

Socio-Economic Development in the EU: A Multi-Criteria Analysis

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Abstract

Socio-economic development of EU countries has been and remains a constant concern of specialists in the field in recent years, reflected in a country's welfare analysis by socio-economic factors. The study shows that while some European Union countries have a high level of GDP, it lags behind other countries if we consider other indicators showing the level of socio-economic development.

The paper evaluated and compared disparities between the 28 EU countries based on a set of indicators that combine relevant economic and social data. The indicators used in research provide insight into three key areas for sustainable development- economic development, innovation, competitiveness and employment.

The method used is that of real rank, resulting in a ranking of them according to the importance given to each indicator in terms of information content.

Keywords: *socio-economic development; socio-economic indicators; living standards; real ranks method*

JEL Classification: *C44; F02; I30; O11; O57.*

Introduction

The second half of the twentieth century brought to the fore a relatively new concept in terms of economic policy, namely economic and social development, aimed besides economic growth of a country and an increase in welfare, measured usually by per capita income. We can talk about socio-economic development only when we are witnessing a harmonious combination of economic growth and ensuring a better quality of life by solving problems faced by individuals.

Economic development is essential but not sufficient to ensure human welfare, covering material and social wellbeing, reported to a personal set of values (Felce et al., 1995).

In literature the concept of welfare it is defined as a state of wellbeing, a high quality of live.

Measuring the well-being and the quality of life for the population of a country requires and objectively and subjectively approach, an indicator of its performance, a concern at national and international level in the sight that governments establish socio-economic policies conducive to economic performance and social progress, simultaneously with the identification of the determinants factors of welfare (Böhnke et al., 2008).

Economic and social development of a country can be measured by several indicators sometimes arbitrarily chosen, which requires a multidimensional approach.

Economic growth is a priority, but it does not guarantee development and social welfare.

The level of development for a state is covering both economic growth and creates favourable conditions for solving social problems of individuals on long-term.

A priority objective of European Union Sustainable Development Strategy is to promote a competitive eco-efficient economy in order to ensure the welfare of citizens in the Member States.

Specialized studies conducted so far, regarding the level of development of a country, have focused either on economic indicators such GDP starting from the idea that a high level of it involves itself improved quality of social life of the community, or on the social indicators, namely level of employment, educational attainment, net migration rate. Or, the complexity of economic and social activity can't be assessed only by means of an indicator as shown by the studies.

Although GDP is a key indicator for assessing the living standards of the community, its scope is limited, being the foundation for modelling financial and monetary policy of a state, because it is not taken into account social inclusion, access to education and to the labour market, public health, costs of pollution, good governance, aspects that define the quality of life (Hobijn et al., 2001; Neumayer 2003, Marchante et al, 2006).

The drawbacks of using this indicator were highlighted by many economists, among which: William Nordhaus and James Tobin, John Talberth, Robert Costanza, Maureen Hart, Stephen Posner.

William Nordhaus and James Tobin in their paper "The Measurement of Economic and Social Performance" (1973) showed that GDP is an indicator of production and not for consumption, or the purpose of any economic activity is to satisfy the needs of individuals in terms of profit. With the help of MEW indicator (Measurement of Economic Welfare) they have demonstrated that there is a discrepancy between GNP and economic welfare because they are not taken into account the cost of economic growth.

The same conclusion was drawn by the economists John Talberth, Robert Costanza, Maureen Hart, Stephen Posner who in their paper "Beyond GDP: The Need for New Measures of Progress" (2009) shows that GDP expresses only the gross value of production of goods and services produced by the businesses that are operating in that country without taking into account social and environmental factors that contribute to the sustainability of economic growth.

This conclusion can be drawn from the report of the Stiglitz Commission on the "Measurement of Economic Performance and Social Progress" (2009) which recommended the assessment of welfare by taking into account the income and consumption rather than production. The Commission also believes that the appreciation of the economic and social welfare requires a well-identified dashboard of indicators.

There have been attempts to create synthetic indicators that capture key aspects of economic and social development of a country such as: Human Development Index (HDI) invented by the pakistani economist Mahbub ul Haq, updated each year by the United Nations Development Program and published in the Human Development Report, index of sustainable economic welfare (ISEW), genuine progress indicator (GPI), green GDP (Green GDP), real wealth index(Genuine wealth), sustainable net benefit index (SNBI), OECD index of a better life, social progress index, personal well-being index, calculated since 2001, by the Australian Center for quality of life.

Although the aforementioned indicators capture the degree of economic development and social progress of a country, there is criticism regarding the subjectivity in choosing variables that formed the basis of their construction, the positive correlation between the elements analysed, and in connection with their scope, stating that are able to identify only parts of the standard of living.

The association between a state's economic development and social welfare of its citizens has been the subject of numerous studies (Cracolici et al., 2010, Milenkovic et al., 2014), based on approaches that involve non-economic issues aimed at the correlation between the two elements mentioned.

Real Ranks Method

Resource productivity is an important factor for increasing competitiveness, innovation development, environmental protection and employment.

Multi-criteria analysis appeared in the second half of the twentieth century as a tool for taking decisions based on several criteria, conduct a comparative analysis of the alternatives, allowing the hierarchy of options based on a set of techniques. With multi-criteria analysis we can group and combine different assessments who must be considered in the decision making process, as shown for the first time by Keeney and Raiffa in their paper "Decisions with Multiple Objectives: Preferences and Value Tradeoffs." (1993)

In practice there are a large number of multi-criteria analysis methods, the use of one or the other depends on the purpose of research, as stated by Adel Guitouni and Jean-Marc in their work „Tentative Guidelines to Help Choosing an Appropriate MCDA Method". (1998)

Within the multi-criteria analysis techniques we distinguish multicriteria ranking methods, used in developing regional rankings, and to compare a territorial unit to average level, being a useful tool in the elaboration of regional development strategies. Among these, we can mention: uniformly increasing rank method, sum rank method, the method of relative distance, real rank method and matrix method.

The real rank method takes into account the relative distances between the individual values of the indicators, giving different weights to them according to their relevance to the purpose of the investigation.

The first step is the selection of socio-economic indicators, followed by calculation of partial real ranks R_j^i , for each territorial unit "i" and for each indicator "j" setting a partially real rank, using different formulas depending on the significance of the indicator. Thus, in the case of indicators for which high level of them expresses a positive situation (for example net national income), the partial rank is determined using the following formula:

$$R_j^i = n - \frac{x_j^i - x_j^{min}}{x_j^{max} - x_j^{min}}(n - 1) \quad (1)$$

where:

x_j^i = the level of indicator "j" in the territorial unit "i";

x_j^{min} = the level of indicator "j" in the territorial unit with minimum performance;

x_j^{max} = the level of indicator "j" in the territorial unit with maximum performance;

n = number of territorial units;

m = number of indicators included in the research.

If the indicators express a negative situation (for example unemployment rate), the partial real ranks is calculated as follow:

$$R_j^i = n - \frac{X_j^{max} - X_j^i}{X_j^{max} - X_j^{min}} (n - 1) \quad (2)$$

where:

X_j^{min} = the level of indicator “j” in the territorial unit with maximum performance;

X_j^{max} = the level of indicator “j” in the territorial unit with minimum performance.

In this case, the territorial unit with maximum performance X_j^{min} receives rank 1, and the territorial unit with minimum performance will be located at the position with rank n .

Determination of partial ranks R_j^i for each indicator “s” it is made in the form of weighted average, that take into consideration the weight p_j of each indicator “j” according to its relevance for research.

Establishing the final real rank of each territorial unit “i” (\overline{R}_i) it is achieved as a weighted arithmetic average of the partial ranks using the formula:

$$\overline{R}_j = \frac{\sum_{j=1}^m R_j^i \times p_j}{100} \quad (3)$$

$i = 1, 2, \dots, n$

Drawing up the final classification of territorial units is performed from the lowest value of the final ranking, indicating the maximum performance, at the highest value thereof, which shows the minimum performance.

The Results

In order to determine the level of socio-economic development of EU countries and perform their hierarchy depending on their socio-economic potential, we used a set of four indicators (data provided by Eurostat website).

The selection of indicators was limited by the availability of data for all 28 EU member states, which prevented the use of other indicators.

In order to create a multi-criteria hierarchy of EU member states, we chose the following indicators expressing the degree of socio-economic development:

- net national income - represents total primary income receivable by resident institutional units in return for some engagement in productive activity;
- R&D expenditure-expressed as a percentage share of GDP allocated to research and experimental development;
- real effective exchange rate-aims to assess a country's competitiveness in terms of price or cost in relation to its main competitors in international markets (a rise in the index means a loss of competitiveness);
- unemployment rate- represent unemployed persons as a percentage of the labour force;

The values for indicators of socioeconomic development in the countries of the European Union in 2015 are presented in Table 1.

Table 1. Indicators of socio-economic development in the countries of the European Union in 2015

Country/Indicator	Net national income	Total R&D expenditure	Real effective exchange rate	Total unemployment rate
Unit of measurement	millions	% of GDP	Index (2005=100)	%
Austria	276638	3,07	104,19	5,7
Belgium	331035	2,45	102,41	8,5
Bulgaria	37812	0,96	155,25	9,2
Croatia	36408	0,85	92,77	16,1
Cyprus	15181	0,46	90,31	15,0
Czech Republic	120018	1,95	105,67	5,1
Denmark	235513	3,03	105,10	6,2
Estonia	16572	1,50	140,39	6,2
Finland	171543	2,9	106,98	9,4
France	1826611	2,23	99,76	10,4
Germany	2563108	2,87	93,30	4,6
Greece	141907	0,96	83,76	24,9
Hungary	85777	1,38	84,58	6,8
Ireland	142330	1,5	70,82	9,4
Italy	1337921	1,33	100,18	11,9
Latvia	18637	0,63	140,79	9,9
Lithuania	30815	1,04	110,16	9,1
Luxembourg	26859	1,31	109,92	6,5
Malta	7538	0,77	113,60	5,4
Netherlands	562228	2,01	99,48	6,9
Poland	364667	1,00	94,60	7,5
Portugal	144455	1,28	86,43	12,6
Romania	126184	0,49	99,35	6,8
Slovak Republic	61298	1,18	127,03	11,5
Slovenia	29690	2,21	101,96	9,0
Spain	885052	1,22	93,50	22,1
Sweden	380581	3,26	102,93	7,4
United Kingdom	2206934	1,7	96,20	5,3

Source: EUROSTAT, *Sustainable consumption and production*.

Given the different importance of the indicators selected for the research, in terms of their information content and on their impact on economic and social development, we assigned the following weights for aggregating the partial ranks: net national income-30%, total unemployment –rate-30%, real effective exchange rate-25%, total R&D expenditure-15%.

The high percentage given to the two indicators is due to the fact, that most of the researches on disparities between EU countries insist on net national income and unemployment rate, indicators associated with socio-economic development.

Based on the data presented in the Table 1, on socio-economic indicators in 2015, we proceeded to calculate partial real ranks and average rank, making the final classification of the European Union countries, as shown in Table 2.

Table 2. Calculation of partial real ranks, average rank and the establishing the final position

Country	Partial real ranks calculated for				Average rank	Final position
	Net national income	Total R&D expenditure	Real effective exchange rate	Total unemployment rate		
Austria	25,15	2,83	11,67	2,46	11,62	5
Belgium	24,58	8,81	11,10	6,18	13,32	10
Bulgaria	27,68	23,17	28,00	7,11	20,91	27
Croatia	27,69	24,23	8,01	16,29	18,83	24
Cyprus	27,91	28,00	7,23	14,83	18,82	23
Czech Republic	26,81	13,63	15,85	1,66	14,54	14
Denmark	25,59	3,21	11,96	3,12	12,07	7
Estonia	27,90	17,97	23,24	3,12	17,81	21
Finland	26,26	4,47	12,56	7,38	13,90	12
France	8,78	10,93	10,25	8,71	9,449	3
Germany	1,00	4,76	8,18	1,00	3,35	1
Greece	26,58	23,17	5,13	28,00	21,13	28
Hungary	27,17	19,12	5,40	3,92	13,54	11
Ireland	26,57	17,97	1,00	7,38	13,13	9
Italy	13,94	4,51	10,38	10,70	10,62	4
Latvia	27,88	26,36	23,37	8,04	20,57	26
Lithuania	27,75	22,40	13,58	6,98	17,17	20
Luxembourg	27,79	19,80	13,40	3,52	15,71	15
Malta	28,00	25,01	14,68	2,06	16,43	19
Netherlands	22,13	13,05	10,16	4,05	12,35	8
Poland	24,22	22,79	8,60	4,85	14,28	13
Portugal	26,55	20,09	5,99	12,03	16,08	17
Romania	26,76	27,71	10,12	4,32	16,01	16
Slovak Republic	27,43	21,05	18,97	10,57	19,55	25
Slovenia	27,76	19,25	10,95	7,25	16,12	18
Spain	18,72	20,67	8,25	24,67	18,18	22
Sweden	24,05	1,00	11,26	5,12	11,71	6
United Kingdom	4,76	16,04	9,11	2,33	6,80	2

Source: author own computation.

As determined by applying the method of real ranks, we can establish a ranking of EU countries by average rank whose value indicates the distance between states.

Examination of the hierarchy of the UE states reveals that the first places are held by: Germany, with an average rank of 3,35 points, United Kingdom with 6,80 points, France with 9,449 points and Italy with 10,62 points, while the last places are occupied by Slovakia with 19,95 points, Latvia with 20,57 points, Bulgaria with 20,91 points and Greece with 21,513 points.

Positioning on top of the states mentioned above can be explained by the high level of their net national income, compared to other states.

Also, the unemployment rate and real effective exchange rate values are low and spending on research and development are high.

As shown in the results there are large disparities between member states of the European Union in particular due to the financial crisis which reversed a long-term trend marked by the convergence of net national revenue and unemployment rate, the most affected countries are in southern Europe such as Greece, Croatia, Cyprus.

Significant differences between countries appear with regard to expenditure on research and development, due to the shift of expenditures to other areas of public interest, in some countries such as Cyprus, Romania, Croatia and Bulgaria.

Conclusions

Real ranks method is useful in synthesizing information provided by several indicators into one value that provides position in the rankings, but at the same time offers the possibility to measure the distance between states.

In this paper, the real ranks method was applied to measure the level of socio-economic development of countries in the European Union, based on a set of four indicators providing an overview of their welfare

From the values of these indicators, the calculations allowed to determine the average rank for each state, which allowed the measurement of wellbeing and ranking countries according to the level of socio-economic development.

The results of the research showed significant differences in terms of economic and social development of the countries from the northern and western part of EU, compared with countries in south-eastern European Union.

The method applied could prove useful in the analysis of regional disparities in the European Union.

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