Implementation of Europe 2020 Strategy - the taxonomic analysis

Iwona Müller-Frączek, Joanna Muszyńska 1*

Nicolaus Copernicus University, Gagarina St. 11, 87-100 Toruń, Poland

Purpose of the article The article concerns the implementation of the Europe 2020 Strategy. The main aim was to analyse the spatial diversity of countries in terms of the degree of implementation of the strategy and the progress that countries have made in this regard. An attempt was made to assess the relative developmental disparities between countries.

Methodology/methods The methods of multivariate statistical analysis were applied. To assess the degree of implementation of the strategy a dynamic version of Hellwig's synthetic variable method was used. The analysis of the disparities between countries was made with a dynamic measure of the relative taxonomy, proposed by Wydymus.

Scientific aim The scientific aim was to evaluate the progress made by countries in implementing the objectives of the strategy and the relative developmental disparities between Member States with particular attention to the countries that joined the EU in 2004.

Findings The study confirmed the strong differentiation of EU Member States. The majority of countries that joined the Community in 2004, has made significant progress and reduced the disparities compared to others. The countries, political leaders of EU (Germany, France, Great Britain, and Italy) have achieved rather disappointing results.

Conclusions Most of the countries made significant progress in achieving specific objectives such as increasing investment in R & D, reducing greenhouse gas emissions, increase the use of renewable energy and reducing the number of young people do not continue education. The biggest problem remains the fight against poverty and social exclusion. The evaluation of the progress made by individual EU members can not only help to identify good practices, but also to prevent making the same mistakes. The results of the study can be used by the European Commission as well as the institutions and authorities of the different countries of the Community to evaluate the progress made and to take appropriate actions.

Keywords: Europe 2020 strategy, multivariate analysis, Hellwig's synthetic variable method, relative taxonomy

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* Corresponding author. Tel.: +48566114784
E-mail address: Joanna.Muszynska@umk.pl.

Introduction

In 2000, the EU approved the so-called Lisbon Strategy, whose aim was to transform the Community into the most competitive and dynamic economy in the world, based on knowledge, capable of sustainable economic growth with more and better jobs and greater social cohesion (see: European Parliament, 2000). However, at the halfway point of the plan it turned out that the realization of its objectives has become very difficult, and the goals, for various reasons, unrealistic (see: High Level Group …, 2004). In addition, the economic crises in 2008-2009 highlighted the need for reform and determined the development priorities of the Community in the long run. Responding to these challenges, in 2010 the European Union adopted a new strategy. The aim of Europe 2020 Strategy is smart growth of the Community towards an economy based on knowledge and innovations; sustainable growth consisting in promoting a more resource efficient, greener and more competitive economy; inclusive growth that relies on fostering a high-employment economy delivering social and territorial cohesion (European Commission, 2010). The strategy identifies five main objectives of the EU, which guide the action of the Member States and the EU in terms of promoting employment, improving the conditions for innovation, research and development, reaching the objectives of climate change and energy, improving education levels and promoting social inclusion, in particular through the poverty reduction (Domańska 2010). The main targets of the Europe 2020 Strategy are:

- increase the employment rate of people aged 20-64 to 75%,
- 3% of EU's GDP for investment in research and development,
- the achievement of the objectives of "20/20/20" climate and energy - reducing greenhouse gas emissions by 20% compared to 1990, increasing to 20% the share of renewable energy in overall energy consumption and increase energy efficiency by 20%,
- improving education levels by reducing the share of early school leavers to below 10% and increase to at least 40% the percentage of people aged 30-34 with a university degree or equivalent,
- poverty reduction by decreasing the number of people at poverty at risk at least by 20 million.

The implementation of the main targets identified in the strategy and national targets set by the Member States is monitored by the Europe 2020 indicators collected by Eurostat.

The article concerns the implementation of the Europe 2020 Strategy. The main aim of the study was to analyse the spatial diversity of countries in terms of the degree of implementation of the strategy and above all the progress that countries have made in this regard. An attempt was made to assess the relative developmental disparities between countries in the implementation of the strategy. Special consideration was paid to countries of the biggest enlargement of EU, i.e., the countries that joined the Community in 2004.

The study covers the years 2005-2014 and refers to 28 countries members of EU. However due to the lack of the data Croatia was excluded from the analysis till 2010 year. The study was carried out on the basis of synthetic measures. The synthetic variables were calculated on the values of Europe 2020 indicators. During their construction all the indicators were considered equally valid.

In order to consider the different ways of assessing the situation in individual countries three types of synthetic measures were created. At the beginning, according to the idea proposed by S. Wydymus (2013), for each country (and each year) the situation of the country with respect to all the others was analysed. It allowed obtaining the relative synthetic evaluation of the development of individual EU countries in terms of main aspects described in the strategy. At the next steps the approach proposed by Z. Hellwig (1968) was applied. The Hellwig's method consists in the introduction of a hypothetical object (pattern) with the best values of all diagnostic variables achieved by countries. In this approach the synthetic measure of development is formed on the basis of the distance between the object and the pattern. This approach was applied in two ways. At first the values of Europe 2020 indicators were adopted as the diagnostic variables. In the next step, in order to create the determinants the national targets were used. The study allowed evaluating the progress that countries have made in the implementation of the strategy in the subsequent years of the analysis. In addition, the synthetic measures allowed creating the appropriate rankings of countries.

1. Methods of research

Collected by Eurostat the Europe 2020 indicators constituted the basis for assessing the level of implementation of the strategy. In the study, every single indicator was denoted as x_{ijt}, where i - number of the country, j - variable, t – year. Since the level of fulfilment of objectives is described with wide set of indicators it should be considered as a complex phenomenon. In that case, comparing countries requires the use of methods of multidimensional comparative analysis (Panek and Zwierzchowski, 2013). In the study two methods were used: a dynamic measure of the relative taxonomy developed by Wydymus and Hellwig's synthetic variable method in

dynamic version. The relative taxonomy method is discussed, inter alia, by Wydymus (2013), Lira (2015), and Lira et al. (2014). The synthetic measure of development method is described in the literature, among others, by Hellwig (1968), Grabiński et al. (1989) and in English by Olczyk (2014).

1.1. Wydymus dynamic measure of the relative taxonomy

The method consists of constructing relative synthetic measures. Since among the diagnostic variables both benefit and negative variables can be found at the first step all the determinants are converted into stimulants. Then the values of individual variables for each object and each time period are relativized according to the formula:

$$d_{(l/i)jt} = x_{ljt}/x_{ijt}. \tag{1}$$

The value of index d higher than 1 informs about the relative advantages of the country l over the country i. All relative indices d constitute a matrix D that shows the relation between the pairs of objects in respect of all individual variables in subsequent years. The synthetic, quantitative assessment of the level of development of the country, including all the considered aspects, presenting the situation of the country in relation to all others is obtained on the basis of the matrix D^* calculated in accordance with the formula:

$$D^*_{jt} = \begin{bmatrix} 0 & & \frac{1}{k-1} \\ & \text{O} & \\ \frac{1}{k-1} & & 0 \end{bmatrix} \cdot \begin{bmatrix} 1 & d_{(2/1)jt} & \Lambda & d_{(k/1)jt} \\ d_{(1/2)jt} & 1 & \Lambda & d_{(k/2)jt} \\ \text{M} & \text{M} & \text{O} & \text{M} \\ d_{(1/k)jt} & d_{(2/k)jt} & \Lambda & 1 \end{bmatrix}. \tag{2}$$

Diagonal elements of this matrix (denoted as w_{ijt}, i=1,...,k) are the basis for the construction of relative taxonomic measures:

$$W_{it} = \frac{1}{m}\sum_{j=1}^{m}\frac{1}{w_{ijt}}. \tag{3}$$

In case of countries with similar level of development the value of the measure is close to 1. The values of W_{it} smaller than 1 signify relative advantage of the country i over the others in period t. The lower value of the measure W_{it} the better is the situation of the country i over the others.

1.2. Hellwig's synthetic variable method

Hellwig measure of development is a synthetic variable created due to aggregation of diagnostic variables that describe the investigated phenomenon. To make this process possible all the determinants were standardized. Due to the dynamic nature of the analysis, for the normalization process, the averages and standard deviations of variables were calculated on the basis of observations for all objects throughout the study period.

Then a pattern, i.e. a hypothetical object with maximum values of variables in the case of stimulants and minimum for destimulants was constructed. Just as it was during standardisation, the values of the variables for the pattern were set on the basis of observations for all objects throughout the study period (Zeliaś, 2000).

In the next step, the Euclidean distances of the countries to the pattern were calculated. Upon the value of the distances Hellwig's measure of development was created. The measure was constructed in accordance with the formula:

$$H_{it} = 1 - \frac{d_{it0}}{d_{t0} - 2s_{t0}}, \tag{4}$$

where d_{it0} is the Euclidean distance of the country i to the pattern, d_{t0} means the average distance of the countries to the pattern in the year t, and s_{t0} is the standard deviation of the distance of the countries to the pattern in the year t.

The values of the synthetic measure, obtained according to the formula no. 3, mostly belong to the closed interval [0; 1]. Its higher values mean the higher level of development of the country in the terms of the analysed complex phenomenon.

The applied research methods made it possible to assess the level of implementation of the strategy in the terms of the Europe 2020 indicators. An individual situation of each country in this regard was evaluated with Hellwig's measure of development. The use of relative taxonomy method enabled to estimate the relative dispari-

ties between countries. In both cases, dynamic approach allowed for assessment of the progress that countries have made in the considered period.

2. Empirical material

The study was carried out with the use of Europe 2020 indicators, collected by Eurostat (Eurostat (a)). There were 4 stimulants (S) and 5 destimulants (D):

X1 - the employment rate of people aged 20-64 in total (% of population) – S,

X2 - expenditure on R & D (% of GDP) – S,

X3 - greenhouse gas emissions (base year 1990) – D,

X4 - the share of energy from renewable sources (%) – S,

X5 - primary energy consumption in million tons of oil equivalent to 100 thousand population – D,

X6 - early leavers from education and training (% of population aged 18-24) – D,

X7 - people with higher education aged 30-34 years (%) – S,

X8 - people at risk of poverty or social exclusion (% of population) – D,

X9 - people living in households with very low work intensity (% of population below 60 years of age) – D.

Two other indicators available in Eurostat base have been omitted because of the strong correlation with the others.

The whole period of the study was divided into two sub-periods: 2005-2009 - before the announcement of the strategy and 2010-2014 - the period of its implementation. The results for the sub-periods are not comparable because the data for Croatia have been available only since 2010. In the first five-year period the situation of only 27 countries was examined.

The data on strategic objectives for the individual countries and the levels of their fulfilment that were used in the last study were gathered from the annex to the Europe 2020 Strategy (Eurostat (b)) and from reports worked out each year by countries (Eurostat (c)). Since the individual targets were specified only in case of the indicators X1-X8 the last analysis was limited only to them. Due to the specific formula of individual targets in some countries, the analysis was able to be carried out only for year 2014. In case the target for the country was not specified, it was estimated on the basis of a common goal for the entire Union.

3. Results of the study

At the first stage of the study the degree of implementation of the Europe 2020 strategy was evaluated in accordance with the idea of relative taxonomy. The situation of individual countries was assessed with respect to all other members of the Union in the subsequent years. The values of the synthetic measure (denoted W) and the rankings of countries are presented in table no.1. The tendency of changes between the beginning and the end of the subperiod is shown in column labelled as trend. The higher value of the measure the lower level of development of the country in relation to the others. Bold lines indicate the countries that joined the EU in 2004.

In the first subperiod the countries for which the relative measure has decreased slightly predominate. However, it not always takes effect into improving the rankings. For example, the situation of Belgium in relation to all EU countries improved slightly, but there were several countries that develop faster and overtook her in the standings.

In the second five-year period the countries where the situation has deteriorated predominate considerably. The weak position of Malta is particularly evident. In the first period the value of its measure is several times higher than the measure of the best country. In the second five-year period, due to a substantial increase in the share of energy from renewable sources, the value of the measure firmly declining, however, it is still considerably higher than in other countries. The leaders in term of strategy fulfilment are Sweden, Slovenia and Denmark. These countries have occupied leading positions in the rankings. However, in the second period the measures for these countries increased slightly, suggesting that their advantage over other countries in the EU begins to wane.

The analysis of the situation of the countries that joined the EU in 2004 has revealed the strong heterogeneity of the group. There are countries as Slovenia and Lithuania with the high level of development in terms of the fulfilment of the strategy and the countries as Malta and Cyprus where the level is very low. However, the situation most of them has improved in the first investigated subperiod. In this group Poland stands out with the improvement of both the value of the measure and the ranking position. The analysis can be elaborated by considering the relative indices that show the relation between the pairs of objects in respect of all individual variables in subsequent years.

Table 1 The relative measures of the Europe 2020 strategy implementation

country	measure W in subperiod 2005-2009					trend	rankings					trend
Austria	0,77	0,80	0,81	0,84	0,81	down	5	7	8	8	8	up
Belgium	1,00	0,98	0,96	0,96	0,94	up	17	14	13	14	14	down
Bulgaria	1,23	1,24	1,28	1,11	1,07	up	26	26	26	24	24	up
Cyprus	**1,12**	**1,10**	**1,08**	**1,13**	**1,08**	**up**	**22**	**22**	**23**	**26**	**26**	down
Czech Republic	**0,89**	**0,9**	**0,90**	**0,88**	**0,83**	**up**	**11**	**11**	**11**	**11**	**11**	
Denmark	0,68	0,71	0,76	0,75	0,75	down	1	2	4	2	2	down
Estonia	**0,81**	**0,75**	**0,79**	**0,77**	**0,77**	**up**	**8**	**4**	**5**	**5**	**5**	**up**
Finland	0,78	0,81	0,81	0,80	0,82	down	6	8	7	6	6	
France	0,77	0,79	0,80	0,81	0,81	down	4	6	6	7	7	down
Germany	0,82	0,87	0,84	0,87	0,84	down	9	9	9	9	9	
Greece	0,98	1,02	1,03	1,04	1,04	down	14	20	20	20	20	down
Hungary	**0,95**	**0,99**	**0,96**	**0,99**	**0,96**	**down**	**12**	**16**	**14**	**15**	**15**	**down**
Ireland	0,98	0,97	0,99	0,99	1,07	down	15	13	16	16	16	down
Italy	1,05	1,06	1,05	1,08	1,05		21	21	22	23	23	down
Latvia	**0,97**	**0,93**	**0,90**	**0,91**	**1,01**	**down**	**13**	**12**	**12**	**12**	**12**	up
Lithuania	**0,80**	**0,78**	**0,74**	**0,76**	**0,79**	**up**	**7**	**5**	**3**	**3**	**3**	**up**
Luxembourg	1,16	1,15	1,05	1,06	1,03	up	24	24	21	21	21	up
Malta	**4,10**	**4,33**	**4,97**	**5,42**	**6,16**	**down**	**27**	**27**	**27**	**27**	**27**	
Netherlands	0,89	0,9	0,88	0,87	0,86	up	10	10	10	10	10	
Poland	**1,04**	**1,02**	**0,97**	**0,93**	**0,88**	**up**	**20**	**19**	**15**	**13**	**13**	**up**
Portugal	1,13	1,12	1,10	1,07	1,07	up	23	23	24	22	22	up
Romania	1,19	1,18	1,14	1,12	1,16	up	25	25	25	25	25	
Slovakia	**1,00**	**1,01**	**1,00**	**1,00**	**0,97**	**up**	**18**	**18**	**17**	**18**	**18**	
Slovenia	**0,75**	**0,72**	**0,73**	**0,77**	**0,73**	**up**	**3**	**3**	**2**	**4**	**4**	down
Spain	1,00	1,00	1,02	1,03	1,06	down	16	17	19	19	19	down
Sweden	0,70	0,68	0,67	0,68	0,69	up	2	1	1	1	1	up
United Kingdom	1,02	0,99	1,01	0,99	0,99	up	19	15	18	17	17	up
country	**measure W in subperiod 2010-2014**					**trend**	**rankings**					**trend**
Austria	0,83	0,85	0,82	0,83	0,81	up	5	7	5	6	6	up
Belgium	1,01	1,02	1,02	1,03	1,05	down	16	17	16	16	16	
Bulgaria	1,09	1,16	1,17	1,15	1,10	down	21	25	24	22	22	down
Croatia	1,01	1,05	1,08	1,00	0,95	up	15	18	18	14	14	up
Cyprus	**1,17**	**1,19**	**1,26**	**1,22**	**1,23**	**down**	**25**	**26**	**26**	**25**	**25**	
Czech Republic	**0,84**	**0,83**	**0,83**	**0,82**	**0,84**		**7**	**5**	**6**	**5**	**5**	**up**
Denmark	0,79	0,78	0,77	0,78	0,78	up	3	3	3	3	3	
Estonia	**0,81**	**0,81**	**0,81**	**0,85**	**0,91**	**down**	**4**	**4**	**4**	**7**	**7**	**down**
Finland	0,86	0,86	0,84	0,86	0,90	down	9	8	8	9	9	
France	0,86	0,87	0,86	0,85	0,89	down	8	9	9	8	8	
Germany	0,88	0,87	0,87	0,89	0,91	down	10	10	10	10	10	
Greece	1,07	1,13	1,17	1,17	1,16	down	19	21	22	23	23	down
Hungary	**0,98**	**0,99**	**1,02**	**1,02**	**1,03**	**down**	**13**	**15**	**15**	**15**	**15**	**down**
Ireland	1,15	1,15	1,15	1,15	1,11	up	24	23	21	21	21	down
Italy	1,09	1,10	1,10	1,10	1,10	down	20	20	19	20	20	
Latvia	**1,01**	**0,97**	**0,96**	**0,95**	**0,92**	**up**	**17**	**13**	**13**	**12**	**12**	**up**
Lithuania	**0,84**	**0,85**	**0,83**	**0,81**	**0,77**	**up**	**6**	**6**	**7**	**4**	**4**	**up**
Luxembourg	1,19	1,23	1,32	1,28	1,24	down	27	27	27	27	27	
Malta	**2,21**	**1,95**	**1,58**	**1,46**	**1,46**	**up**	**28**	**28**	**28**	**28**	**28**	
Netherlands	0,99	0,97	1,01	1,07	1,06	down	14	14	14	18	18	down
Poland	**0,91**	**0,91**	**0,89**	**0,91**	**0,91**		**11**	**11**	**11**	**11**	**11**	
Portugal	1,06	1,01	1,03	1,06	1,07	down	18	16	17	17	17	down
Romania	1,18	1,15	1,18	1,24	1,28	down	26	24	25	26	26	
Slovakia	**0,96**	**0,95**	**0,93**	**0,95**	**0,94**	**up**	**12**	**12**	**12**	**13**	**13**	down
Slovenia	**0,75**	**0,75**	**0,76**	**0,77**	**0,80**	**down**	**2**	**2**	**2**	**2**	**2**	
Spain	1,10	1,14	1,17	1,19	1,23	down	22	22	23	24	24	down
Sweden	0,70	0,71	0,71	0,73	0,73	down	1	1	1	1	1	
United Kingdom	1,10	1,07	1,12	1,09	1,03	up	23	19	20	19	19	up

Source: own calculation

As an example, table 2 shows the situation of Poland (two sellected variables) in the period 2010-14 against the other countries that joined EU in 2004 and Sweden - the leader of the classification. The value of the measure below 1 indicates the advantage of Poland in relation to the selected country. The higher values signify the advantage of that country.

In the next step, the level of implementation of the strategy by individual countries in relation to a hypothetical, abstract pattern was evaluated. The assessment was made in accordance with the idea of Hellwig's synthetic measure of development. The results are shown in Table 3. The synthetic measures of development are denoted as H.

Table 2 The situation of Poland against selected countries

variable	year	CY	CZ	EE	HU	LT	LV	MT	SI	SK	SE
X1	2010	1,17	1,09	1,04	0,93	1,00	1,00	0,93	1,09	1,00	1,21
	2011	1,14	1,10	1,09	0,94	1,04	1,03	0,96	1,06	1,01	1,23
	2012	1,09	1,11	1,12	0,95	1,06	1,05	0,98	1,06	1,01	1,23
	2013	1,04	1,12	1,13	0,97	1,08	1,07	1,00	1,04	1,00	1,23
	2014	1,02	1,11	1,12	1,00	1,08	1,06	1,00	1,02	0,99	1,20
X6	2010	0,43	1,10	0,49	0,50	0,68	0,42	0,23	1,08	1,15	0,83
	2011	0,50	1,14	0,53	0,49	0,76	0,48	0,25	1,33	1,10	0,85
	2012	0,50	1,04	0,55	0,48	0,88	0,54	0,27	1,30	1,08	0,76
	2013	0,62	1,04	0,58	0,47	0,89	0,57	0,27	1,44	0,87	0,79
	2014	0,79	0,98	0,47	0,47	0,92	0,64	0,27	1,23	0,81	0,81

Source: own calculations

When comparing individual countries to the pattern, it can be noticed that the number of countries that had improved their situations increased significantly. This is particularly evident in the second period, when the strategy was introduced and the countries took actions to fulfil the aims. Even Malta, which before the announcement of the strategy was marked with very low level of development, improved slightly after year 2010. As in previous approach, the leaders in terms of the degree of implementation of the Europe 2020 Strategy, during the whole period of the study, are the Scandinavian countries: Sweden and Denmark.

Table 3 The synthetic measures of development

country	measure H in subperiod 2005-2009					trend	rankings					trend
Austria	0,45	0,44	0,45	0,45	0,50	up	4	5	4	5	4	
Belgium	0,23	0,23	0,24	0,25	0,26	up	18	17	15	14	15	up
Bulgaria	0,04	0,04	0,02	0,21	0,22	up	26	26	26	18	18	up
Cyprus	**0,24**	**0,23**	**0,22**	**0,18**	**0,21**	**down**	**14**	**16**	**16**	**22**	**19**	**down**
Czech Republic	**0,30**	**0,29**	**0,29**	**0,28**	**0,31**	**up**	**13**	**13**	**13**	**13**	**12**	**up**
Denmark	0,52	0,50	0,48	0,52	0,54	up	2	2	2	2	2	
Estonia	**0,41**	**0,45**	**0,44**	**0,45**	**0,46**	**up**	**6**	**4**	**5**	**4**	**5**	**up**
Finland	0,50	0,47	0,47	0,51	0,51	up	3	3	3	3	3	
France	0,41	0,40	0,39	0,39	0,41		5	8	9	9	7	down
Germany	0,35	0,31	0,36	0,34	0,39	up	10	12	10	10	8	up
Greece	0,23	0,22	0,21	0,19	0,21	down	16	19	18	20	20	down
Hungary	**0,22**	**0,17**	**0,19**	**0,15**	**0,17**	**down**	**19**	**22**	**22**	**24**	**24**	**down**
Ireland	0,23	0,25	0,22	0,21	0,06	down	17	14	17	19	26	down
Italy	0,16	0,16	0,17	0,14	0,17	up	23	23	24	25	25	down
Latvia	**0,31**	**0,36**	**0,41**	**0,39**	**0,33**	**up**	**11**	**9**	**8**	**7**	**11**	
Lithuania	**0,37**	**0,40**	**0,44**	**0,42**	**0,39**	**up**	**8**	**7**	**6**	**6**	**9**	**down**
Luxembourg	0,15	0,15	0,16	0,13	0,19	up	24	24	25	26	21	up
Malta	**0,02**	**0,01**	**0,00**	**-0,02**	**-0,01**	**down**	**27**	**27**	**27**	**27**	**27**	
Netherlands	0,36	0,34	0,35	0,34	0,36		9	10	11	11	10	down
Poland	**0,10**	**0,14**	**0,20**	**0,23**	**0,27**	**up**	**25**	**25**	**21**	**16**	**14**	**up**
Portugal	0,18	0,18	0,20	0,22	0,26	up	22	20	20	17	16	up
Romania	0,18	0,18	0,18	0,17	0,18		21	21	23	23	23	down
Slovakia	**0,23**	**0,24**	**0,25**	**0,24**	**0,25**	**up**	**15**	**15**	**14**	**15**	**17**	**down**
Slovenia	**0,40**	**0,42**	**0,41**	**0,39**	**0,45**	**up**	**7**	**6**	**7**	**8**	**6**	**up**
Spain	0,22	0,22	0,21	0,19	0,19	down	20	18	19	21	22	down
Sweden	0,63	0,65	0,67	0,67	0,70	up	1	1	1	1	1	
United Kingdom	0,31	0,32	0,32	0,30	0,28	down	12	11	12	12	13	down
country	**measure H in subperiod 2010-2014**					**trend**	**rankings**					**trend**
Austria	0,45	0,45	0,49	0,43	0,55	up	3	6	5	4	3	
Belgium	0,29	0,30	0,33	0,34	0,30	up	13	15	15	12	15	down
Bulgaria	0,15	0,13	0,13	0,13	0,19	up	25	25	24	22	21	up
Croatia	0,20	0,16	0,15	0,20	0,24	up	18	23	23	20	19	down
Cyprus	**0,19**	**0,20**	**0,21**	**0,13**	**0,18**	**down**	**20**	**19**	**19**	**23**	**22**	**down**
Czech Republic	**0,31**	**0,35**	**0,39**	**0,32**	**0,40**	**up**	**11**	**11**	**10**	**14**	**11**	
Denmark	0,51	0,54	0,57	0,59	0,58	up	2	2	2	1	2	
Estonia	**0,43**	**0,49**	**0,50**	**0,42**	**0,43**		**6**	**3**	**4**	**5**	**7**	**down**
Finland	0,44	0,47	0,51	0,46	0,48	up	5	4	3	3	4	up
France	0,39	0,40	0,43	0,37	0,41	up	7	8	8	9	10	down
Germany	0,39	0,41	0,44	0,40	0,42	up	8	7	7	8	8	
Greece	0,20	0,15	0,11	0,11	0,05	down	19	24	27	26	28	down
Hungary	**0,21**	**0,22**	**0,23**	**0,24**	**0,26**	**up**	**17**	**18**	**18**	**18**	**17**	
Ireland	0,12	0,10	0,12	0,25	0,16	up	27	27	25	16	25	up
Italy	0,15	0,16	0,19	0,16	0,17	up	24	22	21	21	23	up
Latvia	**0,27**	**0,31**	**0,37**	**0,37**	**0,42**	**up**	**15**	**13**	**12**	**10**	**9**	**up**
Lithuania	**0,35**	**0,36**	**0,41**	**0,41**	**0,47**	**up**	**9**	**10**	**9**	**6**	**5**	**up**
Luxembourg	0,15	0,18	0,19	0,12	0,20	up	22	20	20	25	20	up

Malta	**-0,01**	**0,01**	**0,05**	**0,02**	**0,05**	**up**	**28**	**28**	**28**	**28**	**27**	**up**
Netherlands	0,35	0,38	0,39	0,33	0,36	up	10	9	11	13	12	down
Poland	**0,29**	**0,31**	**0,33**	**0,25**	**0,33**	**up**	**14**	**14**	**14**	**15**	**14**	
Portugal	0,18	0,26	0,26	0,24	0,25	up	21	17	17	17	18	up
Romania	0,15	0,17	0,18	0,10	0,16	up	23	21	22	27	24	down
Slovakia	**0,26**	**0,28**	**0,30**	**0,22**	**0,29**	**up**	**16**	**16**	**16**	**19**	**16**	
Slovenia	**0,44**	**0,46**	**0,48**	**0,41**	**0,46**	**up**	**4**	**5**	**6**	**7**	**6**	**down**
Spain	0,13	0,12	0,12	0,13	0,08	down	26	26	26	24	26	
Sweden	0,63	0,66	0,67	0,57	0,67	up	1	1	1	2	1	
United Kingdom	0,31	0,34	0,33	0,35	0,35	up	12	12	13	11	13	down

Source: own calculations

The last analysis was aimed at the assessment of the degree of implementation of national targets. As previously, Hellwig's synthetic measure was applied. But in this case, the variables (denoted Y) were defined as the differences between the value of the indicator (X_i) and the target. In many cases, the value of the variables equalled 0, because the individual targets have already been achieved (compare Country Reports 2015, Eurostat (c)). Based on the values of the synthetic measure of development (denoted H_y) ranking of countries was constructed. The results are shown in the table no 4. For comparison purposes the previous rankings are also presented.

Table 4 The assessment of the degree of implementation of national targets in year 2014

									measure	**rankings**		
country	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**H_y**	**H_y**	**H**	**W**
Austria	2,8	0,77	2,36	0,9	0	0	0	145	0,67	6	3	6
Belgium	5,9	0,54	0	5	1,30	0,3	3,2	525	0,57	11	15	16
Bulgaria	10,9	0,70	0	0	1,40	1,9	5,1	77	0,46	14	21	22
Croatia	3,7	0,61	0	0	0	0	2,8	9	0,72	3	19	14
Cyprus	**7,4**	**0,03**	**0**	**4**	**0**	**0**	**0**	**80**	**0,64**	**8**	**22**	**25**
Czech Republic	**1,5**	**0**	**0**	**0**	**0**	**0**	**3,8**	**0**	**0,85**	**1**	**11**	**5**
Denmark	4,1	0	3,90	0,8	0	0	0	142	0,74	2	2	3
Estonia	**1,7**	**1,54**	**6,75**	**0**	**0,10**	**1,9**	**0**	**85**	**0,33**	**18**	**7**	**7**
Finland	4,9	0,83	7,96	0	0	1,5	0	157	0,45	15	4	9
France	5,1	0,74	2,72	8,7	0	0	6,3	2058	0,31	20	10	8
Germany	0	0,16	10,14	4,2	15,20	0	10,6	0	-0,07	28	8	10
Greece	16,7	0,38	0	2,7	0	0	0	1289	0,30	21	28	23
Hungary	**8,3**	**0,42**	**0**	**5,2**	**0**	**1,4**	**0**	**753**	**0,53**	**12**	**17**	**15**
Ireland	2,0	0,45	2	7,4	0	0	7,8	87	0,46	13	25	21
Italy	7,1	0,24	0	0	0	0	2,1	4264	0,38	17	23	20
Latvia	**2,3**	**0,82**	**0**	**1,3**	**0**	**0**	**0**	**26**	**0,69**	**4**	**9**	**12**
Lithuania	**1,0**	**0,88**	**0**	**0**	**0**	**0**	**0**	**0**	**0,68**	**5**	**5**	**4**
Luxembourg	0,9	1,06	4,69	6,5	0	0	13,3	30	0,24	23	20	27
Malta	**3,7**	**1,15**	**0**	**5,3**	**0,08**	**10,3**	**6,5**	**25**	**0,18**	**26**	**27**	**28**
Netherlands	4,6	0,53	8,02	8,5	2,00	0,7	0	111	0,32	19	12	18
Poland	**4,5**	**0,76**	**0**	**3,6**	**0**	**0,9**	**2,9**	**0**	**0,60**	**10**	**14**	**11**
Portugal	7,4	1,41	0	4	0	7,4	8,7	306	0,18	25	18	17
Romania	4,3	1,62	0	0	0	6,8	1,7	369	0,28	22	24	26
Slovakia	**6,1**	**0,31**	**0**	**2,4**	**0**	**0,7**	**13,1**	**19**	**0,42**	**16**	**16**	**13**
Slovenia	**7,2**	**0,61**	**0**	**3,1**	**0**	**0**	**0**	**89**	**0,61**	**9**	**6**	**2**
Spain	14,1	0,80	0	3,8	0	6,9	1,7	4016	0,08	27	26	24
Sweden	0	0,84	1,39	0	2,80	0	0	0	0,66	7	1	1
United Kingdom	0	1,28	0	8	4,80	1,8	0	3540	0,18	24	13	19

Source: own calculations

When reviewing the implementation of the Europe 2020 Strategy in the terms of national targets, the image of Europe is noticeably different. Only a few countries occupy a similar place in the rankings in both approaches. This group of countries includes both countries with a high level of development as Denmark and Lithuania, and less developed countries such as Spain and Malta. Sweden, who led in the rankings in previous approaches, dropped to seventh position. The leader in terms of the level of fulfilment of national targets is Czech Republic, which have already accomplished six of the eight aims. It seems that Germany has very difficult task. They occupy the last place in the standings despite they have already achieved two targets including a high employment rate people aged 20-64. Malta which accomplished one aim, as in previous approaches, took place in the end of ranking. It should be emphasized that among ten the best countries six of them joined EU in 2004.

Conclusions

The applied research methods made it possible to assess the degree of implementation of the Europe 2020 strategy and the progress made by EU Member States in this regard. The created synthetic measures enabled to

point the best and the worst countries in this respect. Also the relative disparities between countries in the implementation of the strategy were analysed. It was examined whether countries increase or decrease the developmental advantage over the other, during the investigated period of time.

The study confirmed the strong differentiation of EU Member States in achieving the objectives of Europe 2020. The leaders in terms of the level of implementation of the Europe 2020 strategy as well as the progress made in the investigated period of time are the Scandinavian countries: Sweden, Denmark, and Finland. During the whole period of analysis these countries have occupied leading positions in the rankings. It should be emphasized that the majority of countries that joined the Community in 2004, has made significant progress in achieving the objectives and reduced the relative disparities compared to other Member States. The leaders among them were: Slovenia, Lithuania, and the Czech Republic. It should also be noted that the countries, political leaders of EU (Germany, France, Great Britain, and especially Italy) achieved rather disappointing results. Taking into consideration the role of these countries in the Community, the lack of significant progress in the implementation of the strategy can demonstrate the scale of problems that the European Union must overcome.

The analysis showed that most of the countries made significant progress in achieving specific objectives such as increasing investment in R & D, reducing greenhouse gas emissions, increase the use of renewable energy and reducing the number of young people do not continue education. The biggest problem in all EU countries remains the fight against poverty and social exclusion.

In 2015, the European Union has reached the halfway point in the implementation of the Europe 2020 Strategy. At this stage, it becomes increasingly important to monitor the achievements of all the Commonwealth countries in the implementation of the various specific objectives and the strategy as a whole. The evaluation of the progress made by individual EU members can not only help to identify good practices, but also to prevent making the same mistakes. The results of the study can be used by the European Commission as well as the institutions and authorities of the different countries of the Community to evaluate the progress made and to take appropriate actions.

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