time one (Figure 11). This is surprising, given the current role played by reduced-hours jobs during recessions. The evidence in favour of labour market adjustment on the number of hours is visible only for the Mediterranean countries, and not much anywhere else.

In terms of occupations, we finally split the data into occupation groups (Table 4), following the ISCO (COM) International Standard Classification.

**Figure 12: Transitions into unemployment and inactivity from different occupation sectors**
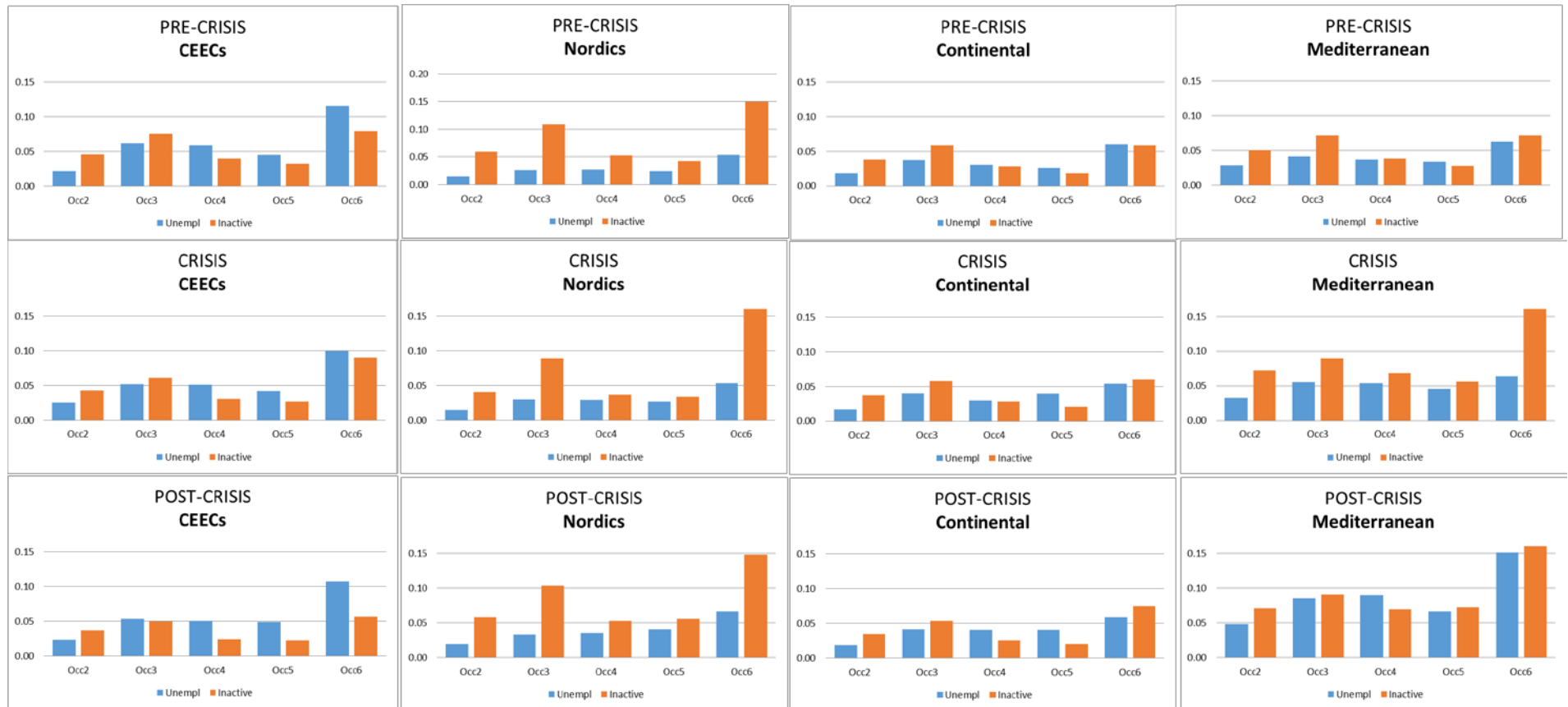


*Source*: Authors' computations based on the EU-SILC data and the ISCO-88 (COM) International Standard Classification

**Table 4: Occupation categories in the EU-SILC data**

| |
|---|
| Equals 1 if the individual belongs to armed forces (OMITTED) |
| Equals 2 if the individual belongs to legislators, senior officials and managers, professionals, technicians and associate professionals or clerks. |
| Equals 3 if the individual belongs to service workers and shop and market sales workers, skilled agricultural and fishery workers. |
| Equals 4 if the individual belongs to craft and related trades workers. |
| Equals 5 if the individual belongs to plant and machine operators and assemblers. |
| Equals 6 if the individual has an elementary occupation. |

*Source*: EU-SILC data based on the ISCO (COM) International Standard Classification

In almost all countries (Figure 12), people in particular occupation sectors, particularly elementary occupations, Occ6, and to a lesser extent service works and people in skilled agricultural or fisheries work display a higher probability to move into inactivity. This figure is consistent across countries. A worsening of inactivity rates for these occupation categories has been observed during the crisis. For Mediterranean countries, there is no hint at a trend-reversal in the post-crisis period; on the contrary transitions into inactivity as well as unemployment seem to have increased even if not marginally much more.

In terms of transitions out of unemployment and inactivity by occupations, legislators, senior officials and managers, professionals, technicians and associate professionals or clerks (Occ2) record the highest transitions out of unemployment – for CEECs (0.6), Nordics (0.14), Continental (0.10). For Mediterranean countries, the number fluctuates between 0.8 and 0.10, with this probability not having improved much post-crisis.

## 7. LOOKING BEYOND

### *Long-run counterfactuals*

The transitions and flows presented so far give a static picture of the short-run (year-on-year) dynamics of the EU labour markets. As was noted in the methodology section, we can use these short-run dynamics to draw inferences about the *long-run* dynamics of the different labour markets (i.e., the steady-state equilibrium implied by these dynamics) as well as, subsequently, to examine the differences of these dynamics

across countries. To do so, we rely on the reported transition matrices to calculate the long-run equilibrium. The latter is the outcome distribution (shares of employment, unemployment and inactivity) resulting from raising each transition to a power – let's call it $n$ – such that the resulting distribution is stable for any power $n+k$ (with $k>0$), i.e., it remains stable for all subsequent periods (this is the notion of steady state). In this analysis, the value of $n$ – or the power required to reach steady-state – is an indication of the speed of convergence to equilibrium. This tends to vary across countries, suggesting that different countries are to different degrees at a distance from their equilibrium. To demonstrate this variation, in Figure 13 we focus on the case of unemployment and plot, for each country, the derived long-run equilibrium rate of unemployment against the actual unemployment rate observed in the data.[24] It should be noted that the equilibrium unemployment rates are derived for each year, based on the EU-LFS transition matrix observed in that year. This further allows us to observe how equilibrium unemployment changes year-on-year on the basis of changes in the transition dynamics in each country under study.

As can be seen, there are important country variations in all three aspects: the level of equilibrium (and actual) unemployment; the temporal evolution of equilibrium (and actual) unemployment; and the distance between equilibrium and actual unemployment. For countries such as Austria, Belgium, Cyprus (until 2013), Greece (until 2012), Croatia, Hungary, Italy and perhaps Portugal (until 2009), equilibrium unemployment follows quite closely actual unemployment – suggesting that the actual level of unemployment in these countries is not due to (transitory) deviations for equilibrium but rather possibly due to structural factors. In contrast, for countries such as Bulgaria, the Czech Republic, Denmark, Estonia, Spain, Finland, France, Luxemburg, Malta and the Netherlands (as well as for a subset of other countries post-crisis), actual unemployment is – and, sometimes, importantly so – above the equilibrium.

For these countries, the evidence suggests that adjustment dynamics inside the labour market (mobility across statuses) play, at least in part, some role in accounting for the level of unemployment. It is worth noting also the case of Slovenia (and Italy), where actual unemployment appears to have been for a prolonged period *below* its equilibrium

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[24] The notion of long-run equilibrium here relates to the idea of Markov Chains, i.e., of 'memoryless' changes in a distribution over time. As was explained in the 'methodology' section, by applying the observed transition dynamics on the initial distribution of employment, unemployment and inactivity, one can derive in a steady-state ('ergodic') distribution where future iterations of the same transition dynamics do not change the shares of employment, unemployment and inactivity. The whole idea relies on the absence of any shocks or changes in fundamentals (which would of course alter the transition dynamics). In this sense, the notion of equilibrium used here is very different from the notion of "equilibrium unemployment" as defined, for example, in the NAIRU literature.

level – indicating structural conditions in the labour market which contributed to dampening unemployment. It is also interesting to note that deviations from equilibrium (of the adverse form) are not systematically higher in countries known for their relatively poor labour market performance (e.g., such as Greece or Spain): in fact, pre-crisis, countries such as Luxemburg, the Netherlands and Sweden had larger deviations than those observed in any of the Mediterranean countries (Portugal, Italy, Greece and Spain, in particular).

**Figure 13: Actual and steady-state unemployment rates**
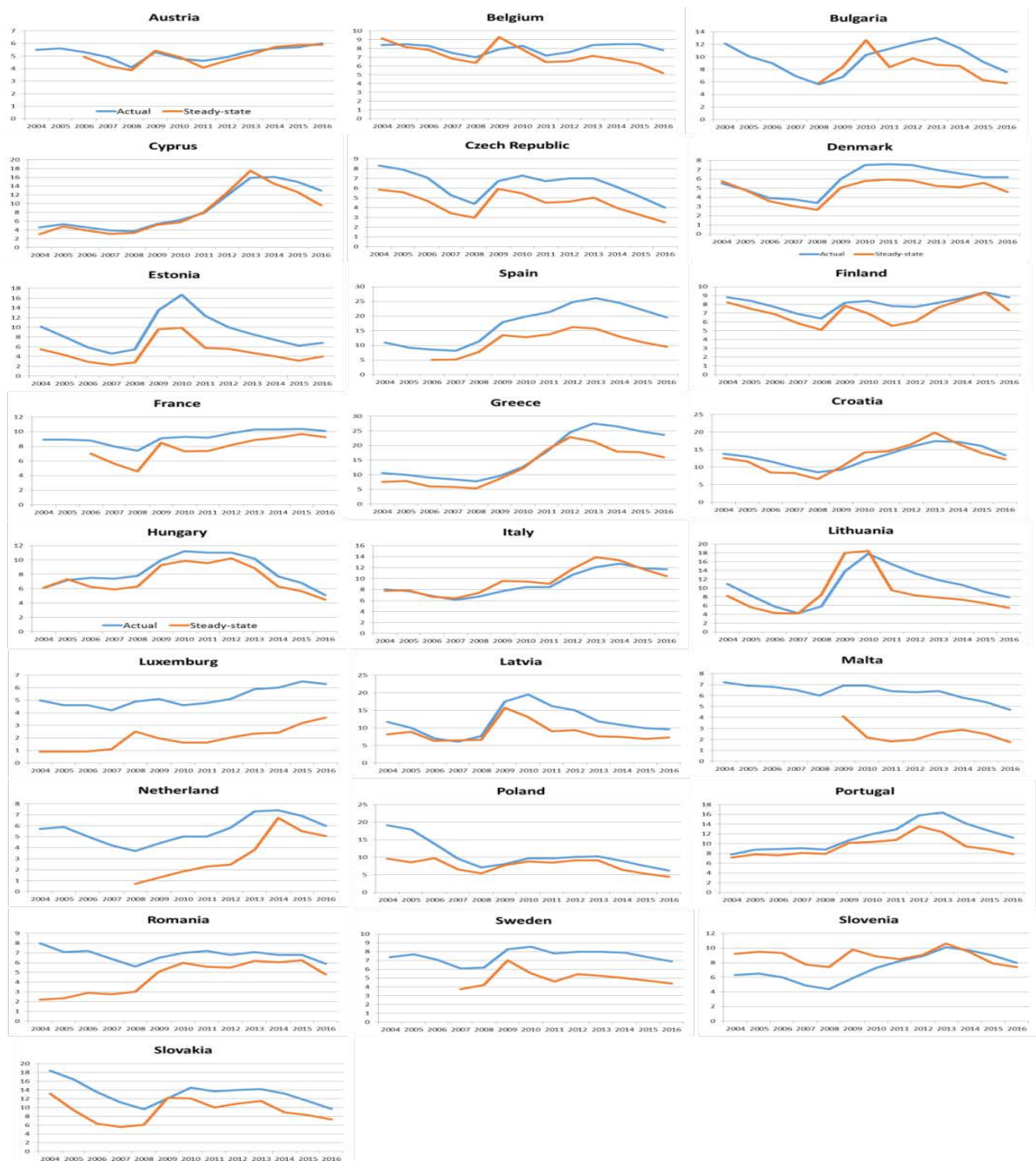


*Sources:* LFS microdata and Eurostat aggregate unemployment data. Authors' computations.

To examine further how transition dynamics contribute to the dynamics of unemployment, we can implement a counterfactual exercise, as presented in Figures 14 and 15. The exercise relies on constructing a hypothetical unemployment distribution towards the steady-state path for each country (or country grouping), on the basis of the transition dynamics observed in a selected reference country, and then calculating the distance (unemployment differential) between the actual and hypothetical distributions. Specifically, as a first step, we apply iteratively over five years the transition dynamics of the reference country to the actual distribution of labour market statuses of each of our countries, so as to derive the counterfactual distribution of labour market statuses in t+5. Then, we calculate the same distribution (in t+5) using the same initial distribution but the country specific (actual) transition dynamic. Our last step is to calculate the difference between the two distributions: this gives us the amounts of employment, unemployment and inactivity (in percentage points) that would have shifted in a 5-year period if each country had the transition dynamics of the reference country.

**Figure 14: counterfactual steady-state distribution**
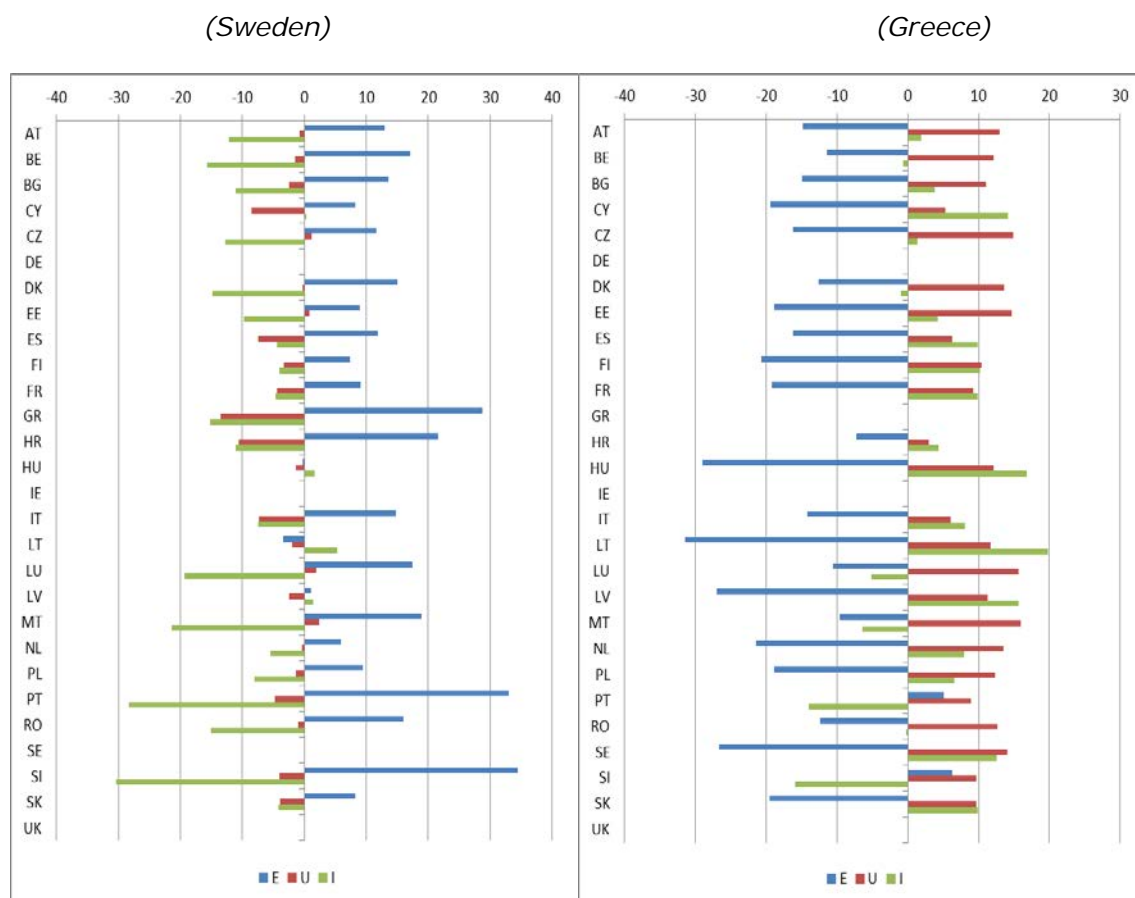


(Sweden)          (Greece)

*Sources:* LFS microdata, authors' computations.

In Figure 14 we report the result from two such exercises, one using the transition dynamics of Sweden as the reference point (left panel) and one using the transition dynamics of Greece (right panel), focusing exclusively on the post-crisis period. Similarly, in Figure 15 we use the transition dynamics of the Nordic group and apply them to the actual distributions of the other country groups, this time for both the crisis and post-crisis periods. As can be seen in Figure 14, transition dynamics play a very important role in equilibrium unemployment. With the exception of Hungary and Lithuania, if the EU countries had the transition dynamics exhibited by Sweden in the post-crisis period, they would have a much better employment performance (in equilibrium terms); while a large majority of countries would also have lower equilibrium unemployment (exceptions include the Czech Republic, Malta, Estonia and Luxemburg). At the extreme, in countries such as Greece, Croatia, Portugal and Slovenia, equilibrium employment could be higher by over 20 percentage points. As is evident from the graph, the main factor driving these results is the far superior performance of Sweden with regard to labour force participation, implying much lower counterfactual inactivity rates in practically all countries (with Hungary and Latvia constituting marginal exceptions). In turn, when using Greece as the counterfactual the picture reverses almost fully. This time, with few exceptions, the transition dynamics of Greece produce more unemployment and inactivity and less employment.

**Figure 15: counterfactual steady-state distribution by country groupings (counterfactual: EU Nordics)**
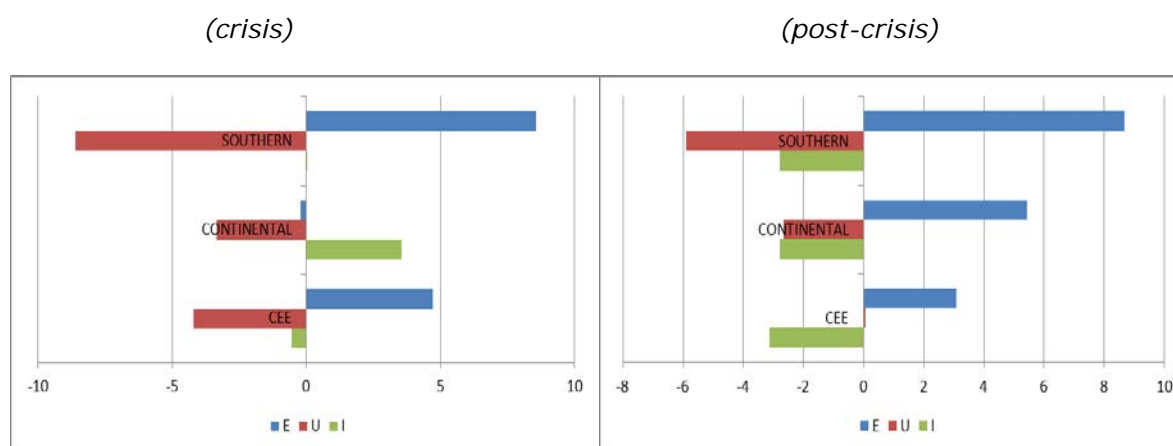


*Sources:* LFS microdata, authors' computations.

Similarly, in Figure 15 we see that the transition dynamics observed for the Nordic countries also have the tendency to produce superior labour market outcomes in the rest of the EU, especially in the post-crisis period. For the crisis period, the counterfactual produces less unemployment in all three country groups but it produces more employment only in the Southern (Mediterranean) and CEE groups; for the Continental

group, the difference shows instead as increased inactivity. For the pre-crisis period, instead, counterfactual employment outcomes are better everywhere, ranging between 3% in the CEE group and 8% in the Mediterranean group), while inactivity appears universally lower by around 2.5-3 percentage points.

## *Structural indicators*

Having established in some detail the extent and types of labour market turnover in the EU, in this section we complement this information by looking at macroeconomic trends in mobility together with the evolution of structural indicators (EPL, product market regulation, etc.). Our objective is to understand whether part of the observed changes in mobility can be broadly restraint to some "macro" explanatory factors. This would also help explain what is behind such heterogeneity in mobility indexes and feeds the discussion of the policy implications stemming from our findings.

The mobility observed in some countries can be linked to the use of time-limited contracts and part-time work, and viceversa. Figure 16 (a) shows that broadly speaking those countries where mobility increased over time are also those where the percentage of part-time work increased. However, the correspondence is not one-to-one. In addition, we find the usual negative relationship between the unemployment rate and mobility, with such a relationship becoming stronger with the crisis (b). This suggests the fact that a high degree of labour market turnover is not necessarily benefiting labour markets, to the extent that those movements interact with shifts out of employment, and into unemployment and inactivity. Focusing on structure indicators in Figure 16 (c), (d), (e) and (f) mobility does not seem to be related with the strictness of Employment Protection Legislation (EPL), however, measured. We find evidence instead of Product Market Regulations (PMR) not being positive related to labour market turnovers (panel c).[25] Some active labour market policies did not interact with mobility either, with the exception of employment incentives, which positively correlate with mobility indices across countries.

The results herein need to be taken with care, however, as they are based on an unconditional cross-plot among two indicators. While it is beyond the scope of this report, possibly, a multivariate analysis with more than one factor explaining mobility at once would deliver a more complete picture.

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[25] PMR is a composite indicator produced by the OECD to measure the extent to which product market regulations (such as licensing) introduce rigidities to the economy (product market). There is wide evidence in the literature that often rigid product markets pose more constraints to economic adjustment and growth than rigidities observed in the labour market. Our results here are in line with this received wisdom.

# Figure 16: Structural indicators across the EU

(a)    Mobility and share of part-time contracts
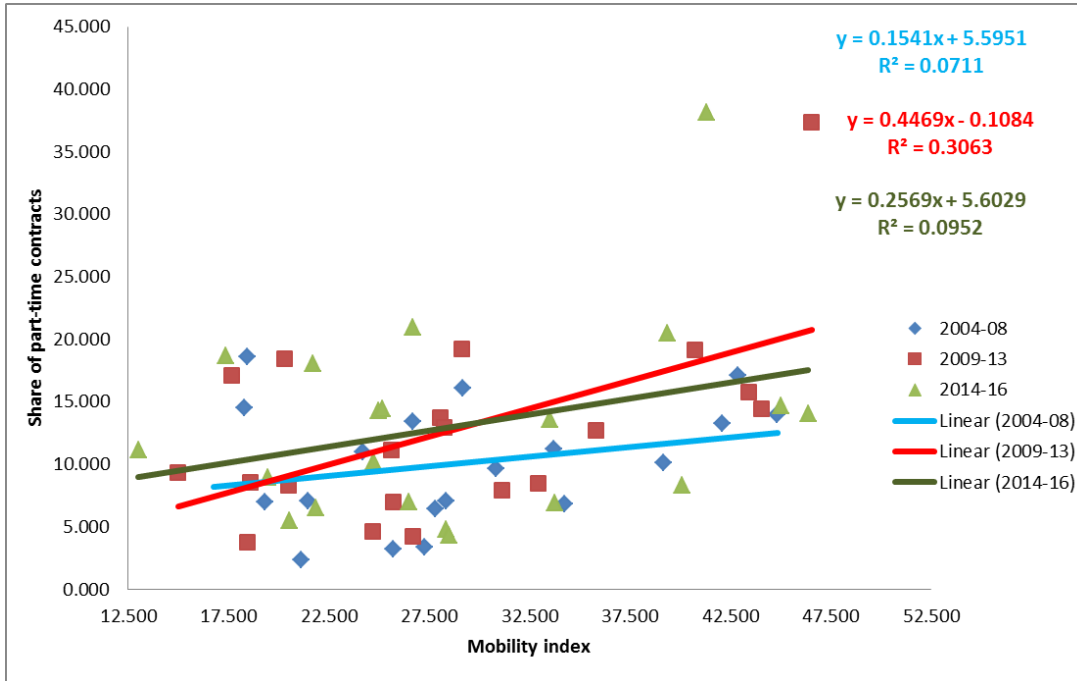


(b)    Mobility and unemployment rate
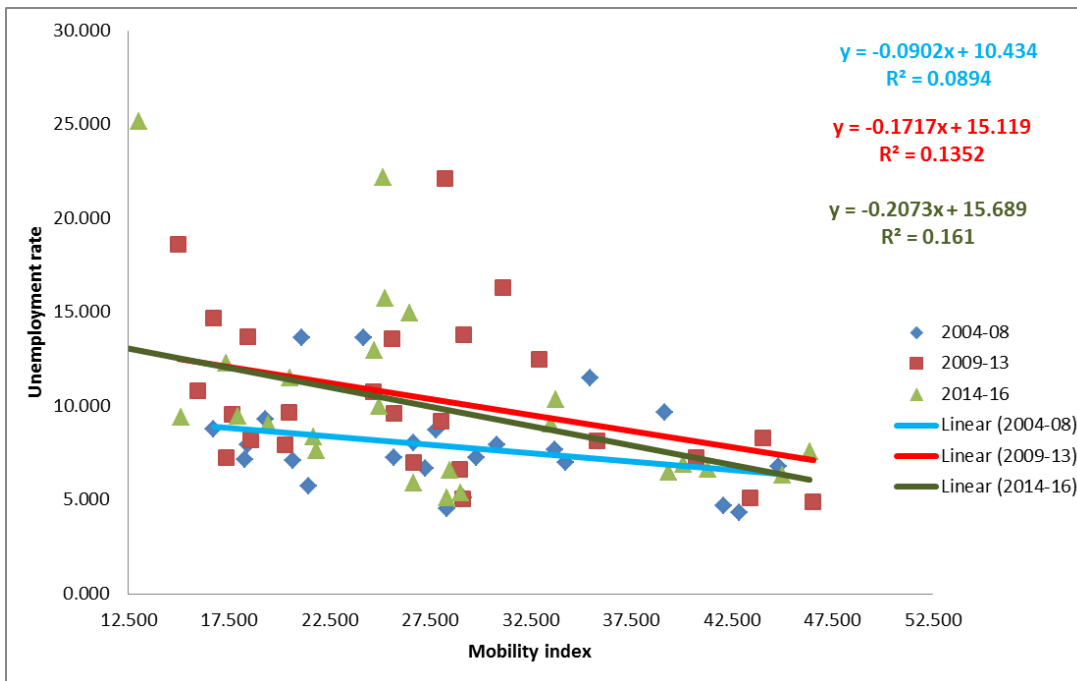
(c)     Mobility and Product Market Regulation (PMR)



$y = -0.0219x + 2.5095$
$R^2 = 0.3557$

$y = -0.0198x + 2.1293$
$R^2 = 0.4892$

$y = -0.0116x + 1.7762$
$R^2 = 0.2336$

Legend:
- 2004-08
- 2009-13
- 2014-16
- Linear (2004-08)
- Linear (2009-13)
- Linear (2014-16)

PMR (y-axis), Mobility index (x-axis)
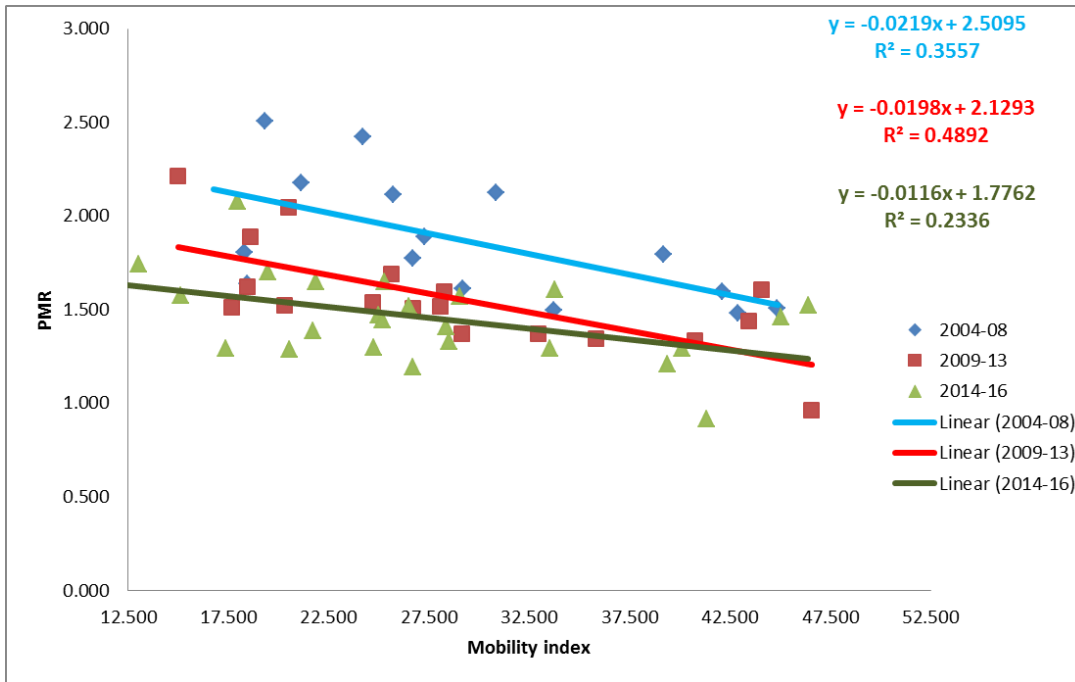
(d)     Mobility and Strictness of Employment Protection Legislation (EPL)



$y = -0.1368x + 2.5858$
$R^2 = 0.0004$

$y = 0.0948x + 2.4209$
$R^2 = 0.0004$

Legend:
- 2004-08
- 2009-13
- 2014-16
- Linear (2004-08)
- Linear (2009-13)

EPL - individual dismissals (y-axis), Mobility index (x-axis)
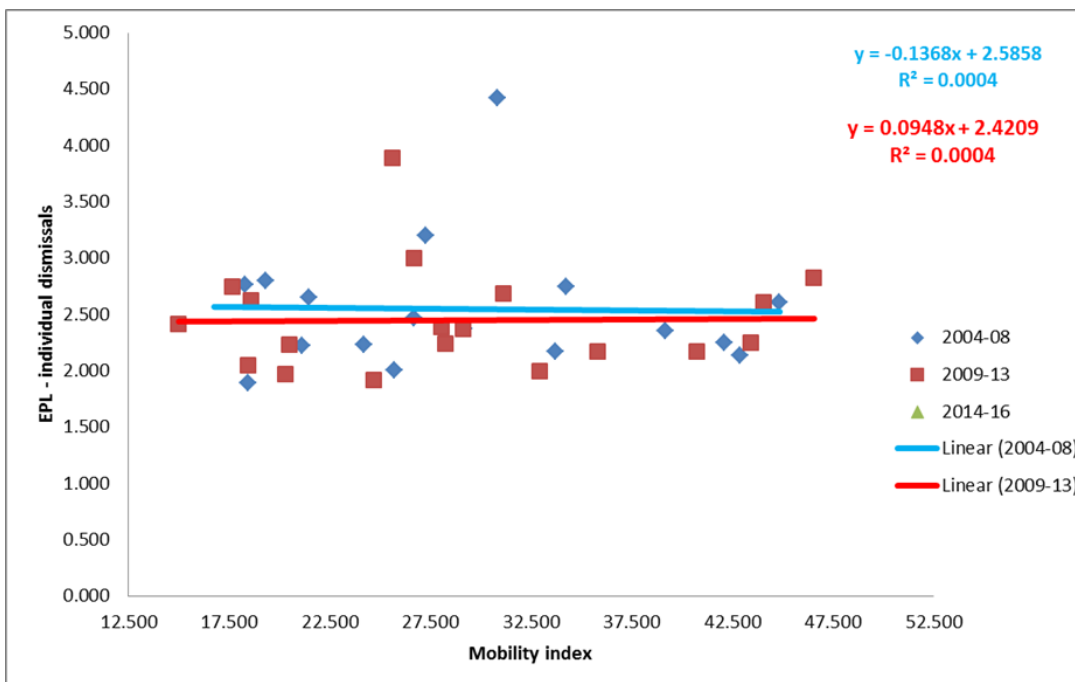
(e)      Mobility and Out of work maintenance scheme
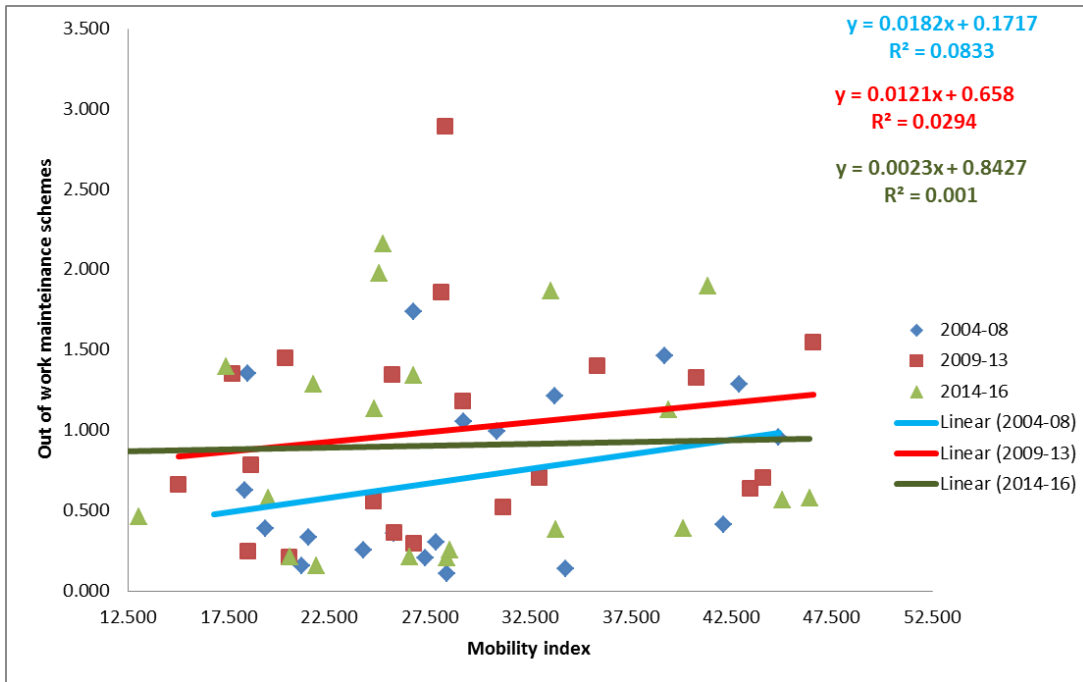


(f)      Mobility and employment incentives
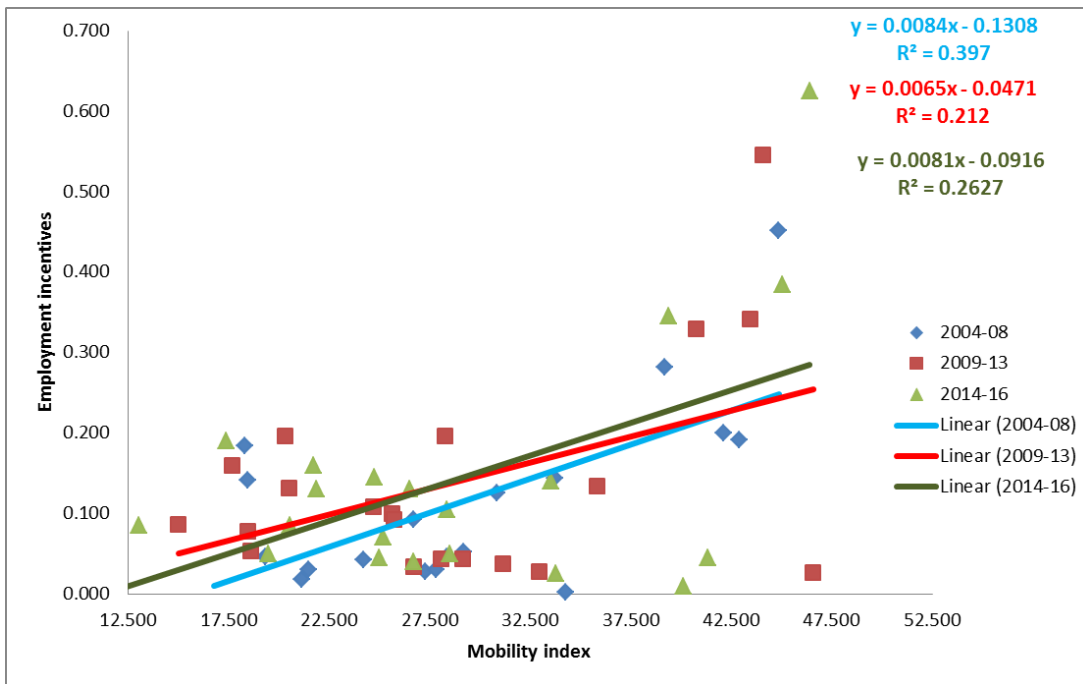


*Sources:* LFS microdata and OECD.Stat. Authors' computations.

## 8.   CONCLUSIONS

The frequency at which individuals change their labour market status – and, inversely, the persistence of specific labour market outcomes at the individual level – give an indication of the flexibility of their labour market. Using individual-level micro-data from the EU-LFS and EU-SILC, this study analysed aggregate labour market transitions across the countries of the EU over 2004-2016, covering the period from before the eruption of the global financial crisis to the economic recovery past the Eurozone crisis. By comparing transition dynamics both across countries and country groups and over time, we were able to identify country differences in this degree of flexibility and to examine how the crisis episodes, associated to the global financial crisis and the Eurozone crisis, impacted on the European labour markets.

Our analysis showed that all EU countries, across country groups, exhibit a high degree of employment persistence and persistence of inactivity, which shows little cyclicality. The dynamics concerning unemployment persistence, however, as well as transitions from and into unemployment, appear more varied. Concerning unemployment persistence, our evidence shows that this is by far lowest in the Nordic countries and highest, post-crisis, in the Mediterranean. Unemployment persistence increased with the crisis everywhere, and with the exception of the Central and Eastern European countries, it continued to rise also post-crisis. Transitions from employment to unemployment also increased with the crisis everywhere, with the trend recovering after the crisis in Central and Eastern Europe and the Mediterranean but continuing to rise elsewhere. In turn, successful labour market entries (defined as moves from inactivity into employment) and successful employment transitions (defined as moves from unemployment into employment) are highest in the Nordics and least favourable in the Mediterranean. Particularly for the latter group of countries, the 2014-16 can hardly be dubbed "recovery" as those years have not necessarily yet determined an inversion of the crisis' trend, with countries being far away from the levels of successful and unsuccessful labour market outcomes observed before the crisis.

Disaggregating these patterns on the basis of individual characteristics, revealed that individual heterogeneity plays a role, with male and highly educated workers experiencing more favourable transitions from unemployment into employment on the whole (including during the crisis period), although this was stronger in some groups (e.g., Nordics) than others (e.g., the Mediterranean). Amongst all groups and periods, age seemed to be the main factor accounting for the largest differences in labour market transitions. Concerning the case of unemployment persistence, for example, this was found to be higher for young individuals (16-24 and 25-29 years old) in the Nordics, well

above any other category; more mature workers in the Continental countries (30-54 years old); the 25-29 year olds in the Mediterranean and in central and Eastern Europe. Inversely, overall mobility was found to be higher – and increasing with the crisis – for people below 54 and for highly educated people in Continental countries; by younger individuals and again for the highly educated in Central and Eastern Europe and the Mediterranean; and highest for the 16-24 year olds – but not for the highly educated – in the Nordics.

Concerning employment stability, which was found to be high across the board, our analysis revealed some differences to the extent that this is driven by job stability versus successful job-to-job moves (labour market churn). Pre-crisis, churn was comparatively very high in countries such as Spain (possibly linked to the high use of temporary employment contracts there), although with the crisis labour market churn declined practically everywhere. Post-crisis, the lowest rates of labour market churn are observed in countries such as Slovakia, Italy, Greece and Romania – although almost invariably these countries are at the same time among the ones with the highest rates of employment persistence (and thus, job stability). Temporary contracts, however, as well as part-time employment, do not seem to have played a particularly important role for labour market transitions on the whole. Concentrating on the case of transitions into and from unemployment (from and into part-time and temporary employment, respectively), we found that during the crisis these flexible forms of employment were not significantly associated with higher transitions into unemployment (in fact, during the crisis they were associated with declining unemployment entries in the Nordics) or higher entries from unemployment. The same was true post-crisis, with only the Mediterranean countries showing some heightened probability of formerly unemployed workers to enter self-employment and some substantially reduced probability of moving from part-time into full-time employment.

The descriptive analysis concentrated in turn on the relationship between labour market mobility and various labour markets institutions, such as part-time contracts, product market regulation, employment protection legislation, and employment incentives. We found that mobility is on the whole inversely related to the degree of product market regulation, positively related to the prevalence of part-time contracts and employment incentives schemes, but has no relation with the degree of employment protection in the labour market.

Overall, our results sketch a picture of significant country heterogeneity in the intensity and direction of labour market transitions across the EU. As expected, the crisis did have an impact on labour market transitions and employment/unemployment persistence, but

in most cases, the effect of the crisis was smaller than the size of country differences observed in any one period (pre-crisis, during the crisis and post-crisis). Countries known for their institutional rigidities in the labour market, such as those of the Mediterranean, have been found to have less favourable labour market transitions and higher unemployment persistence. At the same time, we found no evidence that this links directly to the degree of employment protection, the main labour market institution associated with labour market rigidity. Instead, part-time employment seems to have played a – rather marginally – positive role for containing unemployment persistence, while product market regulations appear as a much more significant influence on adverse labour market transitions (and lower labour market mobility in particular). In any case, and despite the relative recovery of the European economies post-crisis, the degree of labour market flexibility (and the rates of labour market transitions) has not fully recovered to their pre-crisis levels.

Drawing on these results, it appears that the policy message emanating from this note is that efforts to increase labour market "fluidity" should continue: unemployment persistence remains high in much of the EU post-crisis, while labour market transitions are not equally satisfactory in all countries or for all groups of workers. Enhancing this fluidity in the labour market, however, and especially facilitating convergence across countries in their extent of unemployment persistence, labour market churn or transitions into employment, does not seem to be conditioned on raising labour market flexibility in the traditional sense (namely, reducing employment protection). Rather, policy should aim at more nuanced and country/context-specific measures, including ones that fall outside the labour market – for example, drawing on what was shown in Figure 16c, it could be claimed that addressing problems of product market rigidity (as identified for example, separately for each EU country by the OECD[26]) could contribute to enhancing the fluidity of labour markets (in terms of workers' transitions across labour market statuses). Our analysis in this study was not necessarily aimed at pinpointing exactly what form such measures should take. However, the evidence it presented offer a view into the areas that need attention in each of the countries in a way which – it is hoped – will be informative for policy.

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[26] See the OECD Indicators of Product Market Regulation Homepage at http://www.oecd.org/eco/growth/indicatorsofproductmarketregulationhomepage.htm.

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## 10. APPENDIX

## Table 1A: Peaks and troughs in unemployment for selected EU countries

| Pre-crisis PEAK | Pre-crisis TROUGH | Crisis PEAK 1 | Crisis PEAK 2 | Post-crisis TROUGH |
|---|---|---|---|---|
| AT=2004 | AT=2008 | AT=2009 | AT=2011 | AT=2016 |
| BE=2005 | BE=2008 | BE=2010 | BE=2011 | BE=2014 |
| BG=2004 | BG=2008 | BG=2013 | - | BG=2016 |
| CY=2005 | CY=2008 | CY=2014 | - | CY=2016 |
| CZ=2005 | CZ=2008 | CZ=2010 | - | CZ=2016 |
| DE=2005 | DE=2008 | DE=2009 | - | DE=2016 |
| DK=2004 | DK=2008 | DK=2011 | - | DK=2015 |
| EE=2004 | EE=2007 | EE=2010 | - | EE=2015 |
| ES=2004 | ES=2007 | ES=2013 | - | ES=2016 |
| FI=2004 | FI=2008 | FI=2010 | FI=2012 | FI=2015 |
| FR=2004 | FR=2008 | FR=2009 | FR=2010 | FR=2015 |
| GR=2004 | GR=2008 | GR=2013 | - | GR=2016 |
| HR=2004 | HR=2008 | HR=2014 | - | HR=2016 |
| HU=2005 | HU=2007 | HU=2010 | - | HU=2016 |
| IE=2004 | IE=2007 | IE=2012 | - | IE=2016 |
| IT=2004 | IT=2007 | IT=2014 | - | IT=2016 |
| LT=2004 | LT=2007 | LT=2010 | - | LT=2016 |
| LU=2004 | LU=2007 | LU=2009 | LU=2010 | LU=2015 |
| LV=2004 | LV=2007 | LV=2010 | - | LV=2016 |
| - | - | MT=2009 | - | MT=2016 |
| NL=2005 | NL=2008 | NL=2014 | - | NL=2016 |
| PL=2004 | PL=2008 | PL=2013 | - | PL=2016 |
| PT=2005 | PT=2008 | PT=2013 | - | PT=2016 |
| RO=2004 | RO=2008 | RO=2011 | - | RO=2015 |
| SE=2005 | SE=2007 | SE=2010 | - | SE=2016 |
| SI=2005 | SI=2008 | SI=2013 | - | SI=2016 |
| SK=2004 | SK=2008 | SK=2010 | - | SK=2016 |
| UK=2006 | UK=2007 | UK=2011 | - | UK=2016 |

*Sources:* Eurostat data, authors' computations.

# Table 2A: Transition probabilities by worker group

| | | | Central Eastern | | | Nordics | | | Continental | | | Mediterranean | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | E | U | I | E | U | I | E | U | I | E | U | I |
| *Males* | | | | | | | | | | | | | | |
| *2004-2008* | | E | **0.947** | 0.029 | 0.025 | **0.929** | 0.016 | 0.056 | **0.941** | 0.030 | 0.029 | **0.945** | 0.029 | 0.026 |
| | | U | 0.300 | **0.625** | 0.074 | 0.213 | **0.485** | 0.302 | 0.337 | **0.600** | 0.063 | 0.340 | **0.586** | 0.074 |
| | | I | 0.048 | 0.022 | **0.930** | 0.093 | 0.019 | **0.888** | 0.039 | 0.012 | **0.949** | 0.039 | 0.024 | **0.937** |
| *2009-2012* | | E | **0.934** | 0.039 | **0.027** | **0.908** | 0.029 | 0.063 | **0.930** | 0.041 | 0.029 | **0.917** | 0.057 | 0.027 |
| | | U | 0.263 | **0.698** | 0.039 | 0.390 | **0.378** | 0.233 | 0.310 | **0.615** | 0.075 | 0.223 | **0.724** | 0.053 |
| | | I | 0.032 | 0.019 | **0.949** | 0.081 | 0.029 | **0.890** | 0.043 | 0.021 | **0.936** | 0.026 | 0.030 | **0.944** |
| *2013-2016* | | E | **0.953** | 0.024 | 0.023 | **0.903** | 0.031 | 0.065 | **0.925** | 0.045 | 0.030 | **0.933** | 0.044 | 0.023 |
| | | U | 0.291 | **0.670** | 0.039 | 0.355 | **0.460** | 0.185 | 0.286 | **0.652** | 0.062 | 0.220 | **0.727** | 0.053 |
| | | I | 0.031 | 0.016 | **0.953** | 0.101 | 0.036 | **0.863** | 0.042 | 0.020 | **0.938** | 0.024 | 0.030 | **0.947** |
| *Females* | | | E | U | I | E | U | I | E | U | I | E | U | I |
| *2004-2008* | | E | **0.923** | 0.028 | 0.049 | **0.858** | 0.017 | 0.125 | **0.923** | 0.037 | 0.040 | **0.922** | 0.035 | 0.042 |
| | | U | 0.263 | **0.623** | 0.114 | 0.209 | **0.257** | 0.534 | 0.306 | **0.593** | 0.102 | 0.292 | **0.589** | 0.119 |
| | | I | 0.043 | 0.020 | **0.937** | 0.109 | 0.021 | **0.870** | 0.037 | 0.014 | **0.949** | 0.032 | 0.026 | **0.941** |
| *2009-2012* | | E | **0.918** | 0.035 | 0.047 | **0.873** | 0.024 | 0.103 | **0.915** | 0.042 | 0.043 | **0.911** | 0.052 | 0.038 |
| | | U | 0.240 | **0.695** | 0.065 | 0.366 | **0.338** | 0.296 | 0.307 | **0.573** | 0.120 | 0.205 | **0.683** | 0.112 |
| | | I | 0.031 | 0.016 | **0.953** | 0.105 | 0.027 | **0.867** | 0.044 | 0.021 | **0.935** | 0.023 | 0.032 | **0.945** |
| *2013-2016* | | E | **0.935** | 0.024 | 0.041 | **0.871** | 0.033 | 0.096 | **0.914** | 0.041 | 0.045 | **0.925** | 0.044 | 0.031 |
| | | U | 0.267 | **0.661** | 0.072 | 0.337 | **0.401** | 0.261 | 0.275 | **0.625** | 0.101 | 0.195 | **0.695** | 0.110 |
| | | I | 0.031 | 0.013 | **0.955** | 0.116 | 0.037 | **0.847** | 0.039 | 0.020 | **0.941** | 0.020 | 0.031 | **0.949** |
| *Low education* | | | E | U | I | E | U | I | E | U | I | E | U | I |
| *2004-2008* | | E | **0.881** | 0.049 | 0.070 | **0.851** | 0.026 | 0.123 | **0.904** | 0.046 | 0.049 | **0.919** | 0.039 | 0.042 |
| | | U | 0.186 | **0.699** | 0.115 | 0.170 | **0.310** | 0.520 | 0.242 | **0.666** | 0.092 | 0.269 | **0.623** | 0.109 |
| | | I | 0.021 | 0.007 | **0.972** | 0.042 | 0.013 | **0.945** | 0.017 | 0.009 | **0.974** | 0.017 | 0.016 | **0.968** |
| *2009-2012* | | E | **0.853** | 0.075 | 0.072 | **0.836** | 0.039 | 0.124 | **0.889** | 0.060 | 0.051 | **0.886** | 0.071 | 0.043 |
| | | U | 0.160 | **0.782** | 0.059 | 0.302 | **0.376** | 0.322 | 0.223 | **0.670** | 0.108 | 0.177 | **0.738** | 0.085 |
| | | I | 0.012 | 0.006 | **0.982** | 0.039 | 0.019 | **0.943** | 0.019 | 0.013 | **0.967** | 0.011 | 0.018 | **0.972** |
| *2013-2016* | | E | **0.884** | 0.054 | 0.062 | **0.823** | 0.047 | 0.130 | **0.880** | 0.063 | 0.056 | **0.905** | 0.057 | 0.037 |
| | | U | 0.188 | **0.756** | 0.056 | 0.270 | **0.435** | 0.294 | 0.193 | **0.714** | 0.093 | 0.165 | **0.749** | 0.086 |
| | | I | 0.010 | 0.007 | **0.983** | 0.051 | 0.024 | **0.925** | 0.015 | 0.012 | **0.974** | 0.008 | 0.015 | **0.977** |
| *Medium education* | | | E | U | I | E | U | I | E | U | I | E | U | I |
| *2004-2008* | | E | **0.939** | 0.030 | 0.031 | **0.895** | 0.016 | 0.089 | **0.934** | 0.034 | 0.032 | **0.943** | 0.031 | 0.027 |
| | | U | 0.313 | **0.600** | 0.086 | 0.218 | **0.373** | 0.409 | 0.357 | **0.569** | 0.073 | 0.350 | **0.559** | 0.090 |
| | | I | 0.058 | 0.033 | **0.909** | 0.134 | 0.026 | **0.840** | 0.053 | 0.019 | **0.927** | 0.069 | 0.044 | **0.886** |
| *2009-2012* | | E | **0.928** | 0.040 | 0.032 | **0.891** | 0.029 | 0.081 | **0.922** | 0.044 | 0.034 | **0.921** | 0.054 | 0.025 |
| | | U | 0.270 | **0.682** | 0.048 | 0.409 | **0.330** | 0.261 | 0.346 | **0.562** | 0.092 | 0.244 | **0.680** | 0.076 |
| | | I | 0.036 | 0.023 | **0.941** | 0.117 | 0.035 | **0.848** | 0.057 | 0.028 | **0.915** | 0.047 | 0.061 | **0.893** |

| | | E | U | I | E | U | I | E | U | I | E | U | I |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2013-2016 | E | **0.946** | 0.026 | 0.028 | **0.884** | 0.035 | 0.081 | **0.914** | 0.049 | 0.038 | **0.934** | 0.045 | 0.021 |
| | U | 0.291 | **0.656** | 0.053 | 0.339 | **0.420** | 0.241 | 0.305 | **0.620** | 0.076 | 0.235 | **0.694** | 0.071 |
| | I | 0.034 | 0.018 | **0.948** | 0.122 | 0.042 | **0.836** | 0.047 | 0.026 | **0.927** | 0.041 | 0.059 | **0.900** |
| *High education* | | E | U | I | E | U | I | E | U | I | E | U | I |
| 2004-2008 | E | **0.961** | 0.012 | 0.027 | **0.930** | 0.010 | 0.060 | **0.953** | 0.022 | 0.025 | **0.960** | 0.020 | 0.021 |
| | U | 0.413 | **0.512** | 0.074 | 0.251 | **0.341** | 0.407 | 0.432 | **0.490** | 0.078 | 0.414 | **0.506** | 0.080 |
| | I | 0.125 | 0.043 | **0.832** | 0.205 | 0.026 | **0.770** | 0.114 | 0.025 | **0.861** | 0.130 | 0.081 | **0.789** |
| 2009-2012 | E | **0.956** | 0.018 | 0.027 | **0.927** | 0.017 | 0.056 | **0.946** | 0.027 | 0.027 | **0.946** | 0.033 | 0.021 |
| | U | 0.376 | **0.579** | 0.045 | 0.429 | **0.346** | 0.225 | 0.419 | **0.497** | 0.084 | 0.303 | **0.621** | 0.076 |
| | I | 0.094 | 0.039 | **0.867** | 0.188 | 0.037 | **0.775** | 0.115 | 0.035 | **0.850** | 0.086 | 0.083 | **0.831** |
| 2013-2016 | E | **0.963** | 0.013 | 0.024 | **0.920** | 0.023 | 0.056 | **0.944** | 0.028 | 0.028 | **0.954** | 0.028 | 0.018 |
| | U | 0.399 | **0.551** | 0.050 | 0.432 | **0.434** | 0.133 | 0.390 | **0.543** | 0.067 | 0.296 | **0.630** | 0.074 |
| | I | 0.091 | 0.029 | **0.881** | 0.203 | 0.055 | **0.742** | 0.109 | 0.035 | **0.855** | 0.079 | 0.081 | **0.840** |
| *15-24 year olds* | | E | U | I | E | U | I | E | U | I | E | U | I |
| 2004-2008 | E | **0.886** | 0.062 | 0.052 | **0.729** | 0.034 | 0.236 | **0.856** | 0.085 | 0.059 | **0.885** | 0.074 | 0.041 |
| | U | 0.345 | **0.557** | 0.098 | 0.281 | **0.155** | 0.564 | 0.419 | **0.509** | 0.072 | 0.370 | **0.556** | 0.073 |
| | I | 0.063 | 0.039 | **0.898** | | | | 0.114 | 0.037 | **0.849** | 0.088 | 0.060 | **0.852** |
| 2009-2012 | E | **0.861** | 0.084 | 0.055 | **0.692** | 0.053 | 0.255 | **0.828** | 0.104 | 0.068 | **0.830** | 0.130 | 0.040 |
| | U | 0.299 | **0.640** | 0.061 | 0.417 | **0.288** | 0.296 | 0.384 | **0.528** | 0.088 | 0.227 | **0.707** | 0.066 |
| | I | 0.049 | 0.037 | **0.914** | 0.115 | 0.040 | **0.845** | 0.103 | 0.045 | **0.853** | 0.049 | 0.079 | **0.872** |
| 2013-2016 | E | **0.898** | 0.053 | 0.050 | **0.671** | 0.055 | 0.274 | **0.827** | 0.111 | 0.062 | **0.842** | 0.116 | 0.042 |
| | U | 0.361 | **0.588** | 0.051 | 0.258 | **0.397** | 0.345 | 0.364 | **0.552** | 0.084 | 0.241 | **0.697** | 0.062 |
| | I | 0.055 | 0.033 | **0.912** | 0.115 | 0.050 | **0.835** | 0.096 | 0.042 | **0.862** | 0.045 | 0.077 | **0.878** |
| *25-29 year olds* | | E | U | I | E | U | I | E | U | I | E | U | I |
| 2004-2008 | E | **0.958** | 0.025 | 0.016 | **0.901** | 0.021 | 0.078 | **0.921** | 0.053 | 0.026 | **0.926** | 0.049 | 0.026 |
| | U | 0.266 | **0.655** | 0.080 | 0.259 | **0.169** | 0.572 | 0.444 | **0.495** | 0.061 | 0.392 | **0.539** | 0.069 |
| | I | 0.086 | 0.041 | **0.872** | 0.323 | 0.045 | **0.632** | 0.277 | 0.092 | **0.631** | 0.177 | 0.115 | **0.709** |
| 2009-2012 | E | **0.949** | 0.033 | 0.018 | **0.881** | 0.034 | 0.085 | **0.902** | 0.067 | 0.030 | **0.886** | 0.090 | 0.024 |
| | U | 0.244 | **0.720** | 0.037 | 0.475 | **0.363** | 0.162 | 0.396 | **0.519** | 0.085 | 0.272 | **0.672** | 0.056 |
| | I | 0.062 | 0.031 | **0.906** | 0.308 | 0.075 | **0.617** | 0.248 | 0.117 | **0.636** | 0.132 | 0.158 | **0.710** |
| 2013-2016 | E | **0.963** | 0.022 | 0.015 | **0.872** | 0.044 | 0.084 | **0.894** | 0.075 | 0.031 | **0.898** | 0.081 | 0.021 |
| | U | 0.271 | **0.689** | 0.040 | 0.444 | **0.390** | 0.166 | 0.373 | **0.559** | 0.068 | 0.278 | **0.668** | 0.054 |
| | I | 0.066 | 0.029 | **0.904** | 0.311 | 0.111 | **0.578** | 0.241 | 0.105 | **0.654** | 0.143 | 0.157 | **0.700** |
| *30-54 year olds* | | E | U | I | E | U | I | E | U | I | E | U | I |
| 2004-2008 | E | **0.958** | 0.025 | 0.016 | **0.933** | 0.014 | 0.053 | **0.959** | 0.027 | 0.014 | **0.954** | 0.028 | 0.018 |
| | U | 0.266 | **0.655** | 0.080 | 0.231 | **0.567** | 0.202 | 0.333 | **0.610** | 0.057 | 0.301 | **0.605** | 0.094 |
| | I | 0.086 | 0.041 | **0.872** | 0.186 | 0.043 | **0.772** | 0.100 | 0.046 | **0.854** | 0.060 | 0.050 | **0.889** |
| 2009-2012 | E | **0.949** | 0.033 | 0.018 | **0.936** | 0.024 | 0.040 | **0.950** | 0.035 | 0.015 | **0.934** | 0.051 | 0.015 |
| | U | 0.244 | **0.720** | 0.037 | 0.395 | **0.366** | 0.239 | 0.323 | **0.606** | 0.071 | 0.215 | **0.713** | 0.072 |
| | I | 0.062 | 0.031 | **0.906** | 0.185 | 0.060 | **0.755** | 0.103 | 0.063 | **0.834** | 0.053 | 0.069 | **0.878** |

| | | E | U | I | E | U | I | E | U | I | E | U | I |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2013-2016 | E | **0.963** | 0.022 | 0.015 | **0.934** | 0.030 | 0.037 | **0.947** | 0.037 | 0.016 | **0.947** | 0.041 | 0.012 |
| | U | 0.271 | **0.689** | 0.040 | 0.388 | **0.445** | 0.166 | 0.286 | **0.652** | 0.062 | 0.211 | **0.722** | 0.067 |
| | I | 0.066 | 0.029 | **0.904** | 0.200 | 0.080 | **0.720** | 0.090 | 0.059 | **0.851** | 0.047 | 0.074 | **0.879** |
| *55-64 year olds* | | E | U | I | E | U | I | E | U | I | E | U | I |
| 2004-2008 | E | **0.865** | 0.017 | 0.118 | **0.884** | 0.016 | 0.099 | **0.849** | 0.022 | 0.128 | **0.905** | 0.017 | 0.078 |
| | U | 0.144 | **0.635** | 0.221 | 0.133 | **0.407** | 0.461 | 0.075 | **0.742** | 0.184 | 0.141 | **0.676** | 0.183 |
| | I | 0.025 | 0.005 | **0.970** | 0.048 | 0.006 | **0.946** | 0.005 | 0.003 | **0.992** | 0.008 | 0.010 | **0.982** |
| 2009-2012 | E | **0.877** | 0.029 | 0.094 | **0.890** | 0.024 | 0.087 | **0.864** | 0.027 | 0.109 | **0.896** | 0.032 | 0.071 |
| | U | 0.134 | **0.758** | 0.108 | 0.321 | **0.364** | 0.315 | 0.104 | **0.701** | 0.195 | 0.110 | **0.729** | 0.161 |
| | I | 0.015 | 0.003 | **0.982** | 0.051 | 0.014 | **0.935** | 0.010 | 0.006 | **0.984** | 0.012 | 0.010 | **0.978** |
| 2013-2016 | E | **0.908** | 0.021 | 0.071 | **0.892** | 0.032 | 0.076 | **0.876** | 0.027 | 0.096 | **0.920** | 0.028 | 0.052 |
| | U | 0.146 | **0.750** | 0.104 | 0.255 | **0.499** | 0.246 | 0.105 | **0.767** | 0.128 | 0.103 | **0.746** | 0.151 |
| | I | 0.013 | 0.005 | **0.982** | 0.074 | 0.019 | **0.908** | 0.009 | 0.007 | **0.984** | 0.011 | 0.012 | **0.977** |

*Note:* E=employed; U=unemployed; I=inactive so that EE = remains in employment between one year and the next; UU = remains in unemployment, II = remains in inactivity. Observations are weighted according to the labour force share (15-64) in each country over the aggregate. Elements showing a probability of remaining in the same labour market state (employment, unemployment and inactivity) are in bold.

*Sources:* LFS microdata, authors' computations.

## Table 2A: Mobility index across country and worker group

| | | CEE EU countries | | | | | | | | | | | Nordics | | | | Continental | | | | Mediterranean | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BG | CZ | EE | LV | LT | HU | PL | RO | SK | SI | HR | NL | FI | DK | SE | BE | FR | LU | AT | GR | ES | IT | CY | PT | MT |
| Total | 2004-08 | 0.207 | 0.273 | 0.343 | 0.278 | 0.283 | 0.257 | 0.242 | 0.298 | 0.212 | 0.215 | 0.168 | 0.000 | 0.337 | 0.429 | 0.449 | 0.184 | 0.267 | 0.421 | 0.292 | 0.193 | 0.392 | 0.183 | 0.355 | 0.309 | 0.000 |
| | 2009-12 | 0.167 | 0.267 | 0.329 | 0.312 | 0.257 | 0.247 | 0.205 | 0.174 | 0.184 | 0.186 | 0.160 | 0.466 | 0.358 | 0.407 | 0.441 | 0.203 | 0.281 | 0.435 | 0.291 | 0.150 | 0.282 | 0.177 | 0.292 | 0.256 | 0.290 |
| | 2013-16 | 0.151 | 0.284 | 0.401 | 0.338 | 0.265 | 0.285 | 0.219 | 0.116 | 0.206 | 0.195 | 0.180 | 0.414 | 0.336 | 0.394 | 0.464 | 0.217 | 0.250 | 0.451 | 0.267 | 0.130 | 0.252 | 0.174 | 0.253 | 0.248 | 0.291 |
| Males | 2004-08 | 0.218 | 0.265 | 0.315 | 0.262 | 0.287 | 0.240 | 0.241 | 0.299 | 0.203 | 0.203 | 0.176 | 0.000 | 0.303 | 0.414 | 0.427 | 0.189 | 0.261 | 0.417 | 0.271 | 0.218 | 0.380 | 0.183 | 0.350 | 0.304 | 0.000 |
| | 2009-12 | 0.166 | 0.263 | 0.311 | 0.297 | 0.268 | 0.232 | 0.207 | 0.172 | 0.173 | 0.182 | 0.159 | 0.433 | 0.332 | 0.399 | 0.423 | 0.207 | 0.266 | 0.403 | 0.265 | 0.158 | 0.265 | 0.168 | 0.285 | 0.252 | 0.264 |
| | 2013-16 | 0.151 | 0.290 | 0.383 | 0.307 | 0.268 | 0.270 | 0.210 | 0.117 | 0.192 | 0.196 | 0.179 | 0.377 | 0.313 | 0.376 | 0.449 | 0.216 | 0.244 | 0.428 | 0.242 | 0.132 | 0.243 | 0.163 | 0.244 | 0.251 | 0.269 |
| Females | 2004-08 | 0.197 | 0.285 | 0.379 | 0.299 | 0.281 | 0.276 | 0.246 | 0.296 | 0.222 | 0.229 | 0.163 | 0.000 | 0.372 | 0.443 | 0.471 | 0.182 | 0.273 | 0.427 | 0.319 | 0.183 | 0.405 | 0.186 | 0.360 | 0.315 | 0.000 |
| | 2009-12 | 0.169 | 0.275 | 0.354 | 0.329 | 0.247 | 0.264 | 0.205 | 0.179 | 0.197 | 0.192 | 0.162 | 0.496 | 0.388 | 0.417 | 0.460 | 0.200 | 0.295 | 0.467 | 0.325 | 0.146 | 0.300 | 0.189 | 0.298 | 0.260 | 0.355 |
| | 2013-16 | 0.151 | 0.279 | 0.424 | 0.375 | 0.265 | 0.300 | 0.229 | 0.116 | 0.221 | 0.195 | 0.181 | 0.449 | 0.359 | 0.412 | 0.482 | 0.220 | 0.257 | 0.474 | 0.300 | 0.130 | 0.261 | 0.188 | 0.261 | 0.245 | 0.331 |
| Low-education | 2004-08 | 0.185 | 0.211 | 0.331 | 0.266 | 0.278 | 0.224 | 0.204 | 0.310 | 0.136 | 0.236 | 0.174 | 0.000 | 0.291 | 0.436 | 0.386 | 0.167 | 0.228 | 0.404 | 0.278 | 0.176 | 0.371 | 0.157 | 0.327 | 0.295 | 0.000 |
| | 2009-12 | 0.167 | 0.228 | 0.297 | 0.309 | 0.240 | 0.237 | 0.169 | 0.192 | 0.134 | 0.186 | 0.167 | 0.477 | 0.320 | 0.401 | 0.387 | 0.191 | 0.237 | 0.419 | 0.269 | 0.147 | 0.269 | 0.156 | 0.280 | 0.249 | 0.263 |
| | 2013-16 | 0.142 | 0.213 | 0.401 | 0.319 | 0.210 | 0.290 | 0.177 | 0.135 | 0.134 | 0.196 | 0.153 | 0.442 | 0.286 | 0.396 | 0.417 | 0.206 | 0.210 | 0.451 | 0.232 | 0.128 | 0.230 | 0.150 | 0.233 | 0.242 | 0.256 |
| Medium-education | 2004-08 | 0.248 | 0.310 | 0.366 | 0.294 | 0.310 | 0.295 | 0.261 | 0.302 | 0.255 | 0.223 | 0.180 | 0.000 | 0.389 | 0.435 | 0.497 | 0.211 | 0.292 | 0.416 | 0.311 | 0.202 | 0.441 | 0.220 | 0.364 | 0.330 | 0.000 |
| | 2009-12 | 0.187 | 0.291 | 0.361 | 0.320 | 0.282 | 0.271 | 0.215 | 0.171 | 0.202 | 0.195 | 0.165 | 0.487 | 0.400 | 0.436 | 0.477 | 0.229 | 0.311 | 0.443 | 0.306 | 0.158 | 0.329 | 0.206 | 0.296 | 0.296 | 0.385 |
| | 2013-16 | 0.165 | 0.311 | 0.427 | 0.336 | 0.277 | 0.293 | 0.221 | 0.115 | 0.224 | 0.199 | 0.190 | 0.416 | 0.376 | 0.417 | 0.490 | 0.239 | 0.270 | 0.451 | 0.279 | 0.137 | 0.289 | 0.202 | 0.243 | 0.289 | 0.392 |
| High-education | 2004-08 | 0.259 | 0.378 | 0.394 | 0.362 | 0.337 | 0.367 | 0.363 | 0.325 | 0.391 | 0.311 | 0.214 | 0.000 | 0.388 | 0.485 | 0.503 | 0.281 | 0.361 | 0.499 | 0.321 | 0.276 | 0.479 | 0.300 | 0.469 | 0.437 | 0.000 |
| | 2009-12 | 0.212 | 0.375 | 0.379 | 0.388 | 0.353 | 0.317 | 0.314 | 0.186 | 0.372 | 0.270 | 0.227 | 0.496 | 0.397 | 0.449 | 0.496 | 0.260 | 0.369 | 0.487 | 0.353 | 0.202 | 0.359 | 0.269 | 0.374 | 0.334 | 0.458 |
| | 2013-16 | 0.206 | 0.408 | 0.445 | 0.445 | 0.382 | 0.334 | 0.325 | 0.121 | 0.371 | 0.256 | 0.268 | 0.443 | 0.369 | 0.434 | 0.518 | 0.271 | 0.337 | 0.493 | 0.326 | 0.166 | 0.330 | 0.266 | 0.353 | 0.324 | 0.466 |
| 16-24 years olds | 2004-08 | 0.230 | 0.376 | 0.439 | 0.385 | 0.386 | 0.311 | 0.333 | 0.295 | 0.291 | 0.450 | 0.298 | 0.000 | 0.587 | 0.722 | 0.610 | 0.335 | 0.392 | 0.506 | 0.457 | 0.270 | 0.510 | 0.242 | 0.446 | 0.418 | 0.000 |
| | 2009-12 | 0.205 | 0.362 | 0.459 | 0.397 | 0.377 | 0.327 | 0.303 | 0.179 | 0.256 | 0.404 | 0.263 | 0.546 | 0.568 | 0.702 | 0.607 | 0.343 | 0.400 | 0.504 | 0.417 | 0.235 | 0.383 | 0.231 | 0.412 | 0.373 | 0.397 |
| | 2013-16 | 0.196 | 0.398 | 0.524 | 0.467 | 0.402 | 0.376 | 0.301 | 0.131 | 0.290 | 0.458 | 0.307 | 0.456 | 0.525 | 0.700 | 0.637 | 0.334 | 0.380 | 0.562 | 0.408 | 0.235 | 0.360 | 0.236 | 0.391 | 0.376 | 0.472 |
| 25-29 years olds | 2004-08 | 0.313 | 0.384 | 0.456 | 0.398 | 0.456 | 0.366 | 0.400 | 0.390 | 0.357 | 0.444 | 0.277 | 0.000 | 0.549 | 0.637 | 0.623 | 0.388 | 0.504 | 0.475 | 0.400 | 0.310 | 0.595 | 0.288 | 0.534 | 0.472 | 0.000 |
| | 2009-12 | 0.235 | 0.418 | 0.437 | 0.449 | 0.462 | 0.358 | 0.358 | 0.215 | 0.342 | 0.394 | 0.315 | 0.537 | 0.552 | 0.600 | 0.622 | 0.388 | 0.493 | 0.616 | 0.416 | 0.281 | 0.491 | 0.281 | 0.479 | 0.423 | 0.338 |
| | 2013-16 | 0.223 | 0.504 | 0.580 | 0.511 | 0.494 | 0.409 | 0.361 | 0.151 | 0.401 | 0.425 | 0.398 | 0.548 | 0.540 | 0.591 | 0.652 | 0.379 | 0.458 | 0.700 | 0.415 | 0.296 | 0.462 | 0.295 | 0.471 | 0.446 | 0.426 |
| 30-54 years olds | 2004-08 | 0.246 | 0.270 | 0.354 | 0.288 | 0.321 | 0.261 | 0.229 | 0.364 | 0.207 | 0.159 | 0.115 | 0.000 | 0.404 | 0.447 | 0.498 | 0.188 | 0.304 | 0.425 | 0.288 | 0.169 | 0.415 | 0.187 | 0.345 | 0.307 | 0.000 |
| | 2009-12 | 0.181 | 0.256 | 0.357 | 0.321 | 0.286 | 0.268 | 0.198 | 0.187 | 0.185 | 0.149 | 0.126 | 0.484 | 0.441 | 0.415 | 0.498 | 0.223 | 0.317 | 0.451 | 0.304 | 0.138 | 0.320 | 0.193 | 0.271 | 0.246 | 0.255 |
| | 2013-16 | 0.161 | 0.255 | 0.429 | 0.338 | 0.287 | 0.316 | 0.231 | 0.119 | 0.214 | 0.170 | 0.147 | 0.429 | 0.433 | 0.389 | 0.533 | 0.240 | 0.276 | 0.493 | 0.285 | 0.127 | 0.282 | 0.197 | 0.231 | 0.232 | 0.248 |
| 55-64 years olds | 2004-08 | 0.204 | 0.279 | 0.344 | 0.217 | 0.249 | 0.267 | 0.258 | 0.345 | 0.236 | 0.241 | 0.134 | 0.000 | 0.237 | 0.315 | 0.340 | 0.124 | 0.215 | 0.303 | 0.254 | 0.167 | 0.318 | 0.155 | 0.249 | 0.208 | 0.000 |
| | 2009-12 | 0.164 | 0.279 | 0.328 | 0.298 | 0.251 | 0.218 | 0.148 | 0.187 | 0.180 | 0.224 | 0.137 | 0.506 | 0.276 | 0.317 | 0.339 | 0.116 | 0.237 | 0.400 | 0.258 | 0.157 | 0.256 | 0.162 | 0.198 | 0.209 | 0.324 |
| | 2013-16 | 0.140 | 0.239 | 0.378 | 0.282 | 0.228 | 0.225 | 0.171 | 0.106 | 0.177 | 0.187 | 0.132 | 0.392 | 0.255 | 0.287 | 0.360 | 0.126 | 0.187 | 0.419 | 0.220 | 0.105 | 0.227 | 0.149 | 0.181 | 0.198 | 0.291 |

*Notes:* Measures are based on the Shorrocks' mobility index. The table refers to 25 EU countries: Bulgaria (BG), Czech Republic (CZ), Estonia (EE), Latvia (LV), Lithuania (LT), Hungary (HU), Poland (PL), Romania (RO), Slovakia (SK), Slovenia (SI), Croatia (HR), the Netherlands (NL), Finland (FI), Denmark (DK), Sweden (SE), Belgium (BE), France (FR), Luxemburg (LU), Austria (AT), Greece (GR), Spain (ES), Italy (IT), Cyprus (CY),Portugal (PT), Malta (MT).

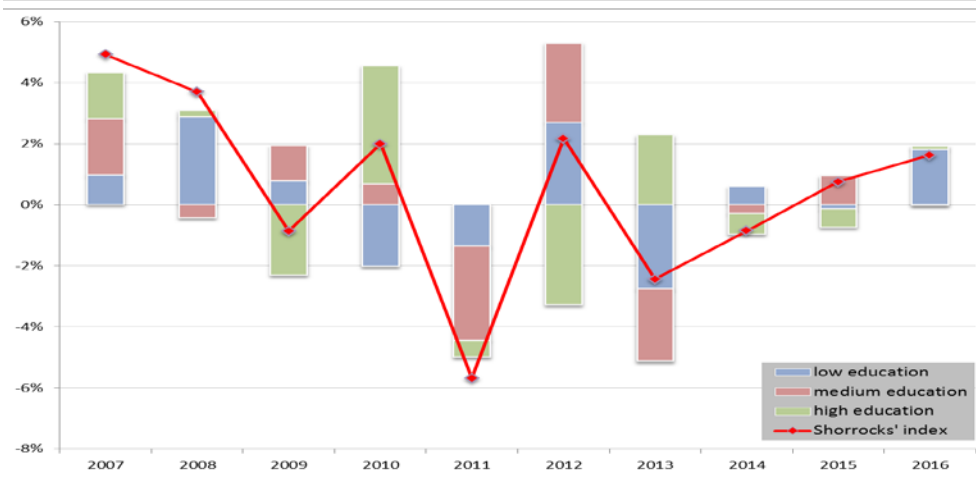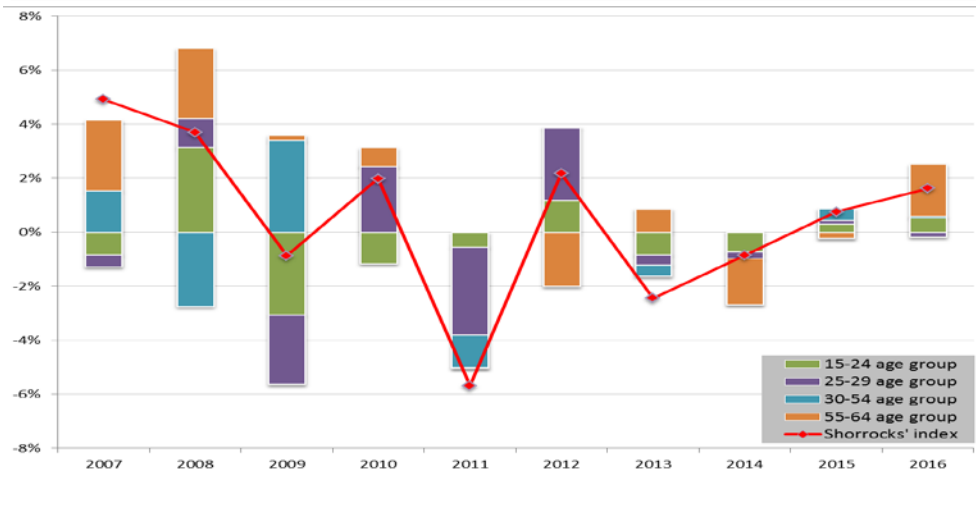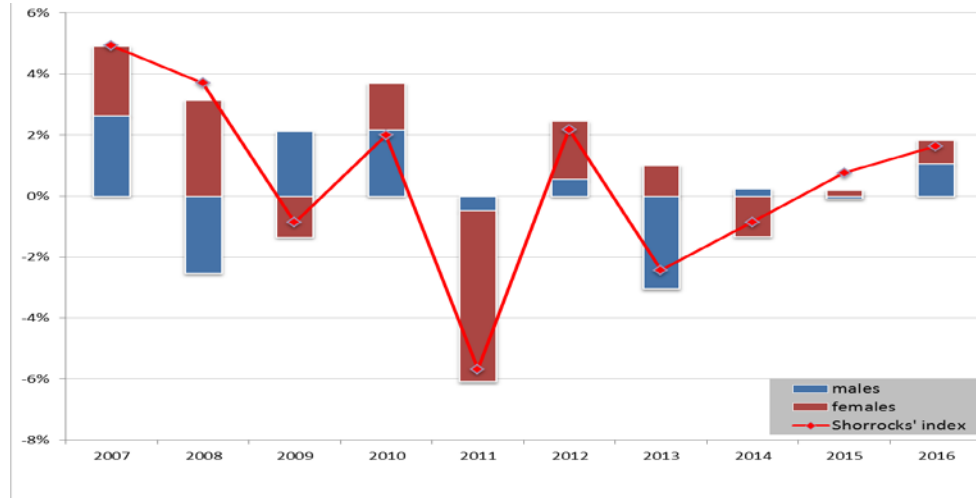*Sources:* LFS microdata, authors' computations.

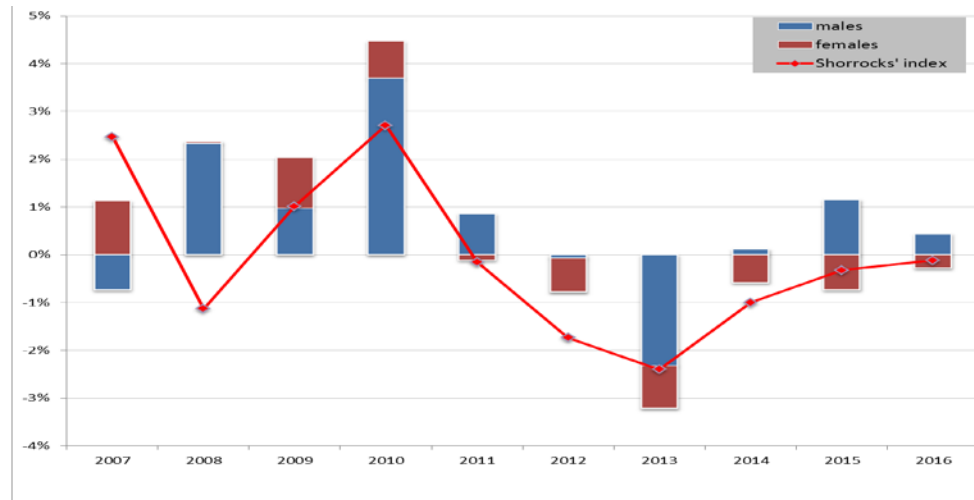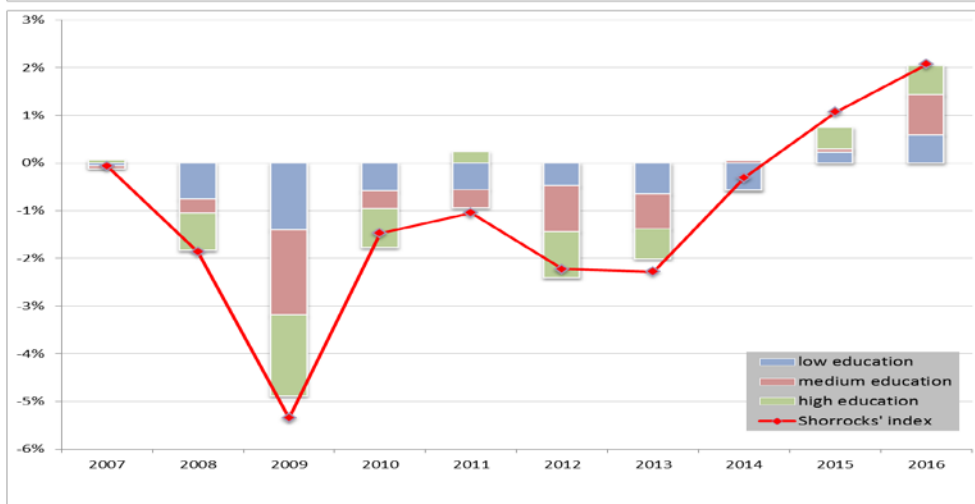# Figure 1A: Decomposition of mobility index by work groups

*(a) Central Eastern*
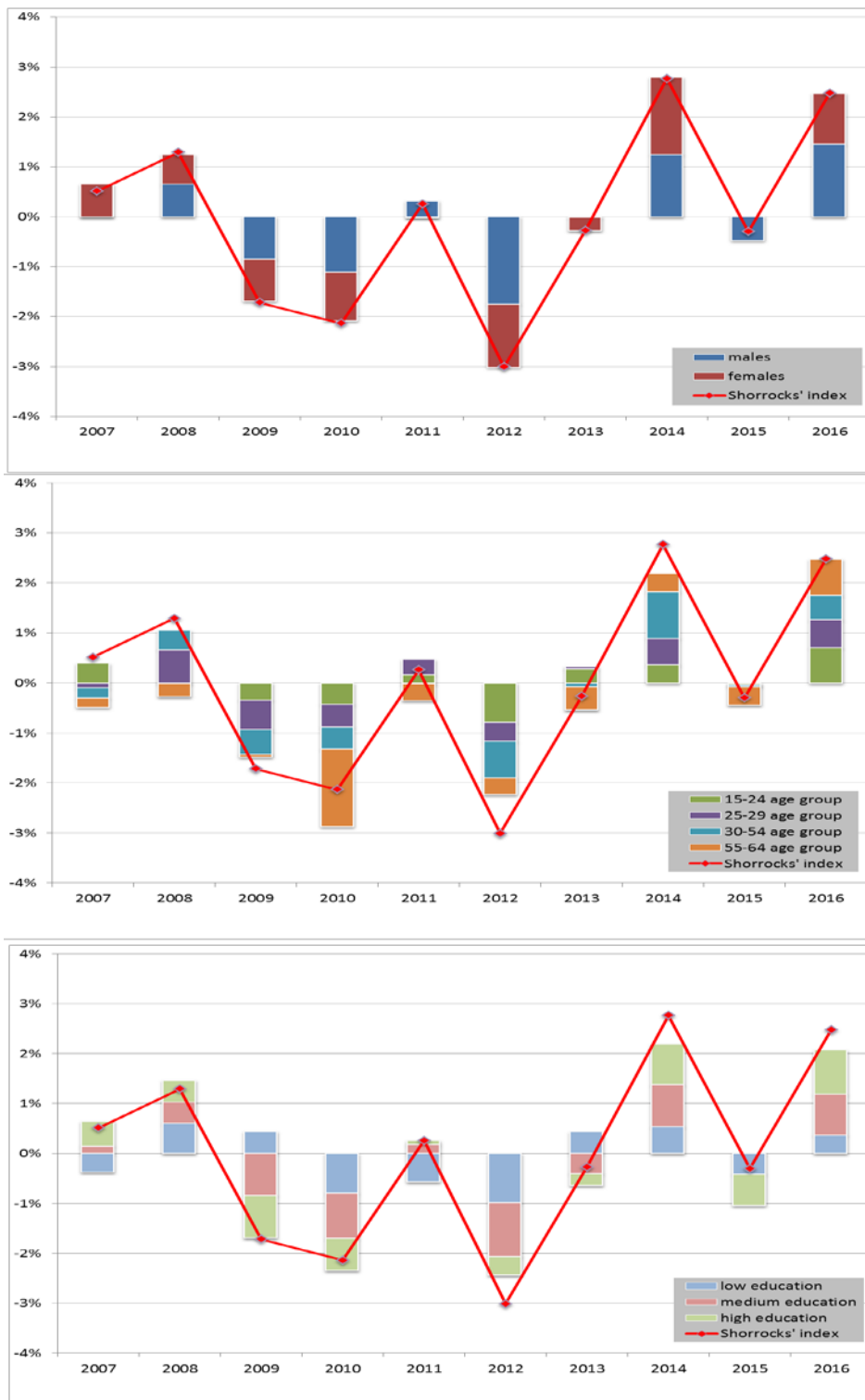
*(b) Nordics*

*(c) Continental*
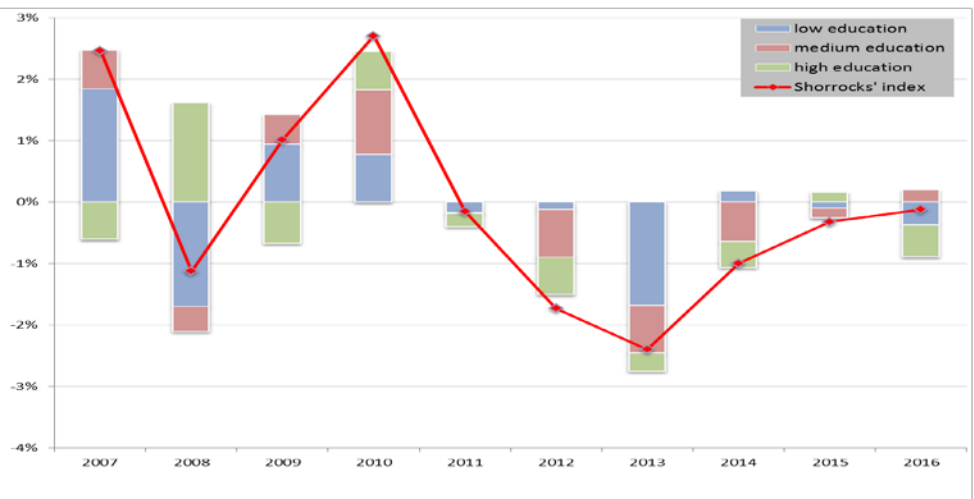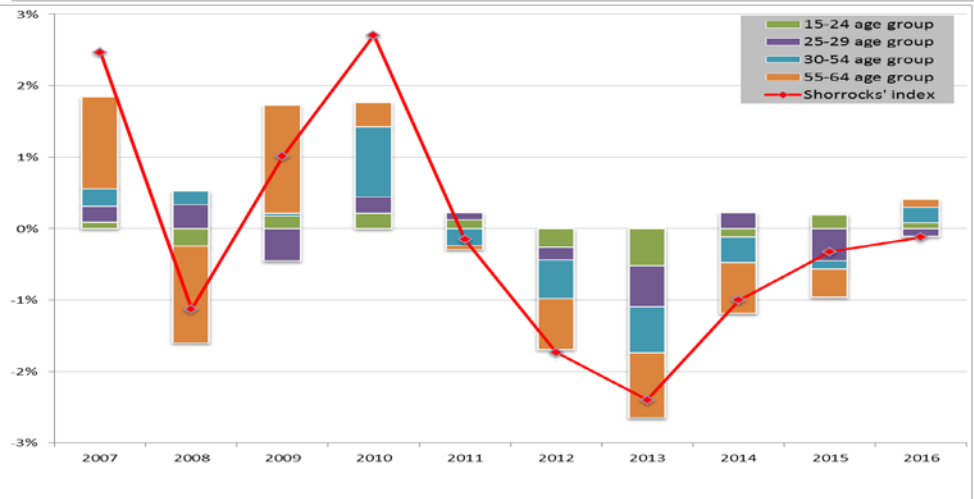
*(d) Mediterranean*



*Sources:* LFS microdata, authors' computations