

# TiPSE

## The **T**erritorial **D**imension of **P**overty and **S**ocial **E**xclusion in Europe

Applied Research 2013/1/24

Work Package 2.9

### **Typology of Countries**

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April 2014

This report presents a more detailed overview of the analytical approach to be applied by the project. This Applied Research Project is conducted within the framework of the ESPON 2013 Programme, partly financed by the European Regional Development Fund.

The partnership behind the ESPON Programme consists of the EU Commission and the Member States of the EU27, plus Iceland, Liechtenstein, Norway and Switzerland. Each partner is represented in the ESPON Monitoring Committee.

This report does not necessarily reflect the opinion of the members of the Monitoring Committee.

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This basic report exists only in an electronic version.

ISBN number -

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## The ESPON TiPSE Project:

The TiPSE project has been commissioned by the European Observation Network for Territorial Development and Cohesion (ESPON) programme. It is concerned with the issue of poverty, and processes of social exclusion in Europe.

One of the key challenges for the EU, in its pursuit of social, economic and territorial cohesion, is to address regional or local concentrations of poverty and social exclusion. In terms of practical governance, this remains a national responsibility within the context of EU strategic guidance. In practice, regional or local administrations are often in 'the front line'; implementing national policies to ameliorate deprivation and exclusion. At a higher level, the EU defines its role as identifying best practices and promoting mutual learning.

Poverty and social exclusion are essentially relative concepts, arguably only meaningful within a specified geographical context. This underlines the essential roles to be played by observation, measurement, and careful data analysis, as preparations for intervention. The TiPSE project aims to support policy, both by enhancing the evidence base and by identifying existing good practice.

A central objective of the TiPSE project is to establish macro and micro-scale patterns of poverty and social exclusion across the ESPON space. This will be achieved by compiling a regional database, and associated maps, of poverty and social exclusion indicators. Such quantitative analysis of geographical patterns is considered a fundamental part of the evidence base for policy.

In addition, in order to better understand the various social and institutional processes which are the context of these patterns, a set of ten case studies are to be carried out. These will be more qualitative in approach, in order to convey holistic portraits of different kinds of poverty and social exclusion as experienced in a wide variety of European territorial contexts. The principal goal for these investigations will be to bring forward clear illustrations of the social, economic, institutional and spatial processes which lead to poverty and social exclusion in particular geographic contexts.

The selection of case study areas has been carried out with careful regard to the wide variety of geographic, cultural and policy contexts which characterise Europe. The ten case studies are also intended to highlight a range of different 'drivers' of poverty and social exclusion, including labour market conditions, educational disadvantage, ethnicity, poor access to services and urban segregation processes. A second objective of the case studies will be to identify policy approaches which can effectively tackle exclusion, and thus strengthen territorial cohesion.

The TiPSE research team comprises 6 partners from 5 EU Member States:

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## Typology of Countries

The work package 'Typology of Countries' seeks to identify groups of countries with similar profiles in terms poverty and social exclusion. A cluster analysis was identified as an appropriate methodology for grouping countries according to their poverty and social exclusion profiles. Afterwards, these clusters will be interpreted and evaluated; (dis)similarities to the identified welfare regimes as well as different policy responses to poverty and social exclusion will be touched upon.

### 1. Cluster analysis: methodology and results

#### *Preparation*

Before computing a cluster analysis, which identifies within a heterogeneous set of objects different homogeneous subsets, several preliminary considerations regarding the choice and preparation of indicators, which play a crucial role for the results of the analysis, are needed. First of all, suitable indicators have to be selected. At the beginning of the TiPSE project, four different domains of social exclusion were identified, reflecting different theoretical concepts of poverty and social exclusion and serving as a basis for different work packages of the TiPSE project: (1) earning a living, (2) access to services, (3) social environment and (4) political participation. For the social exclusion mapping of the project, a list of indicators covering all four domains was compiled at an earlier stage of the project. Thus, the list of indicators already identified by and used within the TiPSE project also provides the basis for the typology of poverty and social exclusion profiles. Moreover, the three indicators on which the EU Poverty Target is based on were additionally integrated in the cluster analysis: (1) at risk of poverty, (2) severe material deprivation and (3) jobless households.

However, due to different reasons not all of these indicators could be integrated into the cluster analysis. Firstly, there are some indicators for which data on one or more countries is missing (e.g. disposable income of private households, unemployment rate as well as several health indicators such as hospital beds per 100,000 inhabitants or dentists, pharmacists or physiotherapists per 100,000 inhabitants). Since countries with missing data could not have been included in the cluster analysis, we had to delete indicators with missing data. Therefore, the fourth domain of social exclusion is not represented in the cluster analysis. Secondly, some indicators correlate highly, which can distort the result of the cluster analysis through overvaluation. Thus, in case of a correlation coefficient higher than 0.7/-0.7, the correlating indicators had to be deleted. This affects the indicators available for male and female, so that only the total rates were included, as well as the share of total population not having indoor flushing toilet for the sole use of their household that correlates with severe material deprivation, or the at-risk-of-poverty rate that correlates with the NEET rate the in-work at-risk-of-poverty rate as well as the Gini coefficient of equal-

ised disposable income. Afterwards, we selected a set of 21 indicators covering at least three of the four domains of social exclusion with available data for the year 2012 on NUTS 0 level and standardised them for the cluster analysis (for an overview of all indicators used please see With some exceptions, Cluster 1 (“Inclusive Centre”) and 2 show the most similarities; the values of these two clusters are significantly closer to each other than to the other three clusters as already referred to in the previous section. Countries in both clusters show low risks of poverty and social exclusion as regards the employment market, education and housing and show the lowest values of the three poverty and social exclusion indicators being the basis of the EU Poverty Target. The division of into two clusters can be ascribed to the persons with tertiary education, with lower shares in Cluster 1 (“Inclusive Centre”), single persons with children, with severely higher rates in Cluster 2 (“Competitive North-West”), and jobless households who can be found more often in the countries being part of Cluster 2 (“Competitive North-West”). Distinctively more dissimilarities can be identified between Cluster 3 (“Disparate East”) and 4, in particular within the dimensions health, housing and household structure. Additionally, whereas more people within the Eastern European countries are affected by severe material deprivation, the risk of receiving insufficient income, illustrated by the share of working poor, is much higher in the Mediterranean countries, probably also related to the crisis.



Table 4).

Due to data availability as regards several indicators, Liechtenstein and Croatia had unfortunately to be deleted from the list; thus, the cluster analysis was prepared for 30 of the 32 ESPON countries. Nevertheless, it has to be stated that the indicators used differ in their validity as regards profiles of poverty and social exclusion. To give an example: Although elderly are clearly identified as a risk group concerning poverty and social exclusion by research studies as well as several TiPSE case studies, the indicator old-age-dependency ratio seems to be less significant in indicating poverty and social exclusion than for example the material deprivation rate. Moreover, the indicators can have different meanings within the different national contexts; thus, results of the quantitative cluster analysis always need to be interpreted carefully.

### *Methodology*

A cluster analysis assigns objects with close similarities to one cluster and objects with low similarities (or striking differences) to different clusters. Therefore, a measurement which quantifies the similarities, a so called distance measure, is needed. These different measurements indicate the distance of features between the single objects (Stein, 2011). There are different measurements that can be used according to the scale of the variables. We used the square-Euclidean distance that sums up the squared distances and calculates the square root of the sum. Thus, differences between similar and non-similar objects become most visible.

However, the calculation of distance and similarity measures only helps estimating the distance of each object to the other ones, but it does not divide the objects into different clusters. There are different cluster algorithms based on different principles, which allocate the objects to clusters. We opted for the hierarchical clustering that allows grouping countries with similar characteristics and therefore leads to homogeneous clusters. Whereas the centroid-based clustering starts with a determined number of clusters and rearranges the objects until an optimum is achieved, the hierarchical clustering aggregates successively the ungrouped objects (Kopp & Lois, 2009). At the beginning, each object is considered as an independent cluster. The two clusters with the lowest distance are grouped to one common cluster; the number of remaining cluster diminishes by one. For the remaining clusters, new distance measures are calculated and the two clusters with the lowest distance are aggregated again (Kopp & Lois, 2009). The final outcome is one big cluster that comprises all objects. Thus, the homogeneity requirements are reduced gradually. Moreover, one aggregated cluster cannot be separated but only be merged with other clusters.

Different measurements of hierarchical clustering calculate the distance measures in different ways. We used the Ward-Method that is restricted to metric data. The Ward-Method does not aggregate the objects with the lowest distance, but rather merges the two clusters, which generate the most minimal increase of variance, the error

sums of squares, in the new cluster (Stein, 2011). The Ward-Method generates very homogenous clusters and represents the most efficient method within the group of hierarchical clustering procedures (Kopp & Lois, 2009; Fenger, 2007). Before conducting the cluster analysis, however, the set of objects should be analysed as regards potential outliers. Outliers should be excluded from the analysis, since they could influence the merging process and could consequently hamper the identification of correlations between objects.

The dendrogram of the single linkage method (see Figure 18 in the Annex) as well as a comparison between the values of the different indicators part of the cluster analysis identify Romania as a potential outlier. Several indicators vary significantly from other countries, such as the activity rate, the number of physicians or doctors, population with tertiary education, the share of population without bath or shower, overcrowding or the share of working poor. Thus, Romania was separated before conducting the cluster analysis and consequently constitutes its own cluster. According to the dendrogram of the single linkage method, Ireland could also be considered as a potential outlier, but to a lesser extent than Romania. Whereas the values for Romania differ significantly from all other countries, Ireland does not show very extreme values; its similarity to other groups of countries rather varies severely between the different dimensions of social exclusion. Due to these distinct differences, in contrast to Romania, Ireland was not treated as an outlier.

The result of the cluster analysis, however, does not consist in the final result of the Ward-Method, which is one big cluster that comprises all objects. What is rather interesting is to analyse the single steps of the cluster formation (Brosius, 2011). Thus, the appropriate number of clusters still has to be determined. The decision to group countries due to their similar characteristics is based on statistical techniques as well as on theoretical reflections. In our case, the most appropriate number of clusters seems to be five.

### *Results of the cluster analysis<sup>1</sup>*

The five cluster, whose numbering does not reflect any sequence of risk, comprise the following countries that show similar profiles of poverty and social exclusion (see also Figure 1):

#### **Cluster 1: “Inclusive Centre”**

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<sup>1</sup> The names of the different clusters originate from Andrew Copus.

Austria, Cyprus, Czech Republic, Germany, Luxembourg, Malta, Slovenia, Switzerland

**Cluster 2: “Competitive North-West”**

Belgium, Denmark, Finland, France, Iceland, Ireland, Netherlands, Norway, Sweden, United Kingdom

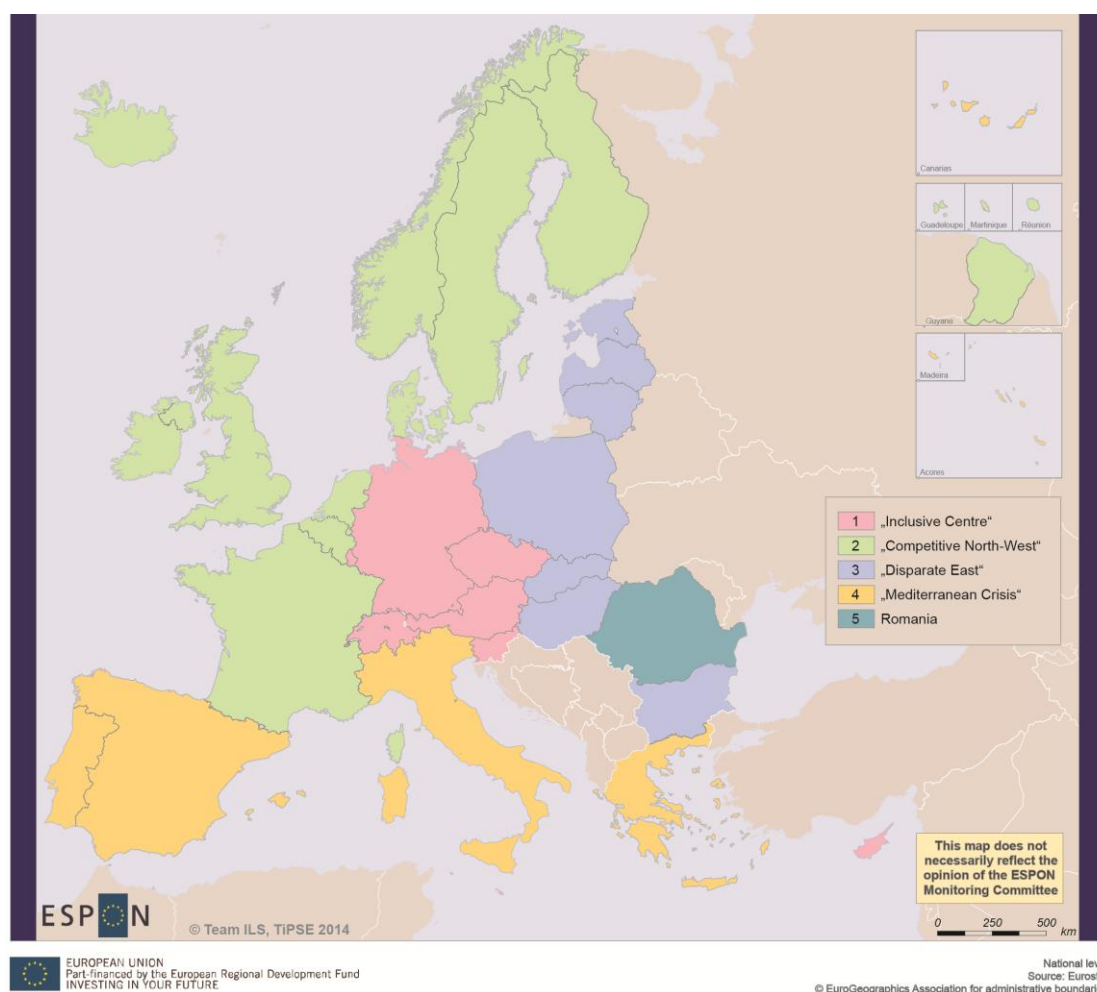
**Cluster 3: “Disparate East”**

Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia

**Cluster 4: “Mediterranean Crisis”**

Greece, Italy, Portugal, Spain

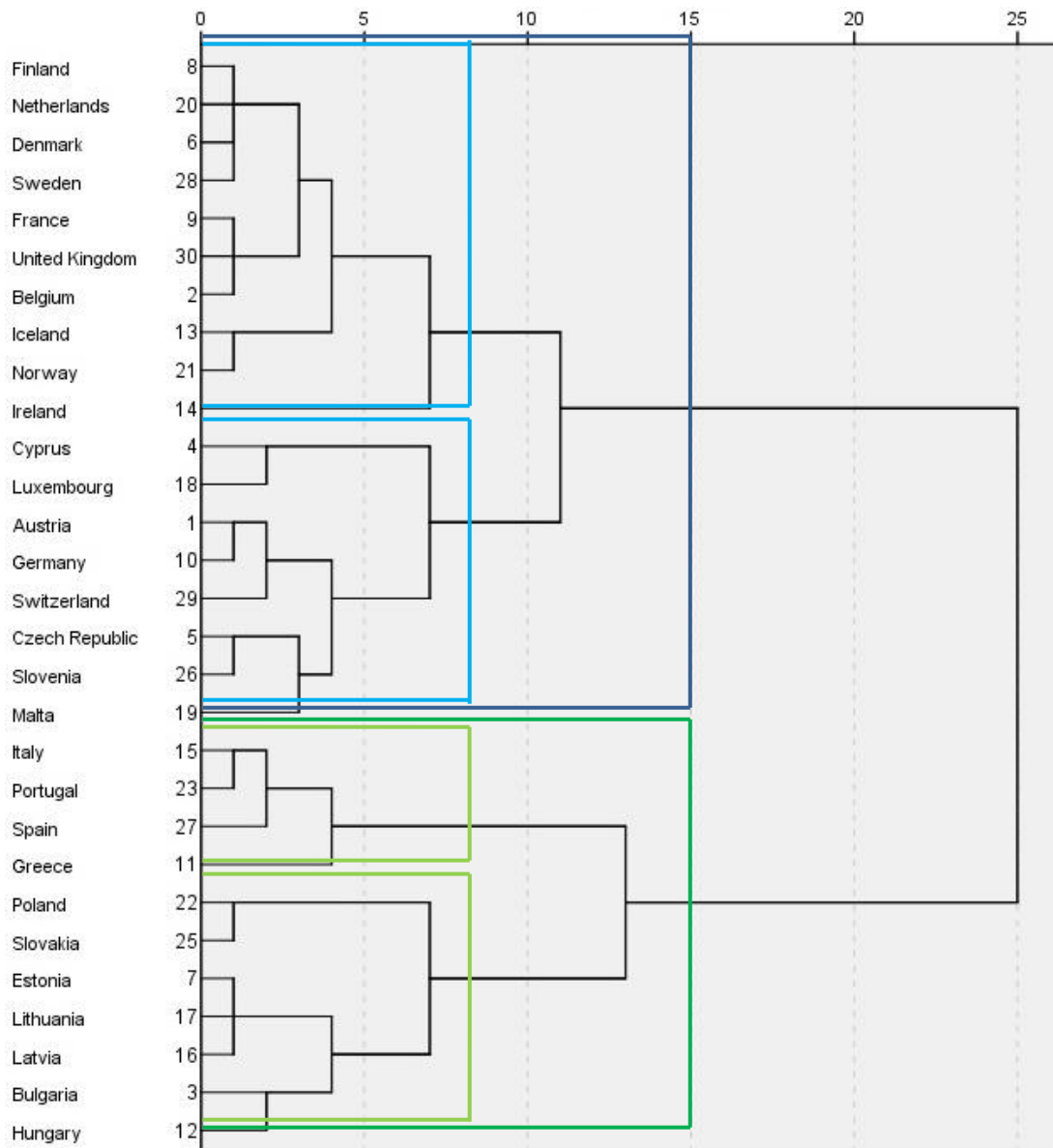
**Cluster 5: Romania**



**Figure 1: Poverty and Social Exclusion Typology**

From the hierarchical cluster analysis, patterns of poverty and social exclusion country profiles become evident. In fact, there is a clear dichotomy between the countries (see Figure 2): Whereas the first group of countries (see dark blue box in Figure 2) consists of the Northern, Atlantic and Central European countries, the second one (see dark green box in Figure 2) entails East Europe as well as the Mediterranean

countries. However, although some countries are part of the same cluster, different patterns of similarity become apparent. There are several smaller groups that are merged together at a very early step of the cluster analysis, e.g. the Mediterranean Countries (see Figure 2). Independently of the number of clusters or the distance measure, Portugal, Spain, Italy and Greece always constitute one cluster. The (Scandinavian) countries Finland, Denmark, Netherlands and Sweden as well as the countries France, UK and Belgium are also merged together quite early and both groups form together a very stable and homogenous cluster.



**Figure 2:** Dendrogram of the cluster analysis

Besides these steady clusters, there are other combinations, however, that seem to be much more fragile. Whereas cluster 1 (“Inclusive Centre”) contains a very stable

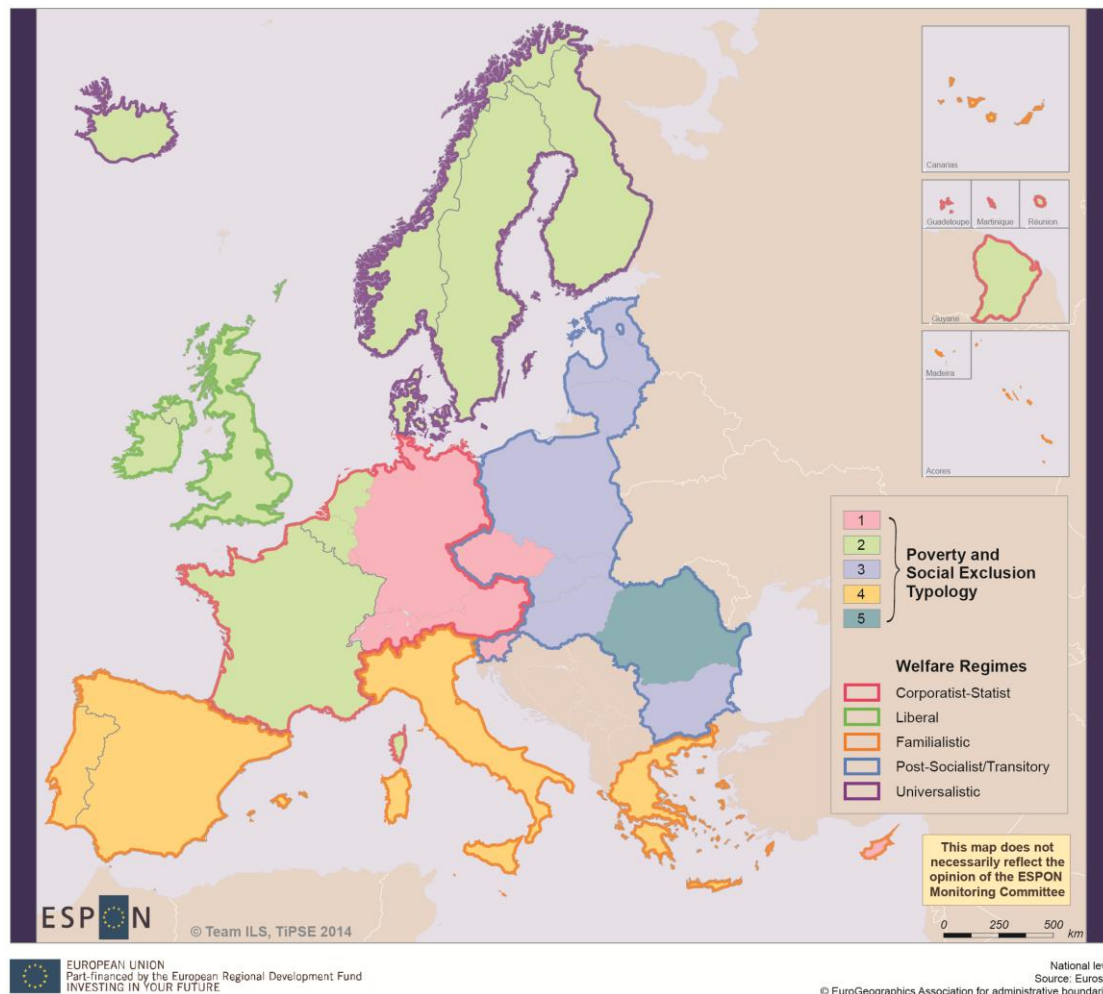
centre with the countries Austria, Czech Republic, Germany, Slovenia and Switzerland, Cyprus and Luxembourg seem to be outlier (see Figure 2) – by increasing the number of clusters, both countries would form their own cluster. Similar patterns become visible in Eastern Europe: Cluster 3 (“Disparate East”) seems to be divided into two parts: Not surprisingly, the Baltic States are treated as an own cluster directly at the beginning of the cluster analysis – just as Poland and Slovakia – but are only shortly afterwards combined with Hungary and Bulgaria. Thus, in case of increasing the number of clusters, Poland and Slovakia would form their own cluster.

## **2. Analogy of welfare state typologies with the Poverty and Social Exclusion Typology (PSE Typology)**

There have been several attempts to capture the characteristics of different welfare states, most notably the well-known typology of welfare regimes by Esping-Andersen (1990). Although the original typology was subject of extensive criticism and numerous attempts to revise and specify the Esping-Andersen’s three original welfare regimes, Fenger (2007) illustrates the astonishing persistence of the original types. Based on all these typologies, the TiPSE project identified the following five welfare regimes in Europe: (1) universalistic, (2) liberal, (3) corporatist-statist, (4) familialistic and the (5) post-socialist/transitory type (Talbot et al., 2012, p. 25) (see Figure 3). In contrast to these welfare typologies that mainly focus on public policies governing social security, the PSE typology (see Figure 1) rather tries to group countries according to their risk as regards poverty and social exclusion. Although both aspects are closely connected, differences of the cluster allocation between both types of typologies can be expected. Nevertheless, when comparing the PSE typology with the five welfare regimes identified by the TiPSE project some similarities come to the fore (see Figure 3).

The most striking similarities refer to cluster of Mediterranean countries. Several authors revising the three welfare regimes by Esping-Andersen illustrated specific characteristics of the Mediterranean countries based on the role of the family and its relationship with clientelism (Ferrara, 1994; Allen et al., 2004). This familialistic welfare regime (Talbot et al., 2012, p. 25) is, with exception of Malta and Cyprus, congruent to the PSE typology, raising the question about the relationship between welfare regimes and their influence on the socio-economic conditions in these countries. Since the 1980s, the Mediterranean countries have significantly increased their social disbursement (Talbot et al., 2012). However, the crisis and the subsequent cutbacks of public expenditure required by the troika aggravate the funding of welfare spending. In addition, shrinking family incomes, due to the crisis and the subsequent cutbacks, and changing family structures threaten families’ capacities to provide support for needy family members and, thus, to complement public spending (Kandylis, 2013; Ramos Lobato, 2013). Nevertheless, it should be stated that the reasons for the socio-economic challenges cannot solely be derived from public policies.

Although many welfare typologies distinguish the Southern European countries from the conservative-corporatist type, the Mediterranean countries are mainly considered as being a subtype rather than an own welfare regime (Fenger, 2007; Ferrera, 1996 and Leibfried, 1992) – which is not the case in our typology. Indicators of poverty and social exclusion differ distinctively from the other clusters and are rather comparable to the post-communist European countries than to the conservative-corporatist type of Central Europe (see Figure 2).



**Figure 3:** Poverty and Social Exclusion Typology & TIpSE welfare regimes

Besides the congruence of welfare regime and poverty and social exclusion typology as regards the Mediterranean countries, similarities can be revealed in other clusters as well. Several groups of countries being part of the same welfare regime are merged right at the beginning of the PSE cluster analysis since they show quite homogenous profiles of poverty and social exclusion, such as:

- Austria, Germany and Switzerland as representatives of the corporatist-statist regime

- Finland, Denmark, Norway and Sweden representing the universalistic regime
- the Baltic states referring to Fenger's (2007) 'Former USSR-type'
- Romania being the only EU country that is part of the 'developing states' type and simultaneously forming its own cluster in the PSE typology

In these cases, the profiles of poverty and social exclusion are quite coherent with the respective welfare regimes.

At the same time, distinctive dissimilarities between both typologies become apparent, again questioning the relationship between welfare regimes and countries' profiles of poverty and social exclusion. Whereas in welfare typologies, UK is a constant representative of the liberal welfare regime equipped with welfare policies strongly deviating from the ones in countries such as France or Belgium, which are part of the corporatist-statist type, the three countries show quite similar poverty and social exclusion profiles – even with the Nordic States. When reducing the number of clusters to four instead of five, cluster 1 (“Inclusive Centre”) and Cluster 2 (“Competitive North-West”) would be combined to one big cluster. Thus, with the accession of the Eastern European countries, Atlantic, Central and Nordic regions seem to move closer together. Risks of poverty and social exclusion of these countries with their quite different welfare regimes (liberal, corporatist-statist and universalistic) are more similar than to post-communist or Southern European countries. Poverty and social exclusion profiles seem to be less linked to a specific welfare regime.

The distinctive dissimilarities between Eastern European countries and the rest also confirms the results of Fenger (2007) who emphasised that the differences between the post-communist and the Western countries mainly stem from differences in their social situation rather than from differences in governmental programmes. Varying social situations within the group of Eastern European countries also explain the integration of Slovenia and the Czech Republic to Cluster 1 (“Inclusive Centre”), since the risk of social exclusion and poverty seems to be distinctively lower in both countries than within the other post-socialist countries (Kovács et al., 2013).





## 2. Interpretation and evaluation of the cluster analysis

There are several indicators that can be used for interpreting the results and evaluating the quality of the different clusters: On the one hand, the so called F-value is used to evaluate the homogeneity of each cluster (see Table 5). The lower the F-value of a specific variable, the lower is the scattering of this variable within a cluster in comparison to the other clusters. For analysing differences and similarities between the clusters, descriptive statistics, such as mean, median and standard deviation can be calculated. They can be illustrated by traffic lights (e.g. Table 1) classifying the risk of poverty and social exclusion as severe, moderate or low as well as by using boxplots (e.g. Figure 4) that summarise different measures of dispersion, such as the median, both quartiles and extreme values, thus showing the distribution of the single values in each cluster.

### *Poverty and social exclusion characteristics of each cluster*

A first analysis of descriptive statistics (see also With some exceptions, Cluster 1 (“Inclusive Centre”) and 2 show the most similarities; the values of these two clusters are significantly closer to each other than to the other three clusters as already referred to in the previous section. Countries in both clusters show low risks of poverty and social exclusion as regards the employment market, education and housing and show the lowest values of the three poverty and social exclusion indicators being the basis of the EU Poverty Target. The division of into two clusters can be ascribed to the persons with tertiary education, with lower shares in Cluster 1 (“Inclusive Centre”), single persons with children, with severely higher rates in Cluster 2 (“Competitive North-West”), and jobless households who can be found more often in the countries being part of Cluster 2 (“Competitive North-West”). Distinctively more dissimilarities can be identified between Cluster 3 (“Disparate East”) and 4, in particular within the dimensions health, housing and household structure. Additionally, whereas more people within the Eastern European countries are affected by severe material deprivation, the risk of receiving insufficient income, illustrated by the share of working poor, is much higher in the Mediterranean countries, probably also related to the crisis.



Table 4) shows relatively clear dissimilarities between the five different clusters. Although there does not seem to be an overall sequence of risk, severe disparities can be identified in relation to different domains or dimensions of poverty and social exclusion.

*Earning a living:* Indicators illustrating the income and employment situation within the researched countries show comparatively good values for Cluster 1 (“Inclusive Centre”) and 2 (see Table 1). The Gini coefficient and severe material deprivation are low (except in Cyprus); only the share of working poor is comparably higher in Cluster 1 (“Inclusive Centre”). As regards the employment market in both clusters, the employment and the total activity rate are high, whereas the average share of employed persons in elementary occupations is comparatively quite low. However, due to highly scattering values between the countries of cluster 1 (“Inclusive Centre”) – especially Cyprus and Malta diverge distinctively – the whole cluster shows slightly inferior values than Cluster 2 (“Competitive North-West”) that achieves the best rates in this domain. Whereas Cluster 3 (“Disparate East”) ranks in the middle, Cluster 4 (“Mediterranean Crisis”), probably as a result of the fiscal and economic crisis, achieves the worst values in this domain – with exception of severe material deprivation, which is distinctively worse in the Eastern European countries, and the total activity rate (15 to 64 years) that is even lower in Romania. Besides the exclusion of the employment market demonstrated by the low employment rates within Cluster 4 (“Mediterranean Crisis”) and 5, countries of these clusters additionally entail higher risks for poverty and social exclusion for employed persons as the high rates of working poor illustrate (see Figure 5). Thus, the employment situation within the countries hit hardest by the crisis is clearly more critical than in Central and Northern Europe; the dichotomy between the Atlantic, Central and Northern European countries on the one hand and the Southern and Eastern European on the other hand becomes evident (see Table 1).

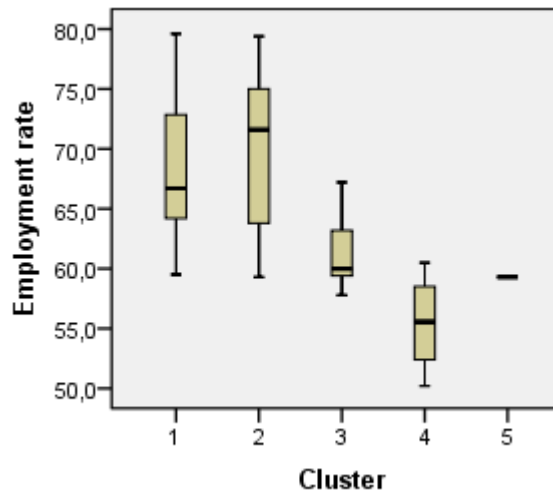


Figure 4: Employment rate by cluster

Data source: Eurostat, 2012

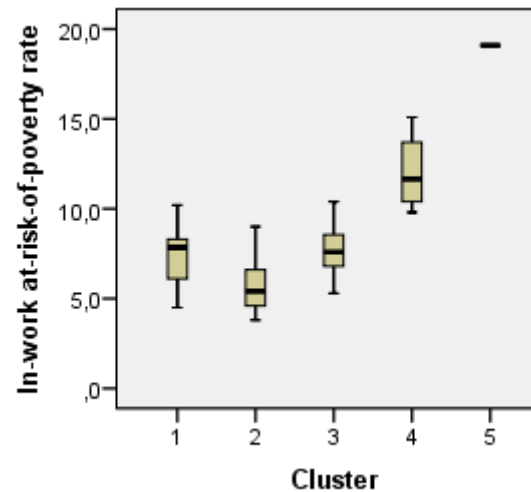


Figure 5: In-work at-risk-of-poverty rate by cluster

Data source: Eurostat, 2012

Table 1: Earning a living – traffic lights<sup>2</sup>

Earning a living					
	Inclusive Centre	Competitive North-West	Disparate East	Mediterranean Crisis	Romania
<i>Income</i>					
Gini coefficient of equalised disposable income					
In-work at-risk-of-poverty rate (employed persons, 18 years or older)					
Severe material deprivation					
<i>Employment</i>					
Ratio of employed persons in elementary occupation					

<sup>2</sup> Traffic lights were calculated as follows: Indicators with a value within a 40% range of the standard deviation (higher and lower as the arithmetic mean) are evaluated as yellow. Values worse than the 40% range of the standard deviation are marked as red and values better than the 40% range as green.

Employment rate (15 to 64 years)					
Total activity rate (15 to 64 years)					
People living in households with very low work in- tensity					

*Access to services:* Similar to the first domain, Cluster 1 (“Inclusive Centre”) and Cluster 2 (“Competitive North-West”) achieve the best values within the three dimensions education, health and housing (see Table 2). Whereas Cluster 1 (“Inclusive Centre”) shows a slightly lower risk of poverty and social exclusion as regards the benchmark indicating housing conditions, the health expectancy at birth illustrating the quality of healthcare is slightly higher in the countries of Cluster 2 (“Competitive North-West”) (see Figure 8). As regards the access to education, Cluster 2 (“Competitive North-West”) achieves high values for the share of persons with tertiary educational attainment (see Figure 6), at the same time, the share of early school leavers (see Figure 7) and the share of young people not in employment and not in any education and training (NEET) are slightly higher than in Cluster 1 (“Inclusive Centre”). However, due to the relevance of vocational education in countries such as Germany and Austria, which show comparatively low rates of tertiary education, the significance of the variable in indicating a risk of poverty and social exclusion has to be interpreted carefully in these cases.

Cluster 4 (“Mediterranean Crisis”) achieve – similar to the values in the first domain and again together with Romania – the worst values of all clusters in the dimension education (see Table 2). The shortage of skilled labour force is highly linked to the situation on the labour market since lower qualified people are much more affected by cyclical unemployment than skilled personnel. At the same time, the risk of social exclusion seems to be lower as regards housing and health care. The number of physicians or doctors per 100,000 inhabitants is quite high – in particular in Greece – and the share of total population without bath or shower achieves values similar to the ones in Cluster 1 (“Inclusive Centre”) and 2. However, findings of a recent research study on health care in Greece illustrate the limitations of such a typology: While available data on health care (such as the number of physicians and the health expectancy) points to a moderate or even low risk of social exclusion in the Mediterranean countries, the findings of a recent research study about health care in Greece draw a completely different picture. Researchers point to the harmful effects of austerity leading to the increasing exclusion of patients from the health system, an increase of infectious disease, and deterioration in the overall health of Greeks (Uni-

versity of Oxford, 2014). Thus, results of the cluster analysis always have to be interpreted carefully and complemented with additional national information.

As regards Cluster 3 (“Disparate East”), it becomes evident that the Eastern European countries are especially challenged by poor physical conditions, such as the low quality of the housing market, as the indicators population without bath or shower (see Figure 9), the overcrowding rate and the share of households with 6 or more persons illustrate, as well as severe material deprivation. According to the Housing Europe Review 2012, low-income groups are more likely to be exposed to severe housing deprivation and overcrowding (Pittini & Laino, 2011). As in the previous domain, Romania shows severe difficulties in all three dimensions and thus remains clearly behind the levels of the other groups of countries, also emphasised within the welfare regime typology of Fenger (2007).

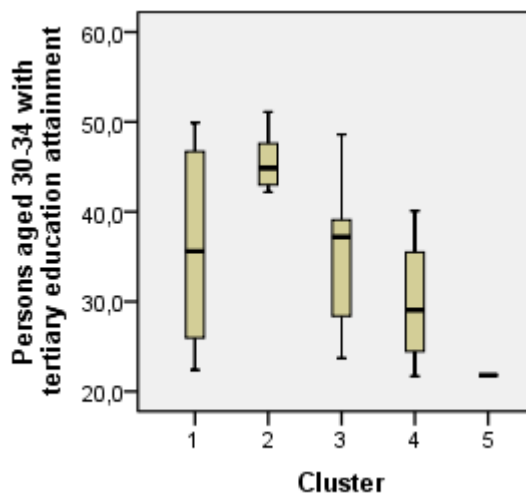


Figure 6: Persons aged 30-34 with tertiary educational attainment (%)

Data source: Eurostat, 2012

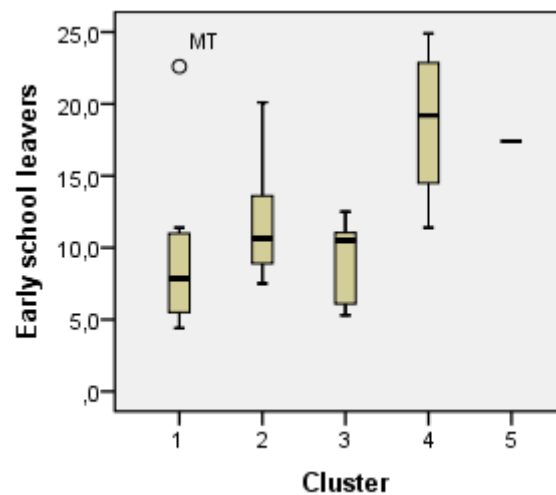


Figure 7: Early leavers from education and training (%)

Data source: Eurostat, 2012

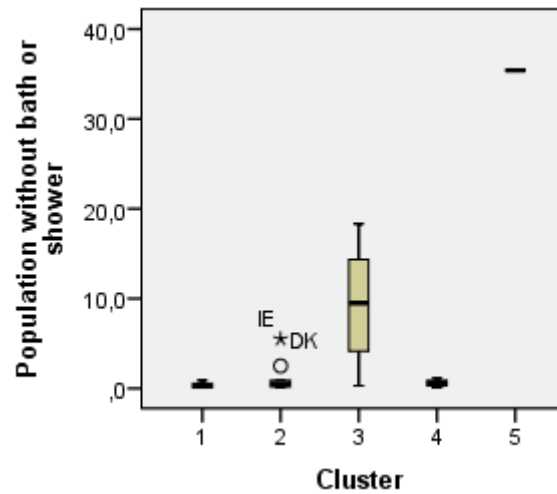
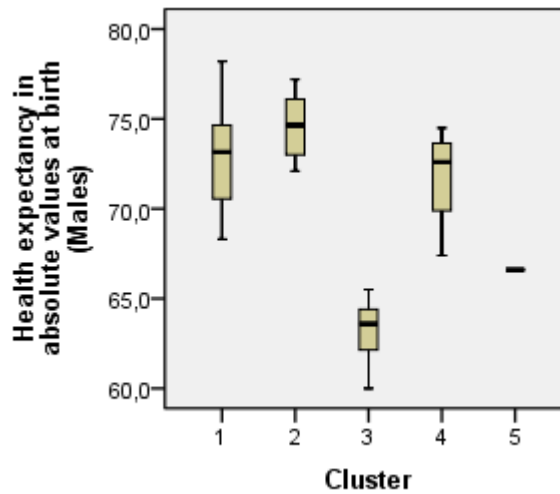


Figure 8: Health expectancy in absolute values at birth (male)
















Figure 9: Population without bath or shower (%)

Data source: Eurostat, 2012

Data source: Eurostat, 2012

Table 2: Access to services – traffic lights

Access to services					
	Inclusive Centre	Competitive North-West	Disparate East	Mediterranean Crisis	Romania
<i>Health</i>					
Physicians or doctors per 100,000 inhabitants					
Health expectancy in absolute values at birth (Males)					
<i>Education</i>					
Persons aged 30-34 with tertiary education attainment (%)					
Early leavers from education and training (% of population)					

Young people not in employment and not in any education and training, 15 - 29 years					
<i>Housing</i>					
Share of total population having neither a bath, nor a shower in their dwelling					
Overcrowding rate (% of total population)					

*Social environment:* As regards the four domains age, ethnic composition, immigrants and household structure, the cluster analysis reveals quite different profiles that are significantly less evident than the simple division into East and South as well as Centre and North of Europe (see Table 3). Whereas in Romania the old-age-dependency ratio is the lowest of all clusters, the Mediterranean countries seem to be highly challenged by an ageing population (see Figure 10). The share of foreign-born population illustrates well-known migration patterns within Europe; thus, countries of the clusters 1 and 2 show the highest rates (see Figure 11). The comparatively bad housing conditions in countries of Cluster 3 (“Disparate East”) and 5 also reflect the household composition: both clusters achieve the highest shares of households with 6 or more persons, whereas the rates in Cluster 1 (“Inclusive Centre”), 2 and 4 are quite low (see Figure 13). As regards one major risk group of poverty and social exclusion – the share of single person households with children – the by far highest rates can be found in Cluster 2 (“Competitive North-West”) and the lowest in Romania and the Mediterranean countries – probably attributed to more traditional perceptions of family, partnership and marriage (see Figure 12).



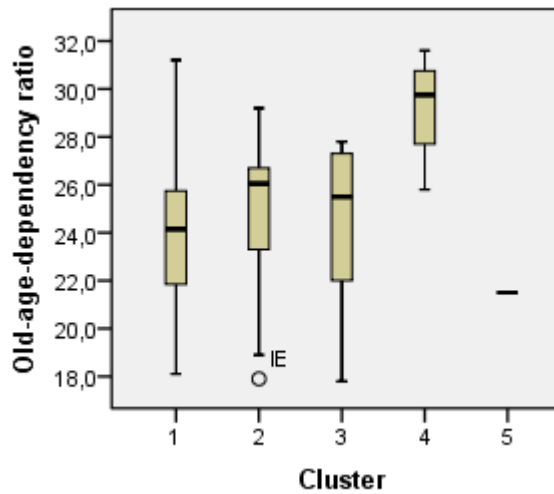


Figure 10: Old-age-dependency ratio

Data source: Eurostat, 2012

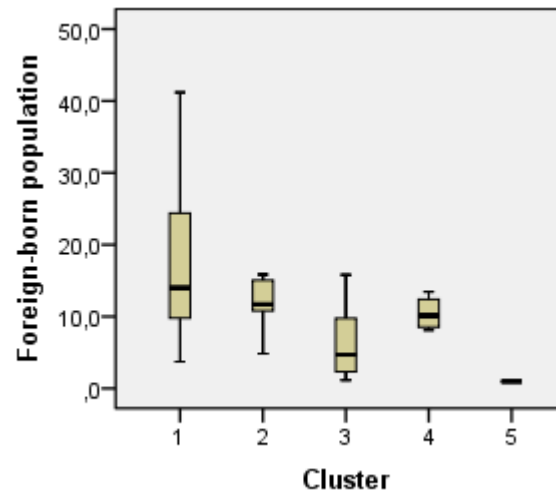


Figure 11: Foreign-born population (%)

Data source: Eurostat, 2012

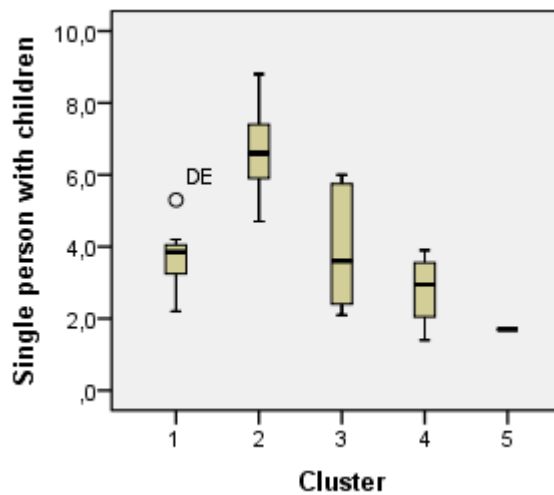


Figure 12: Single person households with dependent children (%)

Data source: Eurostat, 2012

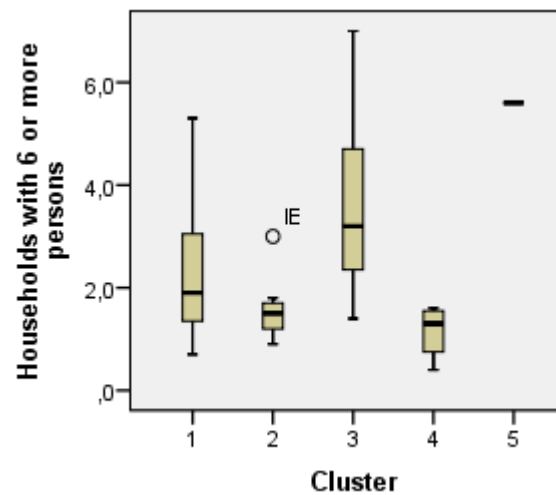












Figure 13: Ratio of households with 6 or more persons

Data source: Eurostat, 2012

**Table 3:** Social environment – traffic lights

<b>Social environment</b>
---------------------------

	Inclusive Centre	Competitive North-West	Disparate East	Mediterranean Crisis	Romania
<i>Household Structure</i>					
Distribution of population by household type 'Single person with dependent children'					
Ratio of households with 6 or more persons					

With some exceptions, Cluster 1 (“Inclusive Centre”) and 2 show the most similarities; the values of these two clusters are significantly closer to each other than to the other three clusters as already referred to in the previous section. Countries in both clusters show low risks of poverty and social exclusion as regards the employment market, education and housing and show the lowest values of the three poverty and social exclusion indicators being the basis of the EU Poverty Target. The division of into two clusters can be ascribed to the persons with tertiary education, with lower shares in Cluster 1 (“Inclusive Centre”), single persons with children, with severely higher rates in Cluster 2 (“Competitive North-West”), and jobless households who can be found more often in the countries being part of Cluster 2 (“Competitive North-West”). Distinctively more dissimilarities can be identified between Cluster 3 (“Disparate East”) and 4, in particular within the dimensions health, housing and household structure. Additionally, whereas more people within the Eastern European countries are affected by severe material deprivation, the risk of receiving insufficient income, illustrated by the share of working poor, is much higher in the Mediterranean countries, probably also related to the crisis.

**Table 4:** Characteristics of poverty and social exclusion

	Inclusive Centre	Competitive North-West	Disparate East	Mediterranean Crisis	Romania	In total
<b><i>Earning a living</i></b>						
Gini coefficient of equalised disposable income	27,4	27,1	31,0	33,9	33,2	29,2
In-work at-risk-of-poverty rate (employed persons, 18 years or older)	7,4	5,8	7,7	12,1	19,1	8,0
Severe material deprivation	5,9	4,1	21,3	12,1	29,9	10,5
Ratio of employed persons in elementary occupation	10,3	9,4	13,3	13,3	11,3	11,1
Employment rate (15-64 years)	68,3	70,0	61,5	55,5	59,3	65,3
Total activity rate (15-64 years)	73,0	76,0	69,8	69,9	64,2	72,5
People living in households with very low work intensity	6,9	11,1	10,1	12,2	7,4	9,8
<b><i>Access to services</i></b>						
Physicians or doctors per 100,000 inhabitants	339,9	342,5	313,7	441,1	236,9	344,7
Health expectancy in absolute values at birth (males)	72,9	74,6	63,2	71,8	66,6	70,8
Persons aged 30-34 with tertiary education attainment (%)	36,1	45,5	34,9	30,0	21,8	37,7
Early leavers from education and training (% of population)	9,5	11,6	8,9	18,7	17,4	11,6
Young people not in employment and not in any education and training (15-29 years)	10,8	11,3	17,8	22,4	19,1	14,4
Share of total population having neither a bath, nor a shower in their dwelling	0,4	1,2	9,3	0,6	35,4	3,9
Overcrowding rate (% of total population)	9,8	6,0	35,2	17,1	51,6	16,8

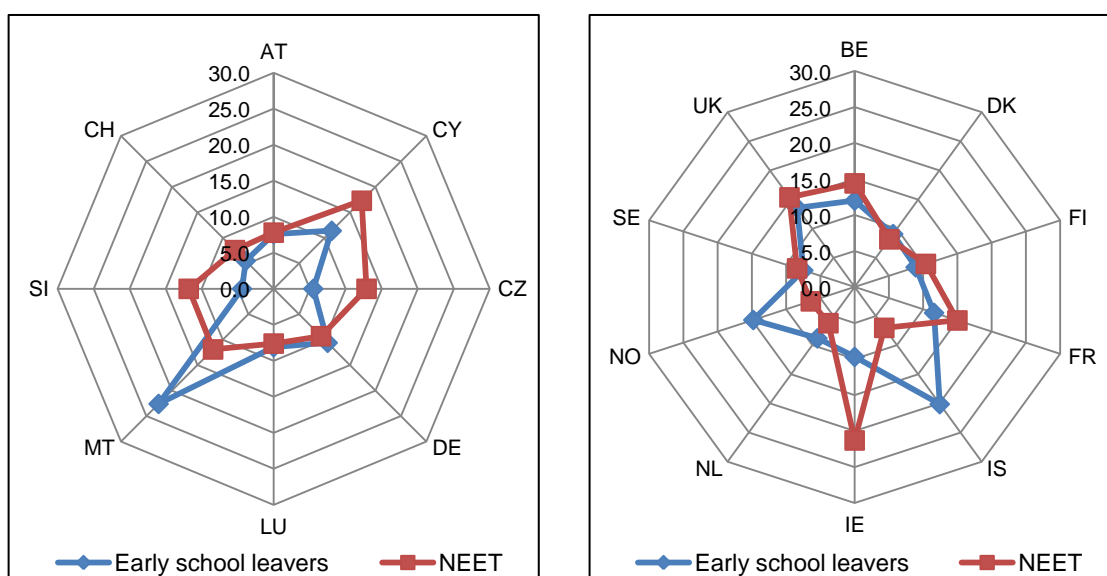
<b>Social environment</b>						
Age dependency ratio	46,0	52,4	45,7	51,3	43,0	48,7
Young-age-dependency ratio	21,9	27,8	21,4	22,1	21,5	23,8
Old-age-dependency ratio	24,1	24,7	24,2	29,2	21,5	24,9
Ratio of foreign-born population	17,7	11,8	6,5	10,5	1,0	11,6
Distribution of population by household type 'Single person with dependent children'	3,7	6,7	4,0	2,8	1,7	4,6
Ratio of households with 6 or more persons	2,3	1,6	3,7	1,2	5,6	2,3

Data Source: Eurostat, 2012

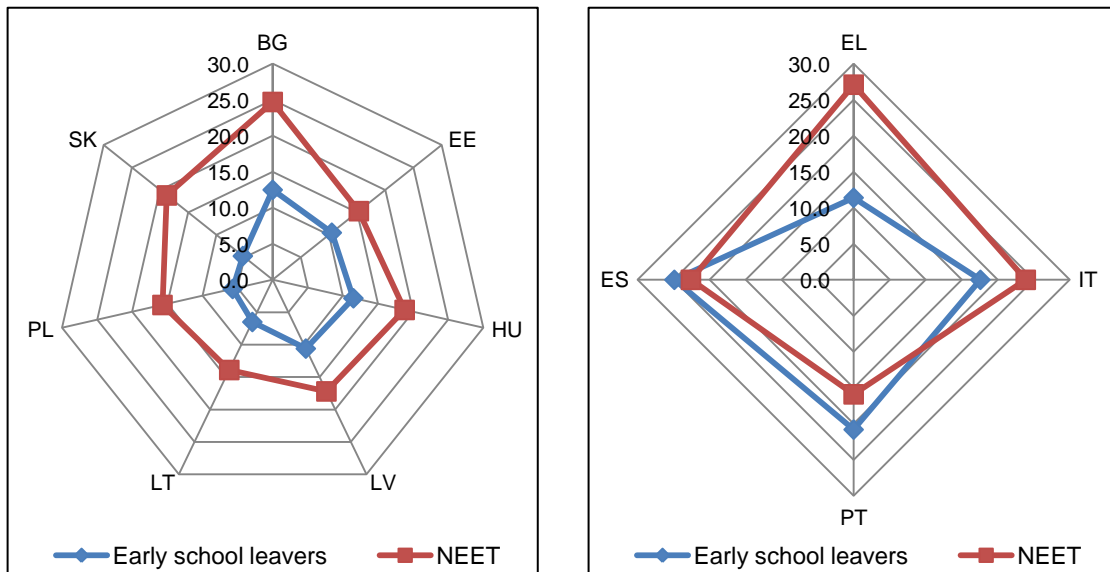
### Homogeneity of the clusters

Besides descriptive statistics, the F-value can be applied to indicate the level of homogeneity of each cluster. It is calculated by dividing the variance of a variable in the whole set of objects by the variance of the same variable only within the cluster. The lower the F-value, the less a single variable scatters within the cluster in comparison to the whole set of objects. Thus, one cluster can be considered as being completely homogenous when the F-value of each variable is lower than 1. In the following paragraphs, indicators that scatter highly are illustrated as a cobweb graph.

*Inclusive Centre*<sup>3</sup>: This type of countries is characterised by high employment rates, comparatively good values as regards health care, education and housing, high rates of foreign-born population as well as distinctively low share of severe material deprivation and in-work at risk-of-poverty rates. Nevertheless, according to the F-values of each indicator, Cluster 1 (“Inclusive Centre”) seems to be the least homogenous cluster; the standard deviation of some indicators is quite high. Dissimilarities relate in particular to the dimension education with the indicators persons aged 30-34 with tertiary education attainment (see Figure 6) and early school leavers (see Figure 14), which differs in 18.2 percentage points between the highest value (Malta) and the lowest (Slovenia). Another indicator that scatters highly is the share of foreign-born population that ranges between 3.7% in the Czech Republic and, not surprisingly, the highest value of 41.2% in Luxembourg.



<sup>3</sup> Austria, Cyprus, Czech Republic, Germany, Luxembourg, Malta, Slovenia, Switzerland



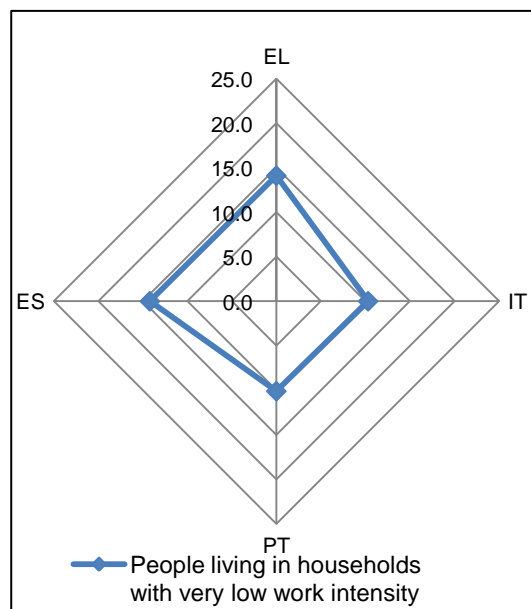
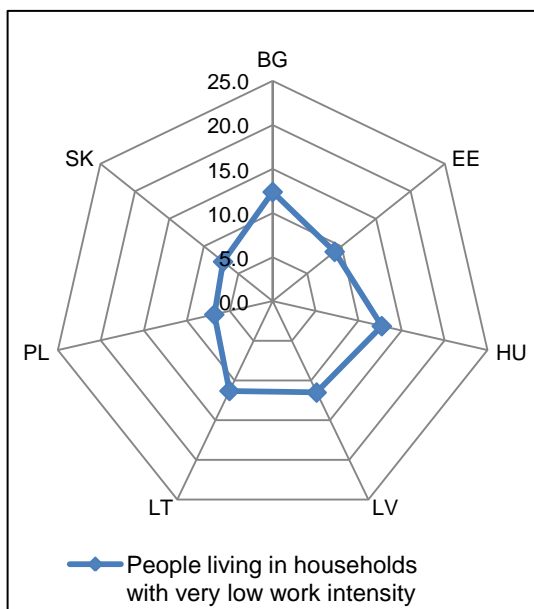
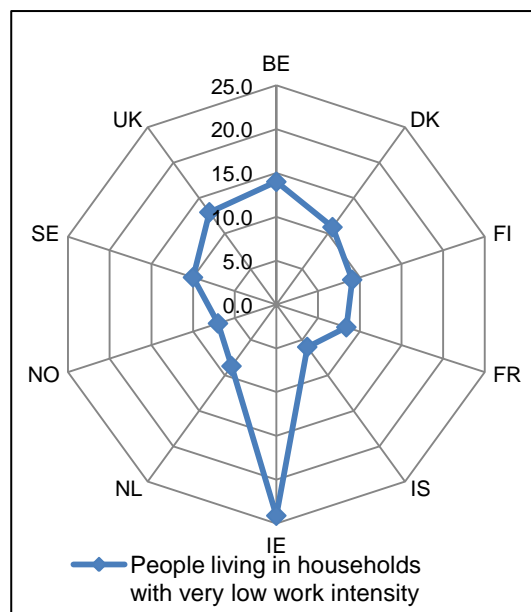
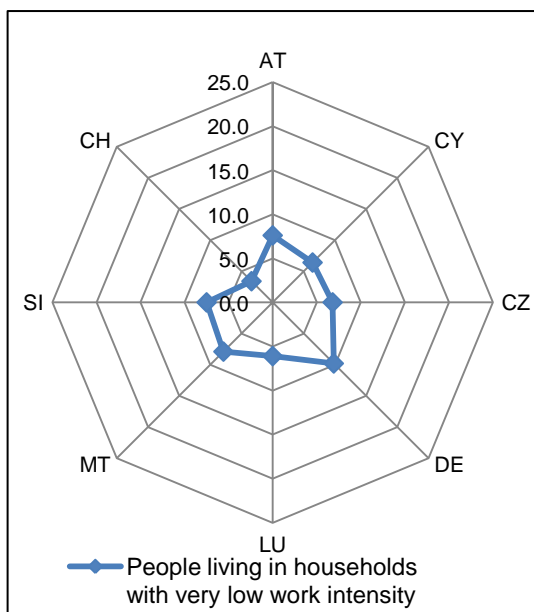
**Romania:** Early leavers from education and training – **17.4%** | NEET – **19.1%**

**Figure 14:** Early leavers from education and training & share of NEET

Data source: Eurostat, 2012

*Competitive North-West*<sup>4</sup>: Table 1 confirms the characteristics of this group of countries, which features the best values as regards the employment market, an outstanding share of people with tertiary education – whereby the other education indicators are slightly worse than in Cluster 1 (“Inclusive Centre”) – the highest health expectancy at birth, good housing conditions as well as distinctively low share of severe material deprivation and in-work at risk-of-poverty rates. However, this group of countries achieves the highest value as regards the share of single persons with children. Cluster 2 (“Competitive North-West”) shows the highest homogeneity within the different indicators. Except the indicator illustrating low work intensity (see Figure 15) whose values scatter between 6.0% in Iceland and 24.1% in Ireland, all other indicators are very homogenous. In several dimensions, Cluster 2 (“Competitive North-West”) achieves comparatively good or even the best values (e.g. employment rate, health expectancy at birth, tertiary education, severe material deprivation).

<sup>4</sup> Belgium, Denmark, Finland, France, Iceland, Ireland, Netherlands, Norway, Sweden, United Kingdom



**Romania:**

Share of people living in households with very low work intensity – **7.4%**

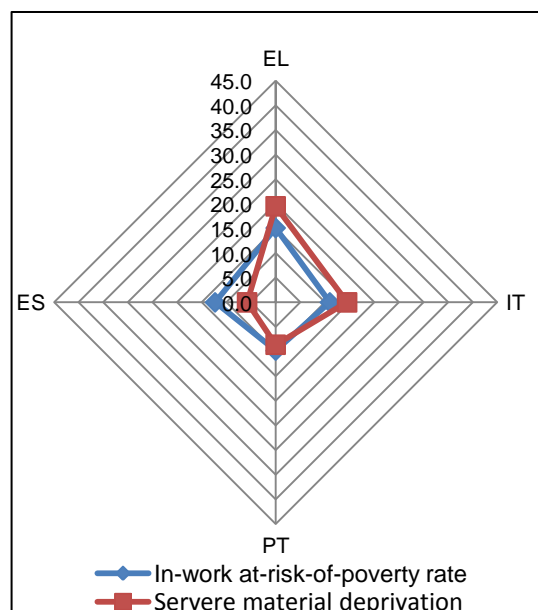
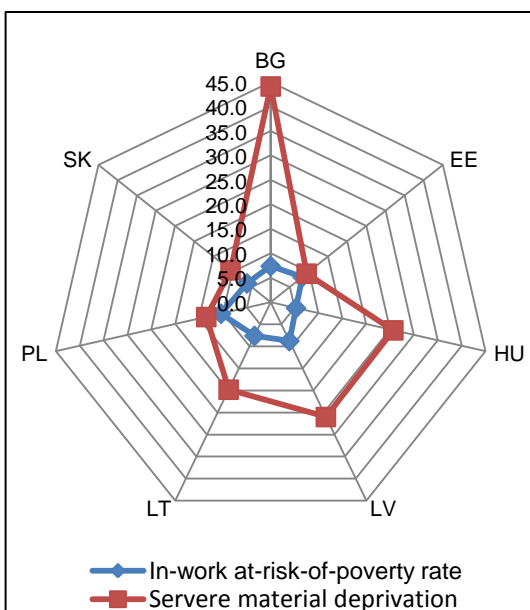
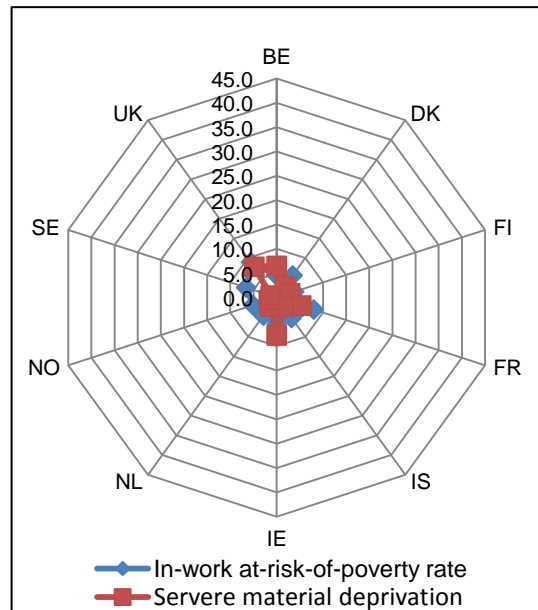
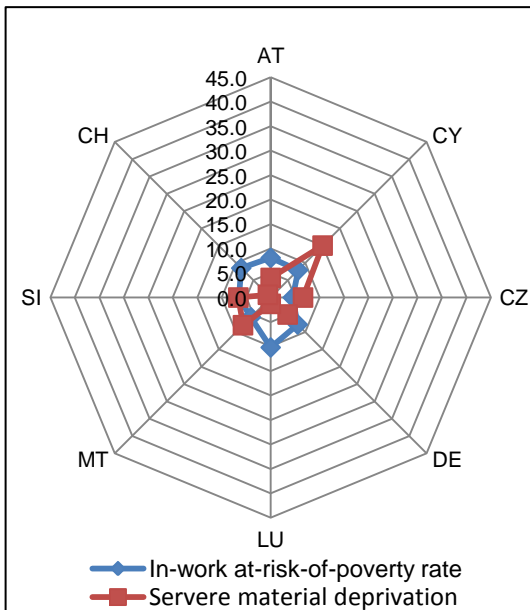
**Figure 15:** Share of people living in households with very low work intensity

Data source: Eurostat, 2012

Disparate East<sup>5</sup>: This cluster including post-communist countries ranks in the middle of all clusters as regards the quality of the employment market and the educational

<sup>5</sup> Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia

sector (see Figure 6 and Figure 14). It is characterised by the lowest health expectancy at birth, is highly challenged by the poor conditions of its housing markets as well as by one of the highest values concerning material deprivation. However, in both dimensions this group of countries shows high dissimilarities: Whereas the share of households with 6 or more persons varies between Estonia with the lowest and Poland with the highest value, the severe material deprivation rate shows the highest range; although all countries have comparatively inflated rates, Bulgaria shows by far the highest value (44.1%) (see Figure 16).





## Romania:

In-work at-risk-of-poverty rate – **19.1%** | Severe material deprivation – **29.9%**

### Figure 16: In-work at-risk-of-poverty rate & Severe material deprivation

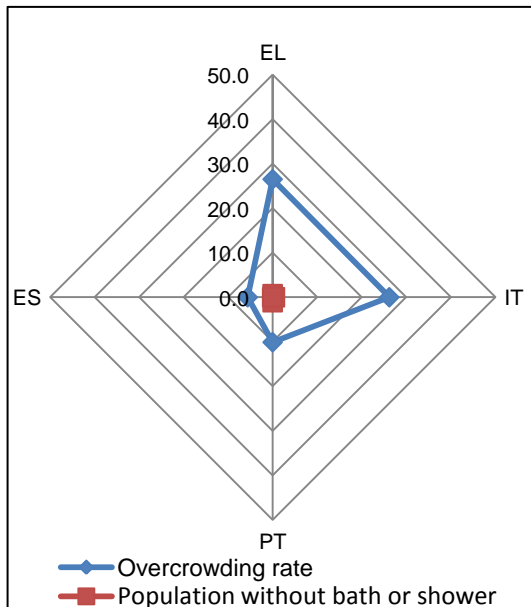
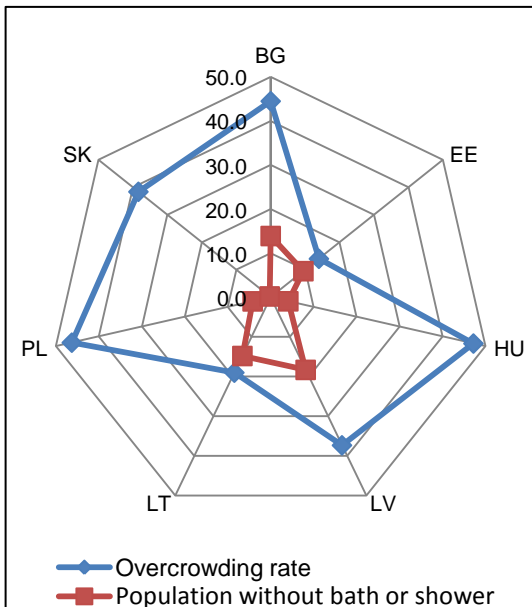
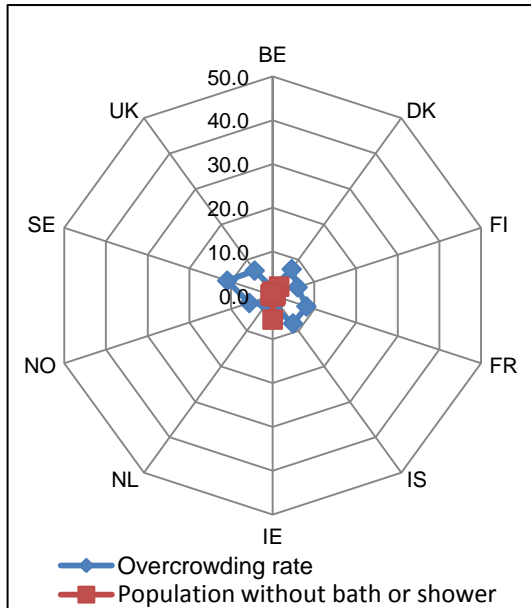
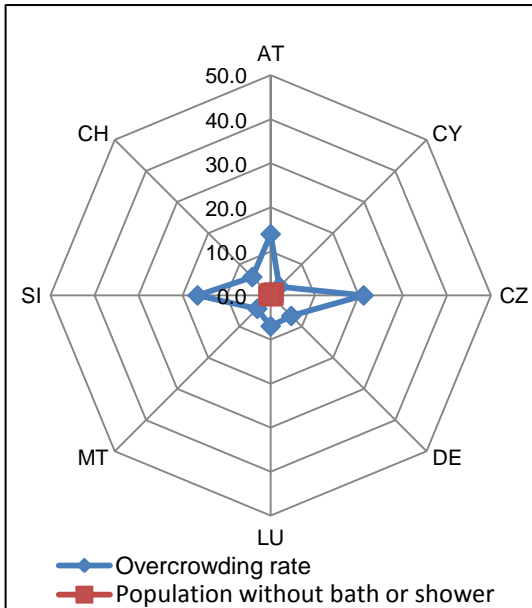
Data source: Eurostat, 2012

Mediterranean Crisis<sup>6</sup>: All countries in this cluster are hit hard by the economic and fiscal crisis and consequently show the worst conditions on the employment market. The cluster is characterised by elevated income disparities, the highest shares of employed persons in elementary occupation and the lowest employment rates. Whereas the health expectancy is comparatively high, indicators illustrating the quality of education are partly even lower than in Cluster 5 (Romania) (with exception of the share of persons with tertiary education). Moreover, this cluster is highly challenged by an ageing population and a comparatively high rate of working poor. Cluster 4 (“Mediterranean Crisis”) is very homogenous in almost every indicator; only few indicators vary significantly: The share of employed persons in elementary occupation is relatively high; only Greece shows a low rate. Moreover, Greece has outstanding values regarding the number of physicians and doctors; the overcrowding rate ranges from 5.6% in Spain to 26.5% in Greece (see Figure 17).

Romania: Romania seems to be an outlier as regards its profile of poverty and social exclusion. It is one of the countries achieving the worst values in terms of the employment market, tertiary education (see Figure 6) and severe material deprivation (see Figure 16). Moreover, Romania is characterised by the by far poorest conditions of the housing market (see Figure 17), the highest value of in-work-poverty (see Figure 5) and, at the same time, the lowest share of foreign-born population. Thus, several indicators are distinctively higher or lower as in the other four clusters; the economic, physical and social situation remains clearly behind the levels of the other countries.

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<sup>6</sup> Greece, Italy, Portugal, Spain



**Romania:**

Overcrowding rate – **51.6%** | Population without bath or shower – **35.4%**

**Figure 17:** Overcrowding rate & Population without bath or shower

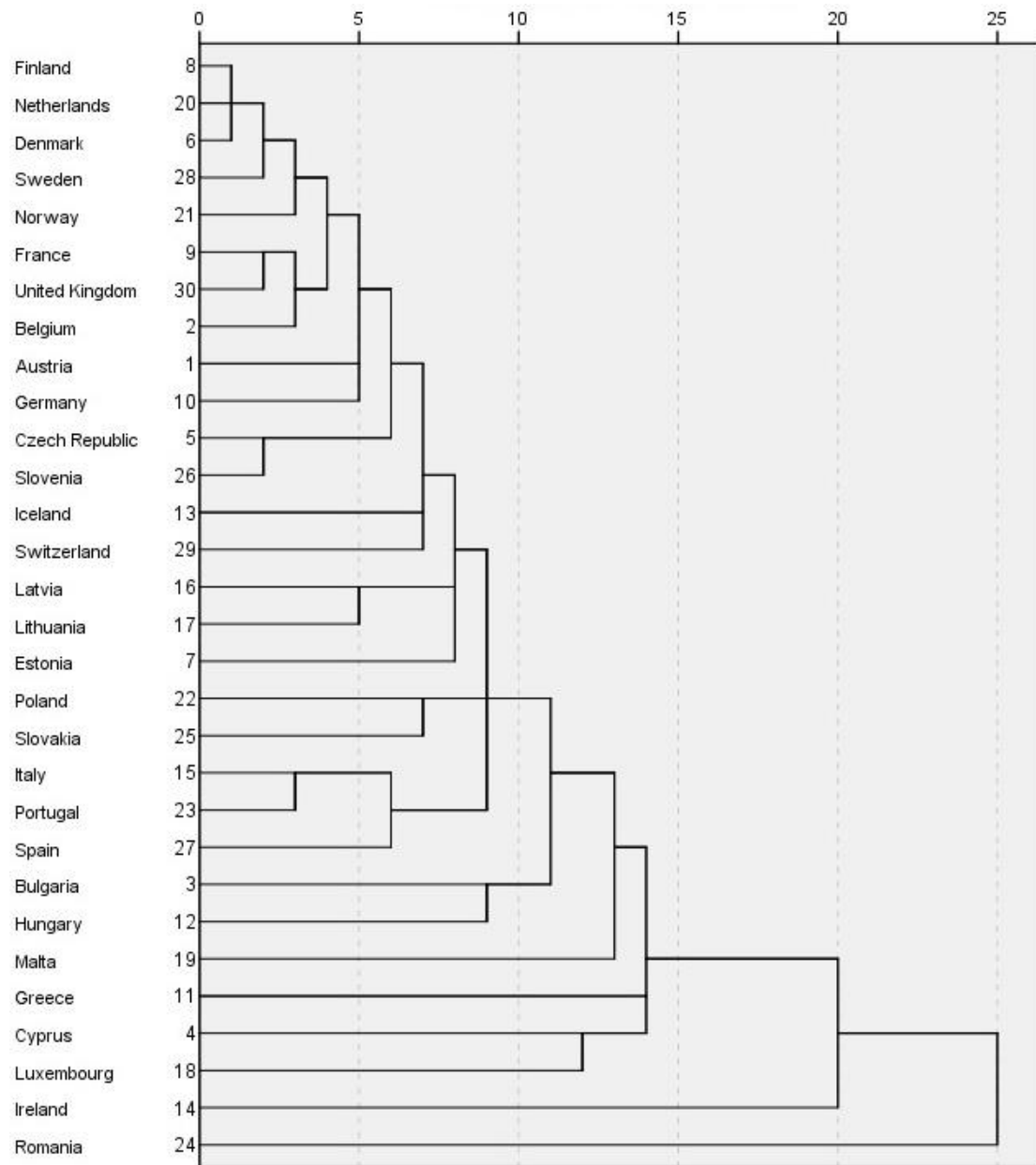
Data source: Eurostat, 2012<sup>7</sup>

<sup>7</sup> Data from Ireland is from 2011.

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# Annex



**Figure 18:** Dendrogram Single Linkage

**Table 5:** Detailed characteristics of poverty and social exclusion by cluster

Cluster		Gini coefficient	Ratio of employed persons in elementary occupation	Employment rate	Total activity rate (15 to 64 years)	Physicians or doctors per 100,000 inhabitants	Health expectancy in absolute values at birth (Males)	Persons aged 30-34 with tertiary education attainment (%)	Early leavers from education and training (% of population)	Young people not in employment and not in any education and training	Share of total population having neither a bath, nor a shower in their dwelling
1	median	27,8	10,2	66,7	72,6	332,8	73,2	35,6	7,9	10,6	0,4
	arithmetic mean	27,4	10,3	68,3	73,0	339,9	72,9	36,1	9,5	10,8	0,4
	F-value	0,4	1,3	0,7	1,0	0,9	0,4	1,3	1,2	0,3	0,0
2	median	26,2	10,3	71,6	77,3	337,6	74,7	44,9	10,7	9,4	0,5
	arithmetic mean	27,1	9,4	70,0	76,0	342,5	74,6	45,5	11,6	11,3	1,2
	F-value	0,7	0,9	0,8	0,9	0,4	0,1	0,1	0,5	0,7	0,0
3	median	32,0	14,3	60,0	69,4	323,5	63,6	37,2	10,5	17,2	9,5
	arithmetic mean	31,0	13,3	61,5	69,8	313,7	63,2	34,9	8,9	17,8	9,3
	F-value	1,0	0,5	0,2	0,5	0,5	0,2	0,8	0,3	0,4	0,8
4	median	34,4	14,3	55,6	70,9	387,0	72,6	29,1	19,2	23,3	0,6
	arithmetic mean	33,9	13,3	55,5	69,9	441,1	71,8	30,0	18,7	22,4	0,6
	F-value	0,1	1,1	0,3	0,8	2,2	0,4	0,6	1,1	0,6	0,0
5	median	33,2	11,3	59,3	64,2	236,9	66,6	21,8	17,4	19,1	35,4
	arithmetic mean	33,2	11,3	59,3	64,2	236,9	66,6	21,8	17,4	19,1	35,4
	F-value										
In total	median	28,5	11,1	64,2	72,7	340,9	72,7	39,7	10,6	14,7	0,6
	arithmetic mean	29,2	11,1	65,3	72,5	344,7	70,8	37,7	11,6	14,4	3,9
Cluster		Over-crowding	Age dependency	Young-age-	Old-age-depend-	Ratio of foreign-	Distribution of popula-	Ratio of house-	In-work at-risk-of-	Severe material	People living in

		rate (% of total population)	ratio	dependency ratio	dependency ratio	born population	single person with dependent children'	holds with 6 or more persons	poverty rate	deprivation	households with very low work intensity
1	median	6,8	45,3	21,4	24,2	14,0	3,9	1,9	7,9	5,8	7,2
	arithmetic mean	9,8	46,0	21,9	24,1	17,7	3,7	2,3	7,4	5,9	6,9
	F-value	0,2	0,4	0,2	1,0	2,2	0,2	0,8	0,3	0,2	0,2
2	median	6,5	52,4	27,0	26,1	11,7	6,6	1,5	5,4	2,9	9,6
	arithmetic mean	6,0	52,4	27,8	24,7	11,8	6,7	1,6	5,8	4,1	11,1
	F-value	0,0	0,2	0,5	0,9	0,2	0,4	0,1	0,2	0,1	1,8
3	median	38,4	47,5	21,3	25,5	4,7	3,6	3,2	7,6	19,8	11,3
	arithmetic mean	35,2	45,7	21,4	24,2	6,5	4,0	3,7	7,7	21,3	10,1
	F-value	0,7	0,9	0,1	1,1	0,6	0,8	1,5	0,3	1,4	0,4
4	median	18,2	51,9	22,2	29,8	10,2	3,0	1,3	11,7	11,6	12,2
	arithmetic mean	17,1	51,3	22,1	29,2	10,5	2,8	1,2	12,1	12,1	12,2
	F-value	0,5	0,2	0,0	0,4	0,1	0,3	0,1	0,5	0,4	0,4
5	median	51,6	43,0	21,5	21,5	1,0	1,7	5,6	19,1	29,9	7,4
	arithmetic mean	51,6	43,0	21,5	21,5	1,0	1,7	5,6	19,1	29,9	7,4
	F-value										
In total	median	9,1	49,1	22,4	25,6	11,3	4,1	1,6	7,7	7,2	9,1
	arithmetic mean	16,8	48,7	23,8	24,9	11,6	4,6	2,3	8,0	10,5	9,8

Data Source: Eurostat, 2012

**Table 6:** Detailed characteristics of poverty and social exclusion by country

Cluster		Gini coefficient	Ratio of employed persons in elementary occupation	Employment rate	Total activity rate (15 to 64 years)	Physicians or doctors per 100,000 inhabitants	Health expectancy in absolute values at birth (Males)	Persons aged 30-34 with tertiary education attainment (%)	Early leavers from education and training (% of population)	Young people not in employment and not in any education and training	Share of total population having neither a bath, nor a shower in their dwelling
1	Austria	27,60	10,9	72,4	75,9	478,0	72,5	26,3	7,6	7,8	0,5
	Cyprus	31,00	18,8	64,2	73,5	301,7	73,5	49,9	11,4	17,3	0,9
	Czech Republic	24,90	7,9	67,0	71,6	358,0	68,3	25,6	5,5	12,9	0,6
	Germany	28,30	6,2	73,3	77,1	373,1	73,0	32,0	10,6	9,3	0,1
	Luxembourg	28,00	13,4	66,4	69,4	277,3	73,3	49,6	8,1	7,6	0,1
	Malta	27,20	10,6	59,5	63,1	307,5	75,8	22,4	22,6	11,9	0,2
	Slovenia	23,70	9,8	64,2	70,4	243,0	68,6	39,2	4,4	11,8	0,5
	Switzerland	28,70	5,1	79,6	83,0	380,7	78,2	43,8	5,5	7,6	0,1
2	Belgium	26,50	11,0	61,9	66,9	292,0	72,1	43,9	12,0	14,4	0,9
	Denmark	28,10	9,5	72,4	78,6	348,2	73,0	43,0	9,1	8,2	2,5
	Finland	25,90	7,3	68,5	75,2	326,7	72,5	45,8	8,9	10,4	0,7
	France	30,50	13,9	63,8	71,0	327,0	73,2	43,6	11,6	15,0	0,5
	Iceland	24,00	11,2	79,4	84,9	360,3	76,3	42,8	20,1	7,0	0,1
	Ireland	29,80	14,4	59,3	69,2	420,6	76,1	51,1	9,7	21,3	5,5
	Netherlands	25,40	6,4	75,0	79,3	292,3	76,1	42,2	8,8	6,2	0,1
	Norway	22,60	3,9	75,4	78,2	406,8	74,0	47,6	14,8	6,4	0,2
	Sweden	24,90	5,0	73,5	80,3	380,2	77,2	47,9	7,5	8,4	0,5
	United Kingdom	32,80	11,1	70,8	76,3	271,2	75,3	47,1	13,6	15,4	0,5
3	Bulgaria	33,60	14,7	59,4	67,1	371,1	65,5	26,9	12,5	24,7	13,9
	Estonia	32,50	12,6	67,2	74,9	323,5	63,4	39,1	10,5	15,3	9,5
	Hungary	26,90	14,3	57,8	64,3	286,9	63,6	29,9	11,5	18,8	4,1
	Latvia	35,90	15,8	64,1	74,4	291,1	60,9	37,2	10,6	17,2	18,3
	Lithuania	32,00	16,6	62,3	71,8	372,0	60,0	48,6	6,5	13,9	14,8

	Poland	30,90	10,2	60,0	66,5	217,9	64,1	39,1	5,7	15,7	4,2
	Slovakia	25,30	9,1	59,4	69,4	333,5	64,7	23,7	5,3	18,8	0,3
4	Greece	34,30	7,6	50,2	67,9	612,6	72,8	30,9	11,4	27,1	0,7
	Italy	31,90	13,2	56,5	63,7	391,6	72,4	21,7	17,6	23,9	0,5
	Portugal	34,50	15,3	60,5	73,9	382,4	67,4	27,2	20,8	15,9	1,1
	Spain	35,00	17,1	54,6	74,1	377,9	74,5	40,1	24,9	22,6	0,1
	Romania	33,20	11,3	59,3	64,2	236,9	66,6	21,8	17,4	19,1	35,4

Cluster		Overcrowding rate (% of total population)	Age dependency ratio	Young-age dependency ratio	Old-age dependency ratio	Ratio of foreign-born population	Distribution of population by household type 'Single person with dependent children'	Ratio of households with 6 or more persons	In-work at-risk-of-poverty rate	Severe material deprivation	People living in households with very low work intensity
1	Austria	13,9	47,6	21,4	26,2	15,9	3,8	2,0	8,1	4,0	7,6
	Cyprus	2,8	41,5	23,3	18,1	23,2	3,1	5,3	7,9	15,0	6,4
	Czech Republic	21,1	44,6	21,2	23,4	3,7	4,2	1,3	4,5	6,6	6,8
	Germany	6,6	51,2	20,0	31,2	12,1	5,3	0,7	7,8	4,9	9,8
	Luxembourg	7,0	45,1	24,9	20,3	41,2	3,9	3,1	10,2	1,3	6,1
	Malta	4,3	45,4	21,4	23,9	8,4	2,2	3,0	5,7	8,0	7,9
	Slovenia	16,6	45,1	20,8	24,4	11,2	3,9	1,8	6,5	6,6	7,5
	Switzerland	5,9	47,4	22,1	25,3	25,6	3,4	1,4	8,5	0,8	3,4
2	Belgium	1,6	52,3	25,9	26,4	15,3	6,4	1,8	4,5	6,5	14,0
	Denmark	7,4	53,9	27,2	26,7	9,5	7,3	0,9	5,6	2,8	10,9
	Finland	6,0	52,9	25,2	27,7	4,8	4,9	1,5	3,8	2,9	9,1
	France	8,1	55,5	28,9	26,6	11,3	5,9	1,5	8,0	5,3	8,4
	Iceland	7,9	50,1	31,1	18,9	10,8	8,8	1,7	5,2	2,4	6,0
	Ireland	2,6	50,4	32,5	17,9	15,8	8,2	3,0	5,6	7,8	24,1
	Netherlands	2,5	50,5	26,1	24,4	11,4	4,7	1,4	4,6	2,3	8,7
	Norway	5,6	51,3	28,0	23,3	12,3	6,8	1,1	5,1	1,7	7,0
	Sweden	10,9	55,1	25,9	29,2	15,0	6,1	1,2	6,6	1,3	10,0



	United Kingdom	7,0	52,4	26,7	25,7	12,0	7,4	1,6	9,0	7,8	13,0
3	Bulgaria	44,5	47,5	19,7	27,8	1,2	2,6	5,0	7,4	44,1	12,4
	Estonia	14,0	48,6	23,0	25,5	15,8	5,5	1,4	8,3	9,4	9,0
	Hungary	47,2	45,7	21,1	24,6	4,7	3,6	3,2	5,3	25,7	12,7
	Latvia	37,3	49,0	21,3	27,7	14,6	6,0	3,1	8,8	26,0	11,5
	Lithuania	19,0	49,2	22,2	26,9	4,9	6,0	1,6	7,6	19,8	11,3
	Poland	46,3	40,7	21,2	19,4	1,8	2,1	7,0	10,4	13,5	6,8
	Slovakia	38,4	39,2	21,5	17,8	2,9	2,2	4,4	6,2	10,5	7,2
4	Greece	26,5	51,7	21,8	29,9	11,3	1,4	0,4	15,1	19,5	14,1
	Italy	26,2	53,1	21,5	31,6	9,0	3,2	1,1	11,0	14,5	10,3
	Portugal	10,1	52,1	22,5	29,6	8,1	3,9	1,5	9,8	8,6	10,1
	Spain	5,6	48,4	22,6	25,8	13,5	2,7	1,6	12,3	5,8	14,2
5	Romania	51,6	43,0	21,5	21,5	1,0	1,7	5,6	19,1	29,9	7,4

Data Source: Eurostat, 2012