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### **Earnings Mobility in Europe: 1994-2001 Do more flexible labour markets experience a higher earnings mobility?**

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# Earnings Mobility in Europe: 1994-2001\*

## Do more flexible labour markets experience a higher earnings mobility?

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### Abstract

The economic reality of the 1990s in Europe forced the labour markets to become more flexible. Using a consistent comparative dataset for 14 European countries, the European Community Household Panel (ECHP), we explore the evolution and the cross-national differences in earnings mobility across Europe between 1994 and 2001 from three angles: first, the evolution of short-term inequality and its link with cross-sectional inequality; second, the evolution of long-term mobility relative to short-term mobility and the implications for long-term inequality; third, we try to understand the cross-national differences in earnings mobility across Europe by exploring the cross-country heterogeneity in labour market policies/institutions. We explore the rank mobility and mobility as an equalizer of longer-term earnings. We find evidence supporting a negative association between the evolution of earnings inequality and earnings mobility. More flexible labour markets, with low levels of regulation and with a high labour market support are found to have higher earnings mobility. Similarly, unionization and corporatism are positively associated with earnings mobility. The "Flexicurity" countries (Denmark and Finland) have among the highest earnings mobility levels in Europe, close to the Anglo-Saxon countries (Ireland and the UK), whereas the Mediterranean countries with a strict regulation and a low labour market support have the lowest mobility. Portugal is the only country with disequalizing mobility in a long-term perspective

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## 1. Introduction

Interest in the extent of mobility in individual earnings over time has increased in recent years and was fuelled by the rise in earnings inequality experienced by many developed countries during the 1980s and 1990s; most notably the United States (e.g. Gottschalk 1997, Haider 2001). This triggered an intense debate with respect to the driving factors and the implications of this increase. Some analysts argue that rising annual inequality does not necessarily have negative implications. This statement relies on the “offsetting mobility” argument, which states that if there has been a sufficiently large simultaneous increase in mobility, the inequality of income measured over a longer period of time, such as lifetime income or “permanent” income - can be lower despite the rise in annual inequality. This statement, however, holds only under the assumption that individuals are not averse to income variability, future risk or multi-period inequality (Creedy and Wilhelm, 2002; Gottschalk and Spolaore, 2002).

The goal of having a mobile society is linked to the goal of securing equality of opportunity in the labour market and of having a more flexible and efficient economy (Friedman, 1962; Atkinson et al., 1992). Another justification for mobility takes place in the context of achieving distributional equity: lifetime equity depends on the extent of movement up and down in the earnings distribution over the lifetime (Atkinson et al., 1992). In this line of thought, Friedman (1962) underlined the role of social mobility in reducing lifetime earnings differentials between individuals, by allowing them to change their position in the income distribution over time. Thus earnings mobility is perceived in the literature as a way out of poverty. In the absence of mobility the same individuals remain stuck at the bottom of the earnings distribution, hence annual earnings differentials are transformed into lifetime differentials. All in all, mobility is seen as a bridge between short and lifetime earnings differentials: a cross-sectional snapshot of income distribution overstates lifetime inequality to a degree that depends on the degree of earnings mobility. If countries have different earnings mobility levels, then single-year inequality country rankings may lead to a misleading picture of long-term inequality ranking. Simple inferences about lifetime income distributions cannot be made on the basis of cross-sectional distributions alone, thus the need for information on earnings mobility.

In order to understand the evolution of economic inequality and opportunity across countries, and the implications for lifetime inequality, it is crucial to complement the analysis of cross-sectional inequality with the analysis of longer-term inequality and the analysis of earnings mobility. Using a consistent comparative dataset for 14 EU countries – the European Community Household Panel (ECHP) – the present study explores the following six questions:

(i) What is the country ranking with respect to earnings inequality and how does the ranking change with the horizon over which inequality is measured?

(ii) To what extent does earnings mobility work to equalize/disequalize longer-term earnings relative to cross-sectional inequality and how does it differ across the EU?

(iii) What is the ordering of countries with respect to the mobility of earnings and what are the implications for the country ranking in lifetime earnings inequality?

(iv) Did short-term mobility increase over time across the EU and what are the links with the evolution of cross-sectional earnings inequality?

(v) Did short-term mobility become more or less equalizing over time and how does it differ across the EU?

The cross-national comparative perspective across Europe is motivated primarily by the increasing country-heterogeneity in labour market institutions across the European countries, which followed the labour market reforms starting in the early 1990s (OECD, 2004). The economic reality of the 1990s in Europe forced the labour markets to become more flexible, to lower non-wage labour costs and allow wages to better reflect productivity and market conditions. The trends in the OECD labour market indicators across Europe indicate in general: a deregulation in the labour and product markets; an increase in the labour market state support as spending for active labour market policies (ALMPs) and higher average replacement rates for the unemployment benefits; and a decrease in the tax wedge (most prominently in the Anglo-Saxon countries, followed by the Scandinavian and the Mediterranean countries). The pace of the institutional changes, however, differs across Europe, resulting in a higher institutional heterogeneity across Europe (Palier, 2010). The high degree of institutional heterogeneity across Europe in 2001 is reflected by the OECD indicators on labour market institutions in Figure 1, which plots pairs of two indicators, re-scaled by setting the UK indicators as the base.<sup>2</sup> We consider the indicators related to the wage-setting mechanism: the labour market regulation (EPL); the level of support in the labour market as the spending for active labour market policies (ALMPs), as the generosity of the unemployment benefit replacement rates (UBRR) and as the arithmetic average between ALMPs and UBRR; the degree of unionization and corporatism; the tax wedge and the product market regulation (PMR). We identify similar country clusters as Boeri (2002). In the bottom left corner of the scatter plots we find the Anglo-Saxon countries (UK and Ireland) with low levels of regulation and low levels of support in the labour market, low non-labour costs, with a moderate union density, and a low regulation in the product market. In the upper left corner we find the “Flexicurity” countries (the Scandinavian countries and the Netherlands) with relatively low levels of regulation and high levels of support in the labour market, high tax wedges, a high corporatism and high union density and moderate levels of regulation in the product market. In the lower right corner we find the Mediterranean countries (Greece,

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<sup>2</sup> The definition of the OECD indicators and their summary statistics are in Table A1 and A2 in the Annex. For a complete description of the OECD data, please refer to Bassanini and Duval (2006a, 2006b). The data was obtained by email from the authors.

Portugal and Spain) with a relatively strict regulation and a low support in the labour market, a low union density and an intermediate corporatism, a relatively high PMR and tax wedge. The other countries form the “Rhineland model” (Boeri, 2002) (Germany, France, Belgium, Austria) with a relatively strict labour market regulation and a high labour market support, a medium-high unionization and corporatism and a high tax wedge. This country-heterogeneity in the labour market institutions has the potential to help us understand the cross-national differences in earnings mobility across Europe. As a last step, we explore the associations between earnings mobility and the labour market policies/institutions measured by the OECD indicators to answer the sixth question:

(vi) Is there evidence of significant associations between labour market policies/institutions and earnings mobility? Do individuals in more flexible labour markets and higher levels of labour market support have a higher earnings mobility than those in more rigid labour markets?

To the best of our knowledge, no study has explored in a consistent comparative fashion the different facets of earnings mobility-inequality across Europe over a recent period and covering a longer time frame than six years. Most of the existing studies focus on the comparison between the US and a small number of European countries. Aaberge, Bjorklund, Jantti, Palme, Pedersen, Smith, and Wannemo (2002) compared income (family income, disposable income and earnings) inequality and mobility in the Scandinavian countries and the US during 1980-1990. Brukhauser and Poupore (1997) and Brukhauser, Holtz-Eakin, and Rhody (1998) compared earnings or disposable income mobility and inequality between Germany and the US between 1983 and 1988. Fritzell (1990) studied mobility in Sweden between 1973 and 1980, and compared the results with Duncan and Morgan (1981) for the US between 1971 and 1978. The OECD (1996, 1997) presented a variety of comparisons of earnings inequality and mobility across OECD countries over the period 1986-1991. Hofer and Weber (2002) looked at mobility in Austria between 1986 and 1991 and compared their results with the OECD (1996, 1997) results for Denmark, Germany, Spain and the UK. The results vary depending on the definition and measure of mobility. Van Kerm (2004) looked at income mobility in Belgium, Western Germany and the USA between 1985 and 1997. Most recently, Fields (2008) looked at the US and France between the 1960s and the 1990s. Ayala and Sastre (2008), considering a short balanced panel (five waves of ECHP) of five EU countries, examined the differences in the level and structure of income mobility. They found that earnings represent the income source with the largest contribution to total short-term mobility in each of the five countries. Despite this large contribution, no consistent comparative study on earnings mobility could be identified at the European level. We address this gap in the literature. Exploring mobility in the income components is relevant given that the different income components do have different determinants. By exploiting the eight years of the ECHP for fourteen EU countries, our paper aims to make a substantive contribution to the literature on cross-national comparisons of earnings mobility at the EU level. We examine the

mobility-inequality linkage at the EU level using approaches which bring complementary evidence – both short and long term -, neglected by previous studies.

This paper also contributes to the debate on the limitations of the Shorrocks index in capturing the equalizing/disequalizing effect of mobility (Benabou and Ok ,2001; Fields, 2008). We argue for the need to complement the evidence brought by the Shorrocks index with an alternative measure developed by Fields (2008). The Fields (2008) index, which has not been applied in any comparative study in Europe so far, is able to circumvent the limitations of the Shorrocks index, and thus bring complementary information that could be used for making inferences about lifetime income distributions. Additionally, we explore the role of labour market policies and institutions in understanding the cross-national differences in earnings mobility across Europe, to see whether increasing the flexibility in the labour market has the potential to increase earnings mobility.

## **2. Data**

The study uses the European Community Household Panel (ECHP)<sup>3</sup> over the period 1994-2001 for fourteen EU countries. Luxembourg and Austria are observed between 1995 and 2001, and Finland between 1996 and 2001. Following the tradition of previous studies, the analysis focuses only on men.

A special problem with panel data is attrition over time, as individuals are lost at successive dates causing the panel to decline in size and raising the problem of representativeness. Behr, Bellgardt, Rendtel (2005) found that the extent and the determinants of panel attrition in ECHP vary between countries and across waves within one country, but these differences do not bias the analysis of income or the ranking of national results. Ayala, Navarro, Sastre (2006) assessed the effects of panel attrition on income mobility comparisons for some EU countries in ECHP. They show that ECHP attrition is characterized by a certain degree of selectivity, affecting only some variables and some countries. Additionally, the income mobility indicators display certain sensitivity to the weighting system.

The weighting system applied in our study is the one recommended by Eurostat, namely the “base weights” of the last wave observed for each individual, bounded between 0.25 and 10.

The earnings measure is real net<sup>4</sup> hourly wage adjusted for CPI of male workers aged 20 to 57, born between 1940 and 1981. The study uses only observations with hourly wage lower than 50 Euros and higher than 1 Euro. The resulting sample for each country is an unbalanced panel. For more details on the inflows/outflows in the sample, see Sologon and O’Donoghue (2009).

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<sup>3</sup> The European Community Household Panel provided by Eurostat via the Department of Applied Economics at the Université Libre de Bruxelles.

<sup>4</sup> For France the wage is in gross amounts.

Unlike previous studies that rely on a fully balanced sample to explore mobility as an equalizer of longer-term incomes, we use an unbalanced sample over different sub-periods. Thus we explore mobility as an equalizer of longer term incomes not only for those employed over the entire sample period, but also for those that move into and out of employment. Focusing only on the fully balanced sample may bias the estimation of mobility due to the overestimation of earnings persistency. Moreover, besides the employment status, there are other factors determining panel attrition. Although not reported here, we compared the results using a fully balanced panel in order to check for the impact of differential attrition on the study of earnings mobility as an equalizer of longer term differentials using the Shorrocks and the Fields index.

### 3. Methodology

In this study we explore the different facets of the inequality-mobility relationship at the EU-level using three mobility measures introduced over time as improved alternatives.<sup>5</sup> When exploring mobility, we have in mind two aspects of mobility: mobility as opportunity, and mobility as equalizer of longer-term differentials (Friedman's, 1962).

#### *Mobility as opportunity to change positions in the earnings distributions between years*

The opportunity to move in the earnings distribution between periods is best reflected by rank measures, which capture positional movements in the distribution of earnings. Traditional rank measures are derived from the transition matrix approach between income groups. This approach to mobility, however, fails to capture the movement within each income group, running the risk of underestimating the degree of mobility. An alternative approach, used in Dickens (1999), is to compute the ranking of the individuals in the wage distribution for each year and examine the degree of movement in percentile ranking from one year to the other. For each mobility comparison only individuals with positive earnings in both periods are considered. The measure of mobility between year  $t$  and year  $s$  is:

$$M_{ts} = 2 * \sum_{i=1}^N |F^t(w_{it}) - F^s(w_{is})| / N \quad (1)$$

where  $F(w_{it})$  and  $F(w_{is})$  are the cumulative distribution function for earnings in year  $t$  and year  $s$  and  $N$  the number of individuals with positive earnings in both years. Based on this measure, the degree of mobility equals twice the average absolute change in percentile ranking between year  $t$  and year  $s$ . When there is no mobility  $M$  equals 0 - people maintain their earnings position from year  $t$  to  $s$  - the difference between  $F^t(w_{it})$  and  $F^s(w_{is})$  equals 0 for all individuals.  $M$  equals maximum 1 if earnings in the two years are perfectly negatively rank correlated - in the second period there is a complete reversal of ranks -,

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<sup>5</sup> For a review of the methodology used for measuring mobility, please refer to Fields and Ok, (1999); Fields, Leary, and Ok, (2003).



and the value 2/3 if earnings in the two periods are independent. The robustness of this measure of mobility was discussed in Dickens (1999).

We estimate two types of mobility measures:

(i) short-term mobility or 2-year period mobility  $M(t, t+1)$  - defined as mobility between periods one year apart, used to assess the pattern of short-term mobility over time and its link with the evolution of cross-sectional inequality;

(ii) long-term mobility or 8-year period mobility  $M(t, t+7)$  - defined as mobility between periods seven years apart, used to assess the extent to which mobility increases with the time span.<sup>6</sup>

This measure, referred to as “the Dickens index” in the rest of the paper, however, fails to formalize the relationship between earnings mobility and earnings inequality, a limitation corrected by Shorrocks (1978).

***Mobility - as opportunity to change positions in the distribution of long-term earnings relative to single-year earnings***

Shorrocks (1978) introduced a family of mobility measures that incorporates a close relationship between income mobility and income inequality. Mobility is measured as the relative reduction in the weighted average of single-year inequality when the accounting period is extended:<sup>7</sup>

$$0 \leq R_T = I(\sum_{t=1}^T y_{it}) / \sum_{t=1}^T w_t I(y_{it}) \leq 1 \quad (2).$$

$y_{it}$  represents individual annual earnings,  $t$  time  $t = 1, \dots, T$ ,  $I$  is an inequality index that is a strictly convex function of incomes relative to the mean,  $I(\sum_{t=1}^T y_{it})$  the inequality of lifetime income,  $w_t$  the share of earnings in year  $t$  of the total earnings over a  $T$  year period and  $I(y_{it})$  the cross-sectional annual inequality.  $R_T$  ranges from 0 (perfect mobility) to 1 (complete rigidity).<sup>8</sup> There is complete income rigidity if lifetime inequality is equal to the weighted sum of individual period income inequalities, meaning that everybody holds their position in the income distribution from period to period. Perfect mobility is achieved when everybody has the same average lifetime income, meaning that there is a complete reversal of positions in the income distribution. The degree of mobility is computed as  $M_T = 1 - R_T$ . Shorrocks (1978)’s mobility definition is important from an economic point of view because it provides a way of identifying those countries that exhibit a high annual income inequality, but fares better when a longer period of time is considered. If a country A has both greater annual inequality and greater rigidity than country B, it will be more unequal than B whatever period is chosen for comparison. But if A exhibits more mobility, this may be sufficient to change the rankings when longer periods are considered (Shorrocks, 1978).

<sup>6</sup> For Luxembourg and Austria the sample span is of 7 years, and in Finland of 6.

<sup>7</sup> The formula applies for a cohort of constant size.

<sup>8</sup> To compute this index only individuals that are present in all years are considered.

In the literature the Shorrocks index is usually classified among the measures of mobility as an equalizer of longer-term differentials. During recent years, however, the criticism that Shorrocks fails to capture the equalizing effect has been gaining momentum. Benabou and Ok (2001) and Fields (2008) highlighted the main limitation of the Shorrocks measure: it fails to quantify the direction and the extent of the difference between inequality of longer-term income and inequality of base year income, treating equalizing and disequalizing changes essentially in an identical fashion. Our study brings additional evidence for this criticism, and argues for the need to complement the evidence brought by the Shorrocks index with an alternative measure, able to capture the equalizing/disequalizing impact of mobility. Thus we opt for using the Shorrocks index as an overall measure of lifetime mobility – conceptualized as the opposite of earnings rigidity, which captures the opportunity to change positions in the distribution of long-term/lifetime earnings relative to the cross-sectional distribution.

***Mobility - as equalizer of longer term differentials - Fields Index (2008)***<sup>9</sup>

Fields (2008) proposed an alternative index, which circumvents the limitation of the Shorrocks index, capturing mobility as an equalizer/disequalizer of longer-term incomes:

$$\varepsilon = 1 - (I(a)/I(y_l)) \quad (3),$$

where  $a$  is the vector of average incomes,  $y_l$  is the vector of base-year incomes, and  $I(\cdot)$  is a Lorenz-consistent inequality measure such as the Gini coefficient or the Theil index. A positive/negative value of  $\varepsilon$  indicate that average incomes,  $a$ , are more/less equally distributed than the base-year incomes,  $y_l$ , and a 0 value that  $a$  and  $y_l$  are distributed equally unequally. For a complete description of the properties of the Fields index please refer to Fields (2008).

By applying the Shorrocks and the Fields indices, we first assess the degree of long-term earnings mobility across 14 EU countries, and second we establish whether this mobility is equalizing or disequalizing long-term earnings differentials. We choose to work with the mobility index based on the Theil index, as it is more sensitive to the tails of the distribution.

For each approach we estimate two types of mobility measures:

(i) short-term mobility or 2-year period mobility  $M(t, t+1)$  – which for Shorrocks measures the degree to which the relative earnings positions observed on an annual basis are shuffled in the distribution of 2-year earnings, and for Fields measures the extent to which mobility equalizes the inequality measured over a 2-year horizon relative to cross-sectional inequality in base year  $t$ ;

(ii) long-term mobility or 8<sup>10</sup>-year period mobility  $M(t, t+7)$  – which for Shorrocks measures the degree to which the relative earnings positions observed on an annual basis are shuffled in the distribution

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<sup>9</sup> The concept of mobility as an equalizer of longer term income is an old one, complementing mobility-as-time-independence, positional movement, share movement, non-directional income movement, and directional income movement (Fields, 2008).

of 8-year earnings, and for Fields measures the extent to which mobility equalizes the inequality measured over a 8-year horizon relative to cross-sectional inequality in base year  $t$ .

We distinguish between three types of inequality: cross-sectional inequality, short-term inequality – inequality in earnings measured over a 2-year horizon - and long-term inequality - inequality measured over the sample period horizon

Most studies analysing mobility as an equalizer of longer-term differentials rely on a fully balanced panel, meaning only individuals recording positive earnings over the entire sample. The main drawback of this approach is the exclusion of individuals with irregular profiles, thus running the risk of overestimating earnings persistency. Therefore, we opted for an “unbalanced” approach, meaning using unbalanced panels across different sub-periods (e.g. the mobility index for 1994-1997 is based on individuals with positive earnings in each year between 1994 and 1997, and not only on individuals with positive earnings over the entire sample period 1994-2001, which would be the case under a fully “balanced” approach).

#### **4. Changes in earnings inequality**

We start by describing the evolution of the hourly earnings distribution both over time and across different time horizons, the ordering of countries with respect to hourly earnings inequality and how this ordering changes when the accounting period is extended from one to several years. The purpose is to get a glimpse into the intra-country and inter-country changes in the distribution of hourly earnings, both over time and across different horizons.

##### ***Changes in cross-sectional distribution over time***

We start with the changing shape of the cross-sectional distribution of earnings for men over time. On average, men got richer over time in most countries except Austria. Plotting the percentage change in mean hourly earnings between the beginning of the sample period and 2001 at each point of the distribution for each country (Figure 2), reveals a negative and nearly monotonic relationship between the quantile rank and the growth in real earnings in most countries: the higher the rank, the smaller the increase in earnings. Thus hourly earnings of low-paid people improved to a larger extent than those of the better-off. The steepest profile is identified in Ireland, suggesting that across Europe, relative to high wage individuals, the Irish low wage individuals improved their wage situation the most. In Austria, people at the top of the distribution experienced a decrease in mean hourly wage over time, which may explain the decrease in the overall mean. Finland, Germany, Greece, and Netherlands diverge from the other European countries experiencing a higher relative increase in earnings the higher the rank. Only in the Netherlands, men at the bottom of the income distribution recorded a deterioration of their work pay.

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<sup>10</sup> 7 for Luxembourg and Austria, and 6 for Finland.

The positive relationship between the quantile rank and the growth in real earnings may explain the increase in cross-sectional inequality found in the latter four countries, as captured by the Gini index, the Theil index (GE(1)) and the Atkinson inequality index (aversion parameter=1) in Table 1<sup>11</sup>. Consistent across indices, cross-sectional inequality is found to increase also in Italy, Luxembourg and Portugal, despite the negative association between the quantile rank and the growth in real earnings. A decrease in cross-sectional inequality over time is found in the remaining countries.<sup>12</sup> These trends shuffled the country ranking in cross-sectional inequality moderately, as illustrated by the rank correlation of 88,13% between the 1<sup>st</sup> and last wave<sup>13</sup>. The only constancy is found for Portugal and Denmark, which both in 1994 and 2001, remain the most and the least unequal EU countries. Using Theil, in 1994, in between the two extremes, in ascending order of inequality we find Finland (1996), Netherlands, Belgium, Italy, Austria (1995), Germany, Greece, UK, Luxembourg (1995), Ireland, Spain, and France (gross). In 2001, in between the two extremes we find Greece, France, Spain, Luxembourg, UK, Germany, Ireland, Netherlands, Italy, Finland, Belgium, and Austria. In general, these rankings are consistent across indices.

#### ***Changes in the earnings distribution with the accounting period***

We complete the earnings distribution picture with the evolution of earnings inequality when we extend the horizon over which inequality is measured, using both an unbalanced and balanced sample (Table 2). As expected, the longer the horizon the lower the inequality in all countries, except Portugal under the balanced approach, where the 8-year inequality is higher than inequality in 1994.<sup>14</sup> Even based on average earnings over the whole sample period, a substantial inequality in the permanent component of earnings is still present in all countries. There is a tendency, however, for the intra-country differences to be smaller when earnings are averaged over several years than in single-year inequality comparisons: e.g. the standard deviation for the Gini coefficients of the eight-year average of earnings is 0.031, but around 0.036 for single-year earnings. The ranking in long-term inequality changes slightly compared with single-year inequality, as illustrated by the high rank correlation 95.16%. Denmark and Finland with the lowest inequality, and Portugal with the highest inequality maintain their ranks. Austria, Belgium and Netherlands converge to values close to Finland, followed by Italy, then Germany, UK, Luxembourg, Greece, Ireland with similar values, and finally France and Spain.

Inequality measures based on the unbalanced approach are higher than those based on the balanced approach, not surprising given that people working over the entire sample are expected to have more

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<sup>11</sup> Inequality indices differ with respect to their sensitivity to income differences in different parts of the distribution, therefore they illustrate different sides of the earnings distribution.

<sup>12</sup> The trends for Denmark, UK, Spain and Germany are consistent with Gregg and Vittori (2008).

<sup>13</sup> The rank correlation is 81.12% if we do not include Denmark and Portugal, which keep their rank.

<sup>14</sup> This trend is confirmed by all three inequality indices, for all countries.

stable jobs, and thus lower earnings differentials as opposed to the case when we include also those with unstable jobs. Next, we explore earnings mobility across Europe between 1994 and 2001.

## **5. Short-term mobility over time**

First, is there more mobility in terms of rank changes from one year to the next, in 2000 compared to the 1<sup>st</sup> wave and what is the potential link with the evolution of cross-sectional inequality? The Dickens index in Table 3 illustrate that, over time, except Denmark, Ireland, Spain, and the UK, all countries record a decrease in short-term mobility. Linking with the evolution of cross-sectional inequality over time, we conclude that in 2000 men are: better off both in terms of their relative wage and opportunity to escape low pay in the next period in Denmark, Ireland, Spain, and the UK; better off in terms of their relative wage, but worse off in terms of their chance to escape low pay the next period in Austria, Belgium and France; and worse off in terms of both in Finland, Germany, Greece, Italy, Luxembourg, Netherlands and Portugal. These findings, together with the highly significant negative correlation coefficient of -50.3%, bring evidence of a negative association between the evolution of short-term mobility and the evolution of cross-sectional earnings inequality across Europe. The exceptions, Austria, Belgium and France, however, support the debate that mobility is not always beneficial.

Second, to formalize the link between the evolution of mobility and inequality, we look at the Shorrocks and Fields indices, displayed in Table 3. The ranks of countries are quite similar between the Dickens and Shorrocks index. This is also the case for the Fields index in the first wave, but the ranks change quite significantly between the Fields and the other indices for 2000. Comparing the first wave with the last wave, the changes are the same in all countries except, the Netherlands, Finland, the UK and Denmark. In the Netherland and Finland the Fields and Dickens indices go in the same direction, while in the UK the Shorrocks and Dickens index go in the same direction. In Denmark, Shorrocks stagnates, whereas Fields decreases. These differences in findings between the two indices reinforce the limitations of the Shorrocks measure put forward by Benabou and Ok (2001) and Fields (2008) and the need to complement the evidence based on Shorrocks with the one based on Fields to understand the complex link between mobility and inequality. Although not reported here, most trends are confirmed by the balanced approach. Overall, the Shorrocks index appears to be affected to a lesser extent by differential attrition compared with the Fields index (see Sologon and O'Donoghue (2010b) for the balanced approach).

## **6. Long-term mobility versus short-term mobility**

Next, we turn in Table 4 to the comparison of earnings mobility when we extend the period over which mobility is measured. In line with previous studies, the longer the period over which rank mobility

is measured the higher the earnings mobility. Ireland stands out with the highest relative increase in rank mobility with the time span - almost 80%. Relating back to the strong negative relationship between the quintile rank and the growth in real earnings identified in Figure 2, we may conclude that the low wage individuals may be the main beneficiaries of this increase in mobility over the lifecycle.

The ordering of countries in long-term mobility relative to short-term mobility changes substantially as illustrated by Figure 3<sup>15</sup>. In terms of the Dickens index, Luxembourg and Denmark are the least and the most mobile long-term (waves 1-6). Judging whether this mobility is high or low depends on the question being asked. Long-term mobility is certainly high enough to make the point that people are not stuck at the bottom top of the earnings distribution. But is there enough mobility to wash out the effect of yearly inequality in a lifetime perspective? To answer, we turn to the Shorrocks and the Fields index.

So far we found that mobility increases with the horizon over which mobility is measured, meaning that the opportunity to change ones position in the cross-sectional earnings distribution is higher the more years elapse between periods. In this context the lifetime implications of these trends are of interest. Is there any earnings mobility in a lifetime perspective, meaning are the relative income positions observed on an annual basis shuffled in the distribution of long-term or lifetime earnings?

To answer this question we look at the stability profile which plots the Shorrocks rigidity index across different time horizons. In Figure 4 the time horizons are expressed in reference to the 1<sup>st</sup> wave for each country. In all countries, the rigidity declines monotonically as the time horizon is extended, meaning lifetime mobility is present. Thus all EU men do have an increasing mobility in the distribution of lifetime earnings as they advance in their career. Comparing the unbalanced and balanced approaches, although not reported here, we found consistent trends; thus limited impact of differential attrition (see Sologon and O'Donoghue (2010b) for the balanced approach).

The ordering of countries in long-term mobility relative to short-term mobility changes slightly as illustrated by Figure 3.<sup>16</sup> Over the sample-span horizon, the highest mobility is recorded in Denmark, followed by Finland<sup>17</sup>, Austria<sup>18</sup>, UK, Belgium, Greece, Ireland, Netherlands, Italy, France, Spain, Germany, Luxembourg<sup>19</sup> and the lowest, Portugal. Denmark provides the highest opportunity of reducing lifetime earnings differentials relative to cross-sectional ones, and Portugal the lowest.<sup>20</sup>

Also is mobility equalizing or disequalizing lifetime earnings differentials compared with annual earnings differentials? The Fields index, which unlike Shorrocks, captures whether mobility is

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<sup>15</sup> Spearman rank correlation is rather small 51.82%.

<sup>16</sup> Spearman rank correlation is high 83.3%

<sup>17</sup> Finland has the same ranking when comparing all countries over a 6-year horizon.

<sup>18</sup> Austria has the same ranking when comparing all countries over a 7-year or 6-year horizon.

<sup>19</sup> Idem for Luxembourg.

<sup>20</sup> The ranking between Denmark, UK, Spain and Germany is consistent with the one found by Gregg and Vittori (2008) using the Shorrocks index based on all indices considered, including Theil and Gini.

equalizing/disequalizing long-term differentials (Table 4). Overall, mobility increases with the horizon for all countries, except Portugal. The evolution, however, is not monotonic for all countries. All countries except Portugal record positive values of mobility, showing that mobility is equalizing long-term earnings differentials. The story is confirmed also using a fully balanced sample (Sologon and O'Donoghue, 2010b). For Portugal, mobility turns negative when measured over an 8-year horizon, showing that mobility is exacerbating long-term earning differentials relative to cross-sectional ones.

Portugal has the lowest profile, indicating the lowest mobility as equalizer of long term differentials (Figure 5). At the opposite country spectrum, Denmark and Ireland have the steepest profiles and the highest long-term mobility. Some convergence trends emerge as the horizon over which mobility is measured increases. For a horizon of 7-8 years, mobility converges to similar values in Denmark and Ireland, in Belgium and France, in Spain and Germany, and in Luxembourg, Greece and Netherlands (Figure 5).<sup>21</sup>

The ordering of countries in long-term Fields mobility relative to short-term mobility changes to a larger extent compared with the Shorrocks index, but to a lesser extent compared with the Dickens index: the Spearman rank correlation is 65.27%. The highest long-term (sample-span) mobility (Figure 3 and Figure 6) is recorded in Ireland and Denmark, followed by Austria<sup>22</sup>, France and Belgium with similar values, then UK, Finland<sup>23</sup>, Greece, Netherlands, Luxembourg<sup>24</sup>, Germany, Spain, Italy, and Portugal with a negative value. Assuming that the 8-year mobility is a good approximation for lifetime mobility, Ireland and Denmark have the highest equalizing mobility in a lifetime perspective, and Italy, Spain and Germany the lowest. Portugal is the only country where mobility acts as a disequalizer of lifetime differentials.

Although not reported here, we find that the Fields index is affected to a larger extent by differential attrition than the Shorrocks index. Whereas the overall qualitative conclusions regarding the evolution of mobility over time and across horizons are not affected by using a balanced or unbalanced sample, more differences are observed for the country rankings (see Sologon and O'Donoghue (2010b) for the results using the balanced sample).

### ***Inferences for lifetime inequality ranking***

Comparing the rankings in long-term mobility between the Shorrocks and the Fields index in Figure 6 the mobility pictures differ to a moderate extent, confirmed also by the moderate Spearman rank correlation (70.55%) between the long-term Shorrocks and Fields index. Portugal records the lowest values based on both indices, with a disequalizing lifetime mobility. Denmark, Finland, Austria, UK,

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<sup>21</sup> These trends are in general consistent with the balanced approach., which is not reported here but it is available on request from the authors.

<sup>22</sup> Austria has the same ranking when comparing all countries over a 7-year or 6-year-horizon.

<sup>23</sup> Finland has the same ranking when comparing all countries over a 6-year horizon.

<sup>24</sup> Luxembourg has the same ranking when comparing all countries over a 7-year or 6-year horizon.

Belgium and Ireland rank among the seven highest in both Shorrocks and Fields lifetime mobility, suggesting that they have the highest lifetime mobility with the highest equalizing impact on lifetime earnings differentials. Denmark scores the highest in lifetime mobility, but the second highest after Ireland in equalizing mobility, suggesting that mobility in Ireland is slightly more equalizing in a lifetime perspective than in Denmark. Compared with the other countries, Denmark has a higher lifetime mobility with a higher lifetime equalizing impact.

Linking back with the ranking in long-term inequality, we attempt to make inferences regarding lifetime inequality country rankings. We start from the country rankings in long-term inequality in Section 4, and try to deduce the potential re-rankings that may take place in a lifetime perspective. Denmark is the least unequal long-term, has the highest Shorrocks mobility and the most equalizing mobility, thus it is expected to have the lowest inequality in a lifetime perspective. At the opposite extreme we find unequivocally Portugal. Austria has a higher equalizing mobility than Finland and may become less unequal in a lifetime perspective. Finland and Austria are expected to be among the three least unequal countries in a lifetime perspective after Denmark. For the other countries, we do not always find a consistent ranking in expected lifetime inequality rankings based on the Shorrocks and the Field indices, which indicates that the Shorrocks and the Fields index indeed capture different facets of mobility. Future research is needed to settle this dilemma.

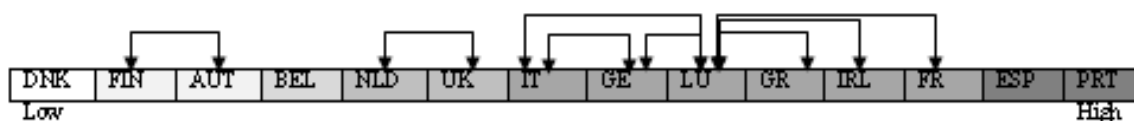


Diagram 1 illustrates the ranking in lifetime inequality relying on the Fields index. Belgium has a lower long-term mobility and a higher equalizing mobility than all countries, except Denmark, Finland and Austria, thus is expected to be the fourth country in lifetime inequality. The Netherlands and the UK are expected to rank next in lifetime inequality, but we cannot establish their relative ranks, given that the UK has a more equalizing long-term mobility than the Netherlands. Next we expect to find Italy, Germany, Luxembourg, Greece, Ireland and France, expect to interchange their ranks. At the end of the lifetime inequality spectrum we expect to find Spain and Portugal, with the highest long-term inequality and the least equalizing mobility. Overall, the “Flexicurity” countries have the lowest expected lifetime inequality and the “Mediterranean” countries the highest.

## 7. Earnings mobility and labour market policies and institutions

Lastly, we try to understand the cross-country differences in earnings mobility across Europe by exploring its link with the labour market policies and institutions. For this we use the OECD data on



labour market indicators.<sup>25</sup> We consider the indicators capturing the labour market regulation (EPL), the level of support in the labour market as spending for active labour market policies (ALMPs) and the generosity of the unemployment benefit replacement rates, the degree of unionization and corporatism, the tax wedge and the product market regulation (PMR). These are closely linked to the wage-setting mechanism, and are expected to be associated with earnings mobility.

Table 5 shows the associations between short-term/long-term mobility and labour market policies/institutions. The labour market indicators used for the correlations with short-term mobility are the moving averages of the yearly indicators over pairs of two years for each country. The labour market indicators used for the correlations with long-term mobility are the average indicators over the period 1994-2001 for each country. The signs and the significance levels of the associations are in general consistent across the three mobility indicators, both short and long-term. We find significant associations for the employment protection legislation (EPL), for union density, for corporatism, for the product market regulation (PMR) and the unemployment benefit replacement rate.

We find evidence that countries with a stricter labour market regulation (EPL) have lower levels of earnings mobility. The negative association is stronger for long-term mobility than for short-term, for the Fields index than the Shorrocks and the Dickens index. The negative association between earnings mobility and EPL is consistent with the view that a strict EPL is a source of labour market rigidity (Cazes and Nesporova, 2003). More labour market support as spending on ALMPs (which typically consist of job-search, vocational training or hiring subsidies programs) and the generosity of the unemployment benefit replacement rate is found to be positively associated with earnings mobility (albeit insignificant for ALMPs). These associations show that the countries with more flexible labour markets and more labour market support have a higher earnings mobility. These findings are consistent with the existing evidence that more developed ALMPs increase the employability of vulnerable groups, while a low EPL facilitates their reintegration into the labour market (Bassanini and Duval 2006a, 2006b). Additionally, generous unemployment benefits prevent individuals from accepting low-paid jobs, they improve the job-matching, thereby increasing the likelihood of more stable employment profiles (Bassanini and Duval 2006a, 2006b). Coupling these three policies has the potential to improve the labour market opportunities of vulnerable groups.

Similarly with EPL, we find that also more regulation in the product markets is negatively associated with earnings mobility; the strongest association is found for the Shorrocks index. A higher union density and corporatism are found to be positively associated with earnings mobility. The findings for corporatism run counter the traditional view that corporatist economies are more rigid than decentralized one, but they

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<sup>25</sup> The definition and the summary statistics of the OECD labour market indicators are in the annex. For a complete description of the OECD data, please refer to Bassanini and Duval (2006a, 2006b). The data was obtained by email from the authors.

are in line with the most recent findings showing that corporatist systems could be more flexible, even more than decentralized economies as they allow the renegotiation of contracts in response to aggregate shocks (Teuling and Hartog, 2008).

These associations are confirmed by the scatter plots in Figure 7 to Figure 11 . They show that the Scandinavian countries (especially Denmark), which embraced the “flexicurity model” with low levels of labour market regulation and high levels of labour market support, with a high corporatism and union density have among the highest levels of mobility across Europe. Next we find the Anglo-Saxon countries with low levels of regulation and low levels of labour market support. The lowest levels of mobility are in the Mediterranean countries which have strict labour market regulations and low levels of labour market support.

## **8. Concluding remarks**

The economic reality of the 1990s in Europe forced the labour markets to become more flexible by reducing the regulation in the labour and product markets, by increasing the spending on active labour market policies and the unemployment benefit replacement rates, by reducing the non-wage labour costs in order to allow wages to reflect the productivity and the labour market conditions. These reforms are expected to increase employment, but also earnings inequality. Whether the raise in inequality has negative implications for lifetime earnings inequality, depends on the degree of earnings mobility. In this study we are interested in the evolution and the cross-national differences in earnings mobility across Europe over this tumultuous labour market period.

Using a consistent comparative dataset for 14 European countries, the European Community Household Panel (ECHP), which covers the reform period between 1994 and 2001, we explore the degree of mobility in individual earnings across Europe from three angles. First we explore the evolution of short-term inequality and its link with cross-sectional inequality and short-term inequality. Second, we look at the evolution of long-term mobility relative to short-term mobility and the implications for lifetime or long-term inequality. Third, we try to understand the cross-national differences in earnings mobility across Europe by exploring the cross-country heterogeneity in labour market policies/institutions.

The changing shape of the distribution of hourly earnings in the EU after 1994 illustrates that hourly earnings of the low paid individuals improved to a larger extent than those of the better off in most countries, except in the Netherlands, Germany, Greece and Finland, where the opposite holds. The Netherlands is the only country where low paid men recorded a deterioration in their work pay, consistent with the recent findings showing increasing low pay and working poverty in the Netherlands in the 1990s (Salverda, 2008). Cross-sectional inequality is found to increase in addition to these four countries also in

Italy, Luxembourg and Portugal, despite the negative association between the quintile rank and the growth in real earnings.

In order to understand these trends in cross-sectional earnings inequality we looked at the evolution of short-term mobility. We found a negative association between the evolution of cross-sectional inequality and short-term rank mobility across the EU. In Germany, the Netherlands, Luxembourg, Italy, Greece, Finland and Portugal the decrease in mobility as identified by the evolution of the short-term Dickens rank mobility index may be a possible explanation for the increase in cross-sectional inequality. Additional proof is found in Denmark, the UK, Ireland, and Spain, where the increase in short-term rank mobility appears to have an equalizing effect on cross-sectional differentials: in 2000, men are better off both in terms of their relative wage and their opportunity to escape low pay in the next period. Some exceptions are present, supporting the debate that mobility is not always beneficial, having a disequalizing effect: in 2000, men in Belgium, France and Austria are found to be better off in terms of their relative wage, despite being worst off in terms of their chance to escape low pay next year.

The rank measures, however do not incorporate the relationship between income mobility and income inequality. To achieve this link, we explored an alternative class of mobility measures – as equalizer of longer-term earnings. First, we explored the traditional Shorrocks index, which, given its limitations in capturing the equalizing effects put forward by Benabou and Ok (2001) and Fields (2008), is interpreted here as the earnings mobility in a long-term perspective, meaning the opportunity that men have to shuffle long-term their relative income positions observed on an annual basis. Second we introduced the Fields index, which circumvents the limitations of the Shorrocks index. To assess how the equalizing effect of mobility changed over time we choose the shortest horizon, formed of periods one year apart.

The 2-year Shorrocks index signals that in 2000, men have an increased opportunity to improve their relative position in the distribution of short-term inequality compared with the 1<sup>st</sup> wave only in the Netherlands, Ireland, Spain and Finland. The 2-year Fields index signals that short term mobility is more equalizing only in Ireland and Spain, whereas in the Netherlands it turns disequalizing. The contradiction in the findings for the Netherlands and Finland between the Shorrocks and the Fields indices emphasizes the need for using the two to provide a complete picture. Linking back to the evolution of the short-term rank mobility and to the positive association found between the quantile rank and the growth in real earnings, we conclude that in the Netherlands the changes in the labour market favoured the better off individuals in the detriment of the low paid workers. Similarly in Finland, but to a much lesser extent, as short-term mobility just decreased, its equalizing impact remaining positive.

Shifting from the short-term to the long-term perspective, we find that the ranking in long-term inequality does not change to a large extent compared with annual inequality, sign of limited lifetime mobility within countries, either equalizing or disequalizing: Portugal remains by far the most unequal EU

country, and Denmark and Finland the least unequal even over an 8-year horizon. The ranking in earnings mobility differs, both across indices and across horizons. Long-term, Denmark renders unequivocally the most mobile earnings distribution with the second highest equalizing effect in the EU. Using the rank measure, men in Luxembourg are found to have the lowest opportunity to improve their position in the distribution of earnings long-term. In terms of the opportunity to shuffle long-term the relative income positions observed on an annual basis, the lowest value is found in Portugal. The least equalizing long-term mobility is found in Italy, and the only disequalizing mobility in a lifetime perspective in Portugal. Coupling the information provided by the Shorrocks and the Fields indices across Europe, Denmark, Finland, Austria, UK, Belgium, and Ireland are found to have the highest lifetime mobility with the highest equalizing impact on lifetime earnings differentials.

Linking the rankings in long-term Fields mobility with the rankings in long-term inequality, we form expectations regarding the country ranking in lifetime inequality: unequivocally, Denmark is expected to have the lowest lifetime earnings inequality in Europe, and Spain and Portugal the highest. After Denmark<sup>26</sup>, among the least three unequal countries we expect Finland and Austria, followed on the fourth place by Belgium. Next, with a higher lifetime inequality we expect Netherlands and/or UK, then the other six countries. In conclusion, the countries adopting the “Flexicurity” model have the lowest expected lifetime inequality and the ones adopting the “Mediterranean” model the highest expected lifetime inequality.

We bring evidence that more flexible labour markets, with low levels of regulation, with a high labour support as ALMPs and generous unemployment benefits, have higher earnings mobility levels. Similarly unionization and corporatism are positively associated with earnings mobility. The “Flexicurity” countries (Denmark and Finland) have among the highest earnings mobility levels in Europe, close to the Anglo-Saxon countries (Ireland and the UK), whereas the Mediterranean countries have the lowest mobility, which signals that a strict regulation coupled with a low labour market support have detrimental effects for earnings mobility.

Besides making a substantive contribution to the literature on cross-national comparisons of earnings mobility at the EU level, our paper also brings evidence regarding the limitation of the Shorrocks measure in capturing the equalizing/disequalizing effect of mobility, put forward by Benabou and Ok (2001) and Fields (2008). We argue for the need to complement the information brought by the Shorrocks index with additional measures that capture mobility as an equalizer of long-term differentials, in the tradition of Fields (2008), in order to make inferences regarding lifetime earnings distributions.

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<sup>26</sup> The Danish top position in distributional outcomes is confirmed by other approaches to earnings mobility ( Sologon and O’Donoghue (2010a), Sologon (2010)).

**Table 1. Earnings Inequality (Index\*100)**

		1994	1995	1996	1997	1998	1999	2000	2001
Germany	Gini	22.15	22.34	22.04	21.89	22.58	22.81	22.75	22.54
	Theil	8.22	8.61	8.23	8.06	8.85	8.96	8.92	8.72
	A(1)	8.08	8.38	8.04	7.84	8.12	8.53	8.41	8.17
Denmark	Gini	15.76	15.26	15.52	15.21	14.24	14.68	14.94	14.05
	Theil	4.22	3.92	4.23	4.15	3.37	3.73	3.83	3.35
	A(1)	4.26	3.78	4.10	3.96	3.37	3.76	3.78	3.33
Netherlands	Gini	18.07	18.37	19.19	18.80	18.93	17.92	18.18	20.67
	Theil	5.63	5.76	6.32	6.07	5.96	5.40	5.56	7.25
	A(1)	5.56	5.77	6.33	5.90	5.65	5.18	5.44	7.08
Belgium	Gini	19.10	17.71	17.64	18.13	17.53	17.33	17.13	17.85
	Theil	6.23	5.37	5.35	5.58	5.15	5.11	5.04	5.48
	A(1)	5.92	4.95	5.04	5.24	4.85	4.92	4.69	5.14
Luxembourg	Gini		25.23	24.74	25.41	25.62	26.58	26.50	26.32
	Theil		10.09	9.85	10.24	10.37	11.19	11.15	10.89
	A(1)		9.88	10.00	10.16	10.02	10.95	11.09	10.66
France	Gini	27.62	26.47	26.26	27.23	27.28	27.41	26.83	26.49
	Theil	13.21	12.04	11.63	12.88	12.58	12.65	11.94	11.87
	A(1)	11.64	10.88	10.58	11.41	11.54	11.59	11.17	10.98
UK	Gini	24.26	24.22	23.35	23.36	23.54	23.25	23.35	23.51
	Theil	10.08	10.01	9.20	9.05	9.24	9.08	9.16	9.29
	A(1)	9.25	9.19	8.57	8.46	8.55	8.32	8.46	8.51
Ireland	Gini	27.59	26.87	25.76	25.47	25.00	23.39	22.77	21.70
	Theil	12.87	11.97	11.00	10.83	10.60	9.31	8.78	7.85
	A(1)	11.84	11.21	10.50	10.14	9.85	8.66	8.15	7.64
Italy	Gini	19.16	18.47	19.02	18.93	19.85	19.72	19.78	19.90
	Theil	6.51	6.08	6.42	6.29	7.13	7.01	7.08	7.19
	A(1)	5.99	5.58	5.91	5.78	6.41	6.30	6.33	6.39
Greece	Gini	23.62	24.37	23.80	25.55	25.66	26.98	26.51	26.37
	Theil	9.51	9.97	9.44	11.23	11.09	12.20	11.93	12.17
	A(1)	8.77	9.13	8.70	9.97	9.99	10.97	10.68	10.55
Spain	Gini	27.87	28.27	28.19	28.71	28.37	26.99	26.36	26.07
	Theil	13.08	13.22	13.36	13.67	13.47	12.69	12.09	11.47
	A(1)	11.84	12.13	11.94	12.33	12.17	11.07	10.60	10.28
Portugal	Gini	30.05	31.14	30.66	30.85	31.13	30.11	31.32	31.72
	Theil	15.79	16.93	16.76	17.27	18.01	17.21	18.86	19.27
	A(1)	13.23	14.16	13.80	14.05	14.37	13.55	14.60	14.92
Austria	Gini		19.49	18.34	18.34	17.39	17.07	16.72	16.85
	Theil		6.67	5.84	5.90	5.27	5.10	4.93	4.97
	A(1)		6.44	5.62	5.52	4.87	4.80	4.67	4.82
Finland	Gini			17.32	17.80	17.30	17.81	17.10	18.50
	Theil			5.22	5.46	5.23	5.38	5.08	5.98
	A(1)			4.94	5.29	4.83	5.19	4.76	5.53

**Table 2. Short and Long-term inequality**

Inequality (Theil)	Ge	Dk	Nl	Be	Lu	Fr	UK	Ir	It	Gr	Sp	Pt	Au	Fi
<b>Unbalanced</b>														
1st wave	0.0822	0.0422	0.0563	0.0623	0.1009	0.1321	0.1008	0.1287	0.0651	0.0951	0.1308	0.1579	0.0667	0.0522
1st wave - 2nd wave	0.0744	0.0316	0.0468	0.0496	0.0869	0.106	0.0866	0.1109	0.054	0.0801	0.1179	0.1524	0.0514	0.0422
1st wave – 6th wave	0.0623	0.0232	0.0424	0.0399	0.0678	0.0915	0.0653	0.0819	0.049	0.0756	0.1046	0.1381	0.0372	0.0346
1st wave-8th wave	0.06	0.0205	0.0395	0.0395		0.0847	0.063	0.0718	0.0494	0.0698	0.0929	0.1423		
<b>Balanced</b>														
1st wave	0.0709	0.0329	0.0479	0.0516	0.0797	0.1113	0.0803	0.1163	0.0573	0.0848	0.1092	0.1414	0.0500	0.0422
1st wave - 2nd wave	0.0655	0.0282	0.0431	0.0425	0.0701	0.0971	0.0709	0.1042	0.0520	0.0744	0.0966	0.1340	0.0438	0.0373
1st wave – 6th wave	0.0611	0.0219	0.0401	0.0395	0.0665	0.0871	0.0632	0.0791	0.0487	0.0714	0.0938	0.1382	0.0375	0.0346
1st wave-8th wave	0.0600	0.0205	0.0395	0.0395		0.0847	0.0630	0.0718	0.0494	0.0698	0.0929	0.1423		

**Table 3. Short-term mobility over time – unbalanced**

Mobility Index	Ge	Dk	Nl	Be	Lu	Fr	UK	Ir	It	Gr	Sp	Pt	Au	Fi
<b>Dickens</b>														
1 <sup>st</sup> wave - 2 <sup>nd</sup> wave	0.189	0.267	0.193	0.27	0.144	0.225	0.211	0.214	0.255	0.295	0.215	0.206	0.286	0.264
2000-2001	0.174	0.271	0.19	0.207	0.131	0.173	0.217	0.234	0.205	0.187	0.261	0.172	0.192	0.253
<b>Shorrocks</b>														
1 <sup>st</sup> wave - 2 <sup>nd</sup> wave	0.053	0.108	0.078	0.106	0.051	0.107	0.088	0.077	0.085	0.130	0.065	0.048	0.108	0.111
2000-2001	0.046	0.108	0.082	0.057	0.042	0.055	0.073	0.078	0.060	0.058	0.078	0.040	0.062	0.114
<b>Fields</b>														
1 <sup>st</sup> wave - 2 <sup>nd</sup> wave	0.067	0.168	0.085	0.170	0.080	0.153	0.116	0.127	0.094	0.131	0.091	0.057	0.130	0.104
2000-2001	0.053	0.165	-0.018	0.050	0.072	0.067	0.102	0.128	0.051	0.050	0.121	0.028	0.056	0.023

Notes: The Shorrocks and Fields mobility indices are based on the Theil Index

**Table 4. Short-term and long-term mobility**

Mobility Index	Ge	Dk	Nl	Be	Lu	Fr	UK	Ir	It	Gr	Sp	Pt	Au	Fi
<b>Dickens</b>														
1st wave - 2nd wave	0.189	0.267	0.193	0.270	0.144	0.225	0.211	0.214	0.255	0.295	0.215	0.206	0.286	0.264
1st wave – 6th wave	0.265	0.385	0.276	0.333	0.205	0.279	0.305	0.335	0.333	0.324	0.275	0.303	0.360	0.365
1st wave-8th wave	0.305	0.427	0.318	0.372		0.300	0.351	0.384	0.354	0.378	0.296	0.320		
<b>Shorrocks</b>														
1st wave - 2nd wave	0.053	0.108	0.078	0.106	0.051	0.107	0.088	0.077	0.085	0.130	0.065	0.048	0.108	0.111
1st wave – 6th wave	0.108	0.235	0.141	0.171	0.100	0.141	0.172	0.160	0.145	0.169	0.109	0.080	0.193	0.218
1st wave-8th wave	0.124	0.267	0.173	0.185		0.135	0.186	0.176	0.149	0.180	0.132	0.093		
<b>Fields</b>														
1st wave - 2nd wave	0.067	0.168	0.085	0.170	0.080	0.153	0.116	0.127	0.094	0.131	0.091	0.057	0.130	0.104
1st wave – 6th wave	0.121	0.309	0.140	0.237	0.161	0.238	0.224	0.374	0.141	0.130	0.140	0.070	0.239	0.180
1st wave-8th wave	0.153	0.376	0.175	0.235		0.240	0.216	0.382	0.138	0.177	0.149	-0.007		

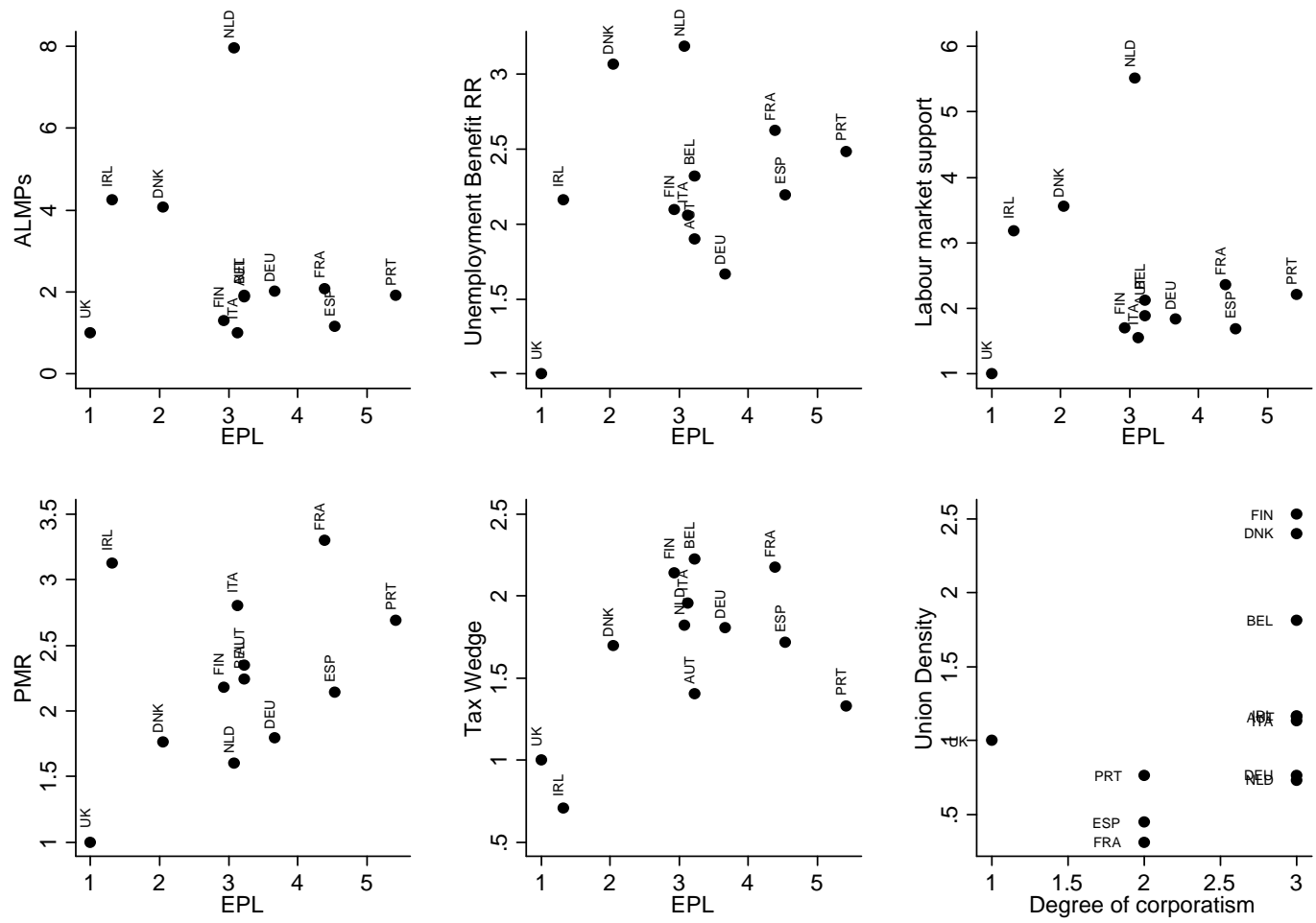
Notes: The Shorrocks and Fields mobility indices are based on the Theil Index

7 waves for Austria and Luxembourg, 6 waves for Finland

**Table 5. Correlation between short-term/long-term mobility and labour market policies/institutions**

	Short-term Dickens Mobility	Short-term Shorrocks Mobility	Short-term Fields Mobility
EPL	-0.2934*	-0.4070*	-0.4367*
Union Density	0.5745*	0.6180*	0.3978*
Corporatism	0.3141*	0.2451*	0.1481
PMR	-0.0988	-0.2388*	-0.0524
Tax Wedge	0.0839	0.1415	-0.0681
URR	0.2124	0.2858*	0.1693
ALMPs	0.0147	0.2148	0.1001
	Long-term Dickens Mobility	Long-term Shorrocks Mobility	Long-term Fields Mobility
EPL	-0.5197	-0.5962*	-0.7181*
Union Density	0.6051*	0.7402*	0.4393
Corporatism	0.3841	0.3386	0.2917
PMR	-0.1274	-0.4351	-0.0753
Tax Wedge	-0.1779	-0.0139	-0.2098
URR	0.2384	0.3721	0.2135
ALMPs	0.1975	0.3260	0.2925

Note: \*=significant at 5% level of confidence

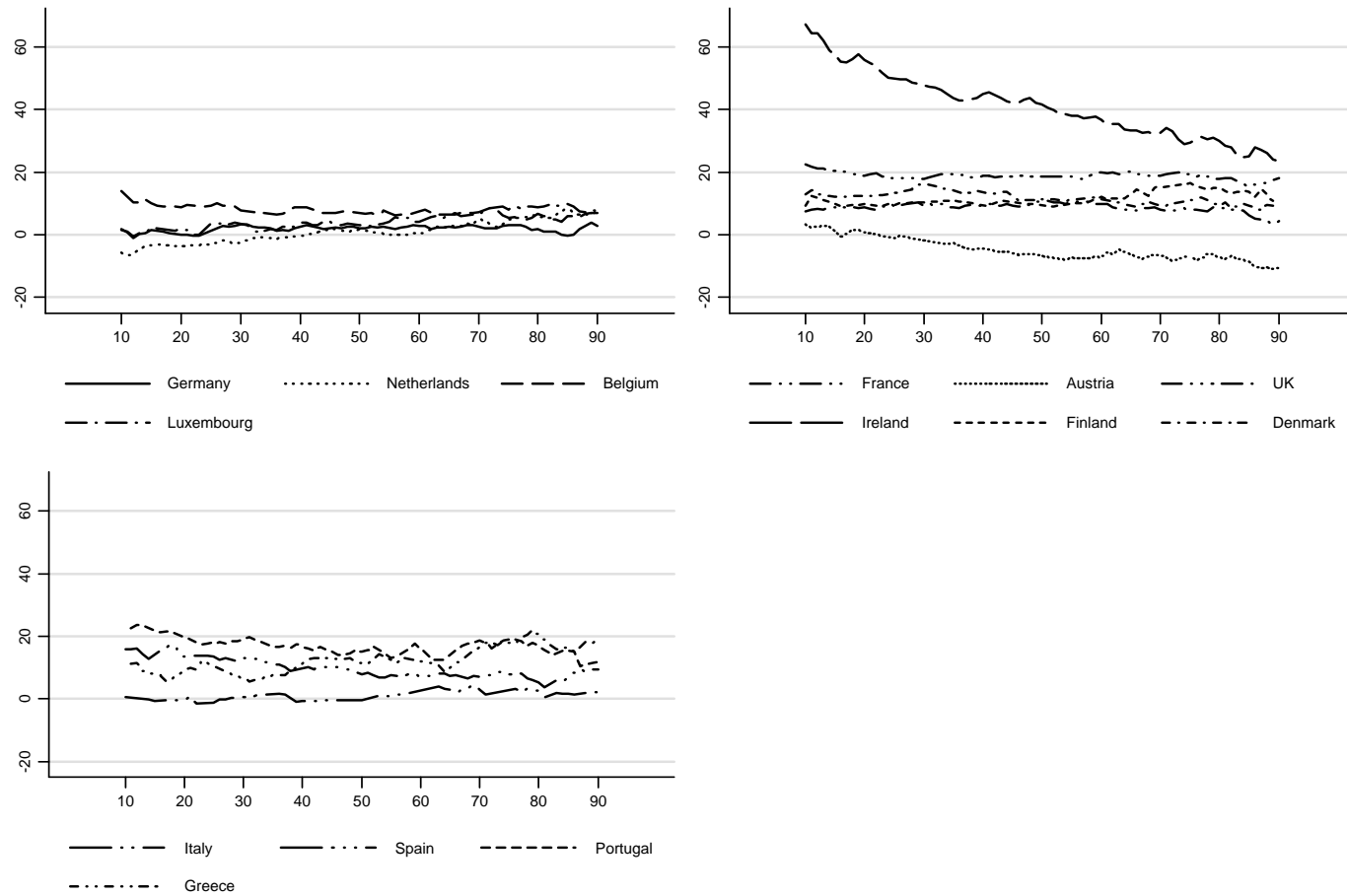


**Figure 1. Labour market policies/institutions in 2001 (scaled UK=1)**

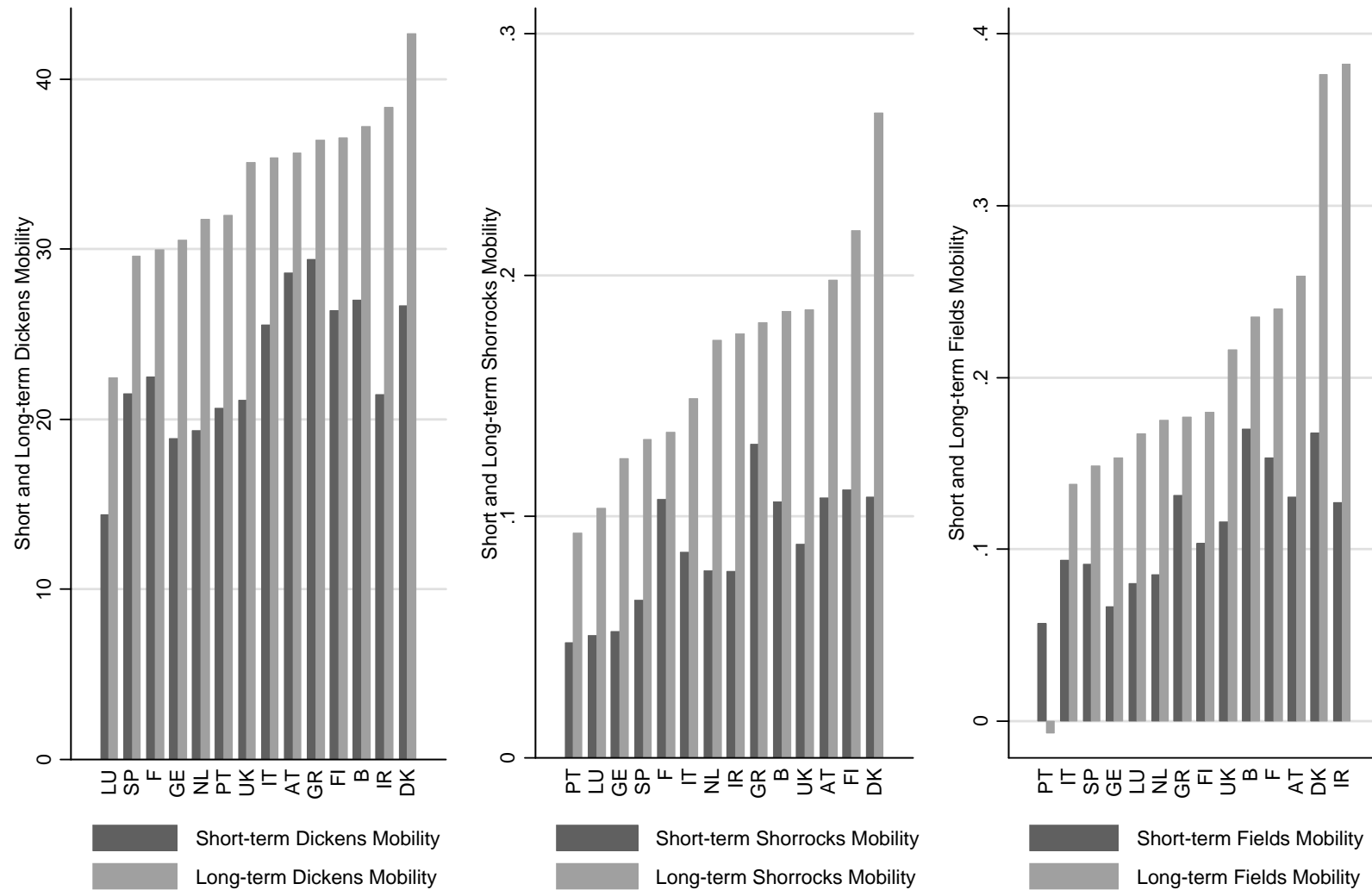
Note: EPL= Employment protection legislation; PMR= product market regulation; ALMPs = spending on active labour market policies; Labour market support is the arithmetic average between ALMPs and the unemployment benefit replacement rate.

Source: Based on OECD data on labour market indicators provided by Bassanini and Duval (2006a, 2006b)



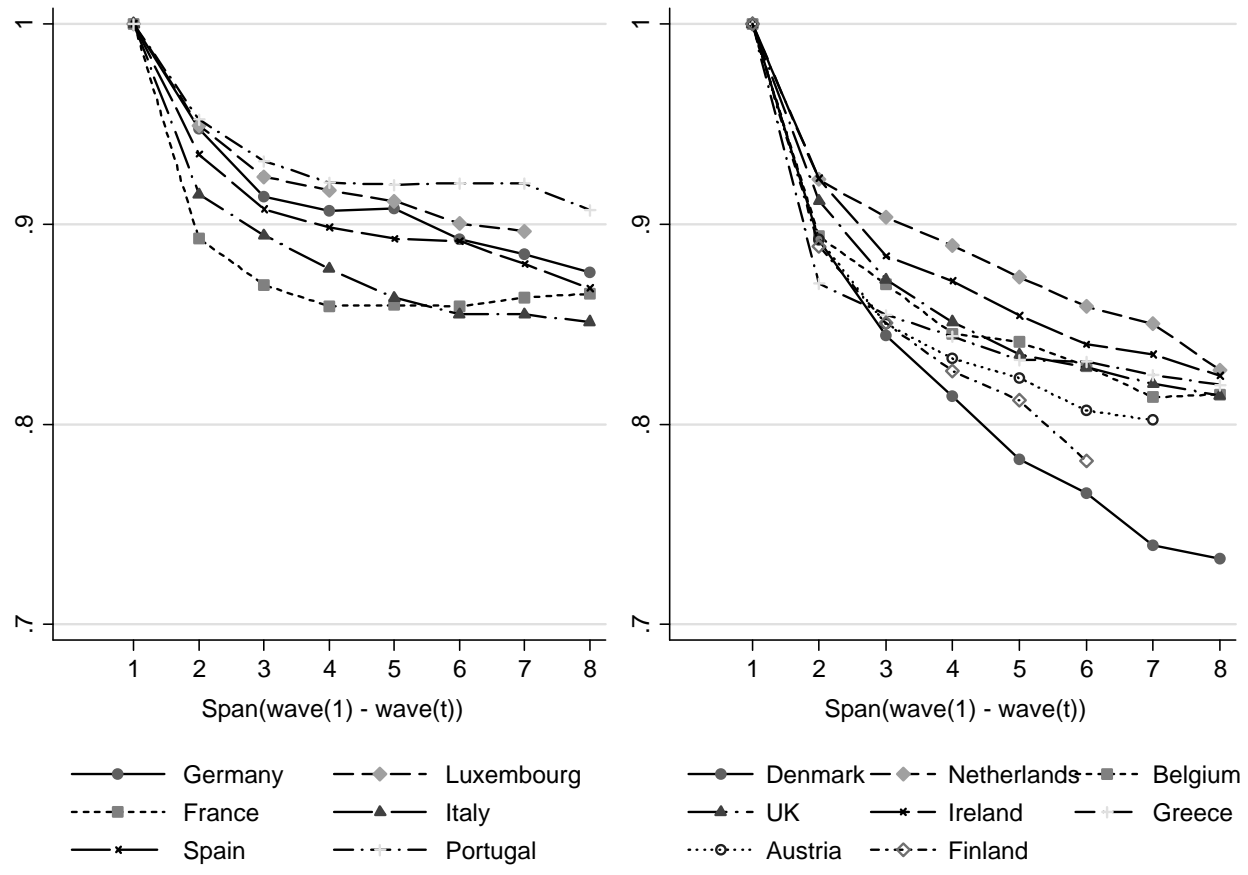


**Figure 2. Percentage Change in Mean Hourly Earnings by Percentiles Over The Sample Period**



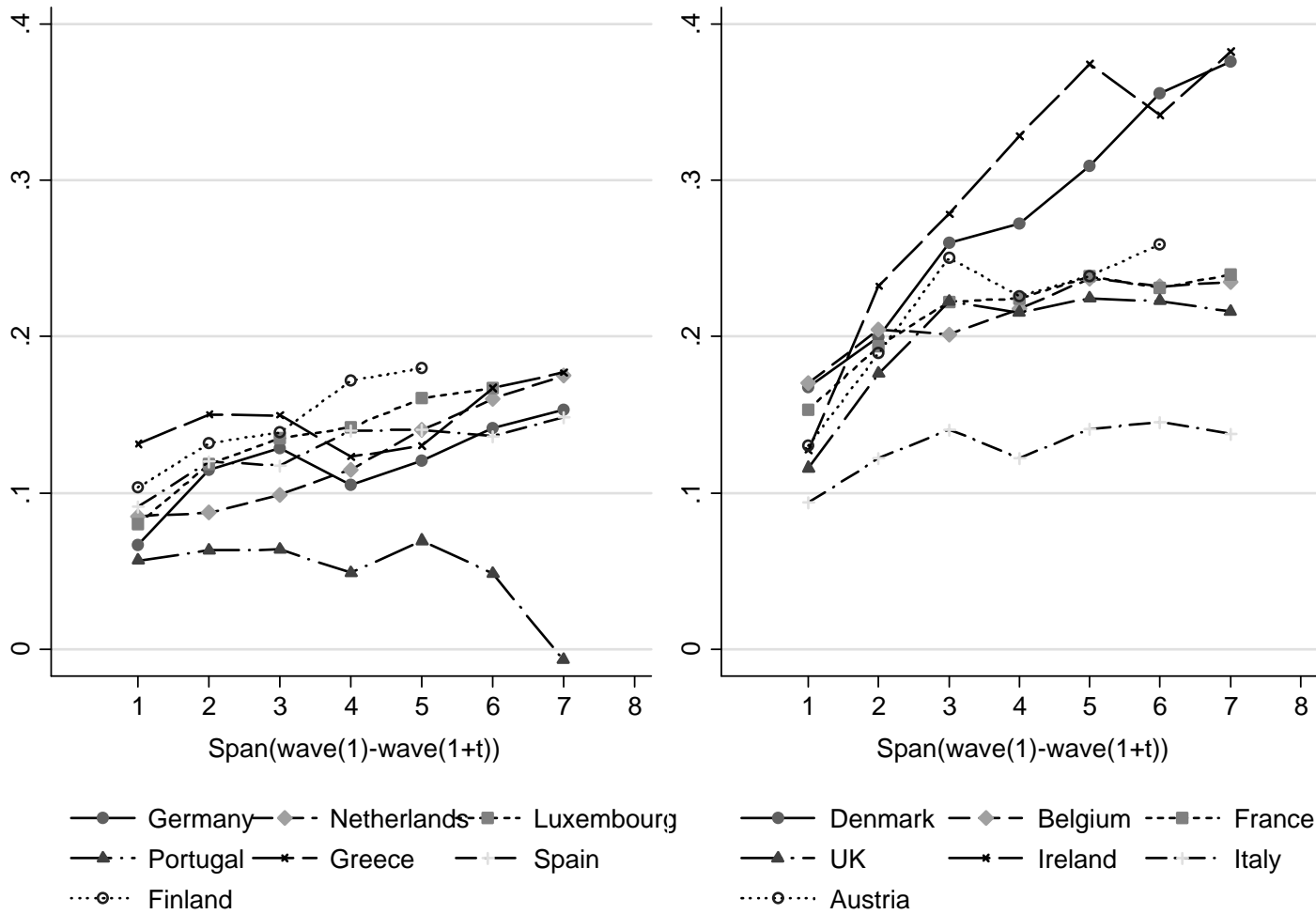
**Figure 3. Short and Long-Term Mobility**

Spearman rank correlation: 51.82% (Dickens), 83.30% Shorrocks, 78.90% Fields)



**Figure 4. Stability Profiles for Male Earnings for Selected Countries (based on Theil) –Unbalanced**

Note: The stability profile plots the rigidity index against the horizon over which the index is measured: 1-year rigidity = 1; 2-year rigidity = rigidity index over a horizon of 2 years, span wave(1)-wave(2); 8-year rigidity = rigidity index over a horizon of 8 years, span(wave(1)-wave(8))



**Figure 5. Mobility Profile based on the Fields Index - Unbalanced**

Note: The mobility profile plots the Fields index against the horizon over which the index is measured: 1-year mobility = 1; 2-year mobility = mobility index over a horizon of 2 years, span wave(1)-wave(2); 8-year mobility = mobility index over a horizon of 8 years, span(wave(1)-wave(8))

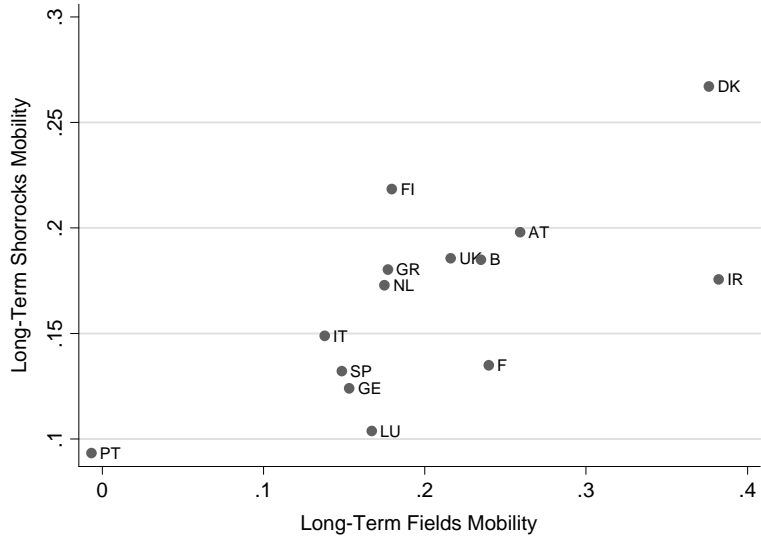


Figure 6. Scatter plot of long-term (6-year, 7-year and 8-year) mobility: Shorrocks vs. Fields

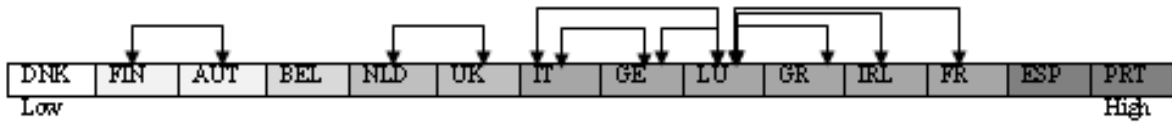


Diagram 1. Lifetime Earnings Inequality Ranking

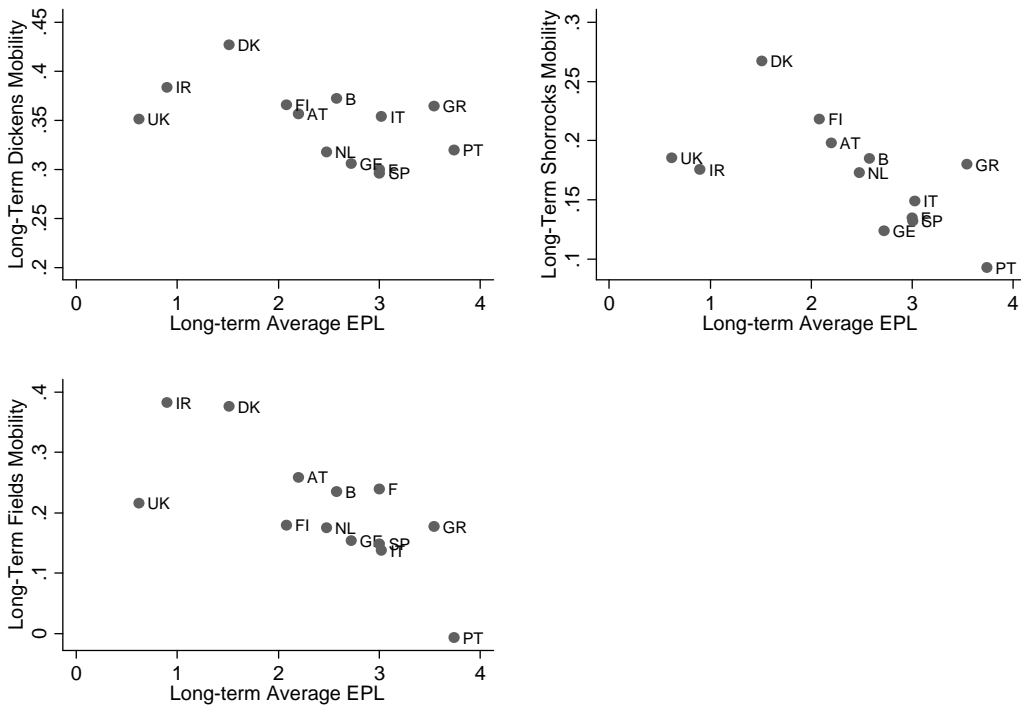
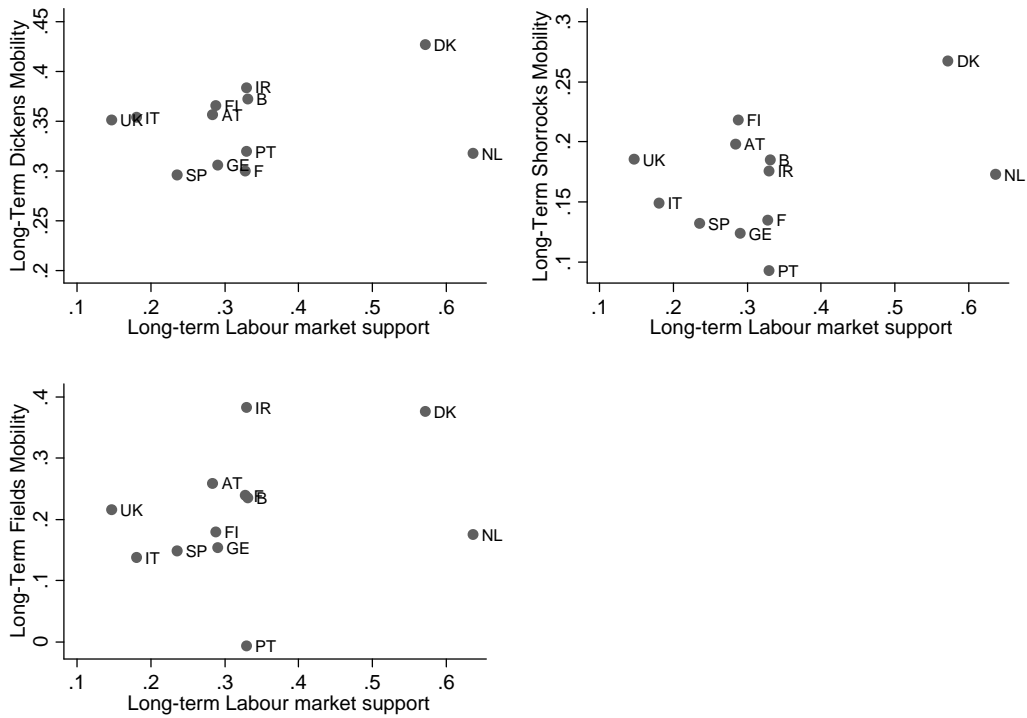
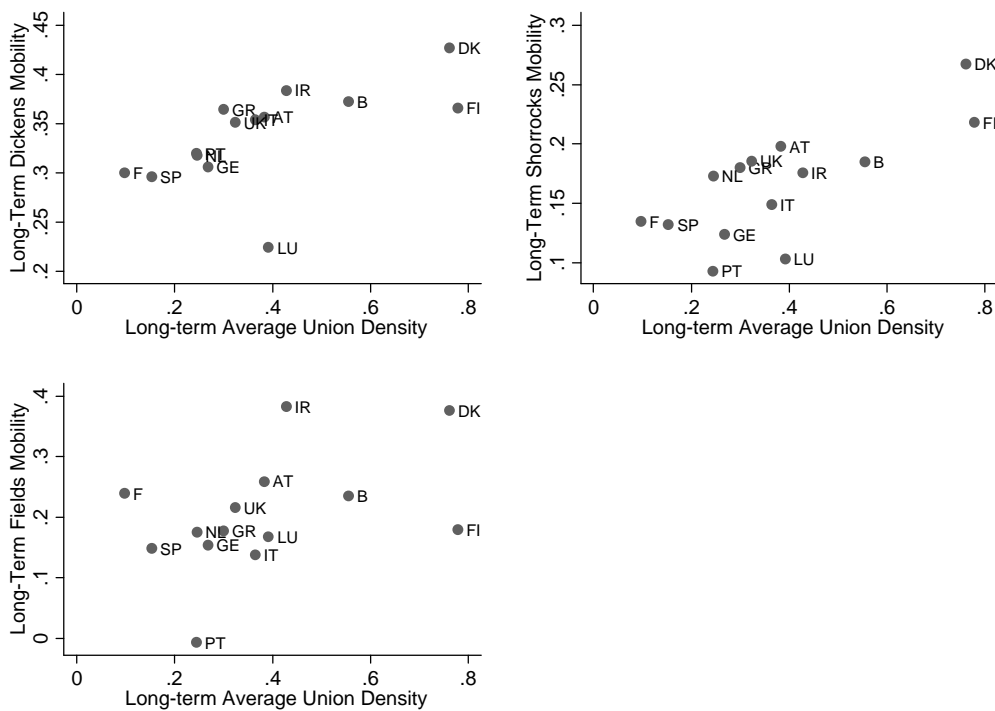


Figure 7 Scatter plot of long-term mobility and long-term average EPL

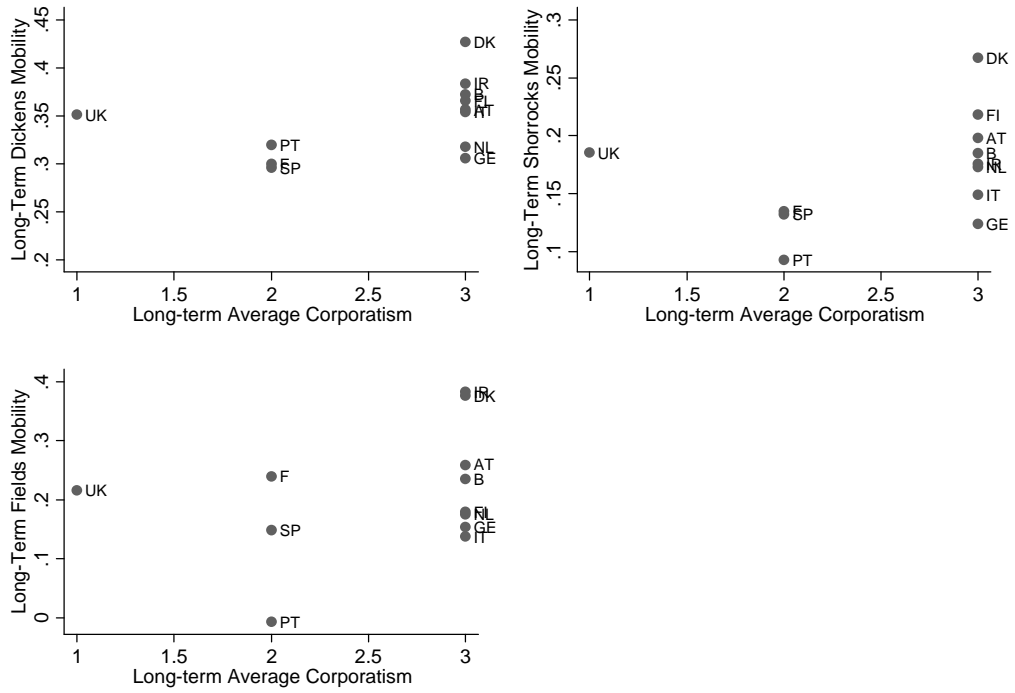


**Figure 8 Scatter plot of long-term mobility and long-term labour market support**

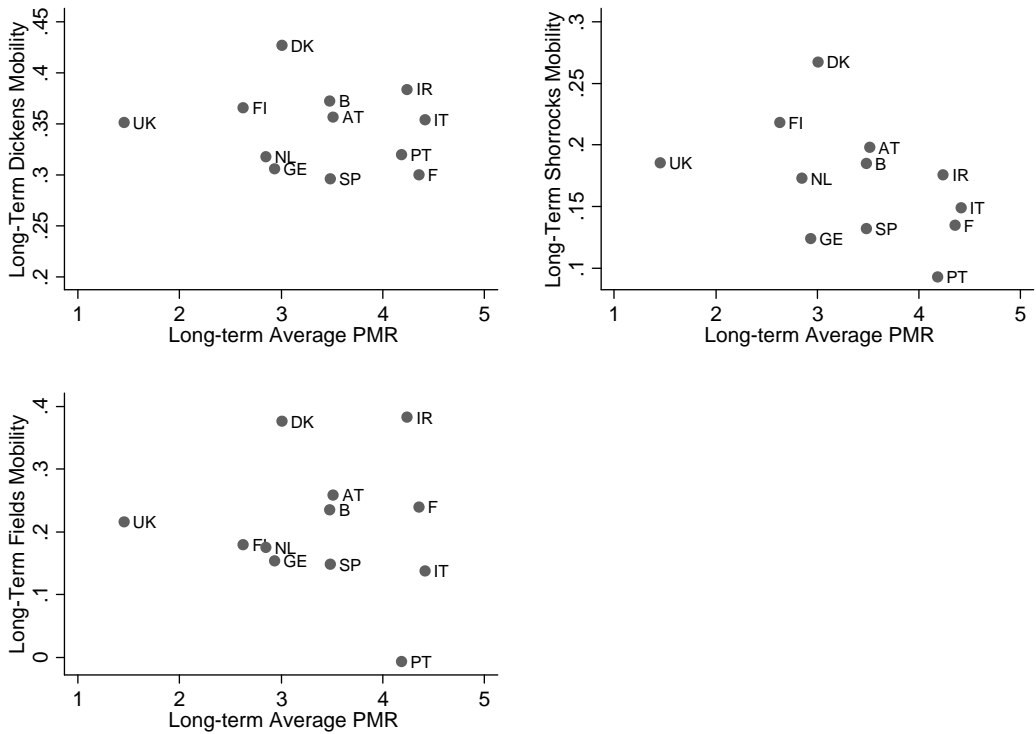
Note: Labour market support is the arithmetic average between ALMPs and the unemployment benefit replacement rate



**Figure 9 Scatter plot of long-term mobility and long-term average union density**



**Figure 10 Scatter plot of long-term mobility and long-term average Corporatism**



**Figure 11 Scatter plot of long-term mobility and long-term average PMR**

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## Annex

**Table A.1 Description of OECD variables**

OECD Variables	Description
Source: Bassanini and Duval (2006a, 2006b)	
EPL = Employment Protection Legislation	OECD summary indicator of the stringency of Employment Protection Legislation. EPL ranges from 0 to 6.
Union Density	Trade union density rate, i.e. the share of workers affiliated to a trade union, in %.
Degree of Corporatism	Indicator of the degree of centralisation/co-ordination of the wage bargaining processes, which takes values 1 for decentralised and uncoordinated processes, and 2 and 3 for intermediate and high
Tax Wedge	The tax wedge expresses the sum of personal income tax and all social security contributions as a percentage of total labour cost.
PMR = Product Market Regulation	OECD summary indicator of regulatory impediments to product market competition in seven non-manufacturing industries. The data used in this paper cover regulations and market conditions in seven energy and service industries. PMR ranges from 0 to 6.
ALMPs = Public expenditures on active labour market policies	Public expenditures on active labour market programmes per unemployed worker as a share of GDP per capita, in %.
Average unemployment benefit replacement rate (UBRR)	Average unemployment benefit replacement rate across two income situations (100% and 67% of APW earnings), three family situations (single, with dependent spouse, with spouse in work)

**Table A.2 OECD labour market indicators – summary statistics**

Variable	Mean	Std. Dev.	Min	Max	Observations	
EPL	overall	2.423	0.956	0.600	3.854	N = 101
	between	0.944		0.621	3.739	n = 13
	within	0.251		1.537	3.211	T = 7.769
Union Density	overall	0.371	0.191	0.096	0.794	N = 108
	between	0.201		0.098	0.779	n = 14
	within	0.017		0.302	0.429	T = 7.714
Degree of Corporatism	overall			1	3	N = 93
	between					n = 12
	within					T = 7.75
Tax Wedge	overall	0.326	0.068	0.128	0.449	N = 93
	between	0.067		0.219	0.404	n = 12
	within	0.022		0.234	0.390	T = 7.75
PMR	overall	3.394	1.015	1.133	5.236	N = 93
	between	0.871		1.454	4.415	n = 12
	within	0.563		2.155	4.459	T = 7.75
ALMPs	overall	0.301	0.209	0.048	1.261	N = 93
	between	0.188		0.094	0.750	n = 12
	within	0.101		-0.035	0.812	T = 7.75
Unemployment Benefit RR	overall	0.360	0.117	0.166	0.649	N = 93
	between	0.115		0.174	0.599	n = 12
	within	0.030		0.271	0.451	T = 7.75

Source: Own calculations based on the OECD data.

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