Equilibrium. Quarterly Journal of Economics and Economic Policy
Volume 14 Issue 3 September 2019
p-ISSN 1689-765X, e-ISSN 2353-3293
www.economic-policy.pl

ORIGINAL ARTICLE

Citation: Cyrek, M. (2019). Government social spending in the EU countries: efficiency in poverty and income inequality reduction. *Equilibrium. Quarterly Journal of Economics and Economic Policy, 14*(3), 405–424. doi: 10.24136/eq.2019.019

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Received: 13.04.2019; Revised: 4.07.2019; Accepted: 23.07.2019; Published online: 30.09.2019

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Government social spending in the EU countries: efficiency in poverty and income inequality reduction

JEL Classification: *H50; I30; I38; O20; D30; D60; E60*

Keywords: *government expenditure; poverty; inequality; efficiency*

Abstract
Research background: Income inequality and poverty attract a lot of attention among politicians, activists as well as scientists, who are trying to find a solution to these socio-economic problems. State intervention is commonly expected in this field, however, there is no agreement about the most efficient methods and instruments, as well as about the scale of public expenditure for the purpose of limiting poverty and inequality.
Purpose of the article: The aim of the paper is to specify efficiency of government social spending in reducing problems of poverty and income inequality in the EU countries. Moreover, the attention is paid to changes in the efficiency in a period of the 2007 crisis occurrence and its overcoming and to sources of the changes.
Methods: To fulfill the main goal of the paper, the DEA method is used, which enables to compare the social efficiency of the EU countries. The Malmquist index is also calculated and decomposed to identify changes in the efficiency and their sources in the crisis period. Data used in the analyses were obtained from Eurostat and OECD databases and cover the period from 2007 to 2016 year.
Findings & Value added: The main findings of the paper shed some light on the differences in social efficiency of government spending in the EU countries. Generally, the countries with a higher level of social spending are also those with lower efficiency in inequality reduction, however, the relationship doesn't appear for poverty alleviation. Thus, the research suggests some substitution between the scale and the efficiency of social spending, at least for the inequality dimension. Moreover, some differences in a social model can be found between the countries of the South and of the North: the countries of the South focus their social policy mainly on inequality reduction, while the Scandinavian countries as well as some other affluent societies direct their public support mainly on poverty alleviation. The research also shows that in the crisis period decreases in efficiency concerned mainly the poverty dimension. It reflects the fact that the poor

were the losers of the crisis in favor of the middle classes. The efficiency losses were induced by negative changes in the current usage of public sources, while institutional reforms positively influenced the efficiency.

Introduction

Poverty and growing income inequality are perceived as essential problems in the modern world. Although absolute poverty does not seem to be a common phenomenon in highly developed countries, such as the EU ones, its relative form as well as any other manifestation of excessive income inequality induces a lot of social tension. Both economic as well as social results of the phenomena cause that they are of growing concern for socio-economic policy. The aim of limiting poverty was set in the European Lisbon's Strategy and its descendant — the Europe 2020 Strategy. Moreover, it raises as especially important issue in a period starting from 2017 year when the last economic crisis has revealed. Nevertheless, it is still mainly responsibility of a domestic policy to reduce the phenomena of poverty and inequality. To achieve the goal, the government social spending is used. However, its efficiency in limiting socio-economic problems seems to differ among countries.

At the first glance, the impact of social spending on poverty and inequality reduction directly depends on the scale of public expenditure. However, its excessive level may induce some threats to public finances' stability, as well as some side effects concerning situation of the poor. Higher efficiency of government spending in achieving social gains allows to reach the targets of social cohesion and simultaneously avoid its excessive growth and its consequences in budget deficits and public debt. An important issue is to find a recipe for increasing the efficiency, and this task may be completed by identifying some benchmark solution of the best performing states.

The main aim of the paper is to specify efficiency of government social spending in reducing problems of poverty and income inequality in the EU countries. Thus, the research problem in the study covers identification of a model of state intervention that is the most socially favorable.

The questions the paper is trying to answer are:

- Which of the EU countries are the most efficient using government social spending to reduce poverty and inequality? Is the efficiency similar concerning both dimensions of social tensions? Can some specific models in social policy be distinguished in different countries?
- What kind of government social spending is the most efficient in reducing poverty and inequality?

– How the financial crisis changed social efficiency of government spending? What are the sources of such changes in efficiency?

To fulfill the goal of the paper, the DEA method is used, which enables to compare the efficiency of the EU countries concerning results of their government social spending in limiting income inequality and poverty. Moreover, the Malmquist index is calculated and decomposed to identify changes in the efficiency and their sources in a period following the occurrence of financial crisis in the late 2007 year.

The paper is organized as follows. The first section includes a short literature review about the impact of government social spending on limiting inequality and poverty. The next one presents the methodology of research. Then, the main results are described and discussed. They cover: comparisons of the EU countries' efficiency in government spending concerning aims of reducing poverty as well as inequality, comparisons of results generated by different kinds of social spending in functional terms, and finally, dynamic changes of efficiency in the EU countries and their decomposition. Conclusions are the final part of the paper.

Literature review

The literature broadly discusses different models and instruments of a welfare state as there is plenty of institutional solutions specifying social policy across countries in the world. In the most general sense, several welfare models are distinguished basing on the set of policy indicators shared by countries. Nordic, Continental/Conservative, Anglo-Saxon and Mediterranean/Southern are the most popular classification for European countries (see e.g. Joumard *et al*., 2012, pp. 6–7; Clemente *et al.*, 2012, p. 2895). Considering instruments of state intervention, Di Gioacchino *et al.* (2014) claim that social public expenditures and market regulations are two distinct means of social protection and report some evidence of a negative relationship between them proving different institutional choices of societies. Ferrer *et al.* (2014, p. 55) point at social spending and tax policy as two substantial aspects of social policy that reflects the overall development strategy of a country. Nevertheless, the main aims of public interventionism in all countries cover reduction of poverty and inequality.

There is a common agreement that social spending determines the levels of both inequality and poverty. Fiszbein *et al.* (2014, p. 169–170) claim that a close relationship exists between reduction of inequality and poverty by social policy. Nevertheless, it is possible that social spending has an impact on inequality and remains poverty unchanged, when income is distributed

from the rich to the middle-class, and that social spending reduces poverty but not inequality, when they influence an equal income growth.

As Fiszbein *et al.* (2014, p. 168, pp. 171–172) point out, the results of welfare programs on poverty depend on both the total funds available (budgetary adequacy) and their targeting (efficiency), which often substitute each other. Similarly, Anderson *et al.* (2018) argue that the influence of government spending on inequality and poverty is determined by: the type of spending (the sector of spending), how well it is targeted, and the way in which it is financed. Generally, the influence of a welfare policy depends on the size, mix and the progressivity of taxes and transfers (Joumard *et al*., 2012).

The literature covers a lot of empirical studies on the influence of public spending on inequality and poverty. Anderson *et al.* (2017) show that higher government spending (especially social) are negatively related to income inequality. Supporting this view is research conducted by Cosmin (2012, p. 1120, 1124) for European countries, who concluded that public expenditures lower income inequality and thus governments are implementing efficient redistributive policies. Considering the impact on poverty, Anderson *et al.* (2018) claim that redistributive role of fiscal policy is much lower in developing countries than in the OECD ones. The World Bank suggests that the influence of social spending is limited by their ineffectiveness in targeting the poor (*World*…, 2003, p. 1). In the same vein, Buracom (2011) analyze the distributional effects of public spending in Thailand and comes to conclusion that all of them are not well targeted toward the poor. In contrast, Haile and Niño-Zarazúa (2017) find strong evidence to claim that social spending essentially influences improvement in aggregate welfare in the developing world.

Moreover, the level of government social spending, as well as its impact on inequality and poverty, changes over time, especially in the conditions of deep downturn or crisis. Clemente *et al*. (2012, p. 2895, 2896, 2902) claim that government social spending is very sensitive to the ups and downs of economic growth and in moments of crisis, sharp cuts are almost immediate, however, the character of the spending changes transforming from a luxury good in lower income nations to a necessity good in affluent societies. In contrast, Savage (2019, p. 123, p. 126) comes to the conclusion that the 2007 crisis resulted in the reemergence of partisan policy making in social spending. Most OECD countries adopted expansionary policies and increased social expenditures. Supporting this view is the observation made by Ferrer *et al*. (2014, p. 63), who argue that in economic crisis, public spending is higher than in good times in order to cover the needs of the population and safeguard their welfare.

The important issue is how the crisis influence poverty and inequality through a channel of public social spending. Kiendrebeogo *et al*. (2017) indicate that the crisis can affect poverty through an income (mean) effect, a distributional effect, and a disruption effect. Their research shows that in developing countries financial crises go along with growing poverty, however, the effect is lower in the countries with a higher level of social spending. It proves the role of a welfare state solutions in poverty reduction in the periods of crisis and confirms the benefits from state intervention.

Although there is a lot of research concerning both changes in public spending during the crisis and the impact of the spending on poverty and inequality, their results are still ambiguous. Especially, empirical studies concerning efficiency of government social spending in inequality and poverty reduction and their changes induced by the crisis are limited and, consequently, there is a lack of common agreement about the preferable welfare model solutions.

Research methodology

The main aim of the study induces a need to identify and compare efficiency of each country's government social policy. The efficiency is understood as the ratio of state interventionism's results on income inequality or poverty reduction to a scale of social public spending.

Focusing attention to a scale of public expenditures is an attitude commonly accepted in the literature, however, there are some trials to use non-monetary indicators of government efficiency as well (e.g. Choi & Park, 2019). Considering the targeted outputs, although some authors consider more compound measures of socio-economic gains, such as HDI (e.g. Prasetyo & Zuhdi, 2013) or PSP (e.g. Afonso *et al*., 2013; Adam *et al*., 2011), it is prevalent to look at the GDP level or growth as the expected outcome. Problems of income distribution are somehow neglected or treated marginally.

We adopt a broad definition of social spending. The analysis is focused on general government expenditure (expressed as % of GDP) in three functional spheres (according to the Classification of the Functions of Government — COFOG): social protection, education and health. The first one is considered as having the most direct and prompt influence on reducing social tensions, while others are usually perceived as investments in human capital of a long-term character. The results of expenditure on education and health in social problems resolving are less direct and may be found mainly in labor productivity gains.

To compare efficiency of each country, we used a non-parametric DEA method. It allows to specify efficiency among a group of DMU's (the EU countries), which is measured in relative terms — as the percentage of the best performing units. We adopted an output-oriented CRS model. However, for comparisons of social gains from different functional kinds of government social expenditure, we used an input-oriented non-radial CRS model that allows for different parameters for each input.

To assess the efficiency, we specified the model in two versions, of which one is focused on poverty reduction (M_1) and the other on inequality issue (M_2). The inputs, adopted in each version of a model, were defined as:

- I_1 – General government expenditure by function % of GDP — Social protection (Eurostat, [tepsr_sp110], 29.08.2018),
- I_2 – General government expenditure by function % of GDP — Education (Eurostat, [tepsr_sp110], 29.08.2018),
- I_3 – General government expenditure by function % of GDP – Health (Eurostat, [tepsr_sp110], 29.08.2018).

The outputs express gains in a social sphere resulting from the public intervention and they were specified as:

- O_1 – Impact of social transfers (excluding pensions) on poverty reduction, e.g. reduction in percentage of the risk of poverty rate, due to social transfers (calculated comparing at-risk-of poverty rates before social transfers with those after transfers; pensions are not considered as social transfers in these calculations) — EU–SILC survey (Eurostat, [tespm050], 29.08.2018),
- O_2 – Impact of state intervention on income inequality reduction, e.g. reduction in income inequality measured by Gini (in 0-1 scale) calculated as Gini for market income (before taxes and transfers) minus Gini for disposable income (post taxes and transfers) (OECD, (http), 03.09. 2018) — called also as Gini gap.

In M_1 model we used output O_1, while in M_2 model — output O_2.

In the first step of our analysis, we focused on a current situation in the EU countries and used the most actual available data (mainly 2016 for M_1 or 2015 for M_2). Thus, the comparisons of the EU countries' efficiency in social policy are done for a period when economic crisis has been already overcome.

In the next step of our research, we adopted a dynamic approach analyzing changes in the social efficiency of state intervention induced by the crisis.

To specify them, we calculated the Malmquist index (tfpch) basing on a radial DEA model, and we completed it with two-factor decomposition.

We distinguished efficiency changes induced by technological change (techch) and technical efficiency change (effch) (Coelli, 1996). We interpret the technological change as a result of institutional reforms that increase availability of the welfare system to resolve socio-economic problems. We understood changes in the technical efficiency as the ones reflecting the current usage of public sources showing management practices and targeting, being strongly influenced by intensity of social tensions.

To analyze the changes in the period from the financial crisis occurrence till its overcoming data for the period 2007–2015/2016 were used. Unfortunately, the results are strongly limited by the data availability. For the model M_1 it was possible to gather all data for the period 2007–2016 for 27 EU countries (only Croatia was excluded from the analysis because of some data unavailability). The strongest difficulties we faced concerned income inequality dimension: M_2 model. Firstly, the Gini gap was calculated only for the sample of 23 EU countries: Bulgaria, Romania, Malta, Cyprus and Croatia were excluded. Secondly, because of both changes in definitions as well as missing data, it was impossible to gather information for the period 2007-2016. Instead, we decided to calculate a simplified version of the Malmquist index — basing only on two points in time: 2007 and 2015. Even in such case we sometimes used the data from the year 2008 instead of 2007 (for France, Germany and Sweden) and 2014 instead of 2015 (for Hungary). Thus, the results are only of a general character and must be taken carefully.

The calculations were done using applications: EMS ver. 1.3 (for non-radial CRS model) and DEAP ver. 2.1 (for decomposition of the Malmquist index).

Using the methods described above, the paper verifies a few important research theses. Firstly, we expect that efficiency of the EU countries in both dimensions: poverty and inequality reduction is similar. It means that inequality is limited mainly by improving the situation of the poor and that both aims of social policy are consistent. Secondly, as stated in the literature, it is expected that a higher scale of social spending goes along with its lower efficiency. If the efficiency is high, it is enough to spend less to limit social tensions and, on the other hand, higher budget limits targeting of the expenditure. Thirdly, efficiency of the social spending that directly influence income level of the people in-need (e.g. social protection expenditure) is supposed to be higher than of the spending of an indirect character (e.g. education and health). Fourthly, we expect that the crisis positively influenced the social efficiency of public spending as it induced institutional changes, especially in the countries with the highest socio-economic tensions.

Results

Social efficiency of government expenditure in the EU countries

The study presents a general assessment of the efficiency of EU countries in both poverty alleviation and inequality reduction by their welfare policy (Fig. 1). The research reveals that Ireland had the most efficient social policy in limiting both poverty and inequality. It was the result of a low level of social spending in this economy. It suggests that how well the expenditures are targeted can be more important than their scale.

The priorities and shape of institutional solutions adopted in each economy result in their different efficiencies considering limiting poverty and inequality. The poorest results in poverty reduction may be found in the poorest countries and the Southern ones: Greece, Romania, Italy or Bulgaria, while the lowest efficiency aimed at inequality is observed in the most affluent countries: the Netherlands, the United Kingdom, Denmark or Sweden. The research shows that there is no direct connection between the efficiency of social policy in limiting poverty and in limiting inequality. It is additionally evidenced by the correlation coefficient between the two dimensions of efficiency that is positive, but very low and not statistically significant (0.24). It suggests that each state sets its independent policy priorities and institutional solutions targeted at different social groups and there is no common agreement about the pattern of income redistribution.

Some additional interesting findings result from comparisons of the position of each economy in both rankings. They allow to specify the character of social policy in each country. Social spending in Greece is mainly targeted at limiting inequality as this country appears to be fully efficient in this dimension, while its efficiency in poverty dimension is the lowest among all countries. Thus, the middle-class is the main beneficiary of social spending in Greece. Similar relations are found in other Southern economies: Italy, Portugal or Spain as well as in Poland, Latvia or Lithuania.

On the other hand, in the Nordic countries such as Sweden, Denmark and, to a lower extent, Finland social spending is mainly targeted at the poorest. Some other economies with high levels of GDP *per capita*, e.g. the United Kingdom or the Netherlands, adopt similar patterns of social expenditures, focused mainly on the aim of poverty alleviation.

This observation is generally consistent with the classification of countries by their welfare state models presented in the literature, which distinguish the Mediterranean from the Continental model, which seems to be more similar to the Nordic or Anglo-Saxon in its prioritizing. It also gathers

some "new" member states with the Southern countries, suggesting that the pattern may be influenced by the GDP *per capita* level. Nevertheless, our research is strongly limited by a quality of statistical data, as the inequality dimension is not directly comparable in time and range of countries to the poverty one. Moreover, it must be noted that either measure of poverty or inequality are indicators of income distribution and reflect similar problem although with differently set priorities. Thus, in-depth studies are required to verify this initial finding.

Moreover, there exist essential negative relations between the scale of government spending and its efficiency in inequality reduction (Tab. 1). They are especially strong concerning education and health expenditures. This observation allows to conclude that the higher the government intervention, especially of a long-term character in human capital creation, the more part of spending goes rather in favor to the middle-classes than the poor and thus limits its efficiency in inequality reduction. Generally, the research shows that substitution between a scale and efficiency of public expenditure in the inequality dimension may take place.

However, the research found no evidence about the relations between the scale of social spending and their poverty efficiency (Tab. 1). Moderate negative correlation appeared only between the scale of social protection spending and its efficiency. This kind of expenditure is expected to have the most direct influence on poverty reduction, and the results suggest that poor targeting may limit its role in poverty alleviation.

These findings revealing substitution between the scale and efficiency of government spending are in line with other research, such as those of Fiszbein *et al.* (2014). Nevertheless, differences between poverty and inequality dimensions suggest that the functional character of public expenditure may play a decisive role in targeting social policy at the poor or the middle-class.

Efficiency of functional kinds of government spending

Another intriguing issue is efficiency of different kinds of social spending in limiting poverty and inequality. It appeared that the pattern of influence of social spending on either of these phenomena was similar in the EU countries (Fig. 2). The most efficient in both dimensions were health expenditures, which have the most pro-poor character, making it possible to alleviate poverty and reduce income disparities. The difference between their efficiency and the next — education spending — exceeded 10 percentage points. The least efficient were social protection expenditures. Although they are expected to directly support the poor or people in difficul-

ties, it appeared that their distribution in the European societies is quite equal and thus their influence on limiting inequality and poverty is limited.

The character of each kind of social spending may result in such a pattern of efficiency. The high efficiency of health and education expenditures may be influenced by their long-term character as investments in human capital. State intervention supporting human development may limit barriers created by inequality of chances and induce productivity growth, the income effects of which may be distributed more equally. Both results are expected to mitigate problems of income inequality and poverty.

Changes in social efficiency of government spending induced by the crisis

Concerning the influence of the economic crisis on efficiency of social spending in the EU countries, the paper identifies the changes in the efficiency adopting Malmquist index and its decomposition (Fig. 3). The achieved results reveal differences in the scale of social consequences of the economic downturn and the institutional reforms adopted in many European economies.

Most of the economies (18 out of 27) noted a decrease in the efficiency of social spending in limiting poverty. This observation indicates a growth of social tensions induced by the crisis and its negative consequences, especially for the poor. The most serious loses in efficiency were found in Romania, followed by Slovakia, Sweden and Poland. On the other hand, efficiency increase in poverty dimension was achieved by many countries which experienced a strong downturn and adopted reforms in their public sphere, e.g. Spain, Ireland, Italy, Greece and Portugal. Efficiency also grew in the United Kingdom, Cyprus, Malta and Bulgaria.

Contrary to poverty dimension, it appears that nearly a half of the EU countries under research (11 out of 23) experienced improvement in efficiency in inequality reduction. Once again, the strongest increases, exceeding 30%, was noted mainly in the states that, enforced by the crisis, made an effort to reform their public sphere — in Greece, Ireland, Portugal and Spain. On the other hand, in Slovakia and Estonia the efficiency of government spending in inequality reduction decreased the most, indicating growing social tensions in these economies.

The efficiency improvement was mainly induced by institutional progress reflected by implementation of new model solutions, new programs and instruments aimed at poverty and inequality reduction. Positive "technological" change was present in nearly all EU countries for poverty dimension and in all for inequality dimension. It stresses positive results of the undertaken public reforms. The only exceptions, considering poverty

aims, are Poland, Hungary and Luxembourg, where a relative "institutional regress" was noted. It suggests comparatively low intensity of implementation of new solutions and instruments in the sphere of social spending aimed at poverty reduction in these economies.

The negative changes in efficiency of social spending were connected in nearly all countries with a decrease in technical efficiency of both implementation of pro-poor solutions as well as those aimed at inequality reduction. Improvements in technical efficiency were found in just a few countries (from the PIIGS group). All other countries faced diminishing technical efficiency connected with the current usage of social funds. Deterioration of social relations induced by the crisis could lower efficiency of social policy and its particular instruments as a result of less individualized social activities.

Main findings and discussion

The research allows to conclude about general differences in a model of social spending among the EU countries. The study reveals no direct connection between efficiency of social policy in poverty and inequality reduction suggesting no common prioritizing concerning welfare policy. Important findings of the research are thus connected with specifying some distinct models of social policy within the EU countries. At least two distinct models may be distinguished — one in which efficiency in poverty reduction is considerably higher than in limiting inequality and the other which is more focused on the inequality issue. The division runs along the line between the Southern and the Northern countries. The South, but also some other economies of "new" members, such as Poland, Lithuania or Latvia, focus their social policy on inequality reduction, while the Scandinavian countries, as well as some other affluent societies, direct their public support mainly on poverty alleviation.

Moreover, our research supports the thesis about substitution between a scale and efficiency of government spending. Although this relation was evidenced only for the aim of inequality reduction, the analysis suggests that poor targeting of social spending negatively influence their efficiency.

Comparisons of the efficiency revealed some benchmark countries that succeeded in adopting public sources to limit socio-economic tensions. It points mainly at Ireland as the state achieving the best results in both dimensions of social goals. The lowest scale of social spending in the EU is an important factor inducing the success, however, Ireland is also among the countries with the highest scale of reduction in the poverty rate as well

as inequality. The relatively low expenditures are thus well targeted raising efficiency. Nevertheless, the field for future research is to analyze detailed Irish solutions of a welfare policy that may be used as benchmark hints for the other EU countries.

The results of our study are in line with the ones of Afonso *et al.* (2010), who share similar methodology for OECD countries and conclude that some southern and large continental European countries report low efficiency, and some Nordic countries ― high efficiency in public social spending aimed at reducing inequality. Ireland got high scores in their results as well. Although the authors use several measures of income distribution, they do not discuss welfare solutions targeting at different groups in society (namely: the poor and the middle class), which we do in the study.

Moreover, the aforementioned authors claim that higher expenditures are associated with more equal income distribution, however, more equality could be also achieved by efficiency improvements (Afonso *et al*., 2010). This finding goes in line also with Cantillon's *et al.* (2003) statement that in the EU countries it is not enough to increase spending to essentially limit poverty, because much of the transfers simply go to people above the poverty line, especially in the southern Europe (see: Marx *et al*., 2015, p. 2080). Although it is empirically confirmed for advanced economies that generally countries with relatively high social spending tended to have lower inequality and poverty (e.g. Battisti & Zeira's (2016) results for OECD show that every increase of fiscal spending of the size of one percent of GDP reduces the Gini coefficient by 0.4 percentage points), there is a long-standing controversy if targeting toward the poor actually enhances the redistributive impact of welfare state policies or "paradox of redistribution" takes place (Marx *et al*., 2015, p. 2081–2083). Our findings support rather the OECD, the IMF and the World Bank's call for targeted benefits (Marx *et al*., 2015, p. 2083), however, the results are not robust to the choice of measure of social gains and the substitution concerns rather general inequality not the poverty dimension.

Our results are also similar to those presented by Hauner and Kyobe (2010), who conduct research on efficiency of government expenditures on education and health (for countries on all income levels) and conclude that efficiency declines with the level of spending. For developing countries, analogous results are presented by Herrera and Pang (2005), while Afonso *et al.* (2013) do the same for Latin America, and Afonso and Kazemi (2017) for OECD. Moreover, another study for OECD countries revealed the importance of good governance for improving efficiency (Adam *et al*., 2011). However, the approach to efficiency in these studies differs from ours, as they use as outputs some specific socio-economic indicators, such

as education enrollment ratios or infant mortality or, as Afonso *et al.* (2013) and Adam *et al.* (2011), compound multidimensional outputs. They thus reflect different outcomes from public spending, but do not express pure problems of distribution.

Our study also allowed to compare efficiency of different kind of social spending. It appeared that the most efficient ones, in both poverty and inequality reduction, are health expenditures. They are followed by education spending, indicating that the best results are achieved by prioritizing policy on long-term investment in human capital. Social protection expenditures were the least efficient, as they are more equally distributed in the society, and thus are not pro-poor and inequality reducing. The findings contradict the initial thesis that a more direct kind of spending is more efficient. It pays attention to the longevity of results of social policy.

The last set of conclusions applies to dynamic changes in social efficiency of government spending induced by the crisis occurrence and institutional reforms undertaken in response to it. As Heimberger (2018) claims, fiscal consolidations typically lead to an increase in income inequality, especially when the consolidation is started in the aftermath of a financial crisis. Our research stressed that the last crisis period was characterized also by deep changes in social efficiency of government spending. What is worth noting is that decreases in efficiency were prevailing concerning the poverty dimension, while in the inequality dimension increases were more common. This suggests that the poor were strongly touched by the crisis as social spending were mainly redirected towards the middle class. Moreover, the efficiency losses in both dimensions were mainly induced by negative changes in technical efficiency, specified by current usage of public financial sources within existing rules, while technological change positively influenced the efficiency, proving legitimacy of institutional reforms.

Conclusions

The study pays attention to the problem of setting goals to socio-economic policy and clarifying its priorities in terms of income distribution. We argue that considering social aims must be of a high concern to politicians, who should consciously decide about the shape of institutional solutions supporting different groups of society by instruments of public spending. The results support the prevailing conviction of researchers that problems of inequality and poverty may be mitigated by increases in spending's efficiency by means of better targeting, not by a simple growth of their scale. Moreover, the implications of social spending seem to have longitudinal

character as they touch human capital creation and nurturing social relations.

The research is of initial character, as it is strictly limited by the data availability and comparability. Nevertheless, it is generally consistent with distinctions of welfare state regimes described in the literature, which may be specified by a range of beneficiaries entitled to public support. It appears that more populistic approach (directed towards the middle-class) can be found in the South and "new" member states, with generally more pro-poor solutions in the more mature economies. The future research should investigate in-depth the reasons for such prioritizing in different countries.

For future research, it also seems valuable to browse our traditional approach to assessing efficiency through a scale of spending to other dimensions of public governance. They may cover some non-monetary aspects of institutional solutions, both formal as informal, level of universality of the welfare system and its targeting, and so on. Moreover, some external determinants of the government social efficiency, found in a labor market, resources availability or social ties in the economies, could be researched.

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Annex

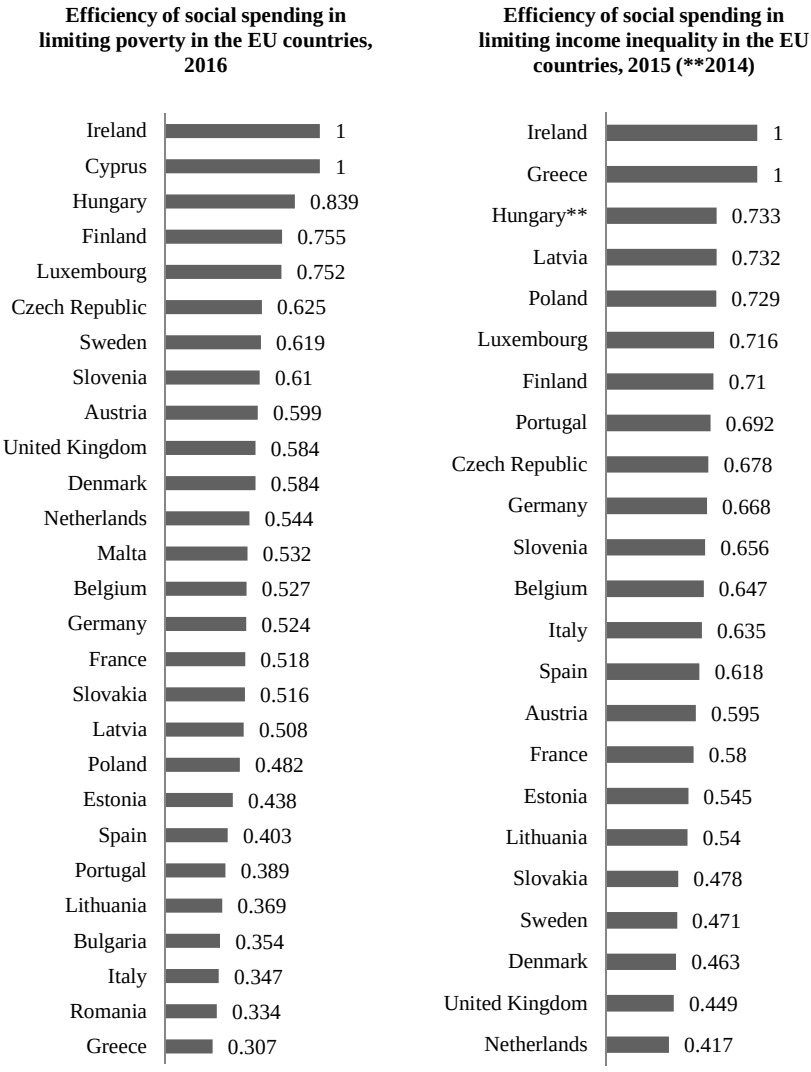
Table 1. Correlation between a scale of government social spending and their efficiency in limiting poverty and income inequality in the EU countries

			Government social spending			
			social protection	**education**	**health**	**total**
Efficiency	poverty dimension	social protection	-0.36287*	0.108341	-0.16815	-0.29691
		education	-0.03717	-0.00216	0.027676	-0.02085
		health	-0.05876	0.298851	-0.22011	-0.05168
		general	-0.07194	0.216306	-0.13402	-0.05273
	inequality dimension	social protection	-0.38594*	-0.48054**	-0.35686*	-0.46502**
		education	0.058877	-0.64468**	-0.06774	-0.07951
		health	-0.10719	-0.3484*	-0.64938*	-0.29884
		general	-0.14836	-0.42635**	-0.60965**	-0.33406

*α=0.1; **α=0.05

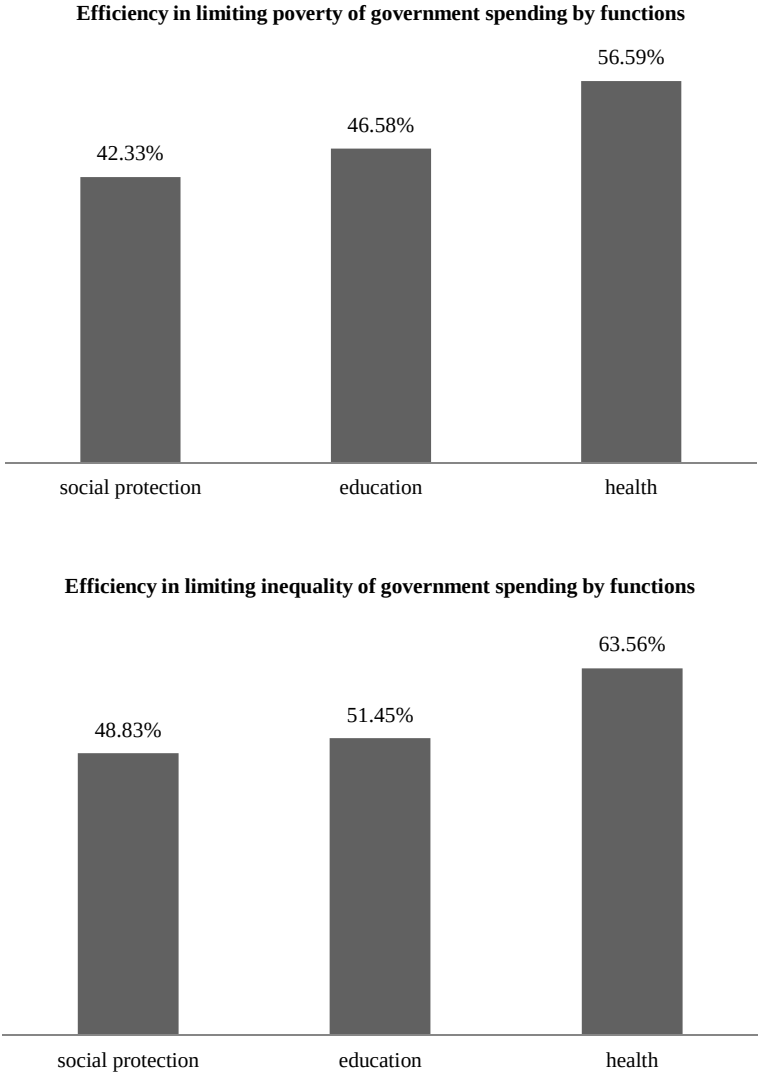
Source: own calculations based on (Eurostat, [tepsr_sp110], 29.08.2018; Eurostat, [tespm050], 29.08.2018; OECD, (http), 03.09.2018).

Figure 1. Efficiency of social spending in limiting poverty and income inequality in the EU countries



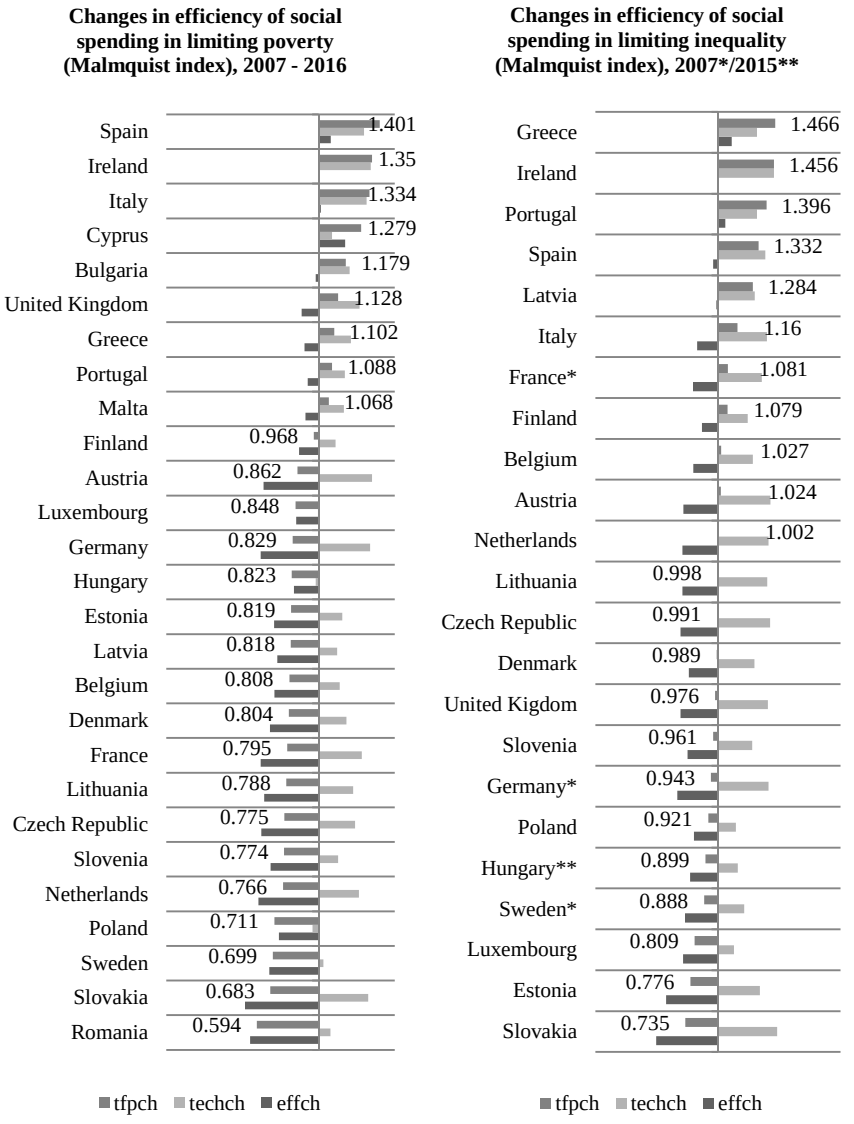
Source: own calculations based on (Eurostat, [tepsr_sp110], 29.08.2018; Eurostat, [tespm050], 29.08.2018; OECD, (http), 03.09.2018).

Figure 2. Efficiency in limiting poverty and income inequality of government social spending by function in the EU countries



Source: own calculations based on (Eurostat, [tepsr_sp110], 29.08.2018; Eurostat, [tespm050], 29.08.2018; OECD, (http), 03.09.2018).

Figure 3. The Malmquist index and its decomposition for social efficiency of government spending in the EU countries



Source: own calculations based on (Eurostat, [tepsr_sp110], 29.08.2018; Eurostat, [tespm050], 29.08.2018; OECD, (http), 03.09.2018).