

EU-12 Countries In The Context Of European Social Model Types

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ABSTRACT

The European social model is a vision of society that combines sustainable economic development with ever-improving living and working conditions. The issue whether or not it is possible to use one so-called European social model in the European Union countries, including in new member states and what it should be like, has been a topic of debates for a long time already. In reality, there are several different social models used in Europe, which interpret the concepts of efficiency and equality differently. The theoretical part of this paper will discuss the European social model and its typology based on research by various authors. We shall compare the social outputs of countries grouped into different model types on the basis of different socio-economic indicators. In the empirical part, we carry out a cluster analysis for positioning new European Union (EU-12) countries into mix of European social models. We concentrate on two of the most important aspects of social systems - monetary poverty/inequality and public policy - and try to classify European Union countries according to their social policy. In the analysis, we also evaluate whether the distribution of EU-15 countries, on the basis of Esping-Andersen's typology, is the same today after a major enlargement of the European Union. We use different clustering methods such as hierarchical and k-means clustering. The analysis is based on EUROSTAT data; clusters are formed on the basis of 2008 socio-economic indicators for EU-27 countries.

Keywords: European social model, cluster analysis, public policy, monetary poverty, inequality

INTRODUCTION

The issue whether or not it is possible to use one so-called European social model in the European Union (EU) countries, including in new member states and what it should be like, has been a topic of debates for a long time already. The European Parliament Report (2006) mentions that the European social model is, first and foremost, a question of values. The European social model is a vision of society that combines sustainable economic development with ever-improving living and working conditions. This implies good quality jobs, equal opportunities, social protection for all, social inclusion and involving citizens in the decisions that affect them. The model seeks to provide welfare for as many Europeans as possible.

Social system of any European country is expressing such general values as equality, non-discrimination, solidarity, and income redistribution. However, the diverse financial possibilities of the countries cause significant limitations to considering these values. Therefore, the main characteristics of the model have not been defined in greater detail, although the term 'European social model' was used for the first time already in the early 1990s in connection with the Maastricht Treaty.

Several different social models are currently used in European countries, which interpret the concepts of efficiency and equality differently, searching for a balance between economic and social values, and scholars are of the opinion that there are several different social models in Europe. The authors (Esping-Andersen, 1990, 1996; Sapir, 2006; Ferrera, 1996, 1998, 2004; Adnett and Hardy, 2005; Juhasz, 2006; Hermann and Hofbauer, 2007; Chytilova and Mejstrik, 2007; etc.) take into consideration expenditure on social protection as well as target groups and scopes of social policies; whether the programs are universal or targeted at a specific group; how equal

conditions are provided; and what is the quality, scope and effect of the benefits and services. One of the first authors of this typology, Esping-Andersen (1990, 2000), defines the welfare regimes¹ on the basis of how responsibility for social risks is divided between three welfare pillars – market, state and family. He uses two important criteria for that; i.e., the levels of decommodification and stratification.

The former implies to what extent a person's welfare is not dependent purely on market conditions and to what extent social services are guaranteed by the state. The second criterion is the degree of social stratification and solidarity in society regarding redistribution of social resources between different social strata.

Initially, three different social model types were identified in Europe (Esping-Andersen, 1990). As a result of later research, the fourth Mediterranean model was separately identified (Bonoli, 1997; Ferrera, 1996). As a rule, today EU-15 countries are grouped into those using the Scandinavian socio-democratic model (Finland, Sweden and Denmark), Anglo-Saxon liberal model (Ireland and United Kingdom), Continental-corporative model (Austria, Belgium, Netherlands, Luxembourg, Germany and France) and the Mediterranean model (Greece, Italy, Portugal and Spain). All four social models are very different. An in-depth analysis of providing efficiency and equality under the four social models enabled A. Sapir (2006) to conclude that the Mediterranean model, which is characterised by a relatively low rate of employment and high poverty risk, provides neither efficiency nor equality. The Continental-corporative and Anglo-Saxon model represent a kind of compromise between efficiency and equality, and only the countries which use the Scandinavian model stake highest on social protection expenditure and provision of general welfare, which with its high rate of employment and low poverty risk combines both efficiency and equality.

The social models used by EU-15 member states have been analysed quite thoroughly from all aspects, whereas those of the new EU-12 countries have not been discussed in greater detail. Esping-Andersen believed that 'post-communist regimes' would shift towards some of the main welfare regime types after 15 years of transition (Esping-Andersen, 1996). This period was approximately over for EU-12 in 2004–2006. Whether these countries represent an independent social type (types), or whether they can be part of the existing typology, is a question discussed in this paper.

The theoretical part of this paper deals with the European social model and its typology, based on research by various authors. We compare social outputs of countries grouped into different model types on the basis of different socio-economic indicators. In the empirical part of the paper, we carry out a cluster analysis for positioning EU-12 (new EU) countries into mix of European social models. We use different clustering methods, such as hierarchical and k-means clustering. The clustering of countries itself is not particularly meaningful, but accompanied by a theoretical analysis, it may be helpful for indicating the needs and directions on how to improve the social models in the countries which have joined the European Union by now. We also analyse whether economic and social changes that have occurred after EU enlargement have involved also changes in the social model typology of EU-15 member states and whether the Esping-Andersen's typology has remained as it was initially. The analysis is based on EUROSTAT data; clusters are formed on the basis of 2008 socio-economic indicators for EU-27 countries.

EUROPEAN SOCIAL MODELS – AN ANALYTICAL FRAMEWORK

Social protection expenditure in the EU increased in 1991–2008 in connection with the expanding needs for and rise in the level of social protection. Average social protection expenditure in EU-15 in 1991 was 25.2% of GDP, in 2008 26.9%. The EU-12 spent on social protection only 16.6% of GDP in 2008, hence over 10% less than EU-15 countries. Comparing the EU-15 countries, the biggest social protection expenditure as a share in GDP were in France, 30.5%, and in Sweden, 29.7%, and the smallest in Ireland – 18.9% of GDP. The level of EU-12 countries

¹ Esping-Andersen discriminates between the notions of welfare regime and 'welfare state' or 'social policy'. When a welfare system is discussed as a whole, where responsibility for welfare production and supply is shared between the state, market and family, the notion of 'welfare state' may be misleading, implying the state only. Therefore he recommends to use the term 'welfare regime'.

is significantly lower, and the lowest expenditures on social protection are in the Baltic countries, in Latvia 11.0% and in Estonia 12.5% of GDP.

Social protection expenditure per capita in the same period increased in the EU-15 from 3,840 to 7,464 PPS, whereas the amount and change rate of the expenditure vary considerably from country to country. The EU-12 average remained on the level of 2,780 PPS in 2008. In the long term, expenditure on social protection as a share of GDP increased in twelve countries of EU-15. This indicator has increased most, compared with the 1980s, in Portugal, Greece, Ireland, Germany and France. Social protection expenditure as a share of GDP has fallen in Luxembourg, Sweden and Netherlands. Hence the growth tendency is typical of lower expenditure countries and the falling tendency of countries with higher percentage of social protection expenditure in GDP.

Social protection expenditure per capita in EU-15 (at constant prices) increased over the period 1991–2008 by an average of 1.4% per year. In the period 1991–1995, the growth was on average 3.0% per year, including the biggest growth in Portugal (8.7% per year) and Ireland (5.6% per year). In the period 1995–2000, the average growth slowed down to 1.7% per year in EU-15. The rates increased in all countries with the exception of Finland (–0.1% per year). The biggest growth per year was in Greece (7.3%) and Portugal (5.0%). In 2000–2008, social protection expenditure per capita (at constant prices) in EU-15 increased by an average of 1.9% per year. The biggest growth per year was in Ireland (9.3%) and in Greece (5.2%). Hence, the countries with lower initial levels have achieved higher growth rates also in this indicator. The growth in EU-12 was the fastest in 2000–2008 in Hungary (an average of 8.0% per year) and in Estonia (7.7% per year). As mentioned above, fast economic growth involved in many new member states an increase in social protection expenditure per capita, notwithstanding their low share in GDP. However, this expenditure is still approximately 5 times lower than the EU-15 average.

Within the framework of cooperation between the EU member states the common social targets and measures for achieving these objectives have been negotiated. Ground for this cooperation was laid already with the European Social Charter in 1961, which also provided the main principles of so-called European social policy. One way to achieve these objectives is to work out a suitable social model for the countries. In the EU Lisbon summit in March 2000, they agreed to use the method of open coordination in social policy. Although the method does not directly define social policies in EU member states, it guides the member states to work toward the common social policy goals, hence toward the harmonization of social levels.

The issue whether it is possible to implement a common social model in EU countries and what it should be like has been a subject of debate for a long time already. The European social model is primarily the matter of values. EU member states in principle share the same values and the same goal: to combine economic capacity and competitiveness with social justice. On the other hand, the countries have different opportunities and resources for the achievement of these objectives. Therefore there are several different social models used in European countries, which interpret the concepts of efficiency and equality differently, searching for a balance between economic and social values. Literature (Esping-Andersen, 1996; Sapir, 2006; Ferrera, 1996, 1998, 2004; Adnett and Hardy, 2005; Juhasz, 2006; Hermann and Hofbauer, 2007; Chytilova and Mejstrik, 2007; etc) distinguishes between four different models: the Nordic model, Anglo-Saxon model, Continental-corporative model and the Mediterranean model.

The countries staking on general welfare are using the Nordic model (Northern European countries such as Denmark, Finland, Sweden, and Norway, which is not an EU member state), which in the literature is also called Scandinavian socio-democratic model (Esping-Andersen, 1990, 1996). These countries are characterised by a high general tax burden, high share of social protection expenditure in GDP, wide assortment, availability and high quality of social services, high significance of universal welfare provision to individuals.

The Anglo-Saxon liberal model (Ireland and United Kingdom) is characterised mainly by that benefits in these countries are not universal but targeted mainly at people with low incomes. The state's responsibility for welfare provision is minimal. Welfare is provided by the market. The state supports it either passively i.e. by providing only minimal benefits, or actively, by subsidising the aid schemes provided by the private sector. The Anglo-Saxon model is characterised by a low tax burden, moderate state expenditure on social protection and hence high personal responsibility and personal contribution rates to social protection and covering of the respective expenditure.

The Continental-corporative model is used in Austria, Belgium, France, Germany, Netherlands and Luxembourg, hence mainly in continental Europe. There is no dominant liberal attitude in these countries toward the market failure like under the Anglo-Saxon model, and social justice is not guaranteed by the state like under the Socio-democratic model either. In these countries the social rights are strictly dependent on personal work contribution, his/her family relations and status. Insurance principle based schemes and benefits are widely used there. Intergenerational solidarity is important. Despite the diminishing trade union membership, the trade unions have retained their strength and essentially influence the labour market relations. Benefits are rather for those who are not in the labour market.

The Mediterranean model, which is used in Greece, Italy, Portugal and Spain, is most similar to the Continental-corporative model. The focus is on family although the state covers only specific social risks against which families cannot protect themselves. In general, this model is most family focused. Unemployment insurance legislation is quite strict, but unemployment benefits are relatively low. These countries have a relatively low employment rate and high poverty risk. Expenditures on social protection are relatively low.

The social models used by EU-15 member states have been analysed quite thoroughly from all aspects, whereas those of the new EU-12 countries have not been discussed in greater detail. An issue is whether or not these countries form an independent social model type, or which type the social protection of one or the other country fits in the best. The social models used in EU new member states are, as a rule, less effective and it is difficult to define them on the basis of the above classification. The question whether the social protection system used in Estonia conforms better to the Nordic model, or does it rather resemble to the Anglo-Saxon model, has been studied in our previous research (Püss et al., 2009) and by K. Kerem (Kerem et al., 2009).

The primary purpose of Europe’s common social policy is to provide welfare to as many citizens of European countries as possible. In order to evaluate the different social models, we compare the social models based on some output estimates recommended by the European Commission (Table 1). Comparing countries with different social models, the biggest social protection expenditure as a share in GDP was in Nordic countries (on average 28.7% of GDP) and the smallest in Anglo-Saxon countries (on average 22.3% of GDP); EU-12 countries spent on social protection on average 16.6% of GDP in 2008.

Table 1: Some Key Social Indicators in Different Social Models in 2008

Indicator	Model type				EU-15 average	EU-12 average	
	Nordic	Anglo-Saxon	Continental	Mediterranien			
At risk of poverty rate, before transfers, %	28.0	31.5	24.7	24.0	26.1	24.6	
S80/S20	3.6	5.2	4.6	5.8	4.9	5.0	
Gini	0.24	0.32	0.27	0.34	0.3	0.3	
At risk of poverty rate, after transfers, %	% T	12.0	18.5	13.2	19.5	15.3	16.5
	M	11.3	17.0	12.3	18.5	14.4	15.4
	F	12.3	19.5	14.0	20.5	16.1	17.4
Employment rate, %	T	74.5	69.6	68.5	63.3	67.3	63.8
	M	77.2	76.1	74.6	73.2	74.2	70.5
	F	71.7	63.0	62.3	53.3	60.4	57.1
Long term unemployment rate, %	0.8	1.5	2.3	3.1	2.6	2.5	
Social protection expenditures, % of GDP	28.7	22.3	28.0	24.3	26.9	17.3	
Social contribution, % of total receipts	43.4	44.9	64.1	55.8	55.2	62.2	
Government contribution, % of total	51.7	51.8	32.1	37.8	40.2	32.6	

Source: Eurostat

Social protection expenditures are financed from various sources. For financing social protection measures, most countries use means collected with the help of a special social tax. This tax rate and principles of taxation vary considerably across countries. Additionally, some social protection expenditures are also covered by the public sector from general tax receipts. Comparing the social model types and financing schemes used in EU countries, quite typical relations are distinctive between them; i.e., relatively high share of social contributions in financing in

countries using the Continental-corporative model, while the share of state financing is higher in countries which use the Nordic model. Comparing the EU-15 and EU-12 countries, it strikes the eye that in new EU member states financing from social tax contributions is dominating.

Comparison of social indicators on the basis of European social model types implies that the biggest inequality (S80/S20 and Gini) is in the Mediterranean countries (the biggest in Portugal 6.6 and 0.37) and the smallest in Nordic countries (in Sweden 3.4 and 0.23, respectively), which also spend the most on social protection. By those indicators the EU-12 countries on average resemble the EU-15 average, whereas the country with the biggest inequality among them is Rumania (S80/S20 on 7.8 and Gini 0.38).

An important purpose of social protection is to combat poverty. Poverty is a process where changes occur very slowly and national social policy measures are what should contribute to alleviation of poverty. That social protection is more effective in Nordic countries is verified also by the significant decrease in the share of population living in poverty as a result of social transfers (for example, the effect in Finland 16 percentage points). At the same time, the effect of social transfers in Mediterranean countries is only 4.5 percentage points (the effect in Spain and Greece only 4 percentage points). The social protection systems in EU-12 also have a smaller effect on poverty risk than in EU-15 on average. The smallest effect on EU new member states is in Bulgaria – 4 percentage points, and the biggest in Hungary – 17 percentage points. From the aspect of gender, we can see that social transfers, in general, help to reduce poverty more among females, both in EU-15 and in EU-12.

A major source of welfare is high employment rate. EU is contributing for the achievement of cohesion first and foremost to economic and employment growth. According to the EU employment strategy, the employment rate in EU should be 70% in 2010, including 60% among women. Similarly with other indicators, Nordic countries stick out by high employment rates, both among males and females. By low employment rates are sticking out the Mediterranean countries again, where females' employment rate is nearly 20 percentage points lower than that of males. EU-12 countries on average are characterised, compared to EU-15 countries on average, by lower employment rates, both among males and among females, as well as smaller impacts of social transfers on poverty alleviation. The Mediterranean countries again stick out by high shares of long-term unemployment, whereas high long-term unemployment rates are in such otherwise high welfare countries as Germany and Belgium.

EMPIRICAL ANALYSIS

Methodology

The term cluster analysis (first used by Tryon, 1939) involves different classification algorithms and methods for grouping objects on the basis of certain criteria into relatively homogeneous groups so that both the similarities within groups and dissimilarities between groups are maximized. Traditional methods of clustering can be divided into two broad categories: relocation methods and hierarchical methods. Relocation clustering methods, such as k-means EM (expectation-maximization), requires an initial number of clusters and will move objects iteratively from one cluster to another, starting from an initial partition until an optimal location is identified. K-means method reduces the within-group sums of squares; for clustering via mixture models, relocation techniques are usually based on the EM algorithm (Fraley and Raftery, 1998, 2002). Hierarchical clustering methods can be either agglomerative or divisive. Agglomerative clustering starts by treating each object as a separate cluster; then merges the closest clusters in each stage into larger clusters and in the last step all objects are joined together. Divisive clustering contrariwise starts by treating all objects as a single large cluster and then splits the cluster into smaller and smaller clusters until every object forms a separate cluster. At each stage of conventional hierarchical clustering, the agglomeration or dividing of clusters is selected so as to optimize some heuristic criterion, such as single linkage (nearest neighbour approach), complete linkage (farthest neighbour approach), Wards' method (minimize the error sum of squares). In model-based methods, a maximum-likelihood criterion is used for merging groups (Banfield and Raftery, 1993).

Cluster analysis is a very popular and commonly used technique in different disciplines but not very often used in socio-economic analysis. However, we can find from literature also a number of studies in similar fields we are discussing and which use a similar methodology: Saint-Arnaud and Bernard (Saint-Arnaud et al., 2003), Fenger

(Fenger, 2005), Ferreira and Figueiredo (Ferreira et al., 2005), Van Vilet and Kaeding (Van Vilet et al., 2007), Obinger and Wagschal (Obinger et al., 2001) etc. We carry out a two-step analysis and use both hierarchical and relocation clustering methods. The hierarchical cluster analysis helps us have some ideas about the optimal number of clusters; relocation methods are more appropriate to form the clusters actually. To eliminate the impact of different measurement units and magnitudes in our dataset, we have standardized the data by using Z-scores computed as: $z_{ik} = (x_i - \mu) / \sigma$, where μ is the mean and σ the standard deviation of variable x . We selected Squared Euclidean distance $D_{ij} = \sum_{k=1}^n (x_{ik} - x_{jk})^2$ for the distance measure because it places progressively greater weight on outliers to generate distance patterns and seems to be more appropriate assumed that countries grouping should be based on a great deal of similarity across all variables and distinction mainly based on outliers. The main problem for selecting this measure is that it does not take into account the correlation and give the excess weight to such variables. One possible solution is to use the principal of component analysis, but as we are interested in certain indicators we decided to include in this article only not highly correlated data in our analysis. We use different clustering methods that allow us to pick up the more robust and better solutions for optimal number of clusters as well as clusters' memberships. In the paper we use only the results of Ward's and k-means clustering, the other results are available upon request from the authors. We have used R, STATA and SPSS packages in our empirical analysis.

Data

In order to select an appropriate set of variables to describe the social model, it is important to understand how to define its boundaries and the linkages with other aspects of socio-economic development. Different authors have approached this question somewhat differently and there is no common and clear definition. There are hundreds of potential indicators and it is not realistic to take into account all possible features appropriated to the social models. We concentrate on two of the most important sides of social systems: monetary poverty/inequality and public policy.

The final selection of variables used in this article is given in Table 2. Most of the data have been obtained from Eurostat database, but some of the missing data comes from websites of national statistical offices.

Table 2: List of Variables used in Empirical Analysis

Monetary poverty and inequality		Public policy	
S1	At-risk-of-poverty rate , total	P1	Social protection expenditures, % of GDP
S2	At-risk-of-poverty rate, Male – Female	P2	Administration costs, % of SPE
S3	At-risk-of-poverty rate , children (<18 years)	P3	Health/sickness expenditures, % SPE
S4	At-risk-of-poverty rate , elderly (>65 years)	P4	Pension expenditures, % SPE
S5	At-risk-of-poverty rate, family with 3+ children	P5	Family/children expenditures, % SPE
S6	Relative median at-risk-of-poverty gap	P6	Unemployment expenditures, % SPE
S7	Inequality of income distribution	P7	Social contribution paid by the protected persons
S8	Gini coefficient	P8	General government contributions
S9	Children living in jobless households	P9	Public expenditures on health, % of GDP
S10	In work at-risk-of-poverty rate	P10	... active labour market policy, % of GDP
S11	Long-term unemployment rate	P11	Shares of labour taxes in total tax revenues
S12	Gender pay gap in unadjusted form	P12	Social protection efficiency

The first strand of data involves the main indicators as well as the age, gender, housing and labour market related differences of monetary poverty and inequality. For describing the overall monetary poverty and inequality we chose the most commonly used indicators, the at-risk-of-poverty rate and the relative median at-risk-of-poverty gap. This allows us to take into account both the depth and extent of monetary poverty. These indicators measure relative poverty and do not essentially imply a low living standard.

Describing the overall inequality of income distribution we have selected the S80/S20 ratio and the Gini coefficient. While the S80/S20 ratio is only responsive to changes in top and bottom quintiles, the Gini coefficient allows taking into account the full distribution of income. For describing the monetary poverty and inequality related

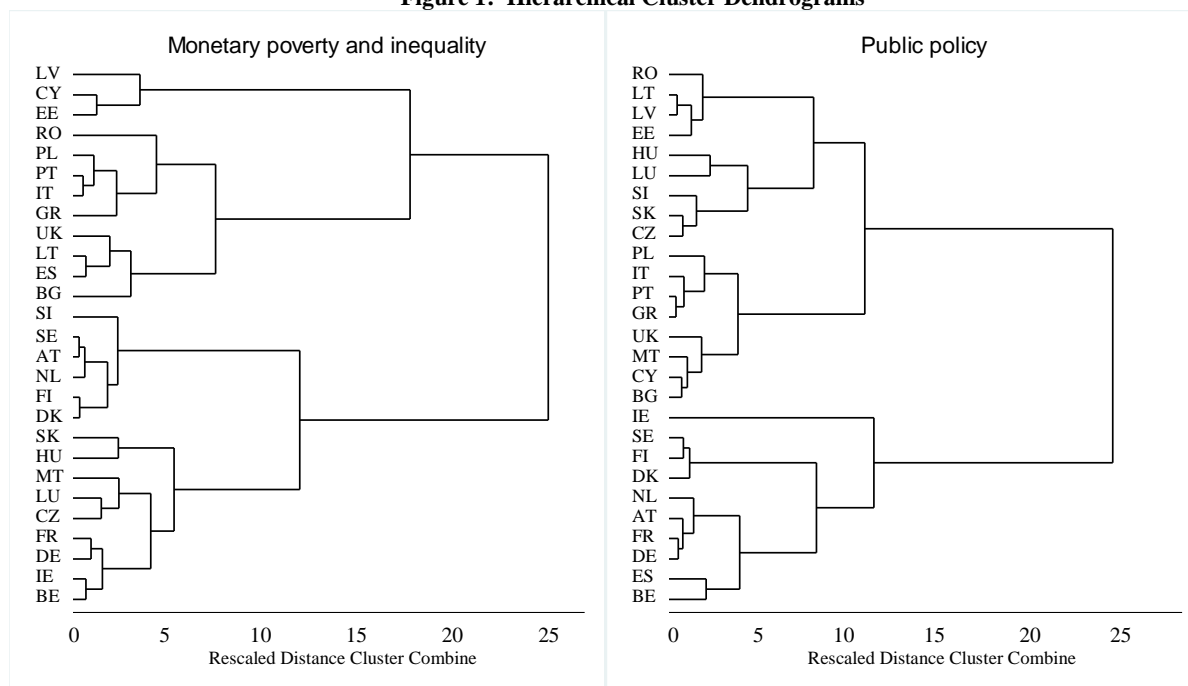
to the working life the more appropriate seemed to be the share of children living in jobless households, working poor, long-term unemployment and gender pay gap. Living in a jobless household leads to a particularly high risk of poverty and further reduces the contact with the labour market. Children from such households have a higher risk of experiencing unemployment later in their life (Sustainable, 2009). The next indicator, in-work at-risk-of-poverty rate, indicates the role of work in reducing the poverty rate and may, but not necessary does reflect adequacy of wage policy and some aspects of labour market policy in the broader sense. The differences of wages between men and women reflect the level of gender inequality in the labour market.

The second strand of data concentrates mainly on the extent and structure of social protection. Social protection is best described by the share of social protection expenditures of GDP. The share of pensions and various benefits has been used to show differences in social protection expenditure structure. The difference between poverty rate before and after social benefits is chosen as the proxy of social protection system efficiency. We have not found comparable data on the duration and coverage, so we left those aspects out.

Cluster Analysis

The relationship between social situation and public policy is bilateral, the public policy must take into account the current social situation and on the contrary, social situation reflects the adequacy of public policy. Of course, this relationship is not the only one that determines the choices of countries, both the public policies and social situation depend on many other factors such as priorities, wealth and traditions in the countries. Countries with a similar social situation may but not necessarily use a similar public policy and similar public policy does not necessarily lead to a similar social situation. Therefore we look the two strands of data separately. This allows us to analyze the similarities and differences between EU-12 countries themselves and with other countries not only in the sense of social system broadly but also classify the countries according to the monetary poverty and inequality as well as public policy and compare the results.

Figure 1: Hierarchical Cluster Dendrograms



We first run the hierarchical cluster analysis using monetary poverty and inequality data; the results based on Ward's method are given as a dendrogram in Figure 1. Looking at the length of the noodles we can clearly

distinguish between three clusters and also the highest value of not formal Calinski-Harabasz's pseudo F-statistic suggests the three-cluster solution. The biggest cluster comprises all the Nordic and Continental countries and Ireland, as well as Slovenia, Slovakia, Czech, Hungary and Malta from EU-12. The level of monetary poverty and inequality in Slovenia seems to be more similar with Nordic countries; the other four EU-12 countries resemble rather the Continental countries. The countries in this cluster enjoy the better social situation compared to the rest of EU with all aspects taken into account. Due to higher risk of poverty and greater inequality, Poland, Bulgaria, Romania and Lithuania are more similar to Mediterranean countries and UK; they form together the second cluster. The countries in the third cluster, Latvia, Cyprus and Estonia, differ from others mainly by a very high risk of poverty of elderly and greater labour market inequality; the other indicators of social situation are rather similar to the previous cluster.

According to the dendrogram, the three clusters described below are not very homogenous and it may be interesting to select for k-mean clustering analysis, somewhat arbitrarily, some solution with more clusters. The more appropriate seems to be a four or five cluster solution; selecting more than five clusters will lead to very little clusters. The five cluster solution is more robust according to the other clustering methods and appears to be the best choice. There are cluster members according to k-means cluster analysis given in Table 3.

Table 3: Cluster Membership, k-means Results

	Monetary poverty and inequality	Public policy*
Cluster 1	FR, BE, DE, IE, LU, HU, MT, SK	FR, DE, AT, BE, NL, ES
Cluster 2	SE, AT, FI, NL, DK, SI, CZ	SE, FI, DK
Cluster 3	ES, IT, PT, PL, GR	PT, GR, BG, IT, MT, PL, UK
Cluster 4	LT, BG, UK, RO	SK, HU, LU, CY, SI
Cluster 5	EE, CY, LV	LV, LT, EE, RO, CZ

*Note: Ireland form one-member Cluster 6

The results support the Esping-Andersen's classification of four social models, the k-means results even a little more exactly (Spain is now joined with other Mediterranean countries). Moreover, this confirms, at least in the sense of poverty and inequality, his opinion that EU-12 countries blend into some of these four models after the transition period. Hungary, Malta and Slovakia form together with a majority of Continental countries the Cluster 1; Slovenia and Czech Republic with the Nordic countries, Austria and Netherlands Cluster 2; Latvia, Bulgaria and Romania together with UK form the Cluster 4; Poland is the only EU-12 country with the Mediterranean countries in the Cluster 3. Only Estonia, Cyprus and Latvia seem to be still different and form another, Cluster 5. However, according to the distances from the cluster centres, the Cluster 3 including also Poland seems to be more homogeneous but in the Cluster 2 and especially in the Cluster 1, EU-12 countries seem to be more as exceptions. According to the ANOVA F-test results (Table 4), all variables of monetary poverty and inequality included in the cluster analysis are significant at the appropriate level ($p < 0.01$). The more powerful in forming and differentiating the clusters are the overall and age related poverty indicators: total risk of poverty, Gini coefficient, inequality of income distribution and elderly poverty risk. The least powerful are the share of long-term unemployment and gender pay gap.

The comparison of the final cluster centres (Table 4) shows that Cluster 2 enjoys a better, or at least above average social situation based on almost all poverty and inequality indicators. The countries in Cluster 1 provide better protection to older persons against poverty, but have a higher long-term unemployment rate in comparison of all other countries. The Cluster 3 differs from others by the high at-work-to-poverty rate, while the gender wage differences there are the smallest. The Cluster 4 has the highest inequality in income distribution. The last, Cluster 5, is more different from all other clusters and can be described as the countries with higher risk of poverty of woman and elderly persons but better protection of children against poverty and greater gender inequality in the labour market compared with other countries as mentioned above.

Table 4: Monetary Poverty and Inequality, Final Cluster Centres (z-scores) and ANOVA Results

Variable	Final cluster centres					ANOVA					
	C11	C12	C13	C14	C15	Cluster		Error			
						Mean Sq	df	Mean Sq	df	F	Sig
S1	0.68	-1.01	1.15	-0.52	1.05	5.042	4	0.266	22	18.946	0.000
S2	-0.29	-0.40	0.48	-0.44	1.97	3.896	4	0.472	22	8.258	0.000
S3	0.51	-0.67	0.79	0.41	-1.40	3.535	4	0.540	22	6.541	0.001
S4	-0.37	-0.18	0.37	-0.62	2.20	4.776	4	0.313	22	15.251	0.000
S5	0.70	-0.93	1.33	-0.54	0.66	3.623	4	0.517	22	7.011	0.001
S6	0.72	-1.00	1.29	-0.48	0.66	4.013	4	0.453	22	8.867	0.000
S7	-0.45	-0.85	1.18	0.60	-0.41	4.806	4	0.311	22	15.468	0.000
S8	1.12	-0.77	0.87	-0.48	0.04	4.822	4	0.303	22	15.892	0.000
S9	0.52	-0.79	-0.22	0.73	-0.68	3.744	4	0.501	22	7.469	0.001
S10	0.68	-1.01	1.15	-0.52	1.05	3.811	4	0.485	22	7.862	0.000
S11	-0.29	-0.40	0.48	-0.44	1.97	2.900	4	0.651	22	4.452	0.009
S12	0.51	-0.67	0.79	0.41	-1.40	3.026	4	0.626	22	4.834	0.006

Source: Authors' calculations

The classification of countries on the basis of public policy in general is in the same line as monetary poverty and inequality, but there are also some differences. The results of hierarchical cluster analysis showed in the dendrogram (Figure 1) suggested the two-cluster solution as the more appropriate. One cluster included all Nordic and majority of Continental countries as previously. Also Ireland is included in this cluster, but now rather as an exception. Additionally Spain, according to social situation more similar to other Mediterranean countries, seems to introduce a different public policy, more similar with some of Continental countries, is included in this cluster. All EU-12 countries together with the rest of the Mediterranean countries, Luxembourg and UK, form the second cluster.

The results of k-means clustering based on the six cluster selection provide almost the same cluster membership as according to the dendrogram for such a selection (Table 3, Figure 1). Only Czech Republic is moved into the other cluster, now joined with Baltic countries and Romania. And again, analogously with the results of our social situation analysis, we can in the some extent confirm the Esping-Andersen's classification with the Mediterranean but without Anglo-Saxon model. Poland, Bulgaria and Malta are joined with the cluster formed mainly of the Mediterranean countries, other nine countries split between two 'new' clusters. The Cluster 1, labelled as Continental again, consists of almost all Continental countries. Despite the social situation it seemed to resemble the Nordic cluster rather than the rest of Continental countries, the public policy of Netherlands and Austria seems to be continuously Continental. Only Luxembourg, notwithstanding its high social protection level, has fallen into another cluster. Finally, Spain's public policy seems to have some Corporative characteristics and is included in Cluster 1, but rather as an exception, as we can see from the distance from the cluster centre. Cluster 2, consists of all and only Nordic countries, Sweden, Finland and Denmark. This cluster is the most homogeneous and resembles most the Continental cluster from among our six clusters. Similarly to the two previous ones, we can call most of the members in Cluster 3 based on the geographical location Mediterranean, with only some exceptions (Poland and UK). Cluster 4 includes Luxembourg, Slovakia, Slovenia, Hungary and Cyprus; Baltic countries together with Romania and Czech Republic form Cluster 5 and finally, Ireland, remarkably different from all others is the sole member of the Cluster 6.

The ANOVA F-test (Table 5) indicated that all public policy variables included in the cluster analysis are significant at the appropriate level ($p < 0.01$). The more powerful in forming and differentiating the clusters are the levels of public expenditure for labour market policy and health care, the share of social protection expenditures in GDP and pension expenditures in SPE. Least helpful are social contributions paid by insured persons, the share of unemployment expenditures in SPE, and social protection efficiency.

Table 5: Public Policy, Final Cluster Centres (z-scores) and ANOVA Results

Variable	Final cluster centres						ANOVA					
	CI1	CI2	CI3	CI4	CI5	CI6	Cluster		Error		F	Sig
							Mean Sq	df	MeanSq	df		
P1	0.97	1.06	0.01	-0.38	-1.33	-0.48	3.778	5	0.339	21	11.154	0.000
P2	0.49	0.01	-0.39	-0.34	-0.40	3.53	3.267	5	0.460	21	7.101	0.000
P3	0.09	-0.91	-0.34	-0.14	0.49	2.84	2.231	5	0.469	21	6.892	0.001
P4	-0.58	-0.32	0.93	-0.43	0.57	-2.84	3.807	5	0.332	21	11.479	0.000
P5	-0.41	0.73	-1.07	0.79	0.47	1.49	3.414	5	0.425	21	8.026	0.000
P6	1.10	0.47	-0.58	-0.24	-0.78	1.10	2.957	5	0.534	21	5.535	0.002
P7	0.66	-0.58	-0.15	0.58	-0.72	-0.40	2.760	5	0.581	21	4.752	0.005
P8	-0.54	1.33	0.33	0.05	-0.97	1.58	3.431	5	0.421	21	8.150	0.000
P9	1.11	0.56	0.11	-0.39	-1.38	-0.27	3.772	5	0.340	21	11.098	0.000
P10	0.97	1.59	-0.46	-0.65	-0.88	0.28	4.126	5	0.256	21	16.142	0.000
P11	0.76	1.02	-0.80	-0.40	0.26	-1.30	3.229	5	0.469	21	6.881	0.001
P12	-0.03	1.44	-0.68	0.26	-0.53	1.99	3.031	5	0.516	21	5.868	0.002

Source: Authors' calculations

Looking at the final cluster centre values (Table 5), the Cluster 5, including Baltic countries, Romania and Czech Republic, is characterized by the lowest share of social protection expenditures in GDP, the lowest public expenditures on health, as well as active labour market policy. Compared to other clusters, spending on children/family and pensions as a share of social protection expenditure is on the average level. The share of social contributions of insured persons and general government contributions are the lowest and the efficiency of social policy is below average. Most of the EU-12 countries form Cluster 4, but there are some significant differences. The share of social protection expenditure in GDP in Cluster 4 is also very small but higher and more effective compared to the above-mentioned cluster. The structure of social protection expenditure in this cluster is also somewhat different, especially due to lower pension expenditures. The public expenditures on health, the role of social contributions of the insured persons as well as general government contributions in general are below the average and are higher than those in Cluster 5. Cluster 2 (Nordic countries) is characterized by highest shares of social protection expenditure and active labour market policy expenditures in GDP, above the average social protection efficiency and public expenditure on health, but lowest shares of health expenditure in social protection expenditures. The role of insured persons is below and the general government contributions above average. Cluster 1, formed mainly of Continental countries, differs from others by the highest public expenditures on health and highest importance of unemployment benefits. Finally, Cluster 3 (Mediterranean) is characterized by more ineffective social protection, highest pension expenditures and lowest family/children expenditures as a share of social protection expenditures.

CONCLUSIONS

In this paper we discussed the European social model and its typology. We compared the social outputs of countries grouped into different model types on the basis of different socio-economic indicators. In the empirical part, we carried out a cluster analysis for positioning new European Union (EU-12) countries into mix of European social models worked out by Esping-Andersen. We concentrated on two of the most important sides of social systems - monetary poverty/inequality and public policy - and tried to classify European Union countries according their social policy.

On the basis of the cluster analysis using monetary poverty and inequality data, we have distinguished between five clusters. The results support the Esping-Andersen's classification of social models. Moreover, this confirms, at least in the sense of poverty and inequality, his opinion that EU-12 countries blend into some of these four models after the transition period. Hungary, Malta and Slovakia form together with most of the Continental countries the Cluster 1; Slovenia and Czech Republic with the Nordic countries, Austria and Netherlands Cluster 2; Poland is the only EU-12 country with the Mediterranean countries in the Cluster 3; Latvia, Bulgaria and Romania together with UK form the Cluster 4. Only Estonia, Cyprus and Latvia seem to be still different and form another, Cluster 5. However, according to the distances from the cluster centres, the Cluster 3 including also Poland, seems to be more homogeneous; and in the Cluster 2 and especially in the Cluster 1, EU-12 countries seem to be more as

exceptions. The more powerful in forming and differentiating the clusters are the overall and age-related poverty indicators; i.e., total risk of poverty, Gini coefficient, inequality of income distribution, and elderly poverty risk. The least powerful are the share of long-term unemployment and gender pay gap.

The countries classification on the basis of public policy, in general, is in the same line with monetary poverty and inequality, but there are some differences. The more powerful in forming and differentiating the clusters are the levels of public expenditure in labour market policy and health care, the share of social protection expenditures in GDP and pension expenditures in SPE. The least helpful are social contributions paid by insured persons, the share of unemployment expenditures in SPE and social protection efficiency.

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