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Research Report

Paper on the identification of the flexicurity profile of Member States using micro-economic data

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Projektbericht

Rheinisch-Westfälisches Institut für Wirtschaftsforschung

Paper on the identification of the flexicurity profile of Member States using micro-economic data

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Final Report – October 2011

Research Project for the European Commission

Imprint

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Research Project for the European Commission

Report

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Flexicurity profile of EU Member States

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1. Introduction

The performance of the labour market has been one of the primary interests of policymakers in many countries around the world, and the importance of this issue has been further enhanced by the current financial and economic crisis. In this context, a well-functioning labour market has to strike a balance between two principles. On the one hand, a sufficient level of flexibility of the labour market makes it possible for employers to adjust their firms' labour force in order to react to changes in product demand and technological progress; employees may also benefit from flexibility if overall productivity and labour demand is increased. Furthermore, labour market flexibility may reduce or even prevent a segregation of the labour market if barriers to labour market entry are lowered. On the other hand, a certain level of security is important for the well-being of workers, and it may also be beneficial for employers as it reduces uncertainty and hence facilitates investment and production decisions. The combination of these two principles has led to the term "flexicurity".

At the level of EU policy making, the European Employment Strategy (EES) has recognized the importance of flexicurity principles. In particular, the EES pursues the goal of achieving high levels of employment, enhanced productivity as well as stronger social cohesion through the implementation and the strengthening of a set of common flexicurity principles, i.e. flexibility and security in the labour market. These principles are organised along the following four dimensions:

1. Life-long learning (LLL),
2. Active labour market policies (ALMP),
3. Modern labour laws and labour turnover (MLL),
4. Modern social security laws (MSS).

The European Union (EU) Member States have implemented these principles to varying degrees. However, there is a lack of studies which offer detailed and comparable evidence on the realisation of flexicurity. Therefore, the aim of the present paper is to provide empirical cross-country evidence that allows an informed assessment of the implementation of the flexicurity dimensions of the EES.

The performance of the EU labour markets has been analysed in detail for the European Commission, General Directorate Employment, Social Affairs and Inclusion, by the Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI) and the Institut für Sozialforschung und Gesellschaftspolitik (ISG). The resulting two studies, ISG and RWI (2010) and RWI (2011), use two micro data sets on individual workers, the European Union Labour Force Survey (EU-LFS) and the European Union Statistics on Income and Living Conditions (EU-SILC). This approach yields evidence which is comparable across countries and which controls for heterogeneity at the individual level. The latter fact takes into account composition effects, e.g. the fact that the composition of the labour force may differ across countries, may affect the performance of labour markets.

Based on the main findings of the two studies mentioned above, this paper provides a flexicurity profile for each of the Member States of the European Union using several indicators for the four flexicurity dimensions. Importantly, these indicators consist of labour market

outcomes, e.g. the duration of unemployment as an indicator for the (in)flexibility of the labour market.

The resulting flexicurity profiles are used to construct a flexicurity ranking of the EU Member States, both for the different flexicurity dimensions as well as overall. Furthermore, the flexicurity indicators are correlated with country-specific institutional indicators, such as the level of employment protection. Finally, we conduct a cluster analysis in order to find out whether certain groups of countries share a common set of flexicurity features.

The identification of country-specific flexicurity profiles as well as the analysis of their correlation with institutional indicators allows for an assessment of the current state of flexicurity in the EU Member States, as well as the potential importance of labour market institutions. Furthermore, the results of the study could give an indication for the direction of future policy reforms and further research on this topic. However, it should be taken into account that the analysis is limited as it does not allow an unambiguous identification of causal effects of labour market institutions.

We are not the first to conduct such an analysis. For example, there is a large literature on “varieties of capitalism”, which aims at understanding the role of institutions, and whether the institutional framework of an economy may lead to a national comparative advantage (Hall, Soskice 2001). Manca et. al. (2010) develop a set of flexicurity indicators along the four flexicurity dimensions mentioned above. Compared to their work, we use micro data on individuals, and consistently focus on labour market outcomes in order to compute our flexicurity indicators. Furthermore, we analyse the relationship between our flexicurity indicators and the institutions/macroeconomic conditions prevailing in the EU Member States.

The paper is structured as follows. In the next section, the two micro data sets used in the analysis, the EU-LFS and EU-SILC data, are described. The third section gives an overview of the methodology employed in the analysis. In the fourth section, we present the flexicurity profiles of the Member States, the ensuing rankings, the correlations with the institutional indicators, and the results of the cluster analysis. The final section summarizes and concludes the discussion.

2. Data

The analysis uses three broad data sources: Two micro data sets, the European Union Labour Force Survey (EU-LFS) and the European Union Statistics on Income and Living Conditions (EU-SILC), as well as data at the macro level, i.e. at the level of the EU Member States, which are disseminated by Eurostat and the OECD. These data sources are described in turn.

The EU-SILC project, which was launched in 2003, provides internationally comparable cross-sectional and longitudinal data (Eurostat 2010a, 2011a). We use the longitudinal data set in our analysis as these data make it possible to follow individuals over time. The longitudinal EU-SILC data contain information for the time period 2004-2008 for Austria, Belgium, Estonia, Spain, Finland, Ireland, Italy, Luxemburg, Portugal, Sweden and the non-EU member country Norway. For all other countries, four years (2005-2008) are available except for Bulgaria (2006-2008), Germany (2005-2006) and Romania (2007-2008). The data collection at the national level is performed by the national statistical agencies. The data collected are processed by Eurostat in order to ensure comparability across countries, e.g. by using the

same concepts and definitions as well as common classifications. The minimum sample size for the longitudinal data is 100,000 households and 200,000 persons aged 16 or older in the European Union Member States.

The EU-SILC data set is a representative sample of households and their members, and is conducted at a yearly frequency. Furthermore, the underlying data structure is a rotational panel (except for Luxembourg), i.e. the same persons are interviewed for a certain time period (four years) and each year one quarter of all respondents is replaced by new respondents. This makes it possible to follow individual persons over time. The data set contains two types of information. First, information at the time of the interview on various individual characteristics (age, sex, labour market status, ...) and household characteristics (size, composition, ...) is available. Second, an employment calendar provides monthly information on the labour market status of the respondent as well as yearly income information, both for the (calendar) year preceding the interview. The income information includes both labour income and unemployment and other benefit payments.

The EU-LFS survey started in 1983 with a relatively small number of countries, and is now conducted in the 27 Member States of the European Union, as well as in three candidate countries and three countries of the European Free Trade Association (EFTA) (Eurostat 2010b, 2011b). Similarly to the EU-SILC data, the Labour Force Surveys at the national level are conducted by the national statistical agencies and processed by Eurostat to ensure comparability across countries. The sample size is about 1.5 million people per quarter, with the sampling rates in each country varying between 0.2 per cent and 3.3 per cent.

The EU-LFS data set is a representative sample survey among private households which provides both annual and quarterly information on the individual members of the households covered who are older than 15. The annual data set, which is used in the analysis of this paper, consists of yearly cross-sections. This means that, contrary to the EU-SILC data, it is not possible to follow individuals over time. The data set contains various characteristics of the persons covered, including age, sex, educational attainment, labour market status (employment – distinguishing between both full-time/part-time and permanent/temporary employment), hours worked, unemployment duration, labour market status in the previous year, information on the current/most recent education or training activity. Furthermore, the EU-LFS contains household information, which however is not available for all countries. The Nordic countries, in particular, do not provide household information in the time period analysed.

Finally, we use data on labour market institutions at the macro level. These were collected by Eurostat and the OECD, and an overview of the variables used as well as their respective sources is provided in Table A.1.

3. Methodology

The empirical analysis in this paper proceeds in four steps. First, we compute flexicurity indicators and construct a flexicurity profile for each of the EU Member States for the flexicurity dimensions mentioned in Section 1: Life-long learning (LLL), Active labour market policies (ALMP), Modern labour laws and labour turnover (MLL), and Modern social security laws (MSS). We use these profiles in order to rank the Member States relative to each other. Second, we explore the interlinkages between the flexicurity profile of each country and its institutional and macroeconomic framework by computing the correlations between the flexicurity

indicators on the one hand and the institutional/macro indicators on the other hand. These first two steps investigate the level differences between countries with respect to the flexicurity indicators. In a third step, a cluster analysis is used to identify groups of European Member States with similar flexicurity profiles. Finally, we examine in detail whether certain groups of the population (e.g. old or unskilled persons), relative to the average person in a country, display specific flexicurity characteristics.

The construction of the flexicurity profiles is based on the empirical analyses carried out by ISG and RWI (2010) and RWI (2011). Employing EU-LFS and EU-SILC micro data, respectively, these studies investigate various aspects of labour market performance in the EU Member States at the level of the individual. In order to do so, they aim at explaining various labour market outcomes using different regression techniques. The explanatory variables include the characteristics of the individuals, e.g. sex, age, education, occupation and the characteristics of their households, e.g. the number of children and of elderly persons in the household, or the employment status of the partner, as well as level differences between countries. The latter are captured by country fixed effects in the regressions, and form the basis of the analysis of the country-specific profiles in the present study.¹

Some of the labour market outcomes investigated in these two studies capture the flexicurity aspects of the national labour markets particularly well, and have therefore been selected as flexicurity indicators. They read as follows:²

- 1) Participation in formal training (for the LLL flexicurity dimension),
- 2) Participation in non-formal training (LLL),
- 3) Unemployment duration (ALMP),
- 4) Labour supply (ALMP)
 - 4a) Labour market participation (men/women),
 - 4b) Number of hours worked (men/women),
- 5) Variance of hours worked (men/women) (ALMP)
- 6) Hirings (MLL),
- 7) Transitions from temporary to permanent employment (MLL),
- 8) Coverage rate of unemployment benefits (MSS),
- 9) Net replacement rate of unemployment benefits (MSS).

The lifelong learning dimension, reflecting the workers' adaptability and employability throughout the life course, is captured by the two indicators "participation in formal training" and "participation in non-formal training". The second dimension, active labour market policies, includes the indicator "unemployment duration", as well as the two labour supply indicators "labour market participation" and "number of hours worked". The latter two are important to consider as an economy can only react to changes in a flexible way if labour supply is high enough. Furthermore, we add the indicator "variance of hours worked", which explicitly takes into account the variation in working hours in a given country and thus indicates the flexibility of work arrangements. As the gender-specific differences in labour supply are expected to be particularly important, the indicators 4), 5) and 6) are differentiated between men and women.

In the modern labour laws dimension, the two indicators "hirings" and "transitions from temporary to permanent employment" capture labour market mobility and the flexibility of con-

¹ See ISG and RWI (2010) and RWI (2011) for detailed information on the specification of the regressions.

² Definitions and data aspects for all flexicurity indicators are provided in Table A.2.

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tractual arrangements, respectively. Finally, the modern social security dimension reflects the provision of income support for unemployed individuals, i.e. the insurance aspect of the unemployment benefit system. This is taken into account by two indicators which capture two different aspect of the unemployment benefit system: The indicator “coverage rate of unemployment benefits” quantifies which share of workers who becomes unemployed receives unemployment benefits, independently of the exact amount of benefits received. For this indicator we only consider individuals aged 16-54, as otherwise our results may be biased by policy measures such as early retirement schemes. The “net replacement rate” computes how much unemployment benefits a person who becomes unemployed receives relative to his previous wage. Unfortunately, this last indicator cannot be computed for all the countries, and therefore does not enter the overall ranking, which is explained below. Overall, this yields a total of 13 flexicurity indicators for the four flexicurity dimensions.

The country-specific values of the 13 flexicurity indicators are equivalent to the country differences computed with the help of the regression analyses mentioned above (the country fixed effects). As the estimation results of the aforementioned studies provide a comparison of countries only with respect to a chosen reference country, we re-estimate the regressions excluding the constant term. Moreover, the EU-LFS data do not include household characteristics for the Scandinavian countries Denmark, Finland and Sweden. According to previous research, these countries have been most successful in implementing and balancing certain flexicurity policies and therefore are of special interest for the comparison of country-specific flexicurity profiles. Thus, in order to be able to include these countries in our analysis, we re-estimate the regressions not including household characteristics.³

Following ISG and RWI (2010) and RWI (2011), different estimation methods are used to estimate the determinants of each flexicurity indicator, i.e. ordinary least squares (OLS) for the “number of hours worked”, a logit model for “hirings”, a probit model for the “participation in non-formal training” and “participation in formal training”, “labour market participation” and “transitions from temporary to permanent employment”, as well as an ordered probit model for the “unemployment duration”.⁴ For these indicators, the values of the country fixed effects can be used. To construct the indicator “variance of hours worked” we first adjust hours worked for the composition of the labour force by quantifying the deviation of hours worked from predicted hours worked, and second compute the variance of the composition-adjusted hours worked for every country.

As already mentioned in Section 2, EU-LFS and EU-SILC data sets cover different time periods. Thus, for a better comparison of the estimation results, all the regressions are restricted to the time period 2005-2008. With two exceptions, all flexicurity indicators are provided for 26 EU Member States. The indicator “Transitions from temporary to permanent employment” can only be provided for 25 countries, because in the EU-SILC data information on temporary employment is not available for Denmark. Moreover, the EU-SILC data do not contain information on net income for Denmark, Finland, Hungary, the Netherlands, Slovakia and the United Kingdom. Therefore, the indicator “Net replacement rate” can only be provided for 20 countries and is not considered for the analysis of the fourth flexicurity dimension MSS.

³ We compare the estimation results and the corresponding country ranking when including and excluding household characteristics for all countries available in both regressions. The comparison shows only minor differences in the ranking of countries.

⁴ For a detailed description of the logit, probit and ordered regression model see Boxes A.1 and A.2.

To better illustrate the flexicurity profiles of each EU Member State, we use the different indicators to construct composite indicators for each flexicurity dimension, which we aggregate into an overall composite indicator. Since the indicators have different measurement units, they have to be normalized before aggregation. As normalization procedure, the standardization method is used, i.e. the deviation of each country-specific indicator x'_c from the cross-country average \bar{x}'_c is calculated and divided by the standard deviation across countries σ'_c (see Nardo et al. 2005) for a detailed overview of normalization methods):

$$I'_c = \frac{x'_c - \bar{x}'_c}{\sigma'_c}$$

This procedure converts all indicators to a common scale with an average of zero and a standard deviation of one, with extreme values still having a greater effect on the composite indicator. Consequently, this prevents a flexicurity indicator with a relatively high measurement unit from dominating the other indicators and hence the overall ranking.

When aggregating the indicators into composite indicators for each flexicurity dimension and an overall composite indicator, two aspects play an important role. First, it has to be made clear whether the value of an indicator affects the composite indicator of a country positively or negatively. With respect to this “direction” of the influence of an indicator, we assume that virtually all the indicators positively enter the composite indicator, implying that a higher score reflects a better flexicurity performance of the country. The only exception is unemployment duration, for which a negative direction is assumed. Second, we need to decide which weight to give to each indicator when constructing the composite indicator. Here, we choose an equal weighting of the flexicurity dimensions, i.e. equal weights are attributed to all four flexicurity dimensions. This procedure avoids that dimensions comprising more indicators are implicitly given a higher weight. Within each dimension, equal weights are attributed to each indicator, which avoids the double-counting of indicators that measure the same behavior for different population groups. This applies to the labour supply (labour market participation and number of hours worked) of men and women, and the variance of hours worked of men and women. The selected flexicurity indicators together with their dimension, data source, data availability (number of countries), estimation method, direction and weight are presented in Table 1.

To conclude the first step of the analysis, we use the indicators to investigate how EU Member States differ with respect to their flexicurity profiles. In particular, the country-specific flexicurity indicators, the composite indicators for each flexicurity dimension as well as the overall composite indicator are compared and ranked against each other. Therefore, we obtain a country ranking for every flexicurity indicator and for every flexicurity dimension, as well as an overall flexicurity ranking of all EU Member States.

In the second step of the analysis, we explore the profiles of each country in more detail by investigating the relationship between flexicurity indicators and institutions/macroeconomic conditions prevailing in the EU Member States. In order to do so, we average all institutional and economic variables at the macro level for the time period 2005 to 2008 (see Table A.1 for a list and description of these variables) and correlate them with each flexicurity indica-

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Table 1
List of flexicurity indicators

Indicator	Dimension	Data Source	Data availability (number of countries)	Estimation Method	Direction	Weight
Participation in formal training	LLL	EU-LFS	26	Probit	+	1/8
Participation in non-formal training	LLL	EU-LFS	26	Probit	+	1/8
Unemployment duration	ALMP	EU-LFS	26	Ordered probit	-	1/12
Labour market participation - Women	ALMP	EU-LFS	26	Probit	+	1/48
Labour market participation - Men	ALMP	EU-LFS	26	Probit	+	1/48
Number of hours worked - Women	ALMP	EU-LFS	26	OLS	+	1/48
Number of hours worked - Men	ALMP	EU-LFS	26	OLS	+	1/48
Variance of hours worked - Women	ALMP	EU-LFS	26		+	1/24
Variance of hours worked - Men	ALMP	EU-LFS	26		+	1/24
Hirings	MLL	EU-SILC	26	Logit	+	1/8
Transitions from temporary to permanent employment	MLL	EU-SILC	25	Logit	+	1/8
Coverage rate of unemployment benefits	MSS	EU-SILC	26	Probit	+	1/4
Net replacement rate of unemployment benefits	/	EU-SILC	20	OLS	/	/

Notes: See Section 1 for a definition of the four dimensions. "Direction" indicates whether a specific indicator enters the overall indicator positively or negatively. "Weight" is the weight of a specific indicator in the computation of the overall indicator. The indicator "Transitions from temporary to permanent employment" can only be provided for 25 countries, as in the EU-SILC data information on temporary employment is not available for Denmark. The indicator "Net replacement rate" can only be provided for 20 countries, as information on net income is not available for Denmark, Finland, Hungary, the Netherlands, Slovakia and the United Kingdom.

tor.⁵ The results might reveal important information on the relationship between labour market outcomes and institutional settings and macroeconomic conditions.

In a third step, we investigate which countries can be grouped together in different country groups based on the indicators computed in Step 1. In order to do so, a cluster analysis (see Box A.3) is conducted for each of the four dimensions as well as for all four dimensions together. The results may give some insights into similarities between countries, i.e. the question whether some countries share some flexicurity features. This in turn may make it possible to draw conclusions on the importance of institutional settings that are correlated with the flexicurity indicators.

In the final step of the analysis, special attention is paid to person and household characteristics determining the various flexicurity indicators. Investigating the impact of these variables makes it possible to evaluate which population groups face increased labour market chances and risks, respectively. From each flexicurity dimension we select one, particularly interesting indicator: "participation in formal training" (LLL), "unemployment duration" (ALMP), "hirings" (MLL) and "coverage rate of unemployment benefits" (MSS). The groups we are particularly interested in are individuals of different age groups (15-24 years, 25-54 years, and 55-64 years) and skill groups (low-, medium- and high-skilled), as well as individuals with young children (0-4 years), and elderly persons (65 and older) in the household.

In order to allow cross-country comparisons, the labour market outcome regressions described above are estimated with interactions between the country indicators (country fixed

⁵ Table A.6 presents the average values of all institutional and economic variables that are significantly correlated with the flexicurity indicators.

effects) and the chosen person and household characteristics. As already mentioned above, EU-LFS data do not include household characteristics for the Scandinavian countries Denmark, Finland and Sweden. Therefore, a first set of regressions is estimated without household variables, which allows us to obtain the coefficients of personal characteristics for all countries in the EU-LFS. The obtained coefficients on the person and household characteristics are used to investigate how specific, and potentially vulnerable, groups of the population fare, relative to other individuals in a given country.

4. Results

4.1 Flexicurity Indicators and Country Rankings

In the first step of the analysis, which is described in detail in the previous section, we compute the indicator values for the four flexicurity dimensions life-long learning (LLL), active labour-market policies (ALMP), modern labour laws and labour turnover (MLL) and modern social security laws (MSS) for every country. We use these indicators to construct flexicurity profiles for each of the EU Member States and to construct a country ranking, both for every indicator and overall. A higher rank indicates that the corresponding country more successfully implemented the flexicurity principles during the time period under consideration than countries at the lower ranks. The country rankings according to the individual flexicurity indicators and the composite indicator for the four flexicurity dimensions are presented in Tables 2 and 3, respectively.⁶

With respect to the first flexicurity dimensions, LLL, Tables 2 and 3 illustrate that the UK and Finland, together with Slovenia and Latvia, achieve high scores for participation in formal and non-formal training, yielding top ranks with respect to the LLL dimension. At the opposite end of the spectrum, Italy and Greece show a relatively poor performance for both indicators, which leads to low positions in this ranking. For all other countries, a more diverse picture emerges, with intermediate positions for one of the indicators and lower positions for the other one.

Regarding the flexicurity dimension ALMP, the UK ranks at the top position in the overall ranking, followed by Austria, Spain, Denmark and Cyprus (Table 3). A distinction between the indicators within this dimension reveals strong variations in the country ranking (Table 2). For example, Denmark and Sweden exhibit the lowest unemployment duration and the highest labour market participation of women. However, both countries feature intermediate rankings with respect to the labour market participation of men and working hours of women, and exhibit even the second- and third-lowest ranking for working hours of men.

Similar variations can be observed for many other countries. For example, the ranking with respect to the indicator for female labour market participation generally displays a negative relationship with the ranking according to the number of hours worked by women. Thus, in countries where women participate strongly in the labour market, their usual working hours are relatively low, and vice-versa. This finding is in line with Kroeger/Schaffner (2011). Therefore, the possibility to work relatively few hours increases the probability to supply labour at all. One potential explanation for this is that the possibility to work less hours increases the

⁶ The values of the indicators underlying these rankings are displayed in Tables A.3 and A.4, respectively.

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Table 2
Country ranking for each flexicurity indicator

Rank	Participation in formal training	Participation in non-formal training	Unemployment duration	Labour market participation - Women	Labour market participation - Men	Number of hours worked - Women	Number of hours worked - Men	Variance of hours worked - Women	Variance of hours worked - Men	Hirings	Transitions from temporary to permanent employment	Coverage rate of unemployment benefits	Net replacement rate of unemployment benefits
1	SI	DK	DK	DK	UK	BG	GR	AT	NL	CY	EE	DE	LU
2	FI	UK	SE	SE	DE	RO	AT	DE	UK	BG	BG	AT	RO
3	LV	FI	ES	PT	ES	CZ	CZ	UK	AT	IE	LV	BE	DE
4	UK	SE	FI	NL	NL	SK	PL	GR	GR	GR	HU	FI	PT
5	LT	AT	CY	UK	IT	LV	LV	NL	FR	LV	RO	FR	ES
6	DK	ES	UK	FI	PT	GR	CY	ES	PL	LT	SE	NL	BE
7	EE	SI	AT	AT	DK	HU	UK	BE	DK	EE	SK	CZ	BG
8	NL	FR	IE	DE	FR	SI	ES	IT	BE	SE	UK	DK	PL
9	PL	NL	LU	EE	SE	PT	SK	FR	DE	LU	LT	HU	SI
10	IE	LU	LV	LV	IE	EE	BG	IE	IE	FI	AT	SE	AT
11	AT	CY	LT	SI	CY	PL	SI	PL	CY	SI	IE	CY	SE
12	DE	CZ	NL	FR	GR	CY	PT	LU	FI	DK	LU	LU	CZ
13	HU	BE	FR	CY	AT	LT	IT	DK	SI	SK	BE	ES	FR
14	RO	IE	EE	IE	CZ	ES	RO	PT	IT	HU	SI	IT	GR
15	SE	DE	PT	LT	FI	FI	EE	FI	ES	CZ	CZ	SI	LT
16	BG	EE	HU	CZ	LV	FR	FR	SE	SE	AT	IT	RO	CY
17	SK	IT	SI	BG	EE	SE	IE	SI	PT	RO	DE	GR	IT
18	CY	LV	IT	ES	LU	IT	HU	CY	CZ	BE	CY	SK	LV
19	CZ	SK	BE	RO	SI	AT	DE	LV	LV	PT	PL	PT	IE
20	PT	LT	DE	BE	BE	LU	BE	EE	EE	NL	GR	IE	EE
21	IT	PL	CZ	LU	RO	DK	FI	CZ	SK	PL	ES	PL	
22	BE	PT	GR	SK	SK	BE	LU	LT	RO	UK	NL	LV	
23	ES	HU	RO	HU	LT	UK	LT	SK	HU	DE	PT	LT	
24	GR	GR	PL	IT	BG	IE	SE	RO	BG	ES	FI	EE	
25	FR	BG	BG	GR	PL	DE	DK	HU	LT	IT	FR	UK	
26	LU	RO	SK	PL	HU	NL	NL	BG	LU	FR		BG	

Source: EU-LFS and EU-SILC, own calculations. – See notes to Table 1. The estimated coefficients underlying the above country rankings are presented in Table A.3 in the appendix. Pairwise significance tests show that about 95% of country fixed effects are significantly different from each other.

probability to participate in the labour market as it enables a combination of market work and child rearing (Ilmakunnas, Pudney 1990). Additionally, it can be observed that the Member States from Central and Eastern Europe are not in the top positions regarding participation and the variability of working hours. This could be due to the historical development that flexible work arrangements were introduced in Continental Europe in the last century while the statutory working week in several New Member States was still 40 hours (EIRO 2011).

The ranking for the flexicurity dimension MLL and the corresponding indicators reveals that Estonia, Bulgaria and Latvia are characterized by high transition rates. At the opposite end of the spectrum, France, Italy, Spain, Germany and Poland perform quite poorly in comparison to the other countries and therefore can be found at the bottom of the ranking. For Greece, Cyprus, the UK and some other countries, divergent positions in the rankings for the specific flexicurity indicators can be observed, leading to intermediate positions in the ranking for the LLL dimension. Transitions from temporary to permanent employment are the lowest in those

Table 3
Country ranking for each flexicurity dimension

Rank	LLL	ALMP	MLL	MSS	Total
1	DK	UK	EE	DE	AT
2	UK	AT	BG	AT	FI
3	FI	ES	LV	BE	SE
4	SI	DK	SE	FI	SI
5	LV	CY	HU	FR	UK
6	NL	FR	SK	NL	NL
7	SE	FI	LT	CZ	DE
8	AT	SE	RO	DK	CY
9	LT	IE	IE	HU	BE
10	EE	DE	AT	SE	LV
11	IE	GR	LU	CY	HU
12	PL	NL	SI	LU	CZ
13	ES	PT	UK	ES	IE
14	DE	LV	BE	IT	LU
15	CY	SI	CY	SI	EE
16	CZ	IT	CZ	RO	ES
17	FR	BE	GR	GR	RO
18	HU	PL	FI	SK	LT
19	BE	CZ	PT	PT	GR
20	SK	EE	NL	IE	IT
21	LU	LU	PL	PL	PT
22	IT	LT	DE	LV	PL
23	RO	HU	ES	LT	FR
24	BG	RO	IT	EE	SK
25	PT	BG	FR	UK	BG
26	GR	SK		BG	

Source: EU-LFS and EU-SILC, own calculations. – The composite results underlying the above country rankings are presented in Table A.4 in the appendix. As the indicator "net replacement rate" cannot be provided for 6 countries, the dimension MSS only consists of the indicator "Coverage rate" which is available for all considered countries.

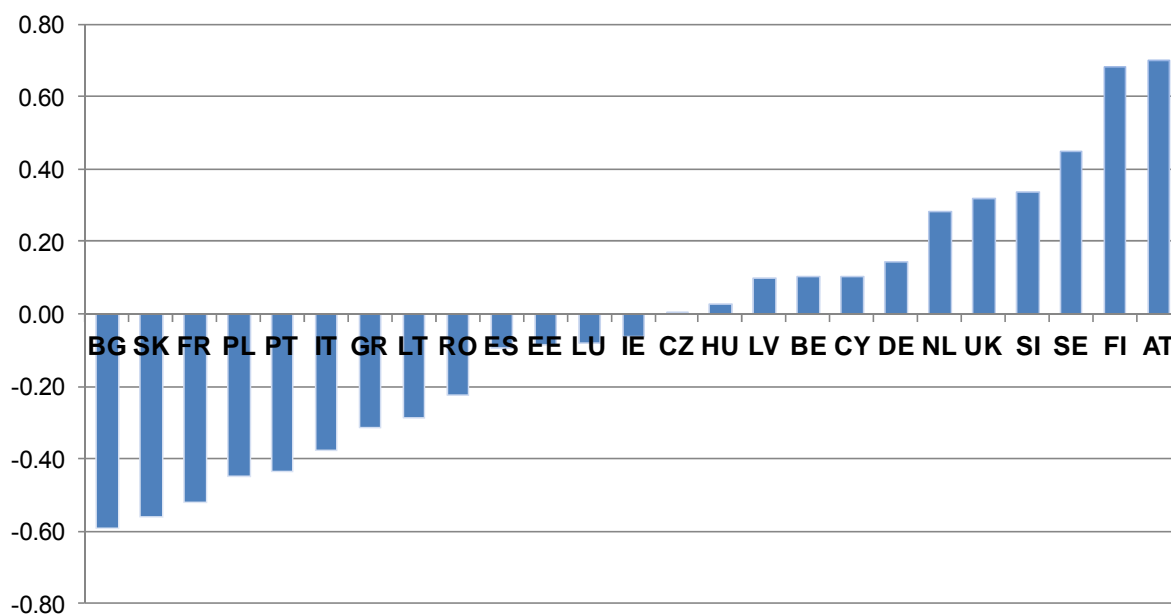
countries with a high share of temporary employment. Spain, Poland, Greece, Portugal and Finland, which are those countries that are above the EU average regarding the share of temporary employment (see Bredtmann and Schaffner 2011), are all at the bottom of the ranking.

The MSS flexicurity dimension, displayed in Table 3, yields a ranking with five Continental European countries (Germany, Austria, Belgium, France, the Netherlands) in the six top places (note that, as explained in Section 3, the overall ranking for this dimension solely takes into account the indicator "Coverage rate of unemployment benefits"). Two countries from Central Europe (the Czech Republic and Hungary) also perform relatively well in this respect, as do the Scandinavian countries (Finland, Denmark, Sweden). At the bottom of this ranking, one can find several countries from Eastern Europe (the Baltic States, Bulgaria) and the UK.

Flexicurity profile of EU Member States

Figure 1

Overall country ranking



Source: EU-LFS and EU-SILC, own calculations.

The net replacement rate of unemployment benefits considers the level of unemployment benefits relative to the previous wage (but does not enter the overall MSS indicator, cf. Section 3). The ensuing ranking is different from the one for the coverage rate. While some of the countries that do well on coverage also do so for the net replacement rate (Germany, Belgium), this is less true for other countries (France, Austria). On the other hand, countries such as Luxembourg and Romania, who top the net replacement rate ranking, are much more highly ranked than in the coverage ranking. The Baltic States are close to the bottom of both rankings. However, it should be born in mind that for the net replacement rate indicator, for some countries the number of persons considered is relatively small. The explanatory power of this ranking for these countries is therefore low.

The ranking of the overall composite indicator is presented in the right column of Table 3 and illustrated in Figure 1. The ranking shows Austria at the top, which reflects the fact that it is the only country that is among the top ten in the rankings of all four flexicurity dimensions. The Scandinavian countries Finland and Sweden follow at the top of the table, as does Slovenia. The UK, which can be found at the top of the rankings for the two dimensions LLL and ALMP but is only second from the bottom in the MLL ranking, comes in fifth place. The continental European countries the Netherlands, Germany, and Belgium come in the places six, seven, and nine. The bottom of the overall ranking is dominated by countries from Central and Eastern Europe (Bulgaria, Slovakia, Poland), and southern Europe (Portugal, Italy, Greece). Overall, the ranking for each flexicurity dimension as well as the overall ranking illustrates that the composite indicators mask divergent situations, implying that particular attention has to be paid to the individual flexicurity indicators when evaluating the countries' performances.

4.2 Flexicurity and Institutions

The second step of the empirical analysis aims at uncovering the interlinkages between the flexicurity indicators derived from labour market outcomes and the institutions/macroeconomic conditions prevailing in the EU Member States. In order to do so, we

compute the correlations between our flexicurity indicators and the macro indicators. As pointed out in Section 3, the results of this exercise can give an indication of potential relationships between the flexicurity indicators and the institutional indicators. However, while in some cases a causal relationship may seem likely, it should be born in mind that the correlations computed do in no way show that such a causal relationship really exists. Establishing causality would for example require the existence of a natural experiment, which is generally hard to find at the European level.

The correlations between the flexicurity indicators and the institutional indicators are summarized in Table A.5. Note that in the case of insignificant correlations, there is basically no evidence for a link between the respective flexicurity indicator and the institutional indicator, which means that one should not interpret the insignificant figures.

Life-long learning

For the first flexicurity dimension, life-long learning, some significant correlations can be observed (see the first two columns of Table A.5). First, the non-formal training indicator is positively correlated with two of the indicators relating to policies which support parents. On the one hand, this correlation is significant for the provision of childcare arrangements for under-three-year-olds, for arrangements of both up to and above 30 hours per week. On the other hand, there is also a positive correlation with income maintenance at birth as a share of GDP. A potential causal interpretation for the first correlation could be that parents who can rely on external childcare have more time to engage in non-formal training activities. Child benefits (as measured by income maintenance at birth) may provide the financial resources for parents to engage in non-formal training activities. This result is in line with Bassanini et al. (2004), who argue that policies that increase women's attachment to the labour market should increase participation in training.

Second, there are negative correlations between the formal training indicator on the one hand, and the institutional indicator on employment protection for temporary employment and the overall employment protection indicator on the other hand. A causal interpretation (which as usual should be given with some care) could stress the fact that strong employment protection generally leads to a segregation of the labour market, with a protected "core" labour force benefitting from good and stable jobs – the "insiders" – , and an unprotected "marginal" labour force who are non-employed or in unstable jobs – the "outsiders" (Saint-Paul 1997). With high employment protection, the incentives for the insiders to engage in training are low because their jobs are relatively safe anyway. For the outsiders, the incentives to train are low as well, because their unstable jobs often do not require high levels of human capital and because their chance of becoming part of the core labour force are relatively low. With low employment protection, the exact opposite is the case, which could lead to higher training activities. On the other hand, the incentives of firms to provide training to workers are higher if workers stay with them for a relatively long period of time (Acemoglu, Pischke 1999). This is the case under higher employment protection for the insiders. For the outsiders, however, the opposite is the case. Therefore, the observed negative correlation between training and employment protection may be driven by a high number of outsiders who do not participate in training activities.

Third, the formal training indicator is negatively correlated with the youth unemployment rate, and the non-formal training indicator is negatively correlated with the long-term unemployment rate. This could be due to the fact that non-formal training is often followed by em-

ployed individuals; if they are unemployed, the incentives to engage in non-formal training are much lower. On the other hand, this result could be due to a lack of training leading to higher unemployment. In particular, young workers who do not engage in formal training, and low-skilled workers who do not get further training, are more likely to become unemployed than tenured and skilled workers.

Fourth, expenditures on active labour market policies (ALMP) as a share of GDP, with respect to both total expenditures and expenditures on ALMP measures, are positively correlated with the non-formal training indicator. This could be due to the fact that ALMP measures are often considered to be equivalent to non-formal training by the participants of ALMP measures.

Finally, the expenditure on education as a share of GDP is positively and significantly correlated with the non-formal training indicator. This is an intuitive result as higher participation in non-formal training activities leads to higher expenditure on education.

Summarizing the correlations for the LLL flexicurity dimension, the most policy-relevant correlations can be found for family policies (especially child care), employment protection, and ALMP. This certainly gives an indication of where potential causal relationships can be found. However, it should be pointed out that the EU-LFS only allows us to investigate repeated snap-shots of investments in human capital. Future research should also take into account that skills produced at one stage of the life cycle of an individual augment skills at later stages (self-productivity of skills), and skills produced at one stage raise the productivity of investment at later stages (dynamic complementarity). These two features of skill formation together produce multiplier effects, i.e. “skills beget skills” (for more details see Cunha and Heckman, 2007), which could be investigated further.

Active labour market policies

The second flexicurity dimension, active labour market policies, includes the flexicurity indicator “unemployment duration”, as well as several flexicurity indicators related to labour supply. As for the unemployment duration indicator, income maintenance at birth is negatively correlated with unemployment duration. This correlation could be explained by the fact that income maintenance at birth makes it easier for parents to work (potentially part-time), thus increasing the attachment of parents to the labour market. Without such policies, parents (especially mothers) may become alienated from the labour market while taking care of their children. This in turn may lead to longer unemployment duration, if parents have difficulties finding a job after re-entering the labour market after a period of child-rearing. However, the correlation between unemployment duration and public expenditure on parental leave as a share of GDP is positive, which is not an intuitive result and should be investigated further.

The correlations between unemployment and youth unemployment on the one hand and unemployment duration on the other hand are positive, which comes as no surprise as higher (youth) unemployment is generally associated with longer unemployment duration.

The correlation between fertility and unemployment duration is also significant, and negative. This result should however not be interpreted causally. Rather, the result comes about because countries which feature high fertility rates also have low unemployment duration during the time period under consideration, without there necessarily being a direct link between the two phenomena. Examples of such countries include the Scandinavian countries, while the exact opposite, i.e. long unemployment duration and low fertility, is the case in

Germany. However, long unemployment durations and therefore high insecurity after interruptions of one's employment history can have an effect on fertility if there are lower chances for women to return to work (Adsera 2005).

Finally, the unemployment duration indicator takes on significantly lower values in countries with high GDP and high expenditure on education, but it is higher in countries with high GDP growth. The latter result could be a business cycle effect, as measured unemployment duration may rise if an economy recovers and many short-term unemployed individuals are re-employed, leaving mainly long-term unemployed individuals in the pool of the unemployed. It is although worth noting that the unemployment duration indicator is not significantly correlated with any of the institutional indicators capturing active labour market policies.

The flexicurity indicators related to labour market participation display correlations which are often of the same sign for women and for men, but the significance of the correlations differs (Table A.5). One exception to this is the correlation of labour market participation and population growth, which is positive and significant for men. A likely explanation for this result is that in countries with more men working, men are more likely to become fathers. A reason for this could be the improved economic situation of employed persons, who are therefore more likely than unemployed persons to get children.

There is some evidence that child care provision is positively related to labour market participation, with two indicators being significant for men and another one for women. This finding is in line with Del Boca et al. (2009). Income maintenance at birth seems to play a similar role, at least for women. Parental leave benefits, on the other hand, are negatively correlated with labour market participation. This is an intuitive result since parental leave benefits give an incentive to leave the labour force, usually for a limited amount of time.

The institutional variables capturing active labour market policy (ALMP) are mostly positively correlated with labour market participation. However, it should be stressed that this does not necessarily imply a positive causal effect of ALMPs on labour market participation. Rather, countries which spend much money on such policies may also display other characteristics which lead to high labour market participation. The correlation between expenditures on active labour market policy and the participation rate of both men and women is displayed in Figures 2 and 3. Although there are some outliers (especially the UK) a clear correlation can be observed. It should also be noted that, as seen before, ALMPs are not significantly correlated with the unemployment duration indicator, which should be the primary target of such policies.

Finally, the expenditure on social protection and on education is positively correlated with labour market participation, which could have various explanations.

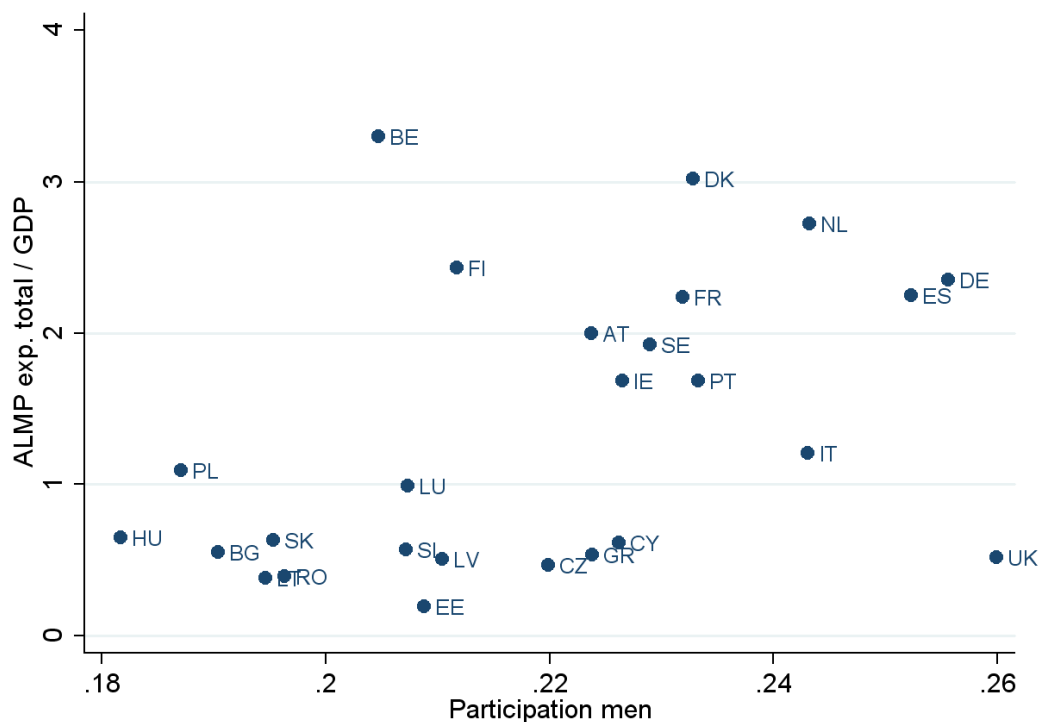
The flexicurity indicators with respect to the amount of working hours of women and men are negatively correlated with one of the tax indicators, which could be a sign of disincentive effects. This could be a causal effect and should be investigated in more detail.

Higher fertility goes together with lower working hours of both women and men, which is also true for some of the child care indicators. Generally, therefore, more children in the household may well lead to lower working hours. However, the opposite direction is also conceivable, i.e. that there is a positive effect of less working hours or the possibility to work

Flexicurity profile of EU Member States

Figure 2

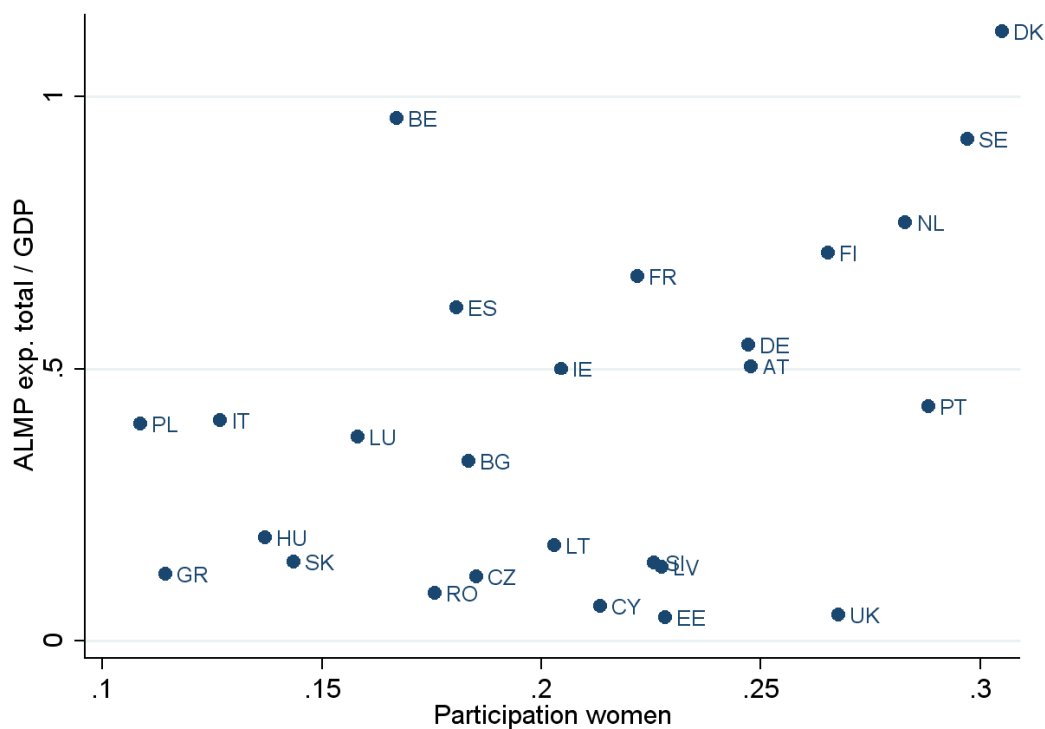
ALMP total expenditures (% of GDP) and labour market participation of men by country



Source: Eurostat (2011c) and EU-LFS, 2005-2008, own calculations.

Figure 3

ALMP total expenditures (% of GDP) and labour market participation of women by country



Source: Eurostat (2011c) and EU-LFS, 2005-2008, own calculations.

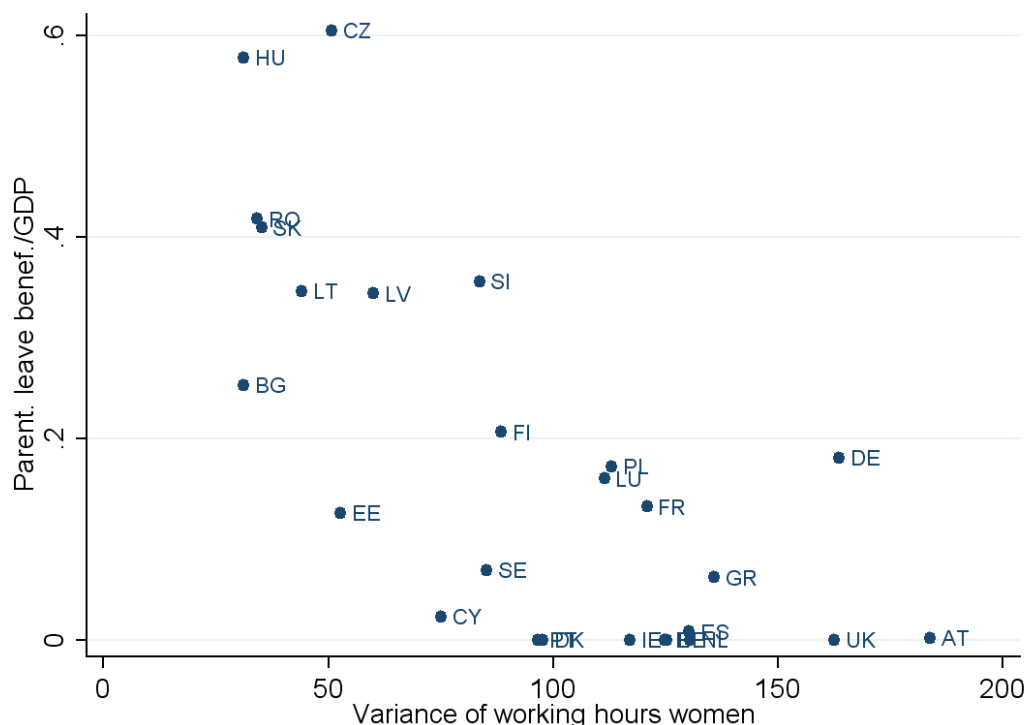
less hours, respectively, on fertility. This potential effect does not seem to be alleviated by childcare provisions, as indicated by the respective negative correlations, on the contrary. Therefore, a hypothesis to be investigated further is the question why these policies are positively correlated with labour market participation (as seen before), but negatively with working hours. The working hypothesis would be that these policies enable parents to participate in the labour market, which increases participation rates, but that these workers work fewer hours, which reduces the average number of hours worked in a country.

The correlations between the number of working hours indicators and the institutional ALMP indicators are consistently negative, i.e. countries with high expenditure on ALMP measures display lower average working hours. This is not an obvious result and should be subject to further investigation. Those countries that are identified to have a large variation in working hours (especially the Scandinavian countries, the Netherlands, Germany and Austria) are also known for high expenditures on ALMP measures. Therefore, the correlation could be due to the fact that there is a higher willingness in these countries to intervene in the labour market by ALMP, laws for flexible work arrangements etc. These policies may increase participation but decrease working hours for those working.

Parental leave benefits are negatively correlated with the variation in working hours of women. The relationship is displayed in Figure 4. This finding can be due to the fact that parental leave benefits increase the probability that young mothers are not working whereas they may have worked part-time if there were no or less parental leave benefits.

Figure 4

Parental leave benefits (% of GDP) and variance of hours worked of women by country



Source: Eurostat (2011c) and EU-LFS, 2005-2008, own calculations.

As seen in the previous subsections, high labour market participation goes together with less working hours and especially high variation in working hours. Therefore, the effect of childcare provision seems to be on the share of parents that work but fewer hours.

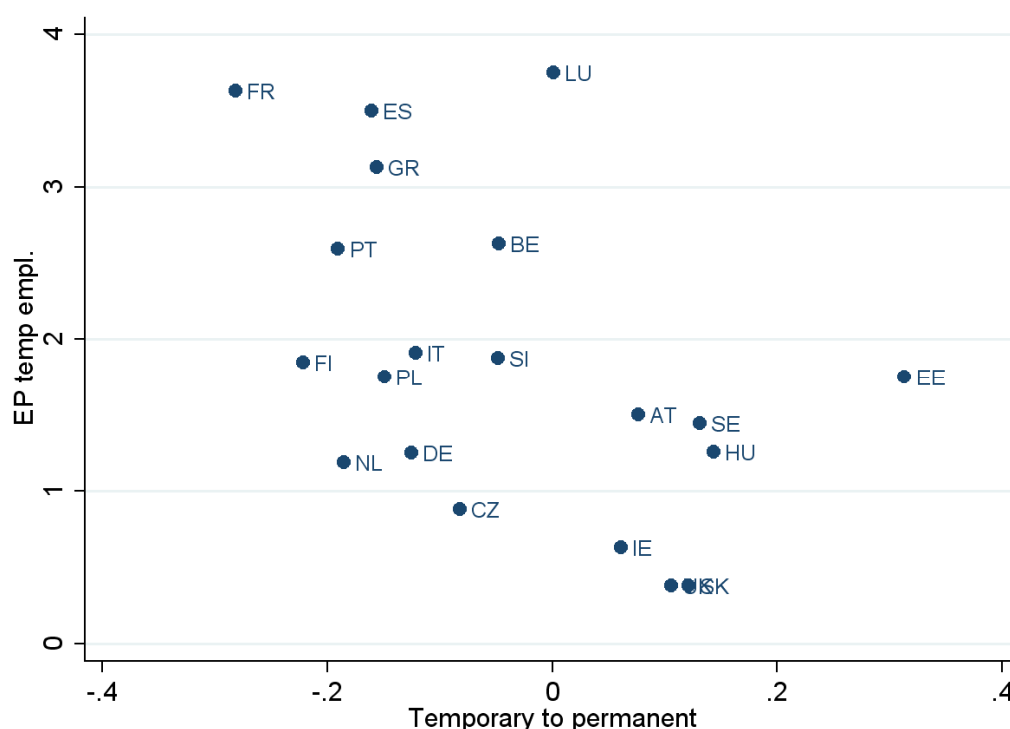
Flexicurity profile of EU Member States

Modern labour laws and labour turnover

For the third flexicurity dimension, modern labour laws and labour turnover, hardly any significant correlations can be detected between the hirings indicator and the macro/institutional indicators. There are only two exceptions, namely a negative correlation with pension expenditure as share of GDP, and a negative correlation with the expenditure on social protection. Neither of these correlations can be given a clear causal interpretation. The general lack of significant correlations for this indicator could be due to the fact that institutions often exert offsetting effects on each other. For example, countries with high employment protection are often characterised by a high degree of wage rigidity (Bertola, Rogerson 1997). While leading to international differences in unemployment flows (which would be picked up by our unemployment duration indicator discussed earlier), this yields similar levels of job turnover, which is predominantly captured by the hirings indicator.

Figure 5

Employment protection of temporary employment and transitions from temporary to permanent employment by country



Source: OECD (2011) and EU-SILC, 2005-2008, own calculations.

As for the second indicator of this flexicurity dimension, transitions from temporary to permanent employment, there are several interesting correlations. First, the transition rate from temporary to permanent jobs seems to be lower with higher employment protection, which is an intuitive result (see Figure 5). Second, and again intuitively, higher GDP growth at the country level is associated with a higher transition rate from temporary to permanent jobs. Finally, the correlation between the institutional indicators of ALMPs and the flexicurity indicator “temporary to permanent” is consistently negative, a result which deserves further investigation. A possible explanation could be that temporary employment and active labour market policies are alternative means for the same target group to enter into permanent employment. If higher expenditures on ALMP increase their positive effects on labour market

integration, temporary employment becomes less advantageous regarding future labour market success with rising ALMP expenditures.

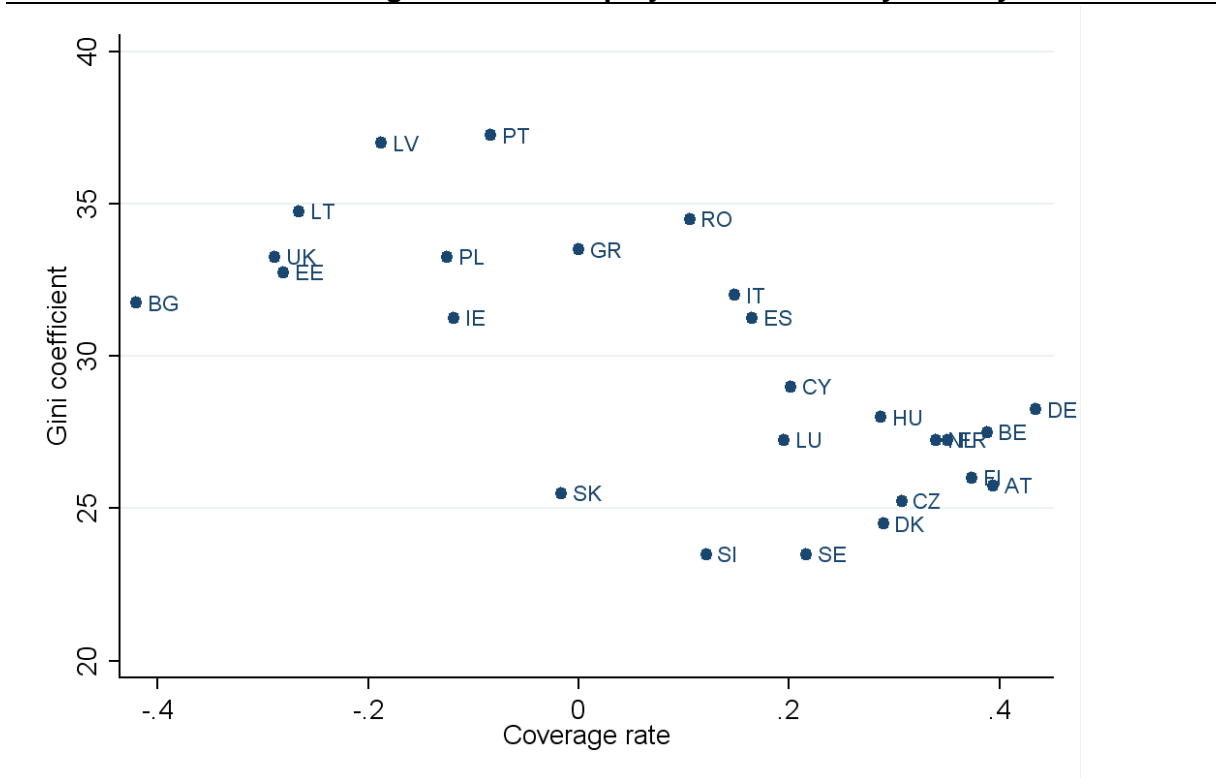
Summarizing the results of the MLL indicators, the most important results are the interactions between the transition rate from temporary to permanent employment on the one hand, and employment protection and ALMPs on the other hand. These policies seem to affect each other, which deserves further investigation (see however Bassanini, Duval 2009, for an empirical investigation of policy complementarities, and Orszag, Snower 1998, for a theoretical analysis).

Modern social security laws

The main indicator of the MLL flexicurity dimensions, the coverage rate of unemployment benefits, is correlated with the tax rate, the pension payments as share of GDP, and two of the childcare indicators. None of these correlations at the country level can be attributed to a clear causal mechanism at the individual level. At the country level, a high coverage rate of unemployment benefits may go together with high tax rates because the unemployment insurance system is tax-financed which, however, is not the case in all countries.

Figure 6

Gini coefficient and coverage rate of unemployment benefits by country



Source: Eurostat (2011c) and EU-SILC, 2005-2008, own calculations.

It also becomes obvious that the coverage rate of unemployment benefits is negatively correlated with income inequality as measured by the Gini coefficient, which is displayed in Figure 6. This could be due to the fact that unemployment benefits do not only act as an insurance against poverty, but that they also can be viewed as providing a subsidy to job search for unemployed individuals (Marion, Zilibotti 1999). The effect of this search subsidy is two-fold. On the one hand, it reduces mismatch as unemployed individuals can look for a job more intensively or for a longer period of time. On the other hand, the reservation wage of

the unemployed rises as unemployed individuals become more selective with respect to the job offers they receive. The latter effect means that fewer workers accept low wages as the coverage rate of unemployment benefits rises, which reduces wage inequality. Furthermore, a high coverage rate of unemployment benefits reduces overall inequality, as income does not fall too sharply for workers who become unemployed. Both effects could explain the negative correlation between the coverage rate of unemployment benefits and the Gini coefficient.

Finally, the coverage rate of unemployment benefits is positively correlated with all three ALMP indicators. This result could be explained by specific combinations of policies at the country level. In particular, countries such as Germany and Sweden provide unemployment benefits to a large majority of the unemployed. On the other hand, unemployed individuals also have to participate in ALMP measures in these countries. Therefore, a positive correlation between the coverage rate of unemployment benefits and ALMP emerges.

The second indicator of the MLL dimension, the net replacement rate of unemployment benefits, hardly features any important correlations with institutional indicators. The only exception is the positive correlation between the net replacement rate and employment protection. This implies that in countries where employment protection is relatively high, this is also true for the net replacement – but this may only be true for relatively few of the individuals who get laid off, as the net replacement rate is computed only for those people who receive unemployment benefits at all. In most countries, this is the case for workers who have been employed for an extended period of time, i.e. insiders (cf. Lindbeck, Snower 1989). Therefore, the unemployment benefit system seems to provide more financial resources to insiders in countries where employment protection is high and the insider-outsider distinction is more important.

For both indicators of the MLL dimension, one can also see that there is no significant correlation with the overall unemployment rate, the youth unemployment rate, or the long-term unemployment rate. However, three important aspects of our analysis should be pointed out in this context. First, there are studies which do find positive, but relatively modest, links between the level of unemployment and the payment of unemployment benefits (Nickell 1997, Blanchard, Wolfers 2000). Second, reverse causality seems likely in this context, as policy-makers may increase unemployment benefit payments when the level of unemployment rises (Holmlund 1998). Third, our indicators do not take into account an important aspect of unemployment insurance systems, namely the duration of unemployment benefit payments. Generally, the exhaustion of benefit payments has an effect on the exit rate out of unemployment (cf. Card et al. 2007 for a critical appraisal). Therefore, our results should be interpreted carefully and further research seems to be important.

Summarising the results on the MLL dimension, it becomes apparent that the first indicator, the coverage rate of unemployment benefits, is much more related to the institutional/macroeconomic indicators than the second indicator, the net replacement rate. Generally, however, the correlations uncovered for the MLL dimension seem to reveal policy choices at the macroeconomic level of the EU Member States, rather than effects of institutions on the behaviour of the individuals in an economy.

4.3 Cluster Analysis

In this part of the empirical analysis the EU Member States are grouped into different clusters/country groups according to the flexicurity indicators presented in Section 4.1. The aim

of this exercise is to find out whether certain groups of countries share a common set of flexicurity features. This is conceivable because the existence of strategic interactions and policy complementarities between the relevant actors and institutions in an economy could have the effect that a specific institutional set-up in one context (e.g. one flexicurity dimension) could lead to a specific institutional set-up in another context (cf. Hall, Soskice 2001). For example, according to Esping-Andersen (1990), most liberal market economies are characterised by relatively low levels of unemployment benefits but high levels of labour market flows. In order to find out whether such groups of countries exist, a cluster analysis as described in Section 3 is conducted. We do so separately for each flexicurity dimension and for all flexicurity indicators together.

The first cluster analysis takes into account the two indicators for participation in training. This leads only to two clusters, with the first cluster consisting of Denmark, Finland and the UK. All three countries are characterised by high participation in training, especially non-formal training (see Table A.3 for the values of the flexicurity indicators). The second cluster consists of the other Member States, which feature lower levels of participation in training.

Table 4
Country clusters based on ALMP indicators

Group 1	Group 2	Group 3	Group 4	Group 5
BE	CY	AT	BG	LU
ES	DK	DE	CZ	
FR	FI	UK	EE	
GR	PT		HU	
IE	SE		LT	
IT	SI		LV	
NL			RO	
PL			SK	

Source: EU-SILC, own calculations.

The results of the cluster analysis based on the seven indicators regarding ALMP are displayed in Table 4. The cluster analysis suggests that there exist five different groups, whereas the first group, consisting only of EU-15 countries and Poland, is characterised by a high variation and therefore flexibility in working hours both of women and of men. Most of the other EU-15 countries are pooled in the second group, which contains the Scandinavian countries together with Cyprus, Portugal and Slovenia. In these countries, one can also observe a high variation in male working hours, but also a high female participation rate and high female working hours. Additionally, unemployment duration is low. The third group consists of the remaining EU-15 countries Austria, Germany and the UK. These countries are therefore comparable along the ALMP flexicurity dimension. This is particularly true with respect to labour supply, especially of women. Furthermore, while there exists a high variation in male working hours in these countries, it is even bigger for female workers. Furthermore, the participation rate of men and women is high, which is also true for the weekly working hours of men. By contrast, the fourth cluster, which consists of CEE countries only, is characterised by a low variation in working hours and low participation rates of both men and women. However, weekly working hours, especially of women are very high. Furthermore, those countries suffer from the longest durations in unemployment. Finally, Luxembourg does not fit in any of the other groups and therefore constitutes the fifth cluster.

Flexicurity profile of EU Member States

Table 5

Country clusters based on MLL indicators

Group 1	Group 2	Group 3	Group 4	Group 5
AT	CY	BE	BG	FR
HU	DE	CZ	EE	
IE	ES	SI	LV	
LT	FI	LU		
RO	GR			
SE	IT			
SK	NL			
UK	PL			
	PT			

Source: EU-SILC, own calculations.

The country clusters based on the indicators for MLL, hirings and transitions from temporary to permanent employment, are presented in Table 5. Here, five different clusters emerge. The fourth and the fifth group represent the opposite ends of the spectrum, with high transitions in Bulgaria, Estonia and Latvia, while France – which constitutes the fifth group – is characterised by low hiring rates and low transition rates from temporary into permanent employment. The other three groups are similar with respect to the hirings indicator. However, the probability to leave temporary employment to permanent employment is relatively high in the first group and relatively low in the second one, with the third group representing an intermediate case.

The clusters based on the MSS dimension, the coverage rate and the net replacement rate of unemployment benefits, are shown in Table 6. The first group consists of countries with a high coverage rate of unemployment benefits, which includes France and Germany. The second and the third group consist of countries that are in a medium range regarding coverage of unemployment benefits and the net replacement rate. However, they can be distinguished by the fact that the coverage rate in the second group is somewhat above the mean and the net replacement rate is somewhat below the mean. The opposite is true for the third group, which consists of Poland and Portugal. The Baltic States as well as Ireland, which constitute the fourth country cluster, are characterised by a non-generous unemployment scheme. Both the coverage rate and the net replacement rate are low. By contrast, in the fifth group, which consists of Luxembourg and Romania, the coverage rate and net replacement rate are high. Finally, Bulgaria does not fit into any of the other groups since it is characterised by the lowest coverage rate of all countries, but by a relatively high net replacement rate.

Table 6

Country clusters based on MSS indicators

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
AT	CY	PL	EE	LU	BG
BE	ES	PT	IE	RO	
CZ	GR		LT		
DE	IT		LV		
FR	SE				
	SI				

Source: EU-SILC, own calculations.

Table 7
Country clusters based on all flexicurity dimensions

Group 1	Group 2	Group 3	Group 4	Group 5
AT	CY	FI	BE	FR
EE	DE	SI	BG	
IE	ES	UK	CZ	
LT	GR		HU	
LV	IT		LU	
SE	NL		RO	
	PL		SK	
	PT			

Source: EU-LFS and EU-SILC, own calculations. – The cluster analysis is based on the four different composite indicators for each dimension. As the indicator "net replacement rate" cannot be provided for 6 countries, the dimension MSS only consists of the indicator "Coverage rate" which is available for all considered countries.

In addition to the clustering for each of the flexicurity dimensions, we apply a cluster analysis to the four composite indicators for the four flexicurity dimensions. Table 7 presents the resulting groups. The first group consists of the Baltic States as well as Austria, Ireland and Sweden. Those countries constitute one group because they have a high value regarding MLL and also above-average participation in training (LLL). These countries have been shaped by a dynamic labour market (i.e. a high level of hirings and transitions into permanent employment) as well as high participation in training. However, it has to be taken into account that these countries are also characterised by small shares of temporary employment. The highest values in life-long learning are achieved by Finland, Slovenia and the UK (Group 3). Furthermore, this group is characterised by high ALMP values and an average achievement in MLL. These two country groups cover countries that fulfil most of the requirements of a flexible labour market, as also becomes apparent when considering the overall flexicurity ranking (Table 3).

By contrast, the remaining three groups are less flexible at least in some categories. For example, life-long learning in the countries of the fourth group (including for example Belgium and Hungary) as well as the ALMP indicator are low. However, these countries are somewhat above the average with respect to MLL. France, which constitutes the fifth group, is an outlier since it has the smallest value of the MLL indicator, low participation in training and a high value of the MSS indicator. The largest group (group 2) consists of countries that are around the mean in (almost) all dimensions. For these countries, the ALMP indicator is somewhat below and the MLL indicator somewhat above average. This group covers most of the big Member States and therefore a high share of the European population.

It can be summarized that the cluster analysis along the four flexicurity dimensions, which takes into account all the aspects of flexicurity, yields a distinction with respect to the flexicurity characteristics of the labour markets of EU countries. However, the groups generated by our analysis are different from classifications such as the one proposed by Esping-Andersen (1990). Furthermore, the differences between the groups, although discernible, are sometimes relatively small. This could be an indication of the fact that the institutional differences within these country groups (or economic models) are currently growing, while the differences between country groups are shrinking (Boeri, van Ours 2008).

4.4 Individual and Household Characteristics

In the final step of the analysis, we investigate how specific, and potentially vulnerable, groups of the population fare, relative to other individuals in a given country, with respect to

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the flexicurity indicators computed in Section 4.1. We do so using one indicator from each flexicurity dimension: “participation in formal training” (LLL), “unemployment duration” (ALMP), “hirings” (MLL) and “coverage rate of unemployment benefits” (MSS). The individual and household characteristics we are particularly interested in are age, skill level, number of small children (0-4 years), as well as the number of elderly (65 years and older) in the household. In contrast to the preceding analyses, we do not focus on differences *between* countries, but look at differences between individuals *within* specific countries.

Tables 8 and 9 summarize, for each EU Member State, how the selected flexicurity indicators vary across different age and skill categories, respectively. Looking at age categories (Table 8), the estimation results suggest that in almost all EU Member States, the probability to participate in formal training decreases with age. This is an intuitive result as formal education/training takes place during the early career stages. In the remaining countries, Hungary, Portugal and Slovakia, medium-aged workers are most likely to participate in formal training. The age profile is even more pronounced for the unemployment duration indicator. Across all countries the risk of longer-term unemployment rises with age, implying that older workers tend to suffer more from longer unemployment spells than younger workers. Furthermore, older workers are also worse off with respect to hirings as the probability of leaving unemployment or inactivity to employment decreases with age. This is the case for 20 Member States considered in the analysis, while for the remaining 6 countries (Hungary, Ireland, the Netherlands, Slovenia, Sweden, the UK) medium-aged workers tend to display the lowest hiring rates. The coverage rate indicator, quantifying the share of newly unemployed workers who receive unemployment benefits, also decreases with age across most countries.⁷ As one would have expected the opposite result, this subject should be investigated further.

Table 8

Determinants of flexicurity indicators: age

	^	v	↑	↓	0
Participation in formal training	HU, PT, SK	-	-	AT, BG, CY, CZ, DK, EE, FI, FR, DE, GR, IE, IT, LV, LT, LU, NL, PL, RO, SI, ES, SE, UK	BE
Unemployment duration	-	-	AT, BE, BG, CY, DK, EE, FI, FR, DE, GR, HU, IE, IT, LV, LT, LU, NL, PL, PT, RO, SK, SI, ES, SE, UK, CZ	-	-
Hirings	-	HU, IE, NL, SI, SE, UK	-	AT, BE, BG, CY, CZ, DK, EE, FI, FR, DE, GR, IT, LV, LT, LU, PL, PT, RO, SK, ES	-
Coverage rate of unemployment benefits	-	-	SE	BE, BG, CY, BZ, DK, EE, FI, FR, DE, GR, HU, LV, LT, LU, NL, PL, PT, SK, SI, ES	AT, IE, IT

Source: EU-LFS and EU-SILC, own calculations. – ^ / v indicate that the flexicurity indicator is highest/lowest for medium-aged workers, while ↑ / ↓ indicate that it is increasing/decreasing with age. With respect to the indicator “coverage rate” the effect of age cannot be estimated for Romania and the UK, as the number of observations is insufficiently low.

⁷ In the case of the coverage rate, we do not consider the oldest age group (55-64 years), as otherwise our results may be biased by policy measures such as early retirement schemes.

With respect to educational groups (Table 9) a negative relationship between the participation in formal training and worker's skill levels can be observed. This is true for all countries, except for Bulgaria, Cyprus and Estonia, where medium-skilled workers exhibit the highest probability to participate in formal training. The estimation results moreover reveal that in most countries, the likelihood of experiencing longer-term unemployment decreases with the educational level. Exceptions are on the one hand countries such as Finland, Luxembourg and Spain, where low- and high-skilled workers face a higher risk of long unemployment duration than medium-skilled workers, and on the other hand countries such as Cyprus, Greece, Latvia and Romania, where medium-skilled workers are worse off than low-skilled workers.

Table 9

Determinants of flexicurity indicators: educational level

	^	v	↑	↓	0
Participation in formal training	BG, CY, EE			AT, BE, CZ, DK, EE, FI, FR, DE, GR, HU, IE, IT, LV, LT, LU, NL, PL, PT, RO, SK, SI, ES, SE, UK	
Unemployment duration	CY, GR, LV, RO	FI, LU, ES	-	AT, BE, BG, CZ, DK, EE, FR, DE, HU, IE, IT, LT, NL, PL, PT, SK, SI, SE, UK	
Hirings	FI	AT, DK, IT, LU, PT, SK, SE	BE, FR, DE, IE, NL	BG, CY, CZ, EE, GR, HU, LV, LT, PL, RO, ES	SI, UK
Coverage rate of unemployment benefits	BE, CZ, FI, LV, PL, PT	CY, IE, LU	AT, BG, DK, EE, FR, IT, LT, NL, SK, SI, SE	GR, HU, ES, UK	

Source: EU-LFS and EU-SILC, own calculations. – ^ / v indicate that the flexicurity indicator is highest/lowest for medium-skill workers, while ↑ / ↓ indicate that it is increasing/decreasing with educational level. With respect to the indicator "coverage rate" the effect of the skill level cannot be estimated for Germany and Romania, as the number of observations is insufficiently low.

For the hirings indicator a more diverse picture emerges. For the largest group of EU Member States, including countries such as Bulgaria, Cyprus and Latvia, the hiring rate is decreasing with the educational level, reflecting the fact that high-skilled workers experience more stable employment relationships and therefore fewer transitions out of and into employment. The ranking of the hirings indicator reveals that most of these countries perform quite well and can be found in the top positions (cf. Table 2). This could be evidence that the top rankings of these countries are mainly due to high transition rates of unskilled workers. For a second group of countries, including Belgium, France, Germany and the Netherlands the opposite, namely relatively low transition rates that are increasing with worker's education, can be observed. This confirms the well-known fact that low levels of education are an important risk factor in the labour market. In most of the remaining countries, medium-skilled workers exhibit the lowest hiring rates. Similarly diverse patterns can be observed for the coverage rate indicator. In the largest group of countries, including Austria, France, and Denmark, the coverage rate is increasing with the skill level.

Turning to household characteristics, Tables 10 and 11 summarize the country-specific effects of the number of children and of the number of elderly in the household on the selected flexicurity indicators. For all EU Member States the number of small children in the household (Table 10) is negatively associated with the probability to participate in formal training,

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Table 10

Determinants of flexicurity indicators: number of children (<= 4 y) in household

	+	0	-
Participation in formal training	-	-	AT, BE, BG, CY, CZ, EE, FR, DE, GR, HU, IE, IT, LV, LT, LU, NL, PL, PT, RO, SK, SI, ES, UK
Unemployment duration	IE	-	AT, BE, BG, CY, CZ, EE, FR, DE, GR, HU, IT, LV, LT, LU, NL, PL, PT, RO, SK, SI, ES, UK
Hirings	AT, BE, BG, CY, CZ, DK, EE, FI, FR, DE, GR, HU, IE, IT, LV, LT, LU, PL, RO, SK, SI, ES, SE, UK	-	NL, PT
Coverage rate of unemployment benefits	DK, FI, HU, LV, LT, SI, ES, SE	CY, FR, GR, IE, IT	AT, BG, CZ, EE, DE, LU, NL, PL, PT, SK, UK

Source: EU-LFS and EU-SILC, own calculations. – +/ -/ 0 denote positive, negative or no significance. With respect to the indicator "coverage rate" the effect of the number of small children cannot be estimated for Belgium and Romania, as the number of observations is insufficiently low.

Table 11

Determinants of flexicurity indicators: number of elderly (>=65 y) in household

	+	0	-
Participation in formal training	HU, IT, SK	BG, GR, LT, PT, ES	AT, BE, CY, CZ, EE, FR, DE, IE, LV, LU, NL, PL, RO, SI, UK
Unemployment duration	AT, BE, BG, CY, EE, FR, DE, GR, HU, IE, IT, LV, LT, LU, NL, PL, PT, SK, SI, ES, UK	CZ	RO
Hirings	CY, DK, EE, FI, DE, GR, HU, LV, LU, NL, RO, SE, UK	PL, SI	AT, BE, BG, CZ, FR, IE, IT, LT, PT, SK, ES
Coverage rate of unemployment benefits	BG, EE, FR, GR, HU, LT	AT, CY, LU, PL, PT	CZ, IE, IT, LV, NL, SK, SI, ES, SE, UK

Source: EU-LFS and EU-SILC, own calculations. – +/ -/ 0 denote positive, negative or no significance. With respect to the indicator "coverage rate" the effect of the number of elderly persons cannot be estimated for Belgium, Denmark, Finland, Germany and Romania, as the number of observations is insufficiently low.

reflecting the fact that time constraints due to the responsibility to care for young children are accompanied by significantly lower human capital investments. Furthermore, the number of small children lowers the risk of long unemployment spells and increases the hirings into employment. The only exceptions are Portugal and the Netherlands, where the hiring rate is negatively associated with the presence of small children, as well as Ireland, where a positive correlation with unemployment duration is prevalent. For the coverage rate the picture is more diverse, with the largest group of countries exhibiting a negative relationship between the number of children and the unemployment benefits coverage. This result is surprising since unemployment benefits are not means-tested in almost all countries and no direct link between family size and unemployment benefits should exist. Therefore, there seem to be different factors that influence both family size and benefit receipt.

Regarding the presence of elderly in the household (Table 11), a negative effect on the participation in formal training can be observed for the large majority of EU Member States, which, similarly to the presence of small children, could be due to time constraints. The estimation results moreover reveal that unemployment duration increases with the rising demands of providing care for dependent persons. However, this result could be due to the fact that the reservation wage of these workers is higher since the household income also consists of pensions of the elderly. This holds true for virtually all EU Member States. The only exceptions are Romania and the Czech Republic, where a significantly negative (for Roma-

nia) and no significant effect (for the Czech Republic) on unemployment duration can be detected.

With respect to the hiring rate, one group of countries, including for example Austria, Belgium and Bulgaria, exhibits a negative correlation with the number of elderly in the household. This again can be explained by the need of care for these persons or increased reservation wages. In contrast to this, there exists a second group of countries, including for example Cyprus, Estonia, and Greece, where the opposite, i.e. a positive relationship between the presence of elderly and the hiring rate can be observed. Since retirees in the household can also provide child care and household work, the hiring rate may be higher because of the presence of elderly persons in the household.

Regarding the coverage rate indicator, the results again reveal a more divergent situation across EU Member States. As already mentioned with respect to the number of children in the household, one would expect no direct link between family size and unemployment benefits. However, no significance of the number of elderly in the household can only be observed for five of the EU Member States (Austria, Cyprus, Luxembourg, Poland and Portugal). For a second group of countries, including for example Belgium, Estonia and Greece, the number of elderly is positively correlated to the coverage rate, while for another group, including for example Italy, Latvia and the Netherlands, the opposite is the case. This result therefore should be subject to more research.

In the preceding analytical steps, we observe large differences between countries regarding the flexicurity dimensions. In contrast, the differences between the demographic groups within one country are similar between the Member States. Overall, the obtained results on the selected person and household characteristics indicate that young and high-skilled workers fare well relative to other individuals in a country, while older and low-skilled individuals face increased labour market risks. These findings are true for almost all countries. Regarding family size (number of children and number of elderly in the household) a heterogeneous picture emerges. In some countries, the number of elderly in particular is negatively correlated with the flexicurity dimensions. However, no clear pattern between the countries can be observed that is comparable to the clusters presented in the previous section.

5. Conclusion

This paper constructs flexicurity profiles for all the EU Member States using two micro data sets, the European Union Labour Force Survey (EU-LFS) and the European Union Statistics on Income and Living Conditions (EU-SILC). These profiles are based on indicators derived from different labour market outcomes, which were analysed in detail by two previous studies, ISG and RWI (2010) and RWI (2011). Furthermore, they are constructed along the four flexicurity dimensions put forward in the European Employment Strategy: Life-long learning, active labour market policies, modern labour laws and labour turnover, and modern social security laws.

The flexicurity profiles are used to create rankings of the Member States along the four flexicurity dimensions, as well as an overall flexicurity ranking of the Member States. The overall ranking gives an indication of how the different countries' labour markets perform in terms of flexicurity relative to the other labour markets within the European Union. On the other hand, the rankings for the different flexicurity dimensions show in which flexicurity area a country does well, and which flexicurity characteristic of its labour market may have to be

improved. The paper also explores the links between the flexicurity indicators and the institutional and macroeconomic frameworks of the Member States.

Several words of caution concerning the interpretation of our findings are in order, however. First, most countries perform differently along the four dimensions of flexicurity. Therefore, it may be more important to look at the results from the specific indicators than at the overall ranking. Second, we compute the indicators in this paper using data for the time period 2005-2008. Given that most of our indicators are subject to the business cycle, analyses for other time periods may well yield different results. Third, despite the use of microeconomic data, the analysis remains descriptive in nature and therefore cannot directly uncover causal relationships. Finally, it is important to realise that the (institutional) characteristics of a labour market do not only exert feedback effects on each other, which leads to policy complementarities. They also interact in a very complex way with other decisive elements of an economy, including the demographic structure, the characteristics of product markets, and culture. Therefore, the same institutional structure may have a very different effect in different countries, and an ideal one-size-fits-all solution is unlikely to be found (cf. Freeman 2000). As the flexicurity indicators in our analysis focus on labour market outcomes, rather than institutions, this point may be of less relevance. Nevertheless, cultural determinants may have an important impact on the effectiveness of labour market institutions, which could make it difficult to implement flexicurity-type policies in all the EU Member States. For example, the provision of generous unemployment benefits is likely to reduce labour supply more strongly if social sanctions are barely existent in a society (Algan, Cahuc, 2006, Algan et al., 2011). In this case an international diversity of labour market outcomes is not only a natural outcome, but it may also be the optimal one.

Bearing these caveats in mind, the results in this paper provide suggestive evidence on the flexicurity characteristics of the labour markets of the EU Member States, and they may give an indication of which institutional features of an economy play an important role in this context. They may therefore act as a trigger for further research looking at more indicators for different time periods, and aiming at the discovery of causal relationships.

References

- Acemoglu, D. and Pischke, J.-S. (1999), Beyond Becker: Training in Imperfect Labour Markets. *Economic Journal* 109 (453): F112-42.
- Adsera, A. (2005): Vanishing Children: From High Unemployment to Low Fertility in Developed Countries. *The American Economic Review* 95 (2): 189-193.
- Algan, Y. and P. Cahuc, Pierre (2006), Civic Attitudes and the Design of Labour Market Institutions: Which Countries Can Implement the Danish Flexicurity Model? CEPR Discussion Papers 5489.
- Algan, Y., P. Cahuc, M. Sangnier (2011), Efficient and Inefficient Welfare States. CEPR Discussion Papers 8229.
- Bassanini, A., Booth, A., Brunello, G., Paola, M. De and E. Leuven. (2005), Workplace Training in Europe, No 1640. IZA Discussion Papers, Institute for the Study of Labor (IZA).
- Bassanini, A. and R. Duval (2009), Unemployment, institutions, and reform complementarities: re-assessing the aggregate evidence for OECD countries, *Oxford Review of Economic Policy* 25 (1): 40-59.
- Bertola, G. and R. Rogerson (1997), Institutions and labor reallocation, *European Economic Review* 41 (6): 1147-1171.
- Blanchard, O. and J. Wolfers (2000), The Role of Shocks and Institutions in the Rise of European

- Unemployment: The Aggregate Evidence. *Economic Journal* 110 (462): C1-33.
- Boeri, T. and J. van Ours (2008), The economics of imperfect labour markets. Princeton: Princeton University Press.
- Borra, C., F. Gomez-Garcia and M. Salas-Velasco (2009), Entry of young economists into working life: analysis of the determinants of first unemployment duration. *Applied Economics Letters* 16 (14): 1483-1488.
- Bredtmann, J. and S. Schaffner (2011), Just a transitory status? The effects of temporary jobs on subsequent employment. mimeo, Essen.
- Card, D., R. Chetty and A. Weber (2007), The Spike at Benefit Exhaustion: Leaving the Unemployment System or Starting a New Job? *American Economic Review* 97 (2): 113-118.
- Cunha, F. and J.J. Heckman (2007), The Technology of Skill Formation. *American Economic Review* 97: 31-47.
- Del Boca, D., S. Pasqua and C. Pronzato (2009), Motherhood and Market Work Decisions in Institutional Context: A European Perspective. *Oxford Economic Papers* 61 (1): i147-i171.
- EIRO (2011), Industrial relations country profiles. http://www.eurofound.europa.eu/eiro/country_index.htm, download 30.10.2011.
- Esping-Andersen, Gøsta (1990), Three worlds of welfare capitalism. Princeton: Princeton University Press.
- Eurostat (2010a), Description of target variables: Cross-sectional and Longitudinal. EU-SILC 065 (2008 operation). Directorate F: Social Statistics and Information Society, Luxembourg.
- Eurostat (2010b), EU Labour Force Survey database User guide. European Commission, Eurostat. Directorate F: Social Statistics and Information Society, Unit F-2: Labour Market. Luxembourg.
- Eurostat (2011a), European Statistics on Income and Living Conditions (EU-SILC). http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/eu_silc, downloaded 13/10/2011.
- Eurostat (2011b), European Union Labour Force Survey (EU-LFS). <http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/lfs>, downloaded 13/10/2011.
- Eurostat (2011c), Eurostat Statistics. <http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics>, downloaded 29/09/2011.
- Everitt, B.S., S. Landau, M. Leese, and D. Stahl (2011), Cluster Analysis. Wiley, 5th Edition.
- Hall, P. A. and D. Soskice (2001), Varieties of capitalism. The institutional foundations of comparative advantage. Oxford: Oxford University Press.
- Han, A. and J.A. Hausman (1990), Flexible Parametric Estimation of Duration and Competing Risk Models. *Journal of Applied Econometrics* 5 (1):1-28.
- Holmlund, B. (1998), Unemployment insurance in theory and practice, *Scandinavian Journal of Economics* 100 (1): 113-141
- ISG and RWI (2010), Study on various aspects of labour market performance using micro data from the European Union Labour Force Survey – Final Report. RWI : Projektberichte.
- Ilmakunnas, S. and S. Pudney (1990), A model of female labour supply in the presence of hours restrictions. *Journal of Public Economics* 41 (2): 183-210.
- Kroeger, H. and S. Schaffner (2011), The intensive and extensive margin of European labour supply. Ruhr Economic Paper, forthcoming, Essen.
- Lindbeck, A. and D. J. Snower (1989), The Insider-Outsider Theory of Employment and Unemployment. Cambridge: MIT Press.
- Long, J.S. (1997), Regression Models for Categorical and Limited Dependent Variables. Sage.
- Manca, A.R., M. Governatori and M. Mascherini (2010), Towards a set of composite indicators on flexicurity: a comprehensive approach. Luxemburg: JRC Scientific and Technical Reports.
- Marimon, R. and Zilibotti, F. (1999), Unemployment vs. Mismatch of Talents: Reconsidering Unemployment Benefits. *The Economic Journal* 109: 266–291.
- Nardo, M., M. Saisana, A. Saltelli, and S. Tarantola (2005), Tools for Composite Indicators Building.

Flexicurity profile of EU Member States

European Commission, EUR 21682 EN, Institute for the Protection and Security of the Citizen, JRC Ispra, Italy.

Nickell, S.J. (1997), Unemployment and Labor Market Rigidities: Europe versus North America. *Journal of Economic Perspectives* 11 (3): 55-74.

OECD (2011), OECD.Stat Extracts. <http://stats.oecd.org>, downloaded 26/09/2011.

Orszag, M. and D. Snower (1998), Anatomy of policy complementarities. *Swedish Economic Policy Review* 5 (2): 303-345.

RWI (2011), Study on various aspects of labour market performance using micro data from the European Union Statistics on Income and Living Conditions (EU-SILC) – Final Report. RWI : Projektberichte.

Saint-Paul (1997), Dual labour markets. A macroeconomic perspective. Cambridge, Mass.: MIT Press.

Appendix

Table A.1

Source and description of institutional variables

Variables	Source	Description
Pop. Growth	Eurostat	Ratio of the population change during the year to the average population in that year (per 1000 inhabitants).
Tax rate	Eurostat	Average tax rate for singles with no children and with an income of 67 per cent of the average wage.
Fertility rate	Eurostat	Mean number of children that would be born alive to a woman during her lifetime if she were to pass through her childbearing years conforming to the fertility rates by age of a given year.
Gini coefficient	Eurostat	Relationship between the cumulative shares of the population arranged according to the level of equivalised disposable income and the cumulative share of the equivalised total disposable income received by them.
Pensions/GDP	Eurostat	Pension expenditures; expressed as a percentage of GDP.
Retirement age	Eurostat	Mean retirement age
Childcare (<29h, <3y)	Eurostat	Children aged under 3 (0-2 years) cared for (by formal arrangements other than by the family) up to 30 hours a usual week as a proportion of all children of the same age group
Childcare (>29h, <3y)	Eurostat	Children aged under 3 (0-2 years) cared for (by formal arrangements other than by the family) 30 hours or more a usual week as a proportion of all children of the same age group
Childcare (<29h, 3-6y)	Eurostat	Children aged between 3 years and the mandatory school age cared for (by formal arrangements other than by the family) up to 30 hours a usual week as a proportion of all children of the same age group
Childcare (>29h, 3-6y)	Eurostat	Children aged between 3 years and the mandatory school age cared for (by formal arrangements other than by the family) 30 hours or more a usual week as a proportion of all children of the same age group
EP temp empl.	OECD	Indicator quantifies regulation of fixed-term and temporary work agency contracts with respect to the types of work for which these contracts are allowed and their duration.
EP regular empl.	OECD	Indicator incorporates three aspects of dismissal protection: (i) procedural inconveniences that employers face when starting the dismissal process, (ii) notice periods and severance pay; and (iii) difficulty of dismissal
EP all empl.	OECD	Employment protection overall.
Child benefits p.c.	Eurostat	Public expenditures on family and child benefits per capita.
Child benefits/GDP	Eurostat	Public expenditures on family and child benefits; expressed as a percentage of GDP.
Income maint./GDP	Eurostat	Income maintenance at birth; expressed as a percentage of GDP.
Parent. leave benef. p.c.	Eurostat	Public expenditures on parental leave per capita.
Parent. leave benef./GDP	Eurostat	Public expenditures on parental leave; expressed as a percentage of GDP.
Unemp. rate	Eurostat	Number of unemployed as a percentage of the active labour market population; calculated with reference to the population 15-74 years old..
Youth unemp. rate	Eurostat	Number of unemployed as a percentage of the active labour market population; calculated with reference to the population 15-24 years old.
Long-term unemp. rate	Eurostat	Long-term unemployed (12 months and more) as a percentage of the total active population.
GDP p.c.	Eurostat	Real GDP per capita is calculated as the ratio of real GDP to the average population of a specific year.
GDP growth p.c.	Eurostat	Growth rate of real GDP per capita
Union density	OECD	Trade union density, defined as percentage of employees who are members of a trade-union.
ALMP exp. total / GDP	Eurostat	Total public expenditure on labour market; expressed as a percentage of GDP.
ALMP exp.: measures / GDP	Eurostat	Public expenditure on labour market policy interventions; type of action: measures; expressed as a percentage of GDP.
ALMP exp.: support / GDP	Eurostat	Public expenditure on labour market policy interventions; type of action: support; expressed as a percentage of GDP.
Max. duration unemp. benef.	Eurostat	Maximum duration of unemployment benefits.
Unemp. benef. repl. rate	Eurostat	Refer to first year of unemployment benefits as percentage of average earnings before tax.
Exp. social protection/GDP	Eurostat	Expenditure on social protection contain: social benefits, administration costs, other expenditure; expressed as a percentage of GDP.
Exp. education / GDP	Eurostat	Total public expenditure on education; expressed as a percentage of GDP.

Source: OECD (2011) and Eurostat (2011). – "Pop." stands for population, "EP" for employment protection, "p.c." for per capita, "ALMP" for active labour market policy, "Exp." for expenditure.

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Table A.2

Definition of flexicurity indicators

Indicator	Definition at individual/country level	Variables EU-LFS /EU-SILC
Participation in formal training	Dummy (0/1) variable for taking up formal education and training during the four weeks prior to the interview. Individuals considered: Total population aged 16-65.	Student or apprentice in regular education
Participation in non-formal training	Dummy variable for taking up non-formal education and training in the four weeks prior to the interview. Individuals considered: Total population aged 16-65.	Attendance to taught learning activities
Unemployment duration	Unemployment duration in 3 categories: 0-5 months, 6-11 months, 12 months and more. Individuals considered: Unemployed persons aged 16-54	Duration of unemployment (3 categories)
Labour market participation - Women	Dummy variable for employment of women. Individuals considered: All women aged 16-65.	ILO work status
Labour market participation - Men	Dummy variable for employment of men. Individuals considered: All men aged 16-65.	ILO work status
Number of hours worked - Women	Number of weekly hours supplied by female workers	Number of hours per week usually worked
Number of hours worked - Men	Number of weekly hours supplied by male workers	Number of hours per week usually worked
Variance of hours worked - Women	Variance of the number of weekly hours supplied by female workers at the country level, adjusted for the national composition of the workforce.	Number of hours per week usually worked
Variance of hours worked - Men	Variance of the number of weekly hours supplied by male workers at the country level, adjusted for the national composition of the workforce.	Number of hours per week usually worked
Hirings	Dummy variable for transitions from nonparticipation or unemployment in month t-1 to employment in month t. Individuals considered: Total population aged 16-65	Main activity on January – December
Transitions from temporary to permanent employment	Dummy variable for transitions from temporary employment in year t-1 to permanent employment in year t. Individuals considered: All workers on temporary contracts.	Type of contract
Coverage rate of unemployment benefits	Dummy variable indicating whether a newly unemployed worker receives unemployment benefits.	Unemployment benefits
Net replacement rate of unemployment benefits	Total unemployment benefits as a share of labour income in the previous job. Individuals considered: Newly unemployed individuals.	Unemployment benefits, employee cash or near-cash income

Notes: The definition applies to the relevant concept at the individual level, except for the variation of hours where it applies to the computation of the indicator at the country level.

Table A.3
Country estimates for each flexicurity indicator

	Participation in formal training	Participation in non-formal training	Unemployment duration	Labour market participation - Women	Labour market participation - Men	Number of hours worked - Women	Number of hours worked - Men	Variance of hours worked - Women	Variance of hours worked - Men	Hings	Transitions from temporary to permanent employment	Coverage rate of unemployment benefits	Net replacement rate of unemployment benefits
AT	0.0000	0.0000	1.0000	0.2477	0.2237	34.0183	44.3028	183.7630	122.2319	-0.0050	0.0766	0.3942	0.4911
BE	-0.0140	-0.0355	2.6868	0.1671	0.2047	32.2463	41.0521	125.1624	105.1646	-0.0050	-0.0474	0.3883	0.5226
BG	-0.0081	-0.0627	3.3051	0.1835	0.1904	40.7709	42.6819	31.1319	35.5810	-0.0045	0.2869	-0.4203	0.5187
CY	-0.0096	-0.0301	0.8384	0.2135	0.2262	37.6467	43.2015	75.1793	100.5451	-0.0045	-0.1337	0.2018	0.3436
CZ	-0.0113	-0.0327	2.9877	0.1852	0.2199	39.7605	44.2684	50.7351	70.5621	-0.0049	-0.0821	0.3072	0.4484
DK	0.0149	0.0935	0.6395	0.3050	0.2328	32.4846	39.3087	97.7157	113.4063	-0.0048	0.3134	0.2898	0.2738
EE	0.0147	-0.0423	2.0523	0.2283	0.2088	38.2735	41.9445	52.7546	47.9549	-0.0047	-0.2218	-0.2805	0.2738
FI	0.0304	0.0350	0.7411	0.2654	0.2117	35.3219	40.5593	88.5057	95.8795	-0.0047	-0.2218	0.3738	0.4328
FR	-0.0187	-0.0189	1.7479	0.2220	0.2319	34.4542	41.7021	120.8600	115.1773	-0.0103	-0.2815	0.3506	0.6107
DE	-0.0027	-0.0421	2.7856	0.2472	0.2556	30.6293	41.0564	163.6280	103.6730	-0.0061	-0.1254	0.4348	0.6107
GR	-0.0154	-0.0591	3.0609	0.1144	0.2238	39.4774	45.3656	135.7623	118.5065	-0.0046	-0.1562	0.0001	0.3947
HU	-0.0043	-0.0569	2.4208	0.1370	0.1817	39.2941	41.6544	31.2426	36.9600	-0.0048	0.1437	0.2877	0.3947
IE	0.0015	-0.0417	1.2914	0.2045	0.2265	31.3627	41.6817	117.0856	101.4152	-0.0045	0.0611	-0.1183	0.2892
IT	-0.0135	-0.0449	2.5548	0.1269	0.2431	34.0492	42.2426	124.7024	87.7895	-0.0088	-0.1216	0.1487	0.3288
LV	0.0242	-0.0453	1.4314	0.2274	0.2104	39.6012	43.2594	60.0389	64.5260	-0.0046	0.2154	-0.1874	0.3272
LT	0.0191	-0.0525	1.6607	0.2030	0.1946	37.5940	40.4124	44.0396	25.3832	-0.0047	0.1003	-0.2655	0.3758
LU	-0.0197	-0.0255	1.4152	0.1581	0.2073	33.0512	40.4781	111.3813	24.5324	-0.0047	0.0009	0.1951	0.7922
NL	0.0108	-0.0195	1.7156	0.2830	0.2432	24.6886	37.5462	130.4105	133.8309	-0.0051	-0.1851	0.3399	0.5154
PL	0.0053	-0.0550	3.2196	0.1086	0.1871	38.2203	44.1167	113.0468	114.7312	-0.0055	-0.1494	-0.1248	0.5154
PT	-0.0121	-0.0562	2.1557	0.2883	0.2333	38.3449	42.3193	96.6997	78.6631	-0.0050	-0.1903	-0.0833	0.6024
RO	-0.0060	-0.0675	3.1755	0.1757	0.1963	40.1696	42.1617	34.2723	38.7166	-0.0050	0.1315	0.1057	0.6344
SK	-0.0095	-0.0485	7.4925	0.1435	0.1953	39.6185	42.8281	35.1485	43.5520	-0.0048	0.1213	-0.0161	0.5066
SI	0.0317	-0.0120	2.4310	0.2257	0.2072	39.2217	42.4160	83.6205	89.8378	-0.0047	-0.0483	0.1213	0.5066
ES	-0.0146	-0.0075	0.7317	0.1806	0.2523	35.4233	42.8395	130.1648	83.7742	-0.0065	-0.1609	0.1647	0.5295
SE	-0.0064	0.0204	0.6687	0.2971	0.2290	34.1495	39.8189	85.2505	81.6579	-0.0047	0.1309	0.2163	0.4518
UK	0.0206	0.0718	0.9786	0.2677	0.2599	31.5310	43.1339	162.5198	128.4244	-0.0060	0.1060	-0.2885	0.4518

Source: EU-LFS and EU-SILC, own calculations. – This table displays the estimation results on country fixed effects (for regression details see Section 3). See Table 2 for a definition of the indicators.

Flexicurity profile of EU Member States

Table A.4

Composite country results for each flexicurity dimension

	LLL	ALMP	MLL	MSS	Total
AT	0.2940	0.9392	0.3802	1.1843	0.6994
BE	-0.5943	-0.1504	-0.0088	1.1608	0.1018
BG	-0.7435	-0.7654	1.1975	-2.0670	-0.5946
CY	-0.3876	0.4436	-0.0600	0.4163	0.1031
CZ	-0.4727	-0.2724	-0.0732	0.8370	0.0047
DK	1.9306	0.4983		0.7676	
EE	0.2416	-0.2800	1.2060	-1.5089	-0.0853
FI	1.7027	0.3354	-0.4194	1.1029	0.6804
FR	-0.5397	0.3673	-2.9238	1.0103	-0.5215
DE	-0.3140	0.2423	-0.7104	1.3464	0.1411
GR	-0.9310	0.2280	-0.1725	-0.3888	-0.3161
HU	-0.5499	-0.7322	0.6279	0.7592	0.0262
IE	-0.1743	0.2798	0.5030	-0.8615	-0.0633
IT	-0.6951	-0.0209	-0.9928	0.2043	-0.3761
LV	0.5096	0.0726	0.9439	-1.1373	0.0972
LT	0.2550	-0.5123	0.5641	-1.4491	-0.2856
LU	-0.6548	-0.3139	0.2558	0.3896	-0.0808
NL	0.3981	0.2249	-0.4547	0.9676	0.2840
PL	-0.2190	-0.1516	-0.5341	-0.8874	-0.4480
PT	-0.7908	0.2142	-0.4412	-0.7218	-0.4349
RO	-0.7347	-0.7342	0.5437	0.0327	-0.2231
SK	-0.6102	-1.7561	0.5749	-0.4535	-0.5612
SI	1.1617	-0.0132	0.0991	0.0950	0.3356
ES	-0.2673	0.5818	-0.9686	0.2682	-0.0965
SE	0.3418	0.3221	0.6522	0.4742	0.4476
UK	1.8439	0.9532	0.0213	-1.5409	0.3194

Source: EU-LFS and EU-SILC, own calculations. – As the indicator "net replacement rate" cannot be provided for 6 countries, the dimension MSS only consists of the indicator "Coverage rate" which is available for all considered countries. For a definition of the four flexicurity dimension and for a detailed description of the construction of the composite indicators see Section 3.

Table A.5
Correlations between flexicurity indicators and institutional variables

	Participation in formal training	Participation in non-formal training	Unemployment duration	Labour market participation - Women	Labour market participation - Men	Number of hours worked - Women	Number of hours worked - Men	Variance of hours worked - Women	Variance of hours worked - Men	Hirings	Transitions from temporary to permanent employment	Coverage rate of unemployment benefits	Net replacement rate of unemployment benefits
Pop. Growth	0	0	0	0	+	0	0	+	0	0	0	0	0
Tax rate	0	0	0	0	0	0	-	0	0	0	0	+	0
Fertility rate	0	+	+	+	+	-	-	0	+	0	0	0	0
Gini coefficient	0	0	0	0	0	0	0	0	0	0	0	-	0
Pensions/GDP	0	0	0	0	+	0	0	+	+	-	-	+	0
Retirement age	0	0	0	0	+	0	0	0	0	0	0	0	0
Childcare (<29h, <3y)	0	+	0	0	+	-	-	+	+	0	0	0	0
Childcare (>29h, <3y)	0	0	0	+	0	0	-	0	0	0	0	0	0
Childcare (<29h, 3-6y)	0	0	0	0	+	-	0	+	+	0	0	+	0
Childcare (>29h, 3-6y)	0	0	0	0	0	0	0	-	0	0	0	0	0
EP temp empl.	-	0	0	0	0	0	0	0	0	0	-	0	0
EP regular empl.	0	0	0	0	0	0	0	0	0	0	0	0	0
EP all empl.	-	0	0	0	0	0	0	0	0	0	-	0	+
Child benefits p.c.	0	0	0	0	0	-	0	+	0	0	0	+	+
Child benefits/GDP	0	0	0	0	0	0	0	0	0	0	0	0	0
Income maintenance/GDP	0	+	-	+	0	0	0	0	0	0	0	0	0
Parent. leave benef./GDP	+	0	+	0	-	+	0	-	-	0	0	0	0
Parent. leave benef. p.c.	0	0	0	0	0	0	0	0	-	0	0	0	+
Unemp. rate	0	0	+	-	0	+	0	0	0	0	0	0	0
Youth unemp. rate	-	0	+	-	0	+	0	0	0	0	0	0	0
Long-term unemp. rate	0	-	+	-	+	+	0	0	0	0	0	0	0
GDP p.c.	0	+	-	0	+	-	-	+	0	0	0	+	0
GDP growth p.c.	0	0	+	0	-	+	0	-	-	0	+	-	0
Union density	0	+	0	0	0	0	-	0	0	0	0	0	0
ALMP exp. total / GDP	0	0	0	+	+	-	-	+	+	0	-	+	0
ALMP exp.: measures / GDP	0	0	0	+	0	-	-	+	+	0	-	+	0
ALMP exp.: support / GDP	0	0	0	0	+	-	-	+	+	0	-	+	0
Max. duration unemp. benef.	0	0	0	0	0	0	0	0	0	0	0	0	0
Unemp. benef. repl. rate	0	0	0	+	0	-	-	0	0	0	0	0	0
Exp. social protection/GDP	0	0	0	0	+	-	0	+	+	-	-	+	0
Exp. education / GDP	0	+	-	+	0	0	0	0	+	0	0	0	0

Source: OECD, Eurostat, EU-LFS and EU-SILC, own calculations. – +/ -/ 0 denote positive, negative or no significance of correlations between flexicurity indicators and institutional variables.

Table A.6
Average values of institutional variables

	Pop. Growth	Tax rate	Fertility rate	Gini coefficient	Pensions/GD P	Retirement age	Childcare (<29h, <3y)	Childcare (>29h, <3y)	Childcare (<29h, 3-6y)	Childcare (>29h, 3-6y)	EP temp empl.	EP all empl.	Child benefits p.c.	Income maint./GDP
AT	4.648	27.565	1.393	25.75	9.448	59.8	4.5	1.0	52.8	17.5	1.5	1.930	583.234	0.139
BE	7.175	35.355		27.5	7.281	56.6	20.3	22.0	36.5	62.3	2.6	2.180	395.308	0.144
BG	-5.027	17.353	1.373	31.75	5.301	55.5	2.0	10.3	7.0	54.7			12.219	0.145
CY	15.431	6.300	1.420	29	5.369	62.3	7.0	15.0	44.3	41.8			165.309	0.119
CZ	5.969	19.898	1.350	25.25	6.257	58.4	1.5	0.3	30.5	38.3	0.9	2.025	29.820	0.163
DE	-1.515	36.378	1.347	28.25	8.845	62.5	9.3	8.3	61.8	30.0	1.3	2.120	464.470	0.050
DK	4.580	38.795	1.830	24.5	7.450	61.7	8.8	63.5	14.8	81.0	1.4	1.500	338.231	0.537
EE	-1.320	16.635	1.560	32.75	4.278	58.2	2.8	12.8	6.3	78.0	1.8		38.920	0.679
ES	15.703	15.685	1.377	31.25	5.387	58.5	22.8	16.3	50.0	43.0	3.5	2.980	32.375	0.167
FI	4.246	24.213	1.823	26	7.029	59.3	6.0	20.3	21.8	55.0	1.8	2.005	248.318	0.458
FR	6.206	25.858	1.973	27.25	10.605	54.5	15.0	18.0	52.8	41.5	3.6	3.050	425.747	0.152
GR	3.975	16.000	1.380	33.5	7.174	61.1	3.5	6.3	36.3	27.3	3.1	2.730	87.989	0.161
HU	-1.654	25.153	1.323	28	6.388	56.7	2.0	5.5	24.0	58.0	1.3	1.585	93.370	0.130
IE	19.921	12.573	1.920	31.25	3.277	59.6	14.0	7.5	71.8	13.8	0.6	1.110	479.348	0.124
IT	6.678	24.103	1.335	32	11.425	58.2	10.3	15.8	21.8	68.8	1.9	1.838	89.586	0.182
LT	-5.569	22.825	1.310	34.75	5.139	57.7	1.3	9.8	8.5	49.3			24.288	0.157
LU	16.906	19.683	1.630	27.25	3.883		13.0	13.0	47.5	18.5	3.8	3.250	1298.955	0.220
LV	-4.941	27.010	1.357	37	5.046	57.9	2.0	14.0	4.8	57.3			19.946	0.183
NL	2.749	28.265	1.717	27.25	8.174	58.4	39.3	4.5	80.3	9.3	1.2	2.058	182.907	0.000
PL	-0.249	26.183	1.273	33.25	6.583	56.6	0.0	2.5	7.8	23.3	1.8	1.900	28.328	0.040
PT	2.316	16.525	1.363	37.25	8.822	59.2	2.3	28.5	11.0	53.5	2.6	3.383	60.780	0.209
RO	-1.853	25.050	1.313	34.5	5.211	57.2	4.5	2.5	45.0	16.5			11.829	0.052
SE	6.705	26.623	1.833	23.5	8.185	60.8	19.3	29.0	32.5	58.8	1.4	2.148	245.370	0.670
SI	6.246	30.095	1.317	23.5	5.551	59.4	3.0	25.5	13.3	68.5	1.9		92.347	0.127
SK	1.271	18.455	1.247	25.5	5.343	56.5	0.7	2.5	8.3	60.5	0.4	1.365	60.776	0.079
UK	6.529	23.628	1.810	33.25	8.200	56.2	29.3	4.5	64.8	22.3	0.4	0.750	210.921	0.377

Table A.6, continued

	Parent. leave benef./GDP	Parent. leave benef. p.c.	Unemp. rate	Youth unemp. rate	Long-term unemp. rate	GDP p.c.	GDP growth p.c.	Union density	ALMP exp. total / GDP	ALMP exp.: measures / GDP	ALMP exp.: support / GDP	Unemp. benef. repl. rate	Exp. social protection/G DP	Exp. education / GDP
AT	0.002	0.46	4.550	9.025	1.178	31125	2.275	30.833	2.005	0.505	1.330	0.550	28.355	5.450
BE	0.000	0.05	7.825	19.700	3.908	29675	1.400	52.937	3.298	0.960	2.140	0.600	28.728	6.103
BG	0.253	7.12	7.900	17.400	4.493	3325	6.850		0.553	0.330	0.165	0.600	14.733	4.373
CY	0.023	3.82	4.375	10.775	0.838	10600	2.375		0.613	0.063	0.510	0.600	18.328	7.070
CZ	0.605	64.70	6.200	14.325	3.253	18750	4.875	18.432	0.465	0.118	0.218	0.500	18.786	4.285
DE	0.181	47.59	9.050	12.900	5.055	28325	2.300	20.351	2.355	0.545	1.530	0.670	28.459	4.495
DK	0.000	0.00	3.950	7.950	0.750	39200	1.175	69.469	3.023	1.120	1.728	0.900	29.500	7.963
EE	0.126	10.08	6.000	12.475	2.768	9225	5.875	7.826	0.190	0.043	0.128	0.500	13.008	5.038
ES	0.008	1.45	9.325	20.100	1.955	21475	1.325	15.044	2.253	0.613	1.548	0.700	21.380	4.368
FI	0.206	61.62	7.350	17.950	1.693	31700	3.000	70.487	2.435	0.713	1.595	0.450	26.211	6.135
FR	0.132	34.16	8.675	20.425	3.483	27850	1.000	7.660	2.240	0.670	1.343		30.834	5.600
GR	0.062	9.81	8.700	24.050	4.438	18550	2.775	24.443	0.535	0.123	0.398	0.400	24.922	4.040
HU	0.578	40.86	7.475	19.100	3.420	9100	2.275	17.045	0.650	0.190	0.370	0.600	22.366	5.298
IE	0.000	0.00	4.875	9.725	1.450	40175	0.950	33.018	1.685	0.500	0.985	0.600	19.353	5.008
IT	0.000	0.00	6.825	21.800	3.228	24600	0.000	33.438	1.203	0.405	0.763		26.883	4.500
LT	0.346	24.94	6.000	11.775	2.360	6900	7.725		0.383	0.175	0.125		14.340	4.830
LU	0.160	102.90	4.575	15.750	1.350	68400	2.925	39.399	0.990	0.375	0.570		20.397	3.437
LV	0.344	19.24	7.300	12.400	2.520	6375	7.475		0.508	0.135	0.310		12.282	5.210
NL	0.000	0.00	3.650	6.500	1.418	32975	2.525	19.907	2.728	0.770	1.605	0.750	28.355	5.430
PL	0.172	11.51	12.100	26.500	6.348	7025	5.475	16.649	1.090	0.398	0.608		18.947	5.180
PT	0.000	0.00	7.825	16.350	3.708	14850	0.875	20.843	1.685	0.430	1.128	0.650	24.370	5.208
RO	0.418	8.33	6.675	20.075	3.448	4125	6.625		0.393	0.088	0.268		13.516	3.865
SE	0.069	7.74	6.800	20.725	0.663	34275	1.900	72.688	1.930	0.923	0.800		29.969	6.813
SI	0.356	43.03	5.450	12.575	2.513	15575	4.750	28.062	0.570	0.143	0.335	0.700	22.120	5.438
SK	0.409	27.89	12.575	24.000	9.193	8100	7.750	19.815	0.633	0.145	0.350	0.500	16.225	3.715
UK	0.000	0.00	5.275	14.025	1.200	30850	1.250	27.884	0.518	0.048	0.180		24.827	5.395

Source: OECD and Eurostat. – Average values are only displayed for the institutional variables that are significantly correlated with at least one flexibility indicator.

Box A.1

The Logit and Probit Models

The logit and probit models are obvious choices in the case of binary outcomes, i.e. outcomes that can only take on two values, 0 and 1. This is true for, e.g., the participation decision (participation: 1, nonparticipation: 0), the distinction between full-time and part-time employment, and between temporary and permanent employment. The outcome is defined as a latent variable y^* such that

$$y_i^* = x_i'\beta + \epsilon_i.$$

The outcome is dependent on a vector of observable characteristics X_i (e.g. socio-demographics) and a random error term ϵ_i .

We do not observe y_i^* , but rather y_i , which can be interpreted as an indicator for whether the latent variable is positive:

$$y_i = \begin{cases} 1 & \text{if } y_i^* > 0 \\ 0 & \text{otherwise.} \end{cases}$$

The estimated probability should be between 0 and 1. The assumption is fulfilled by cumulative distribution functions. Therefore the model can be rewritten as: $P(y_i = 1|x_i) = F(x_i'\beta)$, where F is the logistic cumulative distribution function in the case of the logit model, and the standard normal cumulative distribution function in the case of the probit model.

The marginal effect can be derived by differentiation of F with respect to a particular variable x_1 :

$$\frac{\delta E\left(\frac{y_i}{x_i}\right)}{\delta x_{i1}} = f(x_i'\beta)\beta_1.$$

f is the density function of the appropriate distribution. The marginal effect is therefore not constant but varies with x_i . We present the marginal effects derived at the means of all variables.

In applications, the logit model and the probit model usually yield very similar results.

The reported marginal effects mf_{x_1} can be interpreted in the following way: an increase in variable x_1 by one unit leads to an increase of the output variable by mf_{x_1} units. Is x_1 a dummy/ indicator variable, it means that if x_1 changes from 0 to 1, this leads to an increase of mf_{x_1} units of the outcome variable.

Box A.2

Ordered Regression Models

The ordered regression model (ORM) is an appropriate econometric tool for the case of ordinal outcomes (cf. Han, Hausman 1990; Long 1997). Such outcomes can be ordered, but the distances between the outcomes are not necessarily meaningful, arbitrary or changing. This is for example the case for the anonymized variable for unemployment duration (DURUNE) in the EU LFS. Intuitively, an ORM measures the baseline hazard (in the example of unemployment duration, the probability of belonging to a certain duration class) as a series of dummies with no prior assumptions about the distribution and parametric form of the underlying hazard function. A recent application of ORM to unemployment duration data can be found in Borra et al. (2009).

The ORM can be seen as a generalization of the binary regression model which has the special case that the outcome has only two categories. The outcome is defined as a latent (i.e. unobserved) variable ranging from $-\infty$ to ∞ .

The underlying structural model is:

$$y_i^* = x_i' \beta + \varepsilon_i,$$

where the outcome is dependent on a vector of observable characteristics and a random error term.

Applied to our data, the measurement model divides y^* into three categories (unemployment duration less than six months, between six and eleven months and more than eleven months):

$$y_i = m \text{ if } \tau_{m-1} \leq y_i^* < \tau_m \text{ for } m = 1 \text{ to } 3.$$

τ_0, \dots, τ_3 are the associated threshold values, also called cut points:

$$y_i = \begin{cases} 1 & \text{if } \tau_0 = -\infty < y_i^* < \tau_1 \\ 2 & \text{if } \tau_1 \leq y_i^* < \tau_2 \\ 3 & \text{if } \tau_2 \leq y_i^* < \tau_3 = \infty \end{cases}$$

Note that all but the two exterior cut points need to be estimated together with the coefficients.

The standard formula for the probability of belonging to a particular category in the ORM is:

$$\Pr(y = m | x) = F(\tau_m - x' \beta) - F(\tau_{m-1} - x' \beta)$$

with F as the cumulative distribution function of ε . The shape of this distribution function depends on the estimated model. In an ordered probit model, the distribution function is the standard normal one. In an ordered logit model,

F is the logistic cumulative distribution function with a variance of $\pi^2/3$. Both methods are known to produce mostly similar results (Han, Hausman 1990). The ordered logit specification has the advantage that it allows us to interpret the coefficients in terms of the odds ratio. As the ORM is a non-linear model by nature, interpretation is not straightforward (as it would be the case for linear regression models). We can interpret the coefficient, while holding the other variables constant (usually at their means). The two most common ways of interpretation are:

1. The coefficient β denotes the effect of a standard deviation increase or decrease in a variable on the standardized change in the latent variable
2. The exponentiated coefficient e^{β} denotes the effect of a unit increase or decrease in a variable on the odds ratio. Say, for example, that the exponentiated coefficient of a particular variable is 1.20. Then, holding everything else constant, a unit increase in this variable increases the odds of observing an outcome in a category greater than m versus less than or equal to m by 20 per cent. Accordingly, exponentiated coefficients lower than one mean that an increase in the respective variable is associated with a reduction in the odds ratio. Using this interpretation we can gain insight into which factors are important in the determination of unemployment duration and how they compare to each other sizewise. Therefore, we will display exponentiated coefficients in our regression tables.

Box A.3

Cluster Analysis

Cluster analysis is a statistical tool to classify multivariate data into subgroups. There exist different types of clustering. These types can be classified into hierarchical and partitional clustering. Furthermore, there exist additional strategies that are less common. Partitional clustering is a division of the data points into non-overlapping clusters. By contrast, in a hierarchical clustering subclusters are organized as a tree. Each subcluster consists of smaller subclusters. Cluster analysis is described in detail in Everitt et al. (2011).

To cluster the countries based on the derived indicators we apply a hierarchical clustering. First, each observation, in our case each country, builds one cluster. In each iteration, the two nearest neighbours/clusters are merged into a larger cluster. The clusters are merged until one large cluster remains. The special method used is average linkage clustering. To define the nearest clusters the average distance between all pairs of objects in any two clusters are used:

$$d(r, s) = \frac{1}{n_r n_s} \sum_{i=1}^{n_r} \sum_{j=1}^{n_s} \text{dist}(x_{ri}, x_{sj})$$

Furthermore, the distance can be measured in different ways. We use the so-called Euclidian distance. The Euclidian distance between two points $x = (x_1, x_2, \dots, x_n)$ and $y = (y_1, y_2, \dots, y_n)$ is given by:

$$d(x, y) = \sqrt{(x_1 - y_1)^2 + (x_2 - y_2)^2 + \dots + (x_n - y_n)^2}.$$



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