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Efficient Implementation of the Europe 2020 Strategy Goals: Is Social Equality Achievable Reality or Myth Perhaps?

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**Efficient Implementation of the Europe 2020 Strategy Goals:
Is Social Equality Achievable Reality or Myth Perhaps?**

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Efficient Implementation of the Europe 2020 Strategy Goals: Is Social Equality Achievable Reality or Myth Perhaps?

Michaela Staníčková¹

Abstract

Research background: Economic crisis hit all the European Union Member States hard, the impact of crisis varied considerably. The low growth performance in the EU has increased concerns regarding an increasing wage dispersion, income inequality at large, and social exclusion in line with poverty. Inequality should be seen as a cornerstone of both sustainable and inclusive growth under the Europe 2020 Strategy. Social inequality in the EU is a very real problem which hampers sustainable economic growth.

Purpose of the article: The purpose of this study is to introduce evaluation of social development convergence and divergence trend between EU28 Member States in the context of the Europe 2020 Strategy. The study gives an outline of the issues of labour market and income disparities and poverty. Policy-makers must be clear about what social objectives they are aiming to achieve, therefore special attention is paid to headline national goals of the Europe 2020 Strategy.

Methodology/methods: The main tasks of this study is to assess social dimension and inequalities problems in the EU27 by applying Data Envelopment Analysis method, resp. time-series dynamic efficiency analysis in the form of output-oriented Malmquist Productivity Index. This study contain changes of key social equality indicators related to the Europe 2020 Strategy and compares objectives and general outlines of period 2010-2015, as well as its impact on national economics and living conditions.

Findings & Value added: Results contain elements of typology premises of the EU28 and point to a large diversity in inequality patterns, as author observe both increases and decreases in inequality at the EU level. Recent changes in social inequality have been associated with the business cycle, particularly with the accessibility of the labour market and, of course, with income inequality. Additionally the development challenges are discussed for improvement of the socioeconomic well-being of the EU27 and to avoid social disparities.

Keywords: *DEA Method, Economic Crisis, EU28, Europe 2020 Strategy, Social Inequality.*

JEL Classification: *C67; E24; E61; O52; P51.*

Introduction

The level of social inequalities belongs to important indicators influencing the socio-economic development and other processes taking place in the social and economic realm. Facilitating rational income distribution and reducing poverty are mentioned among the main goals of public policy. It should be mentioned that such multidimensional phenomena as income disparity and poverty might be analysed from many different perspectives, including the national and international within the European Union (EU). Striving for fairness in economic development is crucial in order for societies to be stable and citizens not to feel disenchanting. The economic crisis has put inequalities high on the political agenda, and made this an issue of serious public concern (Rajan, 2010; Stiglitz, 2009). There is an increasing recognition that social policy can reduce inequality and poverty while simultaneously improving the economic functioning of the country as reflected in the idea of inclusive growth in the EU's Europe 2020 strategy, with references to a high-employment economy delivering

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economic, social, and territorial cohesion in which benefits of growth and jobs are widely shared.

In view of the current debate and the literature review, the objectives of this study focus on the following key issues: 1) to describe the recent evolution of inequalities and dispersion across the EU Member States using different definitions of social inequality measures in relation to the Europe 2020 Strategy; and 2) to assess social dimension and inequalities problems in the EU Member States by applying Data Envelopment Analysis (DEA) method. The purpose of this study is to introduce evaluation of social-economic development and trends among the EU countries in the context of the Europe 2020 Strategy. The main tasks of this study is to assess social dimension and inequalities problems in the EU countries by applying time-series dynamic efficiency analysis in the form of output-oriented Malmquist Productivity Index (MPI). This study contain changes of key social equality indicators related to the Europe 2020 Strategy and compares national progress in reference period 2010-2015. Development challenges are discussed for improvement of the socio-economic well-being of the EU Member.

Research Methodology

To study inequality in the EU as a whole, one needs adequate statistical tools which can be used in the geographical and political context faced by the EU. There is ongoing and increasing interest in measuring and understanding the level, causes and development of inequality (Martins, 2015; Sala-i-Martin, 2006; Quah, 1997). The necessity of having performance measured in terms of welfare beyond GDP calls for new approaches capable of simultaneously taking into account economic as well as social and environmental indicators (Galbraith, 2009). Efficiency has become very important part of governments' decisions, and the main reason are financial constraints that public finance need to face in setting of the financial crisis. Empirical studies engaging the technique of non-parametric method Data Envelopment Analysis (DEA), an approach for providing a relative efficiency assessment and evaluating performance of a set of peer entities called decision-making units (DMUs). DEA is convenient for determining the efficiency of DMUs that are mutually comparable – using the same inputs and producing the same outputs but with different performances. Determining whether a DMU is efficient from the observed data is equivalent to testing whether the DMU is on the frontier of the production possibility set (Coelli et al., 2005).

Use of DEA has been mostly engaged in assessing the efficiency in economic sectors and in country settings (Melecký, 2013; Lavado and Cabanda, 2009), the growing literature has been introduced also on DEA application in public sphere (for more cases see Štikarová (2014)). DEA method is a convenient method for comparing national efficiency as an assumption for the performance of territory, because it evaluates not only one factor but a set of different factors that determine the degree of economic development.

Empirical analysis is based on MPI measuring the change of technical efficiency and the movement of the frontier in terms of individual DMUs (Färe et al., 1994). Suppose each DMU_j ($j=1, 2... n$) produces a vector of output $y_j^t = (y_{1j}^t, \dots, y_{sj}^t)$ by using a vector of inputs $x_j^t = (x_{1j}^t, \dots, x_{mj}^t)$ at each time period t , $t = 1, \dots, T$. From time t to time $t+1$, DMU_0 's efficiency may change or (and) the frontier may shift.

MPI measuring the efficiency change of production units between successive periods t and $t+1$, is formulated via (1):

$$M_0(x^{t+1}, y^{t+1}, x^t, y^t) = EFCH_0 \cdot FS_0 \quad (1)$$

where $EFCH_0$ is change in the relative efficiency of DMU_0 in relation to other units (i.e. due to the production possibility frontier) between time periods t and $t+1$. FS_0 describes the change in the production possibility frontier as a result of the technology development

between time periods t and $t+1$. The following formulation of MPI (2) makes it possible to measure the change of technical efficiency and the movement of the frontier in terms of a specific DMU₀ (Zhu, 2012):

$$M_o = \frac{\theta_o^t(x_o^t, y_o^t)}{\theta_o^{t+1}(x_o^{t+1}, y_o^{t+1})} \left[\frac{\theta_o^{t+1}(x_o^{t+1}, y_o^{t+1})}{\theta_o^t(x_o^t, y_o^t)} \cdot \frac{\theta_o^{t+1}(x_o^t, y_o^t)}{\theta_o^t(x_o^t, y_o^t)} \right]^{\frac{1}{2}} \quad (2)$$

The first component on the right hand side measures the magnitude of technical efficiency change between periods t and $t+1$. Obviously, $EFCH_o = \frac{\theta_o^t(x_o^t, y_o^t)}{\theta_o^{t+1}(x_o^{t+1}, y_o^{t+1})} \stackrel{<}{=} 1$ indicating that technical efficiency improves remains or declines. The second component measures the change in production technology, i.e. technology frontier shift, between periods t and $t+1$. Trends of MPI, EFCH and FS are illustrated in Table 1.

Table 1. Characteristics and trends of MPI and efficiency changes

MPI	Productivity	TEC FS	Technical Efficiency Change Technology Efficiency Change
> 1	Improving	> 1	Improving
= 1	Unchanging	= 1	Unchanging
< 1	Declining	< 1	Declining

Source: own elaboration (2017).

When the number of performance measures is high in comparison with the number of DMUs, then most of DMUs are evaluated efficient, and the obtained results are not reliable. There is a rule of thumb, which expresses the relation between the number of DMUs and the number of performance measures and it was found out by Toloo et al. (2015) that in nearly all of the cases the number of inputs and outputs do not exceed 6. Suppose there are n DMUs which consume m inputs to produce s outputs. A simple calculation shows that when $m \leq 6$ and $s \leq 6$, then $3(m + s) \geq m \times s$. As a result, in this study following formula (3) is applied:

$$n \geq 3(m + s). \quad (3)$$

In the study, DMUs number is three times higher than sum of input and outputs, i.e. $28 \geq 3(2 + 7)$, $28 \geq 3(9)$, $28 \geq 27$, so the rule has been proved.

Software tools for solving linear programming problems are used in the study, such as the DEA Frontier, and IBM SPSS Statistics 24.

The analysis presented here will try to provide estimates of European (the EU27 Member States and the EU as a whole) inequality for reference years 2010-2015. This study used the most recent data available from the EU Statistics – the Europe 2020 strategy indicators – social dimension (Eurostat, 2017), see Table 2. Reference period consists of years from 2010 to 2015 with respect to implementation of the Europe 2020 strategy. Efficiency evaluation is calculated across the reference years, and for the overall efficiency change between 2010 and 2015.

Table 2. Indicators of inputs and outputs in period 2010–2015 relevant to DEA modelling

Input indicators		
Gross domestic product (GDP)		Current prices, million euro
General government expenditure (GGE)		Total GGE, million euro
Output indicators (Europe 2020 indicators)		
Employment	Employment rate (ER)	Total employment, LFS, % of total population

Research and development	Gross domestic expenditure on R&D (GERD)	Euro per inhabitant; all sectors
Education	Tertiary educational attainment (TEA)	Tertiary education, age group 30-34
Poverty or social exclusion	People at risk of poverty or social exclusion (PRPSE)	Total age class, % of total population
	People living in households with very low work intensity (PLWI)	% of total population aged less than 60
	People at risk of poverty after social transfers (PRPST)	% of total population
	Severely materially deprived people (SMDP)	% of total population

Source: Eurostat (2017); own elaboration (2017).

Results and Discussion

The results of the author's calculations (see Table 3) confirm the initial statement: inequality within the EU. With this level of inequality, the EU27 appears to be much more unequal than other large economies. During the reference period considered, between-country inequality increased as confirmed MPI decreasing trend by comparing annual MPI change. According to the efficiency analysis and derived results from the solution of MPI, it emerges that the 2010-2015 annual MPI change of the EU countries range from 0.681 to 1.352. In the case of overall MPI change, the ratio emerges from minimum 0.562 to maximum of 2.322 in the reference period 2010-2015. Overall productivity of most evaluated countries has recorded decreasing trend, thus negative. This result is not surprising because of nature of comparing periods, all evaluated European countries have solved with impacts of financial and economic crisis.

Part of the explanation to the large inequalities within EU countries may then have to do with the differences in competitiveness. An economic entity in country, which has low competitiveness, may not have similar opportunities as an economic entity in a highly competitive country. This fact remains and is confirmed. However, what does it mean for efficiency in competitiveness? In the case of efficiency analysis of competitiveness and in time comparison analysis of change, the results are just a little bit different. Why? The concept of competitiveness may then be important not only to evaluate why some countries grow faster than others do, but also why some countries have a better and more efficient distribution of competitiveness over time than others. Is it a high level of competitiveness necessarily associated with a high level of efficiency, and vice versa? It may not always be the case because evaluated countries because it is necessary to compare the values of inputs and outputs. Very important is also the fact that with given level of inputs, countries were able to achieve level of output. Finally, Table 3 show reordered countries, from best to worst, their MPI score and the corresponding rank with respect to the overall-period MPI change. Based on MPI results is clear, that efficiency changes results seem to be balanced in the EU countries.

Table 3. Annual and overall MPI results for reference period 2010-2015

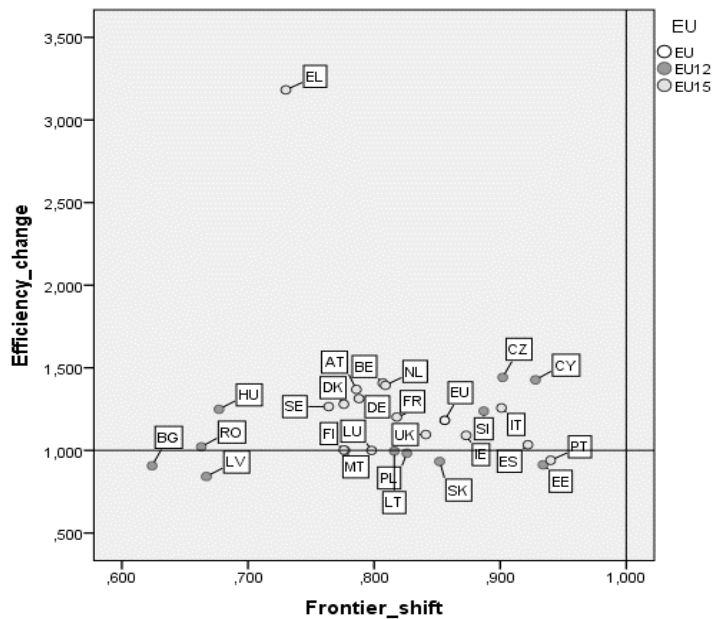
DMU	Annual MPI change					Overall-period MPI change		
	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	Rank	Country	2010-2015
EU	1.022	1.028	1.002	1.004	0.981		EL	2.322

BE	1.038	1.075	1.023	1.008	0.992		CY	1.324
BG	0.944	0.978	0.895	0.681	0.985		CZ	1.300
CZ	1.080	1.113	1.070	1.040	0.979		BE	1.137
DK	1.002	1.005	0.998	0.995	0.990		IT	1.132
DE	1.038	1.012	0.981	1.018	0.988		NL	1.129
EE	1.206	0.877	0.875	0.923	0.976		SI	1.099
IE	0.978	1.012	1.052	0.991	0.962		AT	1.076
EL	1.323	1.352	1.102	1.075	1.046		DE	1.035
ES	0.991	0.985	1.011	1.003	0.937		EU	1.011
FR	0.993	1.008	1.002	1.000	0.982		DK	0.992
IT	1.103	1.106	0.999	1.019	0.969		FR	0.983
CY	0.998	1.114	1.043	1.122	1.035		SE	0.967
LV	1.040	0.823	0.912	0.763	0.841		IE	0.953
LT	0.887	1.124	0.926	1.017	1.052		ES	0.953
LU	0.975	0.845	1.007	0.962	1.000		UK	0.921
HU	1.055	1.137	1.032	0.835	0.774		PT	0.884
MT	0.982	1.049	0.954	0.946	0.848		EE	0.853
NL	1.065	1.015	1.005	1.026	1.001		HU	0.845
AT	0.972	1.083	1.008	1.024	0.992		LT	0.813
PL	0.931	1.039	1.025	0.998	0.986		PL	0.812
PT	0.948	0.976	1.005	0.979	0.969		LU	0.798
RO	0.925	1.095	0.934	0.857	0.794		SK	0.796
SI	1.137	1.061	1.011	0.928	0.948		FI	0.778
SK	0.929	0.967	0.936	0.955	0.982		MT	0.777
FI	0.976	0.934	0.957	0.965	0.918		RO	0.677
SE	0.999	1.002	1.000	0.943	1.026		BG	0.565
UK	1.004	0.948	1.023	0.985	0.986		LV	0.562
Min	0.887	0.823	0.875	0.681	0.774		Overall Min	0.562
Max	1.323	1.352	1.102	1.122	1.052		Overall Max	2.322

Source: own calculation and elaboration (2017).

Classification of EU15 and EU12 Member States with respect the nature of technical and technological change is illustrated in Figure 1. In overall reference period, location of all European countries is recorded with respect to results, resp. their values of EFCH and FS. It is possible to divide European countries in four categories, resp. quadrants. Via illustration of Figure 1, information about differences in efficiency recorded by MPI in 2010-2015 period are confirmed. Across the overall-change period, most of European countries are located in quadrants with low level of FS, and higher or lower level of EFCH. It means that efficiency change is caused especially by the change in the production possibility frontier because of the technology development between reference years, i.e. technology frontier shift. This fact is positive information with respect to indicators of the Europe 2020 strategy, it signifies that countries are able to utilize their internal factor endowment in effective way and are able to apply technological progress for boosting of their competitive advantages, i.e. they contribute thus to qualitative based economic growth and it is option how to raise the steady state.

Figure 1. Comparison of EU distances in efficiency change and frontier shift



Source: own elaboration in SPSS (2017).

All these factors affect the convergence trend of the new EU Member States to the old EU Member States, and the growth in old countries has implicative impact on growth in new countries. This growth may have the same degree in EU12 countries as in EU15 countries, or is a higher and multiplied. In fact, as the catching-up of the poorer Member States is partially based on the relocation of production from high-wage to low-wage locations. Trends of the recent years of economy development in the EU, which shows moderate GDP growth require social legislation improvement, income`s level, labour market and education system development. For future`s social development investigations and governmental decisions needs to be pragmatic approach into financing in order to create employment and reduce poverty level and social disparities in the national economy.

Conclusions

Inequality is a key problem facing the EU, and it has significant impacts not only on human well-being, but also on economic performance. The only way for the EU to meet these challenges is to not only strengthen economic growth policies through broad-based economic programme promoting marketization but also by resolutely pushing for the expansion of social aspect of the EU model (Allmendinger and Driesch, 2014).

The future design of European economic policy must then provide a framework in which the policy instruments essential for a monetary, fiscal, industrial, sectorial, and social policy consistent with full employment and a reduction in inequality play a more prominent role. Europe 2020 is a credible strategy of industrial policy for the future of Europe and has the merits of presenting clear actions, clear targets and a detailed measurement strategy to monitor implementation. Combatting inequality should be considered as an instrumental target for both sustainable and inclusive growth. European policymakers have a long to-do list to foster inclusive growth in Europe (Darvas and Wolff, 2016). In all the countries of the EU, the welfare state has come under intense scrutiny as a result of budgetary pressures and wider societal developments. Simultaneously, the EU needs a sense of common purpose and a common policy framework in support of national social policies. Its aim should be to create a virtuous circle whereby both pan-European cohesion and national cohesion are enhanced.

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