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THE EUROPEAN ECONOMIC SPACE: NEW ASPECTS OF REGIONALIZATION

Abstract: European continent is very diverse in physical, demographic, economic and social aspects. During the past times different processes shaped European continent producing different economic environment across the whole continent. Economic regionalisation is complex in particular due to economic space dynamism. This made regional disparities within existing geographical regions so big that changeability of economic regions boundaries could not be overlooked.

The paper provides a completely new aspect of the economic regionalization, using Data Envelopment Analysis method (DEA). Some relevant economic (financial and macroeconomic stability), demographic and social indicators have been chosen to calculate composite index (Regional Development Index - RDI), considering each of these categories through calculated sub-indexes. The given methodology is developed for the purpose of revealing regional disparities within existing European economic regions and provides an excellent tool for evaluating efficiency of possible regional and economic policies.

Key words: economic region, Data Envelopment Analysis, Regional Development Index, regionalization

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Introduction

Europe is a part of much bigger continental mass, Eurasian continental plate, and because of its specific geographical, historical, political, economic and social characteristics, it is single out as a separate continent. Europe is settled in the northern hemisphere, starching from the North Arctic Ocean to the Mediterranean Sea at the South, and from Atlantic Ocean at the West to the Ural Mountain, Ural River, Caucasus Mountain and Black Sea at the East. Such geographical position, together with certain historical background, demographical issues and economic processes that has been shaped this region, made European continent diverse in many senses.

The geographical regionalization of Europe defines five regions: Northern, Western, Central, Southern and Eastern Europe. Such regionalization reflects diversities among the regions and certain homogeneity within the regions, considering primarily geographical aspects. However, when one reflects about European economic space, the traditional geographical regionalization into five regions is not quite appropriate. Economic regionalization takes into account the geographical characteristics, but it emphasizes the diverse economic processes intertwined with political, demographic and social aspects of the region. Being so dynamic and depending on number of different factors, economic regions require more complex regionalization process. Once established, economic regions' border has to be continuously monitored as they are much more changeable than a border of some other region's type (geographical, demographical, etc.).

For a long time the process of regionalization has been one of the most complex issue of the scientific research, not only within the regional geography and geography in general, but within other scientific disciplines as well (economy, social sciences, political sciences, etc). There is no common principle of regionalization. Some classical geographical approach starts with a uniformity of spatial units as the results of one or several similar factors influences (Тошић, 2012). However, in the meantime this approach has been abandoned and replaced with a new type of regionalization which is more related to study of the structure and relations between spatial elements within certain units. It has already been clear that the complex research of the economic space could be conducted only if some geographical, economic and social aspect had been taken into consideration (Isard, 1960). This was huge theoretical movement within the introduction of the economic geography research and at the same time, new concept of methodology for regional analysis. From that point of time, economic geography as well as regional science have started to use different mathematical and statistical methods in their research incorporating structural, functional and dynamic components (Garrison, 1956; Berry, 1968). During the 1950s and 1960s, economic geography has achieved its "golden period" and within economy it started to develop regional economics as well.

During the time, regional planning became an integral part of the economic and social planning in general and economic region got some new dimension. This dimension is related to a spatial unit which implies different political or economic issues trying to resolve different development problems (Friedman at al., 1974). New processes of change which have started since 1970s reshaped many regions and their economies (the oil crisis induced by the OPEC, new technologies and later the collapse of Breton Woods Agreement). The era of complex, uncertain and competitive world has started, in which only few world cities dominated the global financial markets, the old industrial regions

declined and new technological region emerged (Stimson et al., 2006). All these changes led to greater inter-regional and international connections between as well as within the regions. In line with after mentioned, during the last decade of the twentieth century, economic geography has revived with a great work contribution by Paul Krugman, the famous economist and Nobel Prize winner for economics in 2008. He and his followers brought back location theory accompanied with some other economic theories what imposed development of the new approach he called "the new economic geography - NEG" (Krugman, 1991; Fujita et al., 1999). During the huge and long scientific debate, it was concluded that the NEG was more spatial economics approach, than geographical ones. However, it was very important and significant for the economic geography development, in particular for better understanding of a new aspects of the interrelationships among economic regions at the globalization time. This was in accordance with the economic research of the nations competitiveness and structural adjustment within the regional economic development (Poter, 1998).

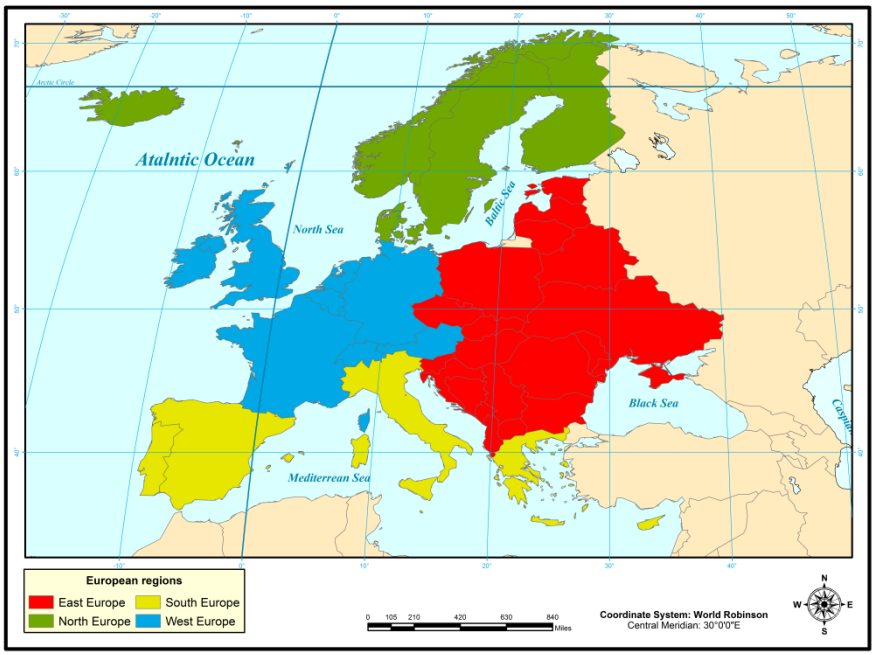


Fig. 1. Economic regions of the European continent (UNSD geo-scheme)

Europe could not remain unaffected by the all changes that were occurring during the second half of the twenty and the first decades of the twenty-first century. The economic regions which were singled out by the broadly accepted economic regionalization produced from United Nations still exists as dominate one (United Nations Statistics Division [UNSD], 2016). Europe is divided into four economic regions: North, West, East and South Europe, where the region of Central Europe has been 'divided' between west and east areas (Fig.1). Being the core of European economy, having stable democratic governments and high standards of living, the West and the North European countries

formed practically one economic region. This area "attracted", in certain sense, other developed countries which geographically belong to the Central Europe "to move" "towards the west" (Switzerland, Austria, Liechtenstein, Germany). In this way one uniform group of countries – the most developed countries of the West European region has been made. Other Central European countries (Poland, Slovakia, Czech Republic and Hungary) were "left" in the "eastern parts of the continent", making, together with some ex-Yugoslav and ex-Soviet republics, the East European region.

This economic geo-scheme has taken into consideration a geographical conceptualization of European space, but also some historical, economic and political processes as well (for example, period of 'Cold War' and existing of the 'bloc division of the World' after the Second World War had great influence on social and economic characteristics of European countries). Integration processes in Europe, which has started immediately after the Second World War (The Coal and Steel Community 1957, European Economic Community 1958, and latter The Europe Union (EU) 1992), together with disintegration processes (the communism collapse in Eastern Europe at the end of 1980s produced some of country disintegration, such as Czechoslovakia and Yugoslavia) ought be incorporated into the economic regionalization of the European continent. The EU enlargement has started since 1990s and made this integration one of the most prominent factors in the economic and political shaping of Europe. Today, the most European countries are the EU members, with an exception of the four developed countries (Iceland, Norway, Switzerland and Liechtenstein) and some developing countries of the East and Southeast Europe (great deal of them are in some stages of the EU accession process). Although the UNSD economic regionalization of Europe covers different processes that have been shaping economic space, the beginning of the 21st century brought so many new challenges which influenced greatly over existing regions (political changes, World economic crisis, migration crisis, terroristic acts, Greek crisis, Brexit). Different way of economic policy and development as well as different political positions did make certain difference for many European countries (Manic et al, 2012; Popovic at al., 2016; Manic et al., 2016). This imposed a need to explain disparities, in particular those that appear within existing economic regions.

The main aim of this paper is to put a new glance onto economic regionalization of European space, considering key economic, demographic and social indicators using a new methodology - Data Envelopment Analysis method (DEA). Analyzing relevant economic, demographic and social indicators across the Europe, and creating composite index (Regional Development Index - RDI) through sub-indexes calculation, the authors found out quite huge differences among countries, even within the same region. The authors started with a hypothesis that using composite indicator rather than different individual indicators are more appropriate in analyzing complex issues of regional development and economic regionalization. The recent political and economic changes made certain consequences on all European countries, which produced new and deepened existing regional disparities.

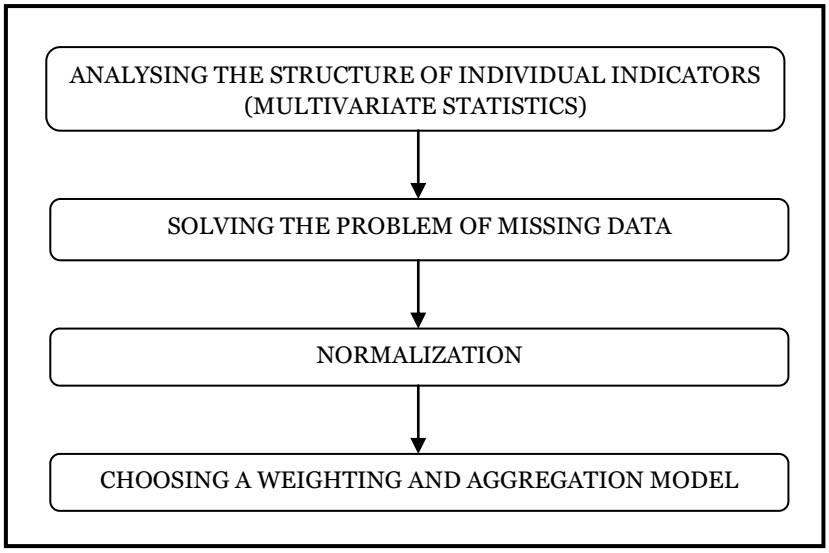
Methodology

The construction of composite indicators is "a useful tool in policy analysis and public communication" (Nardo et al., 2005) for a comparison between the countries and regions regarding the level of their development in different fields (social, demography, micro and

macro economy, business, ecology, education, ICT...). Instead of use a wide number of different individual indicators measuring countries' performance, it is more appropriate to use one composite indicator for depicting complex issues in country development. For that reason and for the purpose of identifying the main disparities within the existing economic regions of Europe, the composite index, Regional Development Index (RDI), was developed using Data Envelopment Analysis (DEA) as key development.

Data Envelopment Analysis (DEA) is a sort of methodology which constructs an 'efficiency frontier' based on each country's individual data using mathematical linear programming (Cook et al., 2014). It determines the best practice by measuring the relative position of each of the countries in terms of the value of the set of observed indicators. Such presentation of existing country's developmentin different fields and recommendations for possible improvement is clearer to be understood by general public and other non-science auditorium.

The very process of composite index construction is not so much complex. It consists of four main fazes (Fig.2): (1) identifying and analyzing individual indicators using the multivariate statistics, (2) filling in missing data, (3) normalization and, (4) defining weight of sub-indexes and aggregation model.



Source: Nardo et al., 2005

Fig. 2. Composite index construction

The most complex and sensitive step in the process of composite index construction is choosing an aggregation and weights calculation method. Namely, the calculation of the composite index implies the determination of its individual sub-index weights. According to the relevant literature considering the weighting procedures, one of the simplest way of its determination would be to give equal importance and weight to all sub-indexes (Zhou et al., 2007). In such way, for example, the individual indicators within the Macroeconomic stability sub-index would have a weight of 0.20, whereas in the case of the Demographic trends sub-index it would be 0.33. This was decided on the DEA

methodology. However, in order to determine the weights for each country and each individual indicator, the "Benefit of Doubt" approach has been used (Charnes et al., 1978). This approach assumes that weights are endogenously determined by the observed performances and benchmark between countries. It is based on linear combination of the observed best performances. This combination of weights, calculated through the process of linear programming, enables the overall relative performance index for each country to become as high as possible.

In order to apply the DEA methodology and determine the weight, the values of all the individual indicators must be normalized. This is very important because different indicators are not expressed in the same direction. The raw values are normalized in an interval between 0 and 1 (the indicators with higher values represent better performance of given country and vice versa).

If higher values of the relevant sub-indicator i for a generic country j mean better performance (for example, a higher GDP per capita means that this country performs better than other countries in the analyzed group), each value x_{ij} is transformed in

$$y_{ij} = \frac{x_{ij} - \min(x_i)}{\max(x_i) - \min(x_i)} \quad (1)$$

Where min (x_i) and max (x_i) are the minimum and the maximum values of x_i across all countries. In this way, the normalized values y_{ij} have values lying between 0 (laggard, $x_{ij}=\min(x_i)$) and 1 (leader, $x_{ij}=\max(x_i)$).

On the other hand, if higher values of the relevant sub-indicator i for a generic country j means worse performance (for example, higher subscription charges for broadband services means that this country performs worse than other countries in the analyzed group), each value x_{ij} is transformed in

$$y_{ij} = \frac{\max(x_i) - x_{ij}}{\max(x_i) - \min(x_i)} \quad (2)$$

In such way, the normalized values y_{ij} have values lying between 0 (laggard, $x_{ij}=\max(x_i)$) and 1 (leader, $x_{ij}=\min(x_i)$).

According to several different authors (Zhou et al., 2006; Zhou et al., 2007; Cherchye et al., 2006, 2008; OECD, 2008), the basic DEA model assumed that sub-indexes' CI (composite indexes) for each country j (j=0,1,...,m) are calculated as the weighted sum of n indicators where the weights are endogenously determined to maximize the value of the composite index for each country. Optimal weights should be determined by solving the next linear programming problem:

$$CI_j = max \sum_{i=0}^{n} y_{ij}\, w_{ij} \quad (3)$$

Where

$$\sum_{i=0}^{n} y_{ij}\, w_{ik} \leq 1$$

And

$$w_{ij} \geq 0$$

for any i=0,1,...,n, any j=0,1,...,m, and any k =0,1,...,m.

Another challenge in this methodology is the size of the data set to complete DEA analysis. There are several different opinions in the literature on what is the optimal size (Cook et al., 2014). Our analysis uses the rule of thumb (proposed in Golany & Roll, 1989), that the number of analyzed countries should be at least twice the number of indicators considered.

After weights calculation for each sub-index using the classical "Benefits of Doubt" approach, we used DEA Cross Efficiency model in order to calculate their final values. Although classical DEA is suitable for identifying the best practice frontiers for each country, its characteristic of self-evaluation have been criticized. In this paper we used the cross efficiency matrix that was developed as a DEA extension to rank countries. This tool for interpreting the results consists of creating a table where the number of rows (j) and columns (j) equals the number of countries in the analysis. For each cell (ij), the efficiency of country is computed with weights that are optimal to country *j* (Doyle & Green 1994). In short, we made our calculation in two steps (Cook& Zhu, 2015):

Step 1: DEA weights are calculated using the constant returns-to-scale (CRS) DEA model (Charnes et al., 1978);

Step 2: the weights calculated in step 1 are applied to individual normalized sub-index values for all countries to get so-called cross evaluation sub-index value for each of those countries.

RDI composite index construction

For each sub-index, a certain number of indicators are introduced (Tab. 1 with raw data values in the Appendix 1).

The normalized values for the 17 indicators are calculated for 38 countries (with an exception of so called "dwarf" countries): Albania, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania,

Luxembourg, Macedonia FYR, Moldova, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Ukraine and United Kingdom.

Tab. 1. Statistical indicators forming the RDI and sub-indexes

Main index	Sub-index	Indicator used
Regional Development Index (RDI)	Financial Development Index (FDI)	FD1 - Bank capital to assets ratio (%)
		FD2 - Bank nonperforming loans to total gross loans (%)
		FD3 - Domestic credit to private sector by banks (% of GDP)
		FD4 - Stock market capitalization (% of GDP)
	Macroeconomic Stability Index (MSI)	MS1 - GDP per capita PPP (constant 2011 international $)
		MS2 – Unemployment rate (% of total labor force)
		MS3 - Current account balance (% of GDP)
		MS4 - Gross domestic savings (% of GDP)
		MS5 - General government gross debt (% of GDP)
	Demographic Trends Index (DTI)	SC1 - Population growth (annual %)
		SC2 - Mortality rate, infant (per 1,000 live births)
		SC3 - Net migration
		SC4 - Urban population (% of total)
		SC5 - Age dependency ratio (% of working-age population)
	Social Conditions Index (SCI)	DT1 - Life expectancy at birth, total (years)
		DT2 - Physicians (per 1,000 people)
		DT3 - Employment in agriculture, male (% of male employment)

Source: Calculated by authors.

The raw data for the analysis were taken from the World bank-World Development indicators database and Global Financial Development Database (GFDD), (all values for 2013). The normalized numerical values were calculated (Tab. 2).

Although it is expected that all correlation be positive, in several cases it can be noticed that there are trade-offs between several indicators - negative correlations (Tab. 3 presents Pearson correlation coefficients).

Within the Financial Development Index, the negative correlation has been showed between FD1 (Bank capital to assets ratio) and FD4 (Stock market capitalization as a percentage of GDP) indicators, while within the Social Condition Index, this was the case between SC4 (Urban population) and SC5 (Age dependency ratio as a percentage of working-age population) indicators.

Tab. 2. Normalized values of the individual indicators

Country	Individual indicators																
	FD 1	FD 2	FD 3	FD 4	MS 1	MS 2	MS 3	MS 4	MS 5	SC 1	SC 2	SC 3	SC 4	SC 5	DT 1	DT 2	DT 3
Albania	0.29	0.49	0.06	0.00	0.06	0.48	0.09	0.26	0.64	0.35	0.08	0.27	0.30	0.60	0.56	0.00	0.0
Austria	0.16	0.93	0.29	0.14	0.45	0.93	0.63	0.60	0.56	0.57	0.89	0.40	0.45	0.43	0.85	0.73	0.9
Belarus	0.55	0.91	0.00	0.00	0.15	0.79	0.31	0.73	0.43	0.42	0.85	0.39	0.64	0.67	0.15	0.55	0.6
Belgium	0.14	0.91	0.15	0.27	0.42	0.67	0.55	0.56	0.84	0.49	0.85	0.47	1.00	0.23	0.79	0.75	1.0
Bos. & Herz.	0.62	0.69	0.14	0.07	0.06	0.00	0.29	0.10	0.80	0.33	0.69	0.32	0.00	0.76	0.44	0.16	0.4
Bulgaria	0.44	0.63	0.16	0.08	0.13	0.90	0.61	0.50	0.80	0.22	0.34	0.29	0.59	0.33	0.35	0.54	0.8
Croatia	0.60	0.63	0.20	0.22	0.18	0.96	0.59	0.50	0.91	0.27	0.82	0.31	0.33	0.36	0.52	0.37	0.7
Cyprus	0.37	0.00	1.00	0.10	0.29	0.50	0.39	0.41	1.00	0.65	0.92	0.34	0.47	0.73	0.75	0.24	0.9
Czech Rep.	0.18	0.88	0.12	0.10	0.28	0.89	0.57	0.68	0.55	0.40	0.89	0.34	0.57	0.42	0.60	0.49	0.9
Denmark	0.19	0.91	0.67	0.34	0.44	0.93	0.79	0.59	0.71	0.51	0.89	0.37	0.82	0.17	0.79	0.47	0.9
Estonia	0.45	0.97	0.20	0.05	0.25	0.87	0.60	0.68	0.42	0.30	0.93	0.32	0.48	0.26	0.51	0.42	0.9
Finland	0.00	0.99	0.31	0.27	0.39	0.13	0.52	0.50	0.81	0.48	0.97	0.38	0.77	0.08	0.84	0.35	0.9
France	0.06	0.91	0.31	0.34	0.37	0.82	0.52	0.50	0.50	0.58	0.84	0.50	0.68	0.00	0.94	0.41	0.9
Germany	0.08	0.95	0.25	0.20	0.45	0.79	0.83	0.59	0.62	0.00	0.87	1.00	0.61	0.33	0.81	0.55	1.0
Greece	0.23	0.25	0.41	0.10	0.23	0.73	0.48	0.33	0.00	0.20	0.83	0.25	0.66	0.16	0.85	1.00	0.6
Hungary	0.29	0.65	0.09	0.09	0.22	0.88	0.63	0.65	0.61	0.30	0.70	0.34	0.54	0.48	0.39	0.39	0.85
Iceland	0.98	0.95	0.33	0.08	0.42	0.07	0.69	0.54	0.57	0.67	1.00	0.32	0.94	0.34	0.91	0.46	0.85
Ireland	0.51	0.54	0.26	0.20	0.50	0.46	0.69	0.79	0.88	0.48	0.88	0.25	0.40	0.26	0.84	0.30	0.74
Italy	0.10	0.60	0.29	0.12	0.33	0.82	0.63	0.48	0.71	0.62	0.89	0.61	0.50	0.14	0.97	0.52	0.91
Latvia	0.35	0.90	0.12	0.02	0.20	0.67	0.49	0.51	0.66	0.12	0.54	0.28	0.48	0.31	0.25	0.48	0.73
Lithuania	0.53	0.82	0.08	0.06	0.24	0.93	0.69	0.50	0.90	0.15	0.84	0.23	0.46	0.40	0.23	0.59	0.69
Luxembourg	0.14	1.00	0.30	0.82	1.00	0.63	0.76	1.00	0.28	1.00	1.00	0.35	0.87	0.64	0.93	0.35	0.99
Macedonia	0.40	0.76	0.11	0.03	0.09	0.68	0.53	0.38	0.76	0.41	0.71	0.32	0.30	0.73	0.35	0.30	0.50
Moldova	0.54	0.74	0.05	0.00	0.00	0.89	0.30	0.00	0.83	0.36	0.00	0.32	0.09	1.00	0.02	0.37	0.07
Montenegro	0.60	0.63	0.12	0.42	0.11	0.73	0.00	0.18	0.82	0.40	0.76	0.32	0.42	0.49	0.42	0.19	0.85
Netherlands	0.07	0.94	0.41	0.40	0.47	1.00	0.89	0.65	0.29	0.47	0.86	0.38	0.87	0.27	0.85	0.60	0.96
Norway	0.15	0.98	0.39	0.30	0.69	0.00	1.00	0.77	0.93	0.67	0.95	0.45	0.70	0.31	0.89	0.62	0.95
Poland	0.28	0.90	0.13	0.17	0.22	0.36	0.49	0.52	0.82	0.35	0.76	0.28	0.36	0.64	0.51	0.21	0.67
Portugal	0.21	0.74	0.47	0.17	0.25	0.86	0.56	0.42	0.84	0.23	0.89	0.25	0.41	0.26	0.80	0.59	0.83
Romania	0.19	0.69	0.04	0.04	0.17	1.00	0.54	0.57	0.64	0.27	0.31	0.08	0.25	0.44	0.33	0.26	0.28
Serbia	1.00	0.52	0.09	0.05	0.09	0.76	0.34	0.28	0.74	0.25	0.64	0.27	0.27	0.40	0.37	0.19	0.36
Slovak Rep.	0.46	0.89	0.12	0.03	0.25	0.56	0.57	0.57	0.74	0.40	0.63	0.32	0.24	0.76	0.46	0.43	0.89
Slovenia	0.24	0.74	0.14	0.09	0.27	0.85	0.79	0.62	0.58	0.40	0.95	0.32	0.17	0.45	0.78	0.27	0.81
Spain	0.18	0.82	0.47	0.42	0.31	0.23	0.59	0.53	0.48	0.30	0.84	0.00	0.69	0.37	1.00	0.76	0.86
Sweden	0.05	0.98	0.48	0.54	0.45	0.60	0.76	0.61	0.80	0.64	0.93	0.47	0.79	0.04	0.91	0.55	0.97
Switzerland	0.13	0.99	0.65	1.00	0.58	0.75	0.88	0.73	0.79	0.70	0.85	0.53	0.59	0.44	0.98	0.58	0.92
Ukraine	0.42	0.58	0.16	0.11	0.04	0.81	0.43	0.33	0.65	0.30	0.47	0.43	0.52	0.66	0.00	0.48	0.54
United King.	0.08	0.97	0.51	0.65	0.38	0.82	0.39	0.42	0.54	0.57	0.83	0.81	0.74	0.20	0.83	0.33	1.00

Source: Calculated by authors.

Tab. 3. Correlation between individual indicators

Correl.	FD1	FD2	FD3	FD4	MS1	MS2	MS3	MS4	MS5	SC1	SC2	SC3	SC4	SC5	DT1	DT2	DT3
FD1	1.00	-0.30	-0.36	-0.46	-0.48	-0.14	-0.40	-0.37	0.21	-0.24	-0.23	-0.36	-0.39	0.41	-0.53	-0.33	-0.44
FD2	-0.30	1.00	-0.15	0.39	0.46	-0.05	0.45	0.46	-0.11	0.22	0.29	0.30	0.39	-0.23	0.20	0.20	0.42
FD3	-0.36	-0.15	1.00	0.52	0.47	-0.14	0.34	0.17	0.04	0.46	0.47	0.20	0.42	-0.31	0.65	0.24	0.49
FD4	-0.46	0.39	0.52	1.00	0.69	-0.03	0.35	0.39	-0.10	0.59	0.39	0.32	0.50	-0.28	0.57	0.15	0.51
MS1	-0.48	0.46	0.47	0.69	1.00	-0.18	0.70	0.76	-0.18	0.69	0.63	0.31	0.64	-0.37	0.74	0.30	0.67
MS2	-0.14	-0.05	-0.14	-0.03	-0.18	1.00	0.03	0.04	-0.22	-0.26	-0.18	0.13	-0.07	-0.08	-0.27	0.15	0.02
MS3	-0.40	0.45	0.34	0.35	0.70	0.03	1.00	0.72	-0.07	0.26	0.51	0.22	0.43	-0.39	0.52	0.47	0.59
MS4	-0.37	0.46	0.17	0.39	0.76	0.04	0.72	1.00	-0.23	0.41	0.57	0.11	0.52	-0.31	0.43	0.29	0.63
MS5	0.21	-0.11	0.04	-0.10	-0.18	-0.22	-0.07	-0.23	1.00	-0.03	-0.14	0.00	-0.33	0.17	-0.20	-0.36	-0.10
SC1	-0.24	0.22	0.46	0.59	0.69	-0.26	0.26	0.41	-0.03	1.00	0.40	0.17	0.43	-0.05	0.54	-0.05	0.38
SC2	-0.23	0.29	0.47	0.39	0.63	-0.18	0.51	0.57	-0.14	0.40	1.00	0.25	0.52	-0.48	0.66	0.34	0.81
SC3	-0.36	0.30	0.20	0.32	0.31	0.13	0.22	0.11	0.00	0.17	0.25	1.00	0.30	-0.24	0.28	0.09	0.42
SC4	-0.39	0.39	0.42	0.50	0.64	-0.07	0.43	0.52	-0.33	0.43	0.52	0.30	1.00	-0.59	0.54	0.53	0.66
SC5	0.41	-0.23	-0.31	-0.28	-0.37	-0.08	-0.39	-0.31	0.17	-0.05	-0.48	-0.24	-0.59	1.00	-0.60	-0.41	-0.54
DT1	-0.53	0.20	0.65	0.57	0.74	-0.27	0.52	0.43	-0.20	0.54	0.66	0.28	0.54	-0.60	1.00	0.32	0.63
DT2	-0.33	0.20	0.24	0.15	0.30	0.15	0.47	0.29	-0.36	-0.05	0.34	0.09	0.53	-0.41	0.32	1.00	0.46
DT3	-0.44	0.42	0.49	0.51	0.67	0.02	0.59	0.63	-0.10	0.38	0.81	0.42	0.66	-0.54	0.63	0.46	1.00

Source: Calculated by authors.

Analysed data within FDI, demonstrates that with the increasing level of financial market development (and stock market- FD4), banks tend to hold less capital (FD1). Countries with more developed stock markets (higher FD4) have stronger competition among different financial market participants. There is a broader range of possibilities to invest or borrow money. Higher competition narrows margins and earnings for owners are smaller. Since increasing leverage[2] increases profits, banks hold less capital (smaller FD1). Beside, in less developed countries, bank investments are usually with higher risk levels, and as bank assets is riskier, more capital it must hold to withstand possible losses (higher FD1-Regulation requirements). Bank capital serves as a protection for its creditors and depositors; the higher level of capital (FD1) means better financial soundness of a bank, which can be very important for countries with less developed financial sector (lower FD4). Clients might have more trust in bank with higher ratio (FD1), especially when depositing money.

Indicators within the SCI that showed negative correlation, describe the share of the urban population in total population and the age dependency ratio in regards to working-age population. In some countries, such as Germany or Belgium, depopulation process began long time ago and is still going on, which results with ageing population by each year. The consequence is continuously magnifying the group of old people (65 and more years old). At the same time, the group of young is smaller and smaller which indicates the shortage of working-age population in the future.

Data Envelopment Analysis (DEA) shows that could be an interesting choice of methodology for the purpose identifying regional disparities and giving useful material for the regionalization process. However, there are certain limitations of DEA analysis, which the authors of this paper were aware of. In the first place it is static in nature. With this DEA model it is only possible to estimate current level of development and weak areas of each country because it missed dynamic component. We made conclusions about regional development of country based on historical data in given year. That resulted with a problem of negative correlation between several indicators – DEA analysis cannot give an answer why these socio-economic variables have opposite direction. This limitation of our analysis brought us in front of dilemma weather this methodology is appropriate for the purpose of this research. However, it is definitely good methodology for identifying regional disparities in the region at one point of time and different research confirmed that (Ali et al., 1993; Chang et al., 1995; Sarafoglou et al., 1990, Haynes et al., 1990). Besides the economic aspect of evaluating the effectiveness of certain regional policies or identifying certain differences, many scientists apply this method to the study of social and demographic change. The final conclusions over the results in this research were produced on theoretical research and analytical experience, especially in order to give another glance to the economic regionalization of Europe. However, further research within the economic regionalization using DEA methodologycould be in the aspect of the inter-temporal examination of the relative efficiencies of DEA methods (Dinc et al., 1997; Stimson et al., 2006).

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[2]*Use of borrowed money to finance a bank (or any other firm). The higher is indebtedness, bank is more leveraged. After paying agreed interest on borrowed money, rest of profit goes to owners, increasing revenue on their investments, of course if bank is operating profitably. If not, losses for owners are even higher, which means that investing in stocks is the riskiest investment and thus should earn the highest revenue.*

Results and discussion

The composite Regional Development Index (RDI) for European area was calculated by using the DEA methodology. It is calculated as the weight sum of the corresponding individual indicators, where the weights are endogenously determined by mathematical linear programming so as to obtain the maximum possible value of the RDI index for each individual country. In this way, the best possible combination of the individual indicators within a country's sub-index has been delivered (there is no other combination that will enable a country to achieve a greater RDI sub-index value). In other words, we consider the most favourable situation for each country.

Tab. 4. Calculated values of the sub-indexes

Country	Cross-efficiency DEA scores (median)					Cross-efficiency DEA ranks (median)				
	FDI	MSI	SCI	DTI	RDI	FDI	MSI	SCI	DTI	RDI
Albania	0.50	0.53	0.30	0.05	0.40	36	35	37	38	38
Austria	0.93	0.90	0.78	0.91	0.93	11	6	15	13	7
Belarus	0.92	0.71	0.86	0.60	0.74	12	29	6	31	28
Belgium	0.91	0.84	0.85	1.00	0.93	15	14	7	1	5
Bos. & Herz.	0.72	0.25	0.70	0.40	0.51	26	38	23	34	37
Bulgaria	0.65	0.90	0.40	0.69	0.76	31	8	35	27	24
Croatia	0.66	0.99	0.65	0.70	0.83	29	1	28	26	16
Cyprus	0.03	0.70	0.92	0.85	0.75	38	30	4	17	25
Czech Rep.	0.88	0.83	0.77	0.86	0.87	19	18	17	16	11
Denmark	0.91	0.93	0.83	0.93	0.94	14	5	10	12	2
Estonia	0.99	0.80	0.67	0.79	0.83	3	19	24	21	15
Finland	0.99	0.55	0.80	0.88	0.78	5	34	14	14	23
France	0.91	0.78	0.78	0.94	0.86	16	20	16	10	14
Germany	0.95	0.83	1.00	0.98	0.93	9	16	2	3	4
Greece	0.26	0.56	0.67	0.80	0.60	37	33	26	20	35
Hungary	0.66	0.84	0.70	0.73	0.79	28	13	22	24	21
Iceland	1.00	0.49	0.93	0.87	0.78	2	37	3	15	22
Ireland	0.57	0.88	0.61	0.76	0.79	35	9	31	23	20
Italy	0.60	0.85	0.82	0.93	0.87	32	12	13	11	12
Latvia	0.91	0.72	0.54	0.62	0.72	13	28	33	30	30
Lithuania	0.84	0.98	0.67	0.66	0.82	20	2	25	28	18
Luxembourg	1.00	0.74	1.00	0.99	0.94	1	25	1	2	3
Macedonia	0.78	0.74	0.71	0.48	0.69	22	26	21	33	31
Moldova	0.76	0.83	0.21	0.07	0.53	23	17	38	37	36
Montenegro	0.66	0.78	0.74	0.72	0.74	30	21	20	25	27
Netherlands	0.93	0.95	0.86	0.96	0.91	10	3	5	6	8
Norway	0.98	0.70	0.83	0.95	0.88	6	31	12	8	10
Poland	0.90	0.66	0.76	0.64	0.72	17	32	18	29	29
Portugal	0.74	0.90	0.62	0.84	0.86	25	7	30	18	13
Romania	0.69	0.87	0.31	0.31	0.61	27	10	36	36	33
Serbia	0.58	0.77	0.60	0.37	0.61	34	23	32	35	34
Slovak Rep.	0.90	0.76	0.64	0.79	0.80	18	24	29	22	19
Slovenia	0.75	0.85	0.75	0.81	0.83	24	11	19	19	17
Spain	0.82	0.51	0.66	0.94	0.75	21	36	27	9	26
Sweden	0.97	0.84	0.84	0.97	0.93	7	15	9	5	6
Switzerland	0.99	0.94	0.85	0.95	1.00	4	4	8	7	1
Ukraine	0.60	0.74	0.54	0.48	0.63	33	27	34	32	32
United King.	0.96	0.77	0.83	0.97	0.90	8	22	11	4	9

Source:Calculated by authors.

The resulting sub-indexes are ranging between zero (the worst possible performance) and 1 (the best possible performance – benchmark) (Tab. 4). The optimal calculated set of weights provides the best position for the given country in relation to all other analysed countries. Any other weighting profile would worsen the relative position of the given country. After creating cross efficiency matrix (explained above and presented in Appendix 2), the weighted individual sub-indexes were calculated as median.

The European countries that have been analysed represent a very diverse group considering geographical, historical, economic, and demographical characteristics. Agreat number of them are part of European Union (including United Kingdom, since Bregzit has not still finished) and 19 are members of Euro zone. Remaining 10 countries that are not EU members include developed countries (Switzerland, Norway and Island), but also some European periphery countries (countries with the worst economic performances in Europe: Bosnia and Herzegovina, Serbia, Montenegro, FRY Macedonia, Albania, Moldavia, Belorussia and Ukraine). In order to understand better nowadays economic performance across the European continent, it is of crucial importance to analyse historical background of its countries.

Historical background of economic development in the European continent

After the Second World War, there were several periods of European economic development: reconstruction of the European economy, economic crisis during the 1970s, reshaping European Economic Community and European Union development, EU enlargement throughout the first decade of the twenty-first century, world economic crisis 2007/2008, etc.

The period of reconstruction after the Second World War was followed by huge economic growth rates throughout all Europe (until 1973 Western European countries had fast economic growth, with rates of growth reaching even 4.7% per year). According to Manic, Popovic and Mitrovic (Manic et al., 2016), the main reasons for that were: taking-off the American technology and business organization, foreign investments and technology transfers, post-war reconstruction, higher employment in the industry, rising integration of European market and stabile macroeconomic environment that facilitated investments. The growth was the fastest in Germany and Austria, but also in Greece, Italy, Portugal and Spain, and upon it these countries started the process of liberalizing and opening towards the world. The Eastern European countries had also high growth rate during 1950s and 1960s, with highest growth rates in Bulgaria, Romania and Yugoslavia. But the political and economic system in these countries was quite different to those in the West – it was communist or socialist system, with command (planned) economy.

Following the period of great economic performance, since 1973 slowing down economic growth had started in Europe. It was due to different reasons: declining earnings on investments, rising public sector and public spending that required higher taxes to finance, which caused rise in shadow economy, higher possibilities to earn profit abroad thanks to globalization process and switch to growth through innovation, without proper adjustment of institutions that were created to answer the needs of extensive growth. European countries responded differently to the economic crisis. Considering that as well as different economic systems developing from the Second World War, it was obvious why occur so huge disparities on the line East – West Europe. The collapse of

communism by the end of 1980s, and transition process during the 1990s of the ex-communist countries, did not diminish the existing differences but made them even greater.

However, the historical context of economic development is not the only element that makes economic regionalization so complex. Process of globalization has started since the second half of the twenty century introducing the need of stronger economic integration which resulted with formation of the first political integration in Europe –European Union (EU). In 1999 within EU, eleven West Europe countries formed European Monetary union (EMU), joined by Greece in 2001, and in following years by 7 more countries from former communist bloc. The EMU hit the new light onto economic, social and geographical disparities in Europe.

Although they share the same monetary policy, the EMU countries present quite diversified group of countries. Contrary to expectations, in the monetary union there was no process of convergence but rather polarization of countries. They could be divided on reach North or core EMU countries (Germany, Austria, Luxemburg, Belgium, France, Nederland and Finland), and poorer or peripheral countries (mostly South European countries). GDP per capita is one of the indicator that identifies the lack of catching-up process for the least developed EMU countries (Portugal has the level of indicator constantly around 60% of Euro zone average, Greece between 60 and 70% with several hits by the crisis, Spain is constantly around 80% of EMU average and Italy shows continuously worsening of the indicator (World Development indicators database 2016). New member countries didn't converge toward more developed members. The level of the relevant indicators mostly ranges between slightly below 60 and 70% of Euro zone average. Economic discrepancy between Core, South and New EMU member's countries within EU is the result of different choice and the course of key macroeconomic policies as well as the chosen growth model. After entering European monetary union, Germany introduced serious economic reforms which included very mild wage growth, increased labour mobility and rise in productivity and its growth strategy is based on the competitive production for export. Lower production costs, higher quality of goods led to the surplus in the trade balance. In south member states and Slovenia, growth model was based on demand and consumption, financed with the inflow of foreign money. After joining the Monetary Union, reduced investors perception of risk and thus interest rates caused huge inflow of cheaper capital from Northern countries. As a consequence, that led increase in borrowing, overinvestment and wrong investment decisions in many sectors. The governments also increased their spending, wages in public sector rose, as well as loans to finance larger expenditures, which caused growth of budget deficit. High capital inflows financed GDP growth rates that were higher than in the countries of the North, but also inflation rates grew. The growth in the price level meant a decrease in price competitiveness and increase in current account deficits.

New economic challenge for whole European continent was the World Economic crisis that began in 2007/2008. The crisis has hit European countries differently: Central European countries had different experience considering the crisis, but significantly less than Western Balkan or some (peripheral) Euro zone countries. Baltic countries had the worst recession (the growth rate was below than -14% in 2009, while in Poland were no negative growth rates). Although the recovery process didn't go smoothly (some of those

countries recorded negative growth rates again, in 2015, all of them had positive growth rates, and in the case of Estonia, Latvia and Lithuania they were very high, around 7%).

The results in applying DEA method

Considering all the economic parameters as well as some of the key demographic and social aspects throughout historical perspective, economic regionalization of European area using DEA method produced four groups of countries: (1) the most developed, (2) developed, (3) less developed countries and (4) laggards. Some of these groups are in accordance with the UNSD geo-schema of the European economic space, but some countries are "displaced" from traditional economic regions and brought "closer" to the regions which are, at first glance, not expected (Fig. 3).

North and West European countries mostly belong to the group of the most developed countries, which is not surprising (that is a core of European economic space). South European region is quite homogeneous with an exception of Greece which was severely hit by World economic crisis (most of the Southern countries belong to the second group, developed countries). However, the biggest deviations from traditional economic regionalization are in the case of East Europe. The historical background, integration and disintegration processes in the last two decades, global economic and political issues, resulted with different economic, social and demographic performance among East European countries.

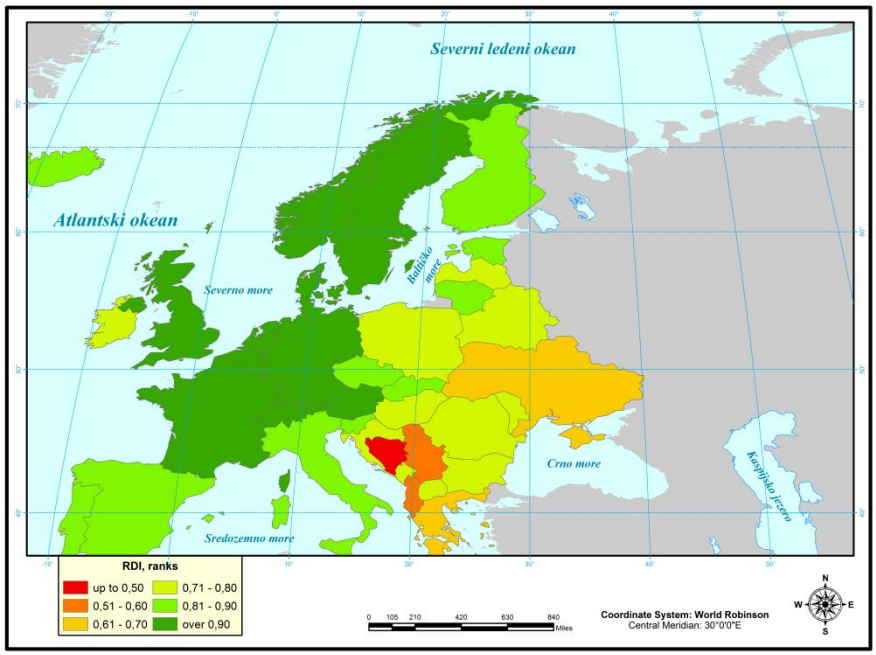

Fig. 3. European economic regions using RDI, 2013

The most developed countries in Europe, the North and West Europe, have GDP level per capita above the average for the EMU, and in case of Luxembourg even more than two times. Growth rates of GDP ranging from around 1% to below 3% (only Luxemburg has rates slightly higher than 4%). With the exception of Belgium and United Kingdom, their current account has surplus, which shows the state of countries' economic health and countries' foreign trade. However, the results in public finances are mixed. If we start from Maastricht's 60% of GDP as healthy value for general government gross debt, only four countries have lover level of indicator (general government gross debt as % of GDP). Unemployment rates are among the smallest in Europe, ranging from 3.2% in Norway to 9.9% in France. The level of financial sector development is described by data on bank intermediation, capital adequacy, nonperforming loans, and stock market capitalization. Generally, European financial systems are more bank centric, which means that companies mostly rely on bank credits as a source of external financing. Financial markets are the most developed in the group of richest European countries-they have the highest average stock market capitalization ratio as a group, although individual data may be vary.

These high scored economic indicators, are followed by high scored social indicators (SCI): very high life expectancy at birth which range for all country between 80.5 (Belgium) to the 82 years (Norway and Sweden), physicians per 1,000 people which range from 2.7 in France up to 4.1 in Norway and employment in agriculture which is expectedly very low (from 1.4% in Belgium up to 3.9% in Switzerland). All these countries are immigration destinations with relatively low population growth rate, but very high performance in educational population structure.

According to the obtained RDI rank, the most of Southern European countries belong to the second group of developed countries (exceptions are Greece and Cyprus). However, several countries from East Europe are classified into this group, also (Slovenia, Czech Republic, Slovak Republic, Estonia, and Lithuania) and two from the North European region (Finland and Iceland). At first looks, it seems unusual that some East European countries "moved" to the group of countries that are named as "developed", these five Eastern countries have the best economic and social performance in the analyzed year. Finland, on the other hand, as a country which has been always regarded as one of the most developed one, found itself in this group because of some low performed economic indicators (negative level of the GDP growth as the consequence of economic and debt crisis in Europe, negative current account balance), and some social indicators (physicians per 1,000 people is 2.9 which is lower than some other Northern countries; some of the East European countries have much higher performance in this indicator than Finland: Czech 3.6, Slovakia 3.2, Estonia 3.2, and Spain with 4.8 is the recorder in this indicator).

The average GDP per capita for this group is around 80% of EMU indicator. The best performers within this group are North European countries (slightly above Euro zone average). Current account of the countries in this group is positive, which means they are net lenders, but average surpluses are significantly lower than in the group of the most developed countries. Unemployment rates vary significantly: Northern countries, together with Czech Republic and Slovenia, have unemployment rates below 10%, and in Spain the rate of unemployment exceed even 25%. Concerning the government finances, the highest indebtedness is in South Europe countries, reaching more than 130% of GDP.

With the exception of Slovenia (consequence of financial crisis), the Eastern European countries of this group have very sound government finances. But, on average, the development level of financial sector is significantly lower than in the group of the most developed countries. The large differences exist between countries concerning the ratio of nonperforming loans. In the worst situation are problematic EMU countries - Italy, Portugal, Slovenia and partly Spain, whose banks have the largest proportion of bad loans. On the other hand, the Southern countries have the highest value of ratio of stock market capitalization, together with Finland, while in Eastern Europe countries and Iceland financial markets are significantly less developed.

Demographic indicators (DTI) indicate that some of the countries have negative population growth (Estonia, Lithuania, Portugal, and Spain) and by the rule, all of them have negative net migration (emigration countries). Slightly positive trend of net migration shows Czech Republic and Slovakia as a results of good economic performance (once, during the transition period these countries were emigration destination, too). By the SCI, Southern European countries show high performance in the case of Southern countries (life expectancy is above 80 years, maybe because of Mediterranean diet type, than in the East European countries where ranging from 73-76 years).

According to DEA calculation, the most diverse economic region in Europe is the East European region. Some countries have better economic performance than others, so the analysed sub-indexes classified them into the higher developed group (second group). However, the East European region as a whole consists of the less developed countries, followed with two South European countries, Greece and Cyprus (consequence of the World economic crisis), and even one West European county–Ireland (in the case of Ireland some indicators such GDP per capita is almost three times higher than average value of the indicator for Eastern countries, but some others are quite bad as a consequence of the last crisis). This lagging of the East European region behind the West is a consequence of its historical and economic past: they were communist or socialist countries which entered the transition process at the end of the twenty century. Transition process was very painful and the transition recession in central European economies lasted three to four years. They started to recover after 1993 or even earlier in some cases. The level of GDP per capita fell most in Slovakia: in 1993 it reached some 75% of 1989 ratio. From three Baltic countries, Estonia was the most successful one with GDP per capita reached 75% of the 1990 level (Historical Statistics of the World Economy, 2008), after which the economy started to growth, with the growth rates reaching in some years more than 10%. In Latvia and Lithuania, the recession was much severe, with the drop in GPD per capita by 45%. After that, in the second half of 1990s and during 2000s, until World economic crisis, both countries had very high growth rates.

Today, average GDP per capita for Eastern Europe countries in this group of countries is slightly above a half of average value of ratio in previous group (developed countries). GDP growth rates are very heterogeneous, ranging from -6,6% in Ukraine (not just due to economic factors), up to 5.2% in Ireland and 4.8% in Moldova. On the contrary to the previous two groups of countries, current accounts in the third group are negative, with the exception of Hungary, Bulgaria and Croatia. In the case of Montenegro deficit reaches more than 15% of GDP, which is quite worrisome situation. Montenegro uses euro instead of national currency, and the outflow of money from the circulation might cause deflation with serious consequences on economic activity. With the exception of

Croatia and Hungary, other Eastern European countries have very healthy public finances. The large disparities within the group are considering the ratio of unemployment, too. The lowest ratio has four Eastern countries: Moldova, Belarus, Romania and Ukraine (close to the levels in the most developed group). On the other side, the highest level is in Greece (more than 24% and Montenegro, almost 20%). The rest of the countries in the third group have unemployment rate from 10-15%.

The countries, such as Ireland and Cyprus, found themselves in this group, improved their finance and economy according to the analysed year (they do not use European rescue packages any longer, but still have very high level of ratio concerning general government gross debt, and Greece is the country with the highest level of this indicator in Europe). Social indicators (life expectancy for both country is around 80 years, while the rest of the group is ranging from 74-75 years; physicians per 1,000 people is lower 2.3 – 2.7, while in some countries of this group is unexpectedly high, such as Greece 6 or Portugal 4).

The last group of countries, the laggards, consists of three East European countries: Serbia, Albania and Bosnia and Herzegovina. The transition process from socialism to capitalism in these countries was more problematic than in other in Europe, especially in the case of Yugoslavia (disintegration of country and the civil war). The disintegration of the Yugoslavia had very huge economic consequences for all ex-Yugoslav republics: interruption of economic cooperation, loss of markets and production cooperates in other republics (now independent states), loss of markets in the countries of Eastern Europe that have entered the process of transition, civil war in one part of ex-Yu area, United Nation sanctions, military interventions. All these things have led to a drastic losses of GDP in all of them (in the beginning of 1990s, the decline in GDP was enormous, reaching in 1993 only 40% of level in 1989 in Serbia and Montenegro (Garfield, 2001), 60% in Croatia, 70% in FYR Macedonia, while in Bulgaria and Romania transition recession resulted in GDP level in 1992 of slightly above 75% of 1989 level) (The United Nations Economic Commission for Europe [UNECE], 1999). While some of the West Balkan countries, such as Croatia and FYR Macedonia did some better economic performance up to nowadays, Albania, Serbia and Bosnia and Herzegovina legged behind. They are facing the problems of low competitiveness they were supposed to resolve in previous decade (Ristić, et al, 2010).

Together with Albania, where GDP per capita was 64% of the level in 1990, the lowest GDP growth rate was in Bosnia and Herzegovina (Historical Statistics of the World Economy, 2008). The average growth rate of these three countries was above 5% until 2009. Unfortunately, that growth was not soundly based. Western Balkan countries followed growth model based on demand which was financed with cheap foreign loans, privatization revenues and remittances. Neither of these flows was used to create export capacities. Even after the democratic political changes in some countries like Serbia, after 2000, political factors and political (in) stability still play an important role in attracting FDI (Trifunović et al, 2009).The goal of government when privatizing former state-owned enterprises was higher current income for financing budget deficit and not the modernization of production capacities and maintaining the employment. Moreover, one of the reasons for suboptimal level of revenues from privatization was a bad choice of auctions for selling state-owned firms (Trifunović 2010, 2011).Domestic banking sectors and other financial institutions were largely privatized, which enabled households and

firms the access to sizeable sources of financing. Domestic saving was not sufficient to cover demand, so opening the region to foreign funding brought sizeable capital inflows and significant current account deficits. The banks mostly invested in the national debt and consumer credit rather than productive investments. This means that stronger credit activity didn't bring to higher productivity growth and the creation of strong export base, and has as a consequence lower long- run growth capacity. For the countries in South-East Europe and especial Western Balkan, remittances were and still are important source of financing, reaching more than 20% of GDP in Bosnia (Popović, 2010). Unfortunately these flows are not used for capital formation, but the consumption of households or eventually small commercial or service stores.

Today, GDP per capita is around a quarter of EMU average for Albania and Bosnia, and one third for Serbia. Growth rates are small, in the case of Serbia negative. In Serbia and Bosnia unemployment rates are significantly higher than 20% and in Albania it is around 14%. Bosnia's general government gross debt is well below 60% of GDP, but Serbia's and Albania's exceeded that threshold. Financial sector is the least developed in this group of countries. They also suffer from very large negative current account balance, as a signal for bad economic health. Small level of Gross domestic savings as percentage of GDP, in case of Bosnia even negative, shows bad development outlook.

Considering social and demographic indicators (SCI and DTI), this three countries differ drastically even between themselves: Albania shows the lowest performance (very similar to Moldova), and Serbia and Bosnia and Herzegovina are not so bad in the SCI (0.6 – 0.7). However, all three have very low economic indicators which are, among other factors, the consequence of the lack adequate development model (in the case of Serbia macroeconomic stability index is relatively high, but financial sector has very low performance) (Popovic, 2016). If something does not quickly change within these countries, all of them will become a very distant European periphery for a very long time.

Conclusion

The European economic space is quite heterogeneous. The economic regions themselves are very dynamic. Their classification is also complex and includes, not only the structure analysis, but also the dynamism of the system and interrelations between the structural elements as well. They have been changing continuously under the influence of the different factors, so the use of appropriate methodology for the economic regionalization is the constant challenge in the geographical science.

Encompassing different economic, demographic and social indicators, Data Envelopment Analysis (DEA) was chosen as the lead methodology for identifying regional disparities across the European economic space as well as within the European economic region. It is based on composite index calculation (Regional Development Index - RDI), which was the base for ranking European countries. The values of the calculated sub-indexes indicate the strong and weak sides of the corresponding aspects of country development and help setting up the further priorities for political intervention, not only in economic area but also in improving the society as well. This methodology could provide a comprehensive picture of the global competitiveness of the countries and their position on the evolutionary path towards the high economic performance of advanced economies.

Some countries show remarkable recovery from the crisis, fast economic progress and tend to "join" more advanced group (Ireland, Slovenia, Slovakia, and Check Republic). On the other hand, three countries that joined last to the EU (Bulgaria, Romania and Croatia) have quite weak economic performances. Some of the East European countries are facing the real hard political or economic time (the Ukraine crisis, Moldavia economic performances) and some are not interesting for integration within common European economic space (Belarus). It is clear that economic performances of Western Balkan countries, with the exception of Croatia, are at the very bottom of Europe. Those countries need a new model of development based on the cost/quality competitive production for export. At the moment, they are not able to stand the pressure from significantly more developed economies in Europe and this is going to be real challenge on their way of the process to EU accession. The RDI analysis could be considered as an appropriate tool for classifying objectives and priorities when designing development policies in the Western Balkans countries and evaluating their achievement (by comparing to other countries in the region and the European Union).

Having certain benefits as well as some disadvantages, DEA methodology could be considered as appropriate for regional disparities analysis as well as for evaluating certain economic and social achievement. The biggest benefits from using such approach in economic regionalization in the first place have the economic policy creators and decisions makers, then scientists in the field of development economics as well as economic geography. Further research would develop towards some methodological issues, reconsidering the structure of the sub-indexes, including some technological development component for each country, especially ICT adoption and affordability (digital divide) (Mitrović, 2015). Also, including temporal dimension in the DEA methodology would eliminate one big its disadvantage and provide comprehensive methodology for the economic regionalization including dynamic component as well.

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Appendix 1. Raw values data used to calculate RDI

Appendix 5-1

Country	Financial Development Index				Macroeconomic Stability Index				
	FD1	FD2	FD3	FD4	MS1	MS2	MS3	MS4	MS5
	Bank capital to assets ratio (%)	Bank nonperforming loans to total gross loans (%)	Domestic credit to private sector by banks (% ofGDP)	Stock Market Capitalizationto GDP (%)	GDP per capita PPP (constant 2011 international $)	Unemployment,total (% of total labor force) (modeled ILO estimate)	Current account balance(% of GDP)	Gross domestic savings (% of GDP)	General government gross debt (% of GDP)
Albania	9.00	22.80	37.26	0.00	10122.04	16.10	-12.82	5.57	72.04
Austria	6.84	3.47	88.20	25.58	43871.72	5.00	1.90	26.51	84.25
Belarus	13.32	4.37	22.90	0.00	17348.06	8.50	-6.86	34.77	106.57
Belgium	6.63	4.18	58.27	48.91	40777.78	11.60	-0.22	23.94	37.33
Bos. & Herz.	14.38	14.17	54.77	13.54	9698.58	27.90	-7.47	-4.61	44.77
Bulgaria	11.57	16.75	59.52	14.14	16363.05	5.90	1.22	20.57	44.03
Croatia	14.04	16.71	69.30	39.58	20033.11	4.50	0.78	20.23	26.43
Cyprus	10.31	44.87	251.37	18.65	29452.89	15.60	-4.53	14.68	10.37
Czech Rep.	7.30	5.61	50.44	18.72	28674.81	6.20	0.21	31.97	86.53
Denmark	7.31	4.40	176.77	62.43	43156.83	5.00	6.19	25.96	59.30
Estonia	11.60	1.39	67.53	8.81	26593.51	6.60	0.98	31.38	108.19
Finland	4.28	0.50	93.56	49.01	38577.21	24.70	-0.99	20.37	42.17
France	5.28	4.16	94.84	62.35	37052.66	7.70	-0.97	20.60	95.34
Germany	5.61	2.34	79.63	35.83	43552.29	8.60	7.27	26.05	74.48
Greece	8.06	33.78	116.68	18.25	24518.60	9.90	-2.07	9.67	180.06
Hungary	9.10	15.62	43.45	17.13	23723.25	6.30	1.96	29.48	76.18
Iceland	20.30	2.50	98.83	14.13	41262.04	26.30	3.62	23.05	82.51
Ireland	12.70	20.65	83.15	35.64	48383.66	16.70	3.55	38.66	31.43
Italy	5.88	18.03	89.38	21.91	33341.04	7.80	1.80	19.22	59.91
Latvia	10.07	4.60	51.44	4.28	22038.47	11.60	-2.00	21.23	67.95
Lithuania	12.91	8.19	40.97	11.76	25786.34	5.00	3.48	20.25	27.94
Luxembourg	6.50	0.21	91.62	149.29	91368.11	12.50	5.47	51.72	132.53
Macedonia	10.82	10.81	48.59	6.10	12291.49	11.30	-0.92	13.17	50.49
Moldova	13.17	11.73	34.12	0.00	4762.64	6.10	-7.07	-10.93	38.59
Montenegro	14.16	16.78	51.29	76.77	14533.96	10.00	-15.23	0.38	40.68
Netherlands	5.37	2.98	115.95	72.79	45662.07	3.40	8.89	29.50	130.17
Norway	6.80	1.13	111.95	54.11	64161.49	27.90	11.94	37.48	22.92
Poland	8.94	4.82	52.24	31.75	23953.66	19.10	-2.04	21.66	40.50
Portugal	7.67	11.89	129.42	30.43	26174.86	6.90	0.09	15.52	38.25
Romania	7.38	13.94	31.15	7.84	19133.91	3.40	-0.48	24.93	72.01
Serbia	20.67	21.54	43.40	9.34	12712.46	9.20	-5.96	6.65	53.90
Slovak Republic	11.86	5.35	50.14	5.05	26469.90	14.20	0.18	24.59	53.90
Slovenia	8.20	11.73	54.99	15.89	28156.30	7.00	6.24	27.64	80.89
Spain	7.24	8.45	129.47	75.89	31749.72	22.20	0.93	22.27	99.29
Sweden	5.10	1.24	131.83	99.26	43976.29	13.30	5.35	27.44	44.78
Switzerland	6.33	0.72	171.12	182.40	55270.98	9.50	8.78	34.79	45.66
Ukraine	11.23	18.98	60.59	20.17	8238.32	8.00	-3.49	9.99	70.31
United King.	5.62	1.76	138.88	118.69	38084.8	7.70	-4.67	15.59	87.94

Appendix 6-2

Country	Demographic Trends Index					Social Conditions Index		
	SC1	SC2	SC3	SC4	SC5	DT1	DT2	DT3
	Population growth (annual %)	Mortality rate, infant (per 1,000 live births)	Net migration	Urban population (% of total)	Age dependency ratio (% of working-age population)	Life expectancy at birth, total (years)	Physicians (per 1,000 people)	Employment in agriculture, male (% of male employment)
Albania	-0.10	12.90	-91750	57.41	44.81	77.83	1.15	34.40
Austria	0.73	3.00	147089	65.97	49.18	81.34	4.83	4.40
Belarus	0.18	3.50	120535	76.67	42.96	72.98	3.93	13.10
Belgium	0.43	3.40	269998	97.86	54.25	80.59	4.89	1.40
Bosn. & Herz.	-0.16	5.40	-2506	39.77	40.73	76.43	1.93	21.71
Bulgaria	-0.57	9.70	-50000	73.95	51.91	75.41	3.87	9.00
Croatia	-0.41	3.80	-20000	58.96	51.12	77.33	3.00	10.00
Cyprus	1.05	2.60	35000	66.92	41.64	80.13	2.33	5.90
Czech Rep.	0.11	2.90	29999	72.99	49.52	78.28	3.62	3.60
Denmark	0.51	3.00	96839	87.68	55.86	80.55	3.49	3.60
Estonia	-0.26	2.50	-11850	67.54	53.49	77.24	3.24	5.30
Finland	0.41	2.00	107409	84.22	58.27	81.13	2.91	5.50
France	0.79	3.60	331555	79.52	60.27	82.37	3.19	3.80
Germany	-1.41	3.20	1249998	75.30	51.81	80.84	3.89	1.70
Greece	-0.67	3.70	-136299	78.01	56.25	81.29	6.17	13.50
Hungary	-0.27	5.30	29999	71.23	47.88	75.87	3.08	6.30
Iceland	1.11	1.60	-378	94.14	51.59	82.06	3.48	6.30
Ireland	0.41	3.10	-140001	63.24	53.66	81.15	2.67	9.90
Italy	0.92	3.00	528269	68.96	56.54	82.69	3.76	4.30
Latvia	-0.94	7.20	-73442	67.38	52.18	74.19	3.58	10.40
Lithuania	-0.86	3.60	-169529	66.51	50.07	73.97	4.12	11.50
Luxembourg	2.36	1.60	48704	90.16	43.71	82.21	2.90	1.80
Macedonia	0.15	5.20	-4999	57.10	41.39	75.34	2.63	17.90
Moldova	-0.06	13.90	-9529	45.00	34.57	71.46	2.98	32.10
Montenegro	0.10	4.60	-2412	64.03	47.71	76.18	2.11	6.50
Netherlands	0.36	3.30	110006	90.50	53.27	81.30	4.14	2.60
Norway	1.13	2.20	235665	80.47	52.21	81.75	4.28	3.20
Poland	-0.07	4.50	-73809	60.54	43.84	77.25	2.22	12.20
Portugal	-0.54	3.00	-140000	63.47	53.48	80.72	4.10	7.00
Romania	-0.37	10.10	-437201	54.56	48.89	75.06	2.45	25.20
Serbia	-0.47	6.00	-99999	55.55	50.11	75.53	2.11	22.40
Slovak Rep.	0.10	6.10	1199	53.60	40.78	76.71	3.32	4.90
Slovenia	0.10	2.20	4324	49.65	48.71	80.52	2.52	7.70
Spain	-0.30	3.60	-593069	79.58	50.76	83.08	4.95	5.90
Sweden	0.99	2.40	272626	85.82	59.30	81.96	3.93	2.50
Switzerland	1.22	3.50	382267	73.91	48.85	82.85	4.05	3.90
Ukraine	-0.28	8.10	195000	69.70	43.34	71.19	3.54	16.50
United King.	0.75	3.70	900000	82.59	55.12	81.06	2.81	1.50

Source: World bank database, http://data.worldbank.org/indicator, [Accessed 21 December 2016]; http://data.worldbank.org/data-catalog/global-financial-development, [Accessed 4 November 2016]

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ЕВРОПСКИ ЕКОНОМСКИ ПРОСТОР: НОВИ ПОГЛЕДИ НА РЕГИОНАЛИЗАЦИЈУ

Резиме: Европски континент је веома разноврстан, како у погледу физичко-географских и демографских одлика, тако и по питању економских и социјалних карактеристика. Током релативно дуге историје, различити процеси су обликовали су економију и становништво Европе, стварајући један веома динамичан систем. Управо због те динамичности, пре свега у економском смислу, питање регионализације европског континента остаје једно од сложенијих са којим се суочава савремена наука. Једном постављена и општеприхваћена географска регионализација Европе, не одговара више у највећем делу постојећим социоекономским приликама, али и разликама између европских региона.

Овај рад пружа један потпуно нов поглед на економску регионализацију, користећи методологију базирану на примени структурне анализе података (енгл. Data Envelopment Analysis -DEA). Изабран је сет одређених економских (финансијских и макроекономских) показатеља, потом демографских и социјалних индикатора и прорачунат композитни индекс – регионални развојни индекс (енгл. Regional Development Index - RDI), прорачунавајући прво за сваку од наведених категорија засебне суб-индексе. Ова методологија је примењена првенствене у циљу детектовања регионалних разлика у оквиру постојеће економске регионализације Европе, а иначе је веома корисна као ефикасан инструмент у евалуацији регионалних и економских политика.

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