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Economic Inequalities And The Level of Decentralization In European Countries: Cluster Analysis[1]

Abstract

This submitted article identifies relations between the degree of decentralization and economic imbalances on the basis of a cluster (exploratory) analysis. Two indicators have been chosen for measuring economic inequalities: an indicator of dispersion of regional GDP per capita as representative of the performance imbalances within countries (it measures the economic development gap among regions in European countries); and a multidimensional inequality-adjusted human development index as representative of inequalities in the distribution of wealth in the countries. Decentralization is measured by means of a decentralization index, which contains both quantitative and qualitative components. Although groups of countries characterised by a high degree of decentralization do not necessarily show the lowest degrees of economic imbalances, it is however possible to conclude that the countries in groups with a higher degree of decentralization are among those countries with more favourable values of the economic imbalances indicators monitored. As a part of the research, two clusters of countries were identified which are identical in their degree of

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decentralization, but differ in the results connected with economic imbalances. The differences are caused by different institutional qualities in the two groups.

Keywords: *cluster analysis, decentralization, economic development, human development, inequality, regional disparities*

1. Introduction

One of the most important policies of the European Union, in terms of both sustainable growth and financial resources, is the cohesion policy. Its main objective is to reduce economic and social inequalities between regions (also called regional disparities). Territorial cohesion reinforces the basic orientation of the EU cohesion policy. It is not interpreted as a „mere" redistributive tool, but is defined as a policy of development. Territorial cohesion is about mobilizing potential, not about compensating for geographical differences. One of its principles is the rule of subsidiarity, which emphasizes decentralization and the role of public administration. The result has been a shift from the concept of "government" to the concept of "governance" (Laboutková 2009, pp. 14–30). Legislation, financial arrangements and trust in local solutions all concentrate on municipalities and regions as the most important players. Federalism in Germany, strong metropolitan and municipal administrations in France and Great Britain, and effective political regionalization in Spain, has stimulated many best-practice conventions in countries that seek their own governance models. A question has arisen whether it is possible to identify decentralization models which do not deepen economic imbalances.

This article identifies, on the basis of a cluster (exploratory) data analysis, relations between the degree of decentralization and economic disparities, which are represented by differences in regional GDP and imbalances in the distribution of wealth within countries based on the difference between the Human Development Index (HDI) and Inequality-adjusted Human Development Index (IHDI).

The aim of the research is to define groups of countries and to characterize their mutual similarities on the basis of selected indicators and to find out whether a higher degree of autonomy of administrative units brings about lower imbalances in production and in distribution.

For the measurement of regional disparities, an indicator of dispersion of the regional gross domestic product (GDP) per capita is used. Previous studies focusing on the relationship between decentralization and regional disparities have not reached a clear outcome. Most authors have been engaged mainly in fiscal

decentralization (Prud'homme 1994; Panizza 1999, pp. 97–139; Gil Canaleta et al 2004, pp. 71–94; Letelier 2005, pp. 155–183; Bodman and Hodge 2010, pp. 373–404; Sepulveda and Martinez-Vazquez 2011, pp. 321–343). The reason for their narrower focus is the fact that political decentralization is less suitable for quantification. Another weakness of these studies is that most of them are based on national rather than regional sources. Regional data are either aggregated collectively from individual states, or in some instances are not available at all. Yet if we are to examine the relationships between decentralization and regional disparities, it is necessary to work with regional data. The main goal of such an investigation is to detect regional differences rather than differences between countries.

In this context, the decision-making competences are more essential than executive powers (Laboutková 2012, pp. 277–292). Among the recent works which comprehensively investigated the influence of decentralization on regional disparities, one should include the work of Rodríguez-Pose and Ezcurra (Rodríguez-Pose and Ezcurra 2009; p. 52). They analysed the relationship between fiscal and political decentralization and the development of regional disparities in a sample of twenty-six countries. The study concluded that this relationship is significantly influenced by the overall economic level of the given state. While political decentralization in developed countries does not affect the development of regional disparities, fiscal decentralization alleviates them. In contrast however, fiscal decentralization in the emerging economies deepens inequalities between regions.

This negative effect cannot be compensated for by the observed positive effect of political decentralization. The main cause for this is a weak redistributive capacity in these countries in comparison to the developed ones. Such a conclusion strengthens the argument that the cohesion policy should not be understood as a synonym for redistributive policies. The authors of the present article are inclined to accept the modern concept of the cohesion policy and they understand decentralization as a set of quantitative and qualitative factors (financial decentralization and decentralization of decision-making) which complement each other.

For these reasons, an index of decentralization is utilized in this work, in which both the above-mentioned components are included. This is the first contribution of this article to the issue. The second benefit of this paper is its focus not only on imbalances in economic performance, but also on a qualitative point of view through the Human Development Index (HDI), or its modified version, the Inequality-adjusted Human Development Index (IHDI). The concept of the human development index highlighted the importance of those factors (in addition to gross national income per capita) which *are also closely associated* with the quality of life from the perspective of human resources (educational characteristics and life expectancy). For the purpose of the article the "loss"

between the HDI and IHDI was selected. Although the IHDI has been developed only recently and therefore does not yet provide long-term data, it offers a real picture of human development (Sen 1973).

2. Analytical Description of Key Indicators

Decentralization can generally be divided into three categories (Sharma 2009, pp. 47–65): political, fiscal, and administrative. The political concept of decentralization means that the devolution of legislative and/or administrative functions to a sub-national level which autonomously performs the assigned functions through democratically-elected and politically-accountable bodies. One of the indicators of political decentralization is the form of election of the top representatives of local government, which is further supplemented by formal and informal mechanisms of public consultations for planning and implementation of public projects. Fiscal decentralization is considered to be the core of decentralization. It includes two aspects: the first is the division of responsibilities for expenditures and revenue sources among the national, regional, and local levels of government; and the second is the extent of the regional and local governments' power in terms of determining their own spending and revenues. In order to make decentralized functions effective, regional governments must either gain an adequate level of income locally, or a transfer from the central government together with the power to decide on spending. While local governments are usually responsible for public services on the expenditure side, this obligation does not automatically imply their right to levy taxes. A purely administrative concept of decentralization means the transfer of administrative functions from one administrative level to another.

In this respect, a unique empirical research can be found in *From Subsidiarity to Success: The Impact of Decentralization on Economic Growth*, which was carried out in the spring of 2009 by AER[2] in cooperation with BAK Basel Economics.[3] It examined the link between the degree of autonomy of regions (data has been collected from 234 regions in 16 European countries) and the degree of decentralization of the state with economic development[4] (AER 2009).

[2] The Assembly of European Regions (AER), founded in 1985, is the largest independent network of regions in the wider Europe. It comprises 270 regions from 33 countries and 16 interregional organizations.

[3] BAK BASEL – a private economic institute founded in 1980 and based in Basel, which specializes, *inter alia*, in international comparisons of regions.

[4] For more details about the sets of data, see AER (2009).

For measurements of decentralization, all public powers were compared (‘powers’ are here used as a synonym for regulatory power) in countries with different levels of governance: from the highest state level to the municipal level. Owing to its multidimensionality and complexity, decentralization cannot be studied or measured directly. However, many individual aspects in the vertical organization of a country can be observed. These observable aspects (altogether there were 185 of them) were systematically collected, and the measured information was aggregated into an index of decentralization. The *Decentralization Index (DEX)* contains both quantitative and qualitative components. Financial decentralization has a weight of 40% and includes mainly quantitative information about the amount of income and expenditure in relation to the central government. Decentralization in decision-making has a weight of around 60% of the entire index. Apart from information on the relative number of officials, the index of decentralization contains multiple qualitative information sets regarding the structure and distribution of decision-making in public affairs between the various levels of government of a state.

The cause of *uneven regional development* is the occurrence of spatial variability in the socio-economic development, leading to the emergence of spatial inequalities. The imbalance of spatial structures in different regions gives rise to regional disparity, which manifests itself in a dissimilarity or disproportion of phenomena or processes having a unique spatial distribution. In terms of a theoretical explanation, it is difficult to define the causes of uneven regional development. Factors such as the size of the country (Williamson 1965, pp. 3–45), core-periphery models, technological equipment, and infrastructure affect the local allocation of private capital, and thus predetermine redistribution processes within the economy. Specific factors of regional inequality can be traced in the transition countries in connection with the change of the coordination mechanism (Petrakos 2001, pp. 359–383; Ezcurra and Pascual 2007, pp. 5–32). In the last twenty years, the ambiguous impact of the liberalization and globalization of trade has been discussed in the context of regional development (Milanovic 2002, pp. 21–43; Rodríguez-Pose and Gill 2006, pp. 1201–1222). Models of a “new economic geography” emphasize the relationships between uneven spatial development and economic growth (Krugman 1998, pp. 7–17; Fujita and Thisse 2002).

In connection with its assessment of the development in the regions within the member states, Eurostat has published an *Indicator of Variance (Dispersion, D)* of the Regional GDP per capita since 2007. For a given country, the dispersion ‘D’ of the regional GDP of the level 2 regions is defined as the sum of the absolute differences between regional and national GDP per inhabitant, weighted on the basis of the regional share of population and expressed in percent of the national GDP per inhabitant.

The Human Development Index (HDI) has been published since 1990 in the periodical Human Development Reports (HDR) within the United Nations Development Program (UNDP). The annual HDR in November 2010 contained a new methodology and a change in some of the index parameters, including:

- a partial factor approach to education was investigated using the education index,
- factors in life expectancy and level of health care use the life expectancy index;
- a new use of the income index (calculated from Gross National Income – GNI per capita in PPP USD data) as an indicator of the standard of living.

Individual sub-index values are calculated using both the maximum and minimum reported figures, plus the actual reported figures for each country. For example, in 2011 longevity had an interval of 29–83.2 years; the education component intervals consisted of: expected total years 0–20.6; average education period 0–13.2 years, and a combined index ranging from 0–0951. The interval for GNI was 163–108,211 USD per capita in purchasing power parity (UNDP United Nations Development Programme 2011).

The resulting sub-index value ranges from 1 (best outcome) to 0 (worst outcome), and there is a geometric mean value of the HDI (the original HDI was constructed as an arithmetic mean, i.e. without weights). An accompanying indicator of human development is the new multidimensional IHDI, which is based on the same principles as the HDI (i.e. life expectancy, education, and economic level), but also reflects the unequal distribution of each sub-factor in the population (the inequality of access to available resources). It can be concluded that IHDI is the real indicator of the level of human development, while HDI can be interpreted as an index of human development potential, or the maximum level of IHDI which could be achieved in the absence of inequalities in the distribution of wealth. The *Overall Loss (L)* caused by human development inequalities is responsible for the difference between IHDI and HDI, and can be expressed as a percentage. The average loss in the HDI due to inequality is about 23% – that is, adjusted for inequality, the global HDI of 0.682 in 2011 would fall to 0.525. Countries with less human development tend to have greater inequality in more dimensions – and thus larger losses in human development (UNDP 2011).

3. Methods

In the following calculations and statistical data analysis the values of decentralization (*DEX*) calculated in 2009 and economic inequalities (*D* and *L*) calculated for 2010 and 2011 were used. The construction of an Index of Decentralization is unique and complex. It takes both qualitative and quantitative data into account. While quantitative data have been collected from official international sources, the qualitative data have been collected directly in the

regions by means of a questionnaire. The time discrepancy is due to the fact that *IHDI* began to be published in 2010 and the last results for the *Indicator of Variance* were published by Eurostat in 2011. The authors assumed that the changes in the values of *DEX* would be negligible for observed countries in one year. The complete data set is available for 22 European countries. For the classification of the countries into the individual groups according to their common characteristics, the Cluster Analysis Method has been used, the basis of which is the classification of statistical sample variables into clusters in such a way that the variables belonging to one cluster are very similar from the viewpoint of the characteristics monitored, and the variables belonging to different clusters are significantly different (Stankovičová and Vojtková 2007, Řezanková, Húsek and Snášel 2007). The individual countries were classified into clusters on the basis of the standardized squared Euclidian distance:

$$D_N(i,i') = \sqrt{\sum_{j=1}^{p} d_j^2(i;i') / s^2(x_j)} \tag{1}$$

where:
$d_j(i;i')$ is the distance between the i-th and i´-th variable,
$i \neq i' = 1,2,...n$, it means $d_j(i;i') = x_{ij} - x_{i'j}$, $j = 1,2,..., p$, and
$s^2(x_j)$ is a sample variance of the j-th variable.

This metric requires the variables not to be correlated. For the verification of this hypothesis, the t-test about the significance of the correlation coefficient was used. The alternative hypothesis was formulated as two-tailed; i.e. the correlation coefficient is not equal to zero. The test statistic used is the t-statistic, which is distributed as Student´s t distribution with df = n – 2. On the 5 percent level of significance, the null hypothesis was not rejected in any tests of the hypothesis about the significance of the correlation coefficient. This means that the variables are not correlated. The calculated values of correlation coefficients and P-values are given in Table 1 below.

Table 1. Correlation coefficients matrix for the years 2010 and 2011

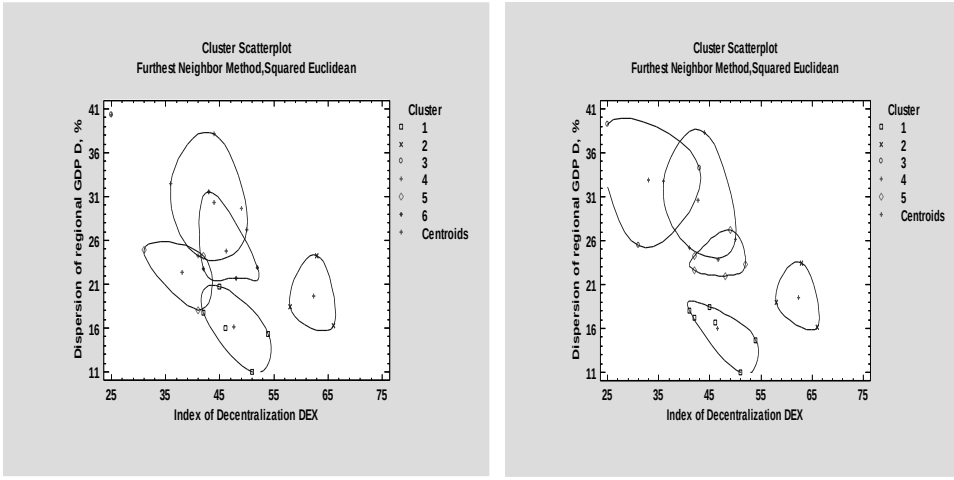
	DEX		D		L	
Index/rok	2010	2011	2010	2011	2010	2011
DEX	- -	- -	-0.344* 0.117**	-0.353* 0.107**	-0.250* 0.261**	-0.335* 0.127**
D	-0.344* 0.117**	-0.353* 0.107**	- -	- -	-0.108* 0.632**	-0.108* 0.632**
L	-0.250* 0.261**	-0.335* 0.127**	-0.108* 0.632**	-0.034* 0.882**	- -	- -

* value of sample correlation coefficient, ** calculated P-Value

Source: Authors' own calculations based on the data from EC (2011, 2012, 2013), AER (2009), UNDP (2011, 2012, 2013).

The next step was the choice of a clustering algorithm. In this step, one of the hierarchical agglomerative clustering algorithms was applied to the data monitored – the furthest neighbour method; i.e. putting together in one cluster those variables where the distance between their most distant elements is minimal. The optimum number of clusters was determined by means of the heuristic approach. When determining a suitable number of clusters, outlier observations were identified, i.e. observations/variables which differed significantly from the others. Namely this concerned Croatia, which represents a separate cluster at de facto any set number of clusters. Chart 1 below provides a better visual representation of the distance of these clusters, as it explicitly shows that variables 3 and 4 are outside the field where all other variables are located. If outlier observations are detected, they should be excluded from the initial matrix because they could cause an undesirable distortion of results. The fact that both the variables/observations are outlier observations was further verified by means of the calculation of Mahalanobis distance, which is part of the test statistic F from the test of outlier observations. Only Croatia was verified to be an outlier observation.

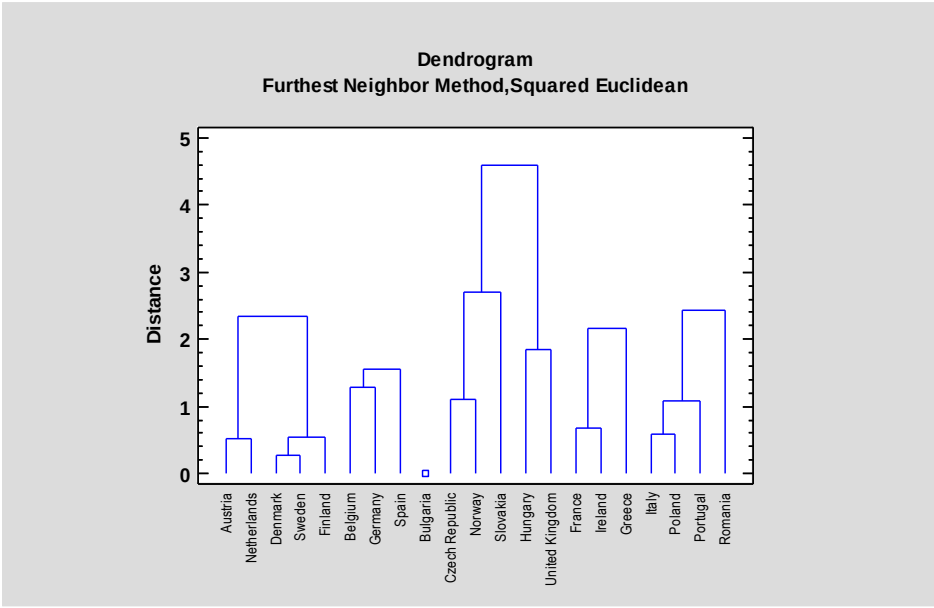
Chart 1. 2D Cluster Scatterplot for 2010 and 2011

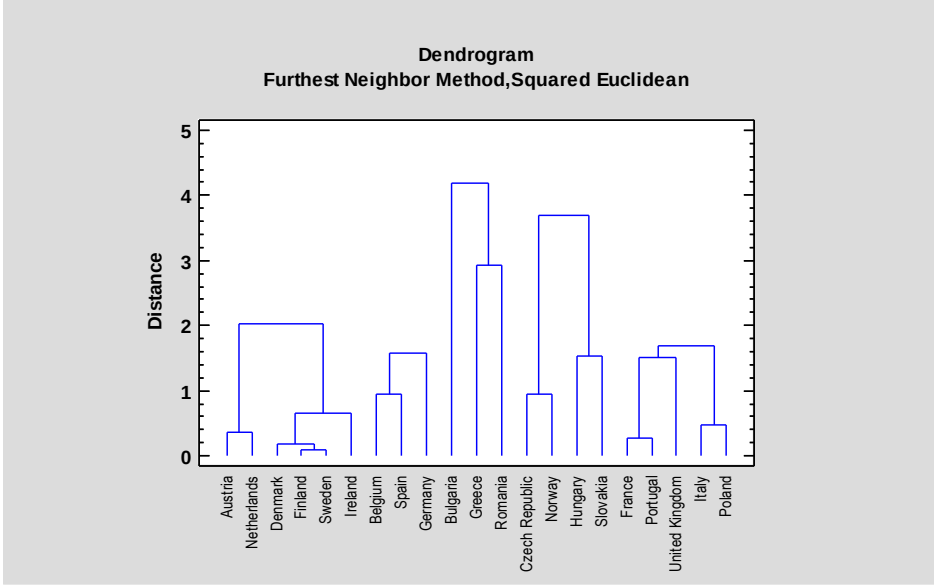


Source: authors' own data gained by means of the programme STATGRAPHICS Centurion XVI.

Once Croatia was excluded from the group of the countries observed, an optimum number of six clusters for the year 2010 and five clusters for the year 2011 were established. The result of the procedure of clusters' creation is graphically illustrated by means of a dendrogram in Chart 2 below.

Chart 2. Dendrogram for 21 countries, the furthest neighbor method, the standardized squared Euclidian distance – 2010 and 2010





Source: authors' own data gained by means of the programme STATGRAPHICS Centurion XVI.

4. Results and discussion

Are countries with a higher degree of decentralisation economically more equal than centrally-governed countries?

For both periods of observation, the observed European countries were classified into the resulting clusters on the basis of their similarity, according to the indicators of the degree of decentralization (*DEX*) and economic imbalances (*D, L*). For 2010, six clusters of countries were used: countries with the smallest economic imbalances on average, mainly regarding uneven regional development (Cluster 1); a group of counties with the combination of high uneven regional development and low values of inequalities in the distribution of wealth on average (Cluster 4); countries with the average highest level of decentralization (Cluster 2); and on the other hand – countries most centralized on average (Cluster 3); and countries with the highest inequalities in the distribution of wealth on average (Cluster 6) – see Table 2. Cluster 5 is rather difficult to define as it is not distinguished by any strong characteristics; it includes countries which are rather centrally governed and where the average value of the indicators of economic imbalances is around the average of all the observed countries. In the cluster analysis for 2011 this group disintegrated: Ireland became part of Cluster 1; Greece was put into Cluster 3; and France into Cluster 6. In 2011 Romania also changed its Cluster (from Cluster 6 to Cluster 3), as well as the UK (from Cluster 4 to Cluster 5). Mainly in 2011, as parts of their groups, France, Ireland and the UK are not as compatible with the other countries from the viewpoint of the indicators observed. For example the UK is highly specific in terms of decentralization, which can be the cause of its "fluctuation" between the selected clusters. While England, where almost 90% of the UK inhabitants live, is governed by the central institutions of the United Kingdom, the remaining three countries (Scotland, Wales and Northern Ireland) have various levels of autonomy. In 2011 Ireland significantly improved in terms of the imbalance in the distribution of wealth (by 2 percentage points), which transferred it to the cluster characterised by a low average of economic imbalances. For France, the year-to-year values of the indicators observed almost did not change, but the disintegration of the former group put it together with the countries with slightly above-average values of observed economic imbalances. Further analysis will therefore mainly focus on those countries which did not change their groups in the periods observed (16 countries), including Greece and Romania because these counties, together with Bulgaria, formed a relatively compact group for 2011.

Table 2. Distribution of countries into clusters according to the similarity of indicators

Group Characteristics	Country	
	2010	**2011**
1 Average decentralized countries with the least uneven regional development	AT NL DK SE FI	AT NL DK SE FI IE
2 Highly decentralized countries	ES DE BE	ES DE BE
3 Centrally-governed countries with the highest economic inequalities	BG	BG EL RO
4 Countries with high uneven regional development and low inequalities in distribution of wealth	CZ SK NOR HU UK	CZ SK NOR HU
5 Rather centrally-governed countries	FR IE EL	
6 Average decentralized countries with rather higher economic inequalities	IT PL PT RO	IT PL PT FR UK
	HR	HR

Source: authors' own data gained on the basis of the results STATGRAPHICS Centurion XVI.

Countries with the lowest average value of decentralization in both the periods observed showed the worst results on average, both in the uneven regional development indicator as well as in the indicator measuring the inequalities in the distribution of wealth (DEX_3^{2010} = 25; D_3^{2010} = 40.3; L_3^{2010} = 11.3; DEX_3^{2011} = 33; D_3^{2011} = 32.9; L_3^{2011} = 12.06). The countries placed into the second cluster –Austria, Belgium, Germany and Spain (and in 2011 also Ireland) with the average highest level of decentralization (DEX_2 = 62.33 for both the periods observed) showed an average value of the index of dispersion D_2^{2010} = 19.7; D_2^{2011} = 19.56 and the average loss in distribution L_2^{2010} = 8.7;

L_2^{2011} = 7.8, which are valued slightly below the average. It can therefore be stated that the countries with the highest degree of decentralization perform better on average than centralized countries.

Table 3. Centroids in 2009, 2010, 2011

Cluster	*DEX*		*D*		*L*	
	2009	2009	2010	2011	2010	2011
1	47.6	46.5	16.16	16.0167	7.3	6.51667
2	62.3333	62.3333	19.7	19.5667	8.7	7.8
3	25.0	33.0	40.3	32.9333	11.3	12.0667
4	44.0	42.75	30.34	30.625	7.54	5.825
5	38.0	-	22.4	-	9.53333	-
6	46.25	46.6	24.725	23.88	11.7	9.66
Average for 21 countries	44.773	44.773	20.46	20.336	8.93	8.048

Note: 'Centroid' can be defined as the average value of each variable over all members of the cluster.

Source: Authors' own calculation in the programme STATGRAPHICS Centurion XVI on the basis of data from EC (2011, 2012, 2013), AER (2009), UNDP (2011; 2012; 2013).

The interpretation of Clusters 1 and 6 is quite challenging. The countries in the first cluster (Austria, Netherlands, Denmark, Sweden, Finland and Ireland in 2011) and the countries in the sixth cluster (Italy, Poland, Portugal, in 2010 Romania and France and the UK in 2011) are characterised by very similar average values of decentralization (DEX_1^{2010} = 47.6; DEX_6^{2010} = 46.25; DEX_1^{2011} = 46.5; DEX_6^{2011} = 46.6;), which are slightly above the average for the European countries observed. They differ however in the values of economic imbalances shown. While Group 1 achieves lower values of imbalances on average – in *D* and *L* the average values in 2010 are even the lowest out of all the groups (D_1^{2010} = 16.6; L_1^{2010} = 7.3), the values observed for Group 5 on the other hand are higher on average than the average for the whole set, and the average loss in distribution for 2010 is the highest of all (L_5^{2010} = 11.7). Thus the first question to ask is: Why are countries where economic imbalances are among the lowest (Cluster 1) only slightly above average decentralized countries? This group consists of countries which are labelled as socially democratic economies or welfare states; see (Amable 2003) and his models of capitalism, or (Esping-Andersen 1990) and his three worlds of welfare capitalism. To reduce inequality, governments conduct transfers and redistributive policies in favour of disadvantaged regions or weaker social groups. If such equalization systems are too strong, they might weaken the spirit of decentralisation (AER 2009).

A second question which needs to be answered is: How it is possible that the countries with similar levels of decentralization showed very different results in terms of economic imbalances? This question is partially answered by

previous research, which showed that decentralization is not among the strong factors influencing economic imbalances (Bednářová and Laboutková 2014, pp. 1052–1064). Thanks to cluster analysis, it is however possible to provide a more robust explanation. The degree of decentralization is one thing, and the quality of governance another. Huther and Shah (2005) explicitly linked governance to the notion of institutions, defining it as "all aspects of the exercise of authority through formal and informal institutions in the management of the resource endowment of a state" (Huther and Shah 2005). To explain the discrepancy mentioned, certain sub-indicators of the most popular and widely used Worldwide Governance Indicators (WGIs) (WB 2010) were selected. WGIs (in terms of the earlier concept of Governance Matters) follow up the process by which governments are selected, monitored and replaced, the capacity of the government to effectively formulate and implement sound policies, and the respect of citizens and the state for the institutions that govern economic and social interactions among them. The concept was originated and has been monitored long-term by the World Bank, which structures quality governance into six sub-indicators: democracy, political stability, government performance, regulatory quality, rule of law, and control of corruption. Aggregated indicators are normalized and are in the range from –2.5 (worst) to +2.5 (best result). For the purpose of this article, the following sub-indicators were selected for comparison:

Government effectiveness – this captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

Regulatory quality – this captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.

Control of corruption – this captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as the "capture" of the state by elites and private interests.

Values for the sub-indexes selected (Table 4 below) clearly show that the countries in Cluster 1 perform significantly better in terms of the quality of governance than the countries belonging to Cluster 5.

Table 4. The capacity of the government to effectively formulate and implement sound policies

		Government Effectiveness	Regulatory Quality	Control of Corruption
1 Countries with the least economic inequalities	AT	1.84	1.47	1.6
	NL	1.73	1.74	2.2
	DK	2.09	1.88	2.4
	SE	2.01	2.01	2.3
	FI	2.25	1.67	2.2
	average	**1.98**	**1.75**	**2.14**
5 Countries with the highest inequalities in the distribution of wealth	IT	0.45	0.89	0.0
	PL	0.64	0.99	0.4
	PT	1.02	0.72	1.0
	RO	–0.25	0.64	–0.2
	average	**0.46**	**0.81**	**0.3**

Source: authors' own calculation on the basis of WB (2010).

The fourth cluster includes the Czech Republic, Hungary, Slovakia, Norway and the UK (the UK only for 2010). This cluster is also characterised by a rather average decentralization, but high inter-regional differences in economic performance within the individual countries. In 2010, the highest level of regional average GDP per inhabitant was at least three times as high as the lowest level in the United Kingdom and Slovakia, whereas it was more than twice as high in the Czech Republic and Hungary and nearly double in Norway. As in many of the EU Member States, the capital city region (at the NUTS level 2) of these countries had the highest GDP per inhabitant (in PPS). For example, the average level of GDP per inhabitant in Inner London was 2.2 times higher than in Berkshire, Buckinghamshire and Oxfordshire (the region with the second highest level of GDP per inhabitant in the United Kingdom). Such differences between capital regions and the region with the second highest level of GDP per inhabitant were even greater (in relative terms) in Slovakia and the Czech Republic, as the Bratislava region had an average that was 2.6 times higher than in Zapadne Slovensko, while in Prague it was 2.3 times higher than in Jihovychod. In the Czech Republic, the capital city region of Prague (home to 11.9% of the Czech population) had an average GDP per inhabitant (in PPS) that was 72% higher than the EU-27 average in 2010, while the seven remaining NUTS level 2 regions in the Czech Republic (home to the remaining 88.1% of the population) each reported an average GDP per inhabitant that was below 75% of the EU-27 average. The same pattern was observed in neighbouring Slovakia, where the GDP per inhabitant in the capital city region of Bratislava (with 11.5% of the population) was 77% higher than the EU-27 average, while the remaining three

NUTS level 2 regions (with 88.5% of the population) each recorded GDP per inhabitant that was below 75% of the EU-27 average. Among the level 3 regions in Norway, the capital city region of Oslo recorded a GDP per inhabitant equivalent to 248% of the EU-27 average, while none of the other Norwegian regions saw their average GDP per inhabitant fall below the EU-27 average – GDP per inhabitant was above the EU-27 average, ranging from 102% of the EU-27 average in Hedmark og Oppland to 192% in Oslo og Akershus. There were two other Norwegian regions with GDP per inhabitant more than 25% above the EU-27 average (Agder og Rogaland and Vestlandet). (EC 2013)

Another characteristic feature for this group is that while the countries have a relatively high average of uneven regional development, they are among the countries with low or average L (with the exception of the UK). In 2011 this group was even the lowest on average out of all the groups monitored (probably due to the UK's removal from the group). This phenomenon could be explained by the fact that the group includes three post-communist countries, which for decades were rather homogeneous in terms of the distribution of the resources created due to the egalitarian salary policy of the former political nomenclature, which itself did not belong to this equalization. Moreover, education, health care and other public services were free of charge for everybody (paid from taxes) and of the same quality (again with the exception of the political elite). Following the collapse of the centrally-governed economy and during the transformation period, no larger social or economic imbalances originated among the inhabitants of the respective countries, which was also due to the habits in the approach to remuneration, to the funding of public services, and to the phenomenon of wealth in general. A World Bank study (WB 2000) found that although income disparities between the rich and the poor increased in virtually all transition economies during the 1990s, the extent of the increase varied considerably across countries. For example, among Central European transition countries, the increase in inequality was considerably lower than that observed in the Commonwealth of Independent States (CIS). According to the Life in Transition Survey data (EBRD 2007), the citizens of the EU8 countries[5] have a high aversion to income inequality. According to Zaidi, government tax and transfer policies were found to have a powerful impact on the distribution of disposable incomes: for example taxes and transfers dampened the increases in income inequality due to the increased dispersion of earnings in Central European countries to a considerably greater extent than in the CIS (Zaidi 2009). In analyzing variations across countries in terms of peoples ’preferences for redistributive state spending’, many studies have found that respondents in post-socialist countries profess a greater support for such spending than their U.S. or

[5] Poland, Hungary, Slovenia, Slovakia, the Czech Republic, Latvia, Lithuania, and Estonia.

Western counterparts. However, these preferences are not necessarily confined to post-socialist countries alone; e.g. Norway also exhibits similar public preferences for high redistributive state spending (Murthi and Tiongson 2008). Norway is among those countries which redistribute income based on the principle of equality and it thus belongs among socially democratic countries. This assertion can be supported by means of the Gini index. The Gini coefficient is based on the equivalised disposable income of each individual (Falco 2014). Norway, the Czech Republic, Slovakia and Hungary are under the European average.

5. Conclusions

This article has focused on the argument that the degree of decentralization affects the level of economic inequalities. The aim of the research was therefore to select groups of countries and to characterize their mutual similarity on the basis of selected indicators, and to find out whether a higher degree of autonomy of administrative units brings about lower imbalances in production and in distribution. The theoretical basis for the research performed was represented by three main economic functions of a modern government in a mixed economy: firstly a state provides conditions for good functioning of market mechanisms, for achieving an efficient allocation of resources, or else it itself allocates resources for the provision of public property; secondly, the fair functioning of market mechanisms results in income redistribution in the interest of higher income and property equality; and thirdly, it ensures internal and external stability of the economy by means of a macroeconomic stabilization policy (Sojka and Konečný 1996). The economic perspective highlights mainly the criterion of efficiency – which might be divided into consumer efficiency, producer efficiency, and efficiency through competition – as the key argument in favour of decentralization (AER 2009). From the viewpoint of the macroeconomic environment and its stability, policies coming from the centre seemed to be more effective, as the regional units below the central government do not have the appropriate tools for an effective economic stabilisation policy (AER 2009). If, for example, an expansive fiscal policy at the sub-national level is conducted, a big part of the action will be lost through spillovers to other regional units due to their actions as free riders. Kotsogiannis demonstrated that decentralised regimes are associated with lower foreign direct investments for institutional reasons; therefore more centralised countries signal more stability and thus attract more foreign direct investments (Kotsogiannis 2005). Another example is price stability, that can be obtained only by monetary authorities, which are at least on the national level.

Hence a completely decentralised country is not able to protect and promote macroeconomic stability appropriately (Prud'homme 1994).

Based on the cluster analysis performed, the selected countries were divided into three groups which have certain strong unifying characteristics. For the calculations and statistical analysis, values of decentralization (*DEX*) and economic inequalities (*D* and *L*) were used. From the results obtained, it cannot be definitively stated that countries characterised by a high degree of decentralization necessarily show the lowest degrees of economic imbalances. Nevertheless it is possible to conclude that the countries with a higher degree of decentralization belong among countries with more favourable values of the economic imbalances indicators monitored. An optimal degree of decentralisation should achieve a slightly above-average value, because both too high and mainly too low levels of decentralisation cause welfare losses (Clusters 2 and 3). Also other factors, such as the overall economic level of the countries observed and the quality of institutions, play a certain role, as was proved by, e.g. Clusters 1 and 6, and the phenomenon of path dependency (Cluster 4). Future research should focus on the analysis of the clusters identified above from the viewpoint of market failures and the search for the way to deliver public goods efficiently and equitably (according to the fiscal federalism and new public management perspectives in models of government), and also from the viewpoint of establishing an institutional framework which primarily deals with governmental failures (according to the public choice and the new institutional economics perspectives).

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Streszczenie

DYSPROPORCJE EKONOMICZNE I SKALA DECENTRALIZACJI W KRAJACH EUROPEJSKICH – ANALIZA SKUPIEŃ

W przedstawionym artykule na podstawie analizy skupień danych (metody eksploracyjnej) zidentyfikowano zależności pomiędzy decentralizacją a dysproporcjami w rozwoju ekonomicznym. Do pomiaru dysproporcji ekonomicznych wybrano dwa

wskaźniki: wskaźnik regionalnego rozproszenia PKB na mieszkańca, pokazujący dysproporcje w rozwoju gospodarczym (pomiar przepaści ekonomicznej w rozwoju pomiędzy regionami krajów europejskich) oraz wielowymiarowy wskaźnik nierównomiernego rozwoju społecznego, pokazujący dysproporcje jakości życia w badanych krajach. Decentralizację zbadano za pośrednictwem wskaźnika decentralizacji, obejmującego zarówno elementy jakościowe, jak i ilościowe. Chociaż grupy państw charakteryzujących się wysokim stopniem decentralizacji nie wykazują w każdym przypadku najniższego stopnia dysproporcji ekonomicznych, można sformułować wniosek, że kraje zrzeszone w grupach o wyższym stopniu decentralizacji należą do państw o korzystniejszych wartościach badanych wskaźników dysproporcji ekonomicznych. W ramach badań zidentyfikowano dwa skupienia krajów, które są identyczne z punktu widzenia stopnia decentralizacji, ale różnią się pod względem dysproporcji ekonomicznych. Przyczynę stanowi odmienna jakość instytucjonalna w obu grupach.

Słowa kluczowe: *analiza klastrowa, decentralizacja, rozwój gospodarczy, rozwój społeczny, nierówność, dysproporcje regionalne*