ISSN 2671-3365

THE EFFECT OF SOCIAL EXPENDITURES ON INCOME INEQUALITY IN POST-SOCIALIST AND CAPITALIST COUNTRIES: A PANEL DATA ANALYSIS

Kristina Velichkovska

International Balkan University-Skopje, kristina.velickovska@ibu.edu.mk

ABSTRACT

Throughout the history of economics, income inequality has been one of the most debated issues. Since the 1990s, the issue of income inequality and welfare segregation has grown increasingly important for countries' economies around the world. One of the most important ways for the government to directly regulate income inequality is through social expenditure. The impact of government social spending on income inequality in selected European nations was explored in this study by examining social benefits and their impact on the Gini indices. On the one hand, post-socialist nations that have undergone transition, and on the other hand, capitalist countries that have never been under the social regime have been picked to be evaluated. Based on the obtained results, government social spending has a positive impact on income disparity for the post-socialist countries i.e. when the government spends more on social programs, income disparity decreases. The findings for the capitalist countries are inconclusive.

KEYWORDS

INCOME INEQUALITY, SOCIAL EXPENDITURES, PANEL DATA ANALYSIS

JEL CLASSIFICATION CODES

H53, D63, C23

1. INTRODUCTION

Since Adam Smith and David Ricardo, the founders of economics, there has been a continuing discussion regarding how to distribute post-production revenue fairly among individuals. In today's world, income inequality is seen as one of the most serious economic issues, particularly in emerging countries. Income inequality, which is a source of many societal problems, has been identified as the primary cause of economic instabilities. As a result, significant efforts are being made all across the world to overcome this problem. Government social spending is the most important economic policy utilized to address such a significant problem because governmental social policies have a direct impact on the poor (Ilker, 2018).

Every social state owes its citizens the right to a decent quality of living. As a result, the government provides social expenditure through the social spending system. While income inequality has always been at the forefront of economic debate, the relationship between government social spending and income

inequality is more current. Several scientific studies have looked at how economic factors including growth, international commerce, foreign capital investment, education, and democracy affect income inequality. In the scientific literature, there is very little research on the effects of government social spending on income disparity. As a result, one of the most important goals of this research, which looks at the effects of government social spending on income inequality, is to add to the literature and allow for more scientific research in this field. According to the scientific conclusions to be gained, another essential goal of this study is to assist in the selection of economic policies.

Econometric science was employed to investigate such a significant economic and social issue and to produce more effective scientific outcomes. Panel data analysis was performed on data from selected post-socialist and capitalist European countries from 2009 to 2019.

The study first covers the theoretical literature of the impact of government social spending on income disparity, followed by trend analyses of the government social spending in the selected nations and the income inequality measured by the Gini index. Finally, to wrap the analysis, the study uses panel data analysis where it observes the relationship between income inequality and government social spending in the selected post-socialist and capitalist countries. The findings are evaluated and policy recommendations are made in the conclusion section.

2. THEORETICAL FRAMEWORK BETWEEN SOCIAL EXPENDITURE AND INCOME INEQUALITY

There are two ways that social spending is applied (public or private). Social spending is referred as public when financial flows are regulated by the government. Sickness benefits, for example, are considered "public" if they are funded by the social insurance system, but they are categorized as "private" if they are paid directly to employees by companies. All financial flows of governmental institutions for social purposes are included in total public social expenditures. Specific social expenses are included in total net social expenditures. Government social spending refers to expenditures that shift resources from high-income to low-income groups (McMaken, 2015).

Government social spending has proven to be one of the most successful ways to decrease income inequality throughout history (Önen, 2010). Even now, government social spending is the state's primary method of combating poverty (Altan, 2006). It is used all around the world to safeguard living conditions that offer a steady income, as well as to prevent poverty, economic disparity, social exclusion, and marginalization (Lindert, 2002). Different applications of government social spending exist in each country, with instances from European countries being used as examples of institutionalization.

In the world, government social expenditure is applied in three ways. The first is to provide benefits to a certain socioeconomic class, such as low-income families with children. The second type of insurance is social insurance, which includes things like unemployment insurance and pensions, while the third type is the overabundance of in-kind or monetary benefits given to those who earn less than the minimum wage under the average income test, as well as to specific groups (the disabled and the elderly) (Lindert, 2002). Individuals who, despite working, do not meet the minimum subsistence level are, however, excluded in developing countries (OECD, 2016).

The literature that explores the topic of government social spending and income inequality through several methods has come to several conclusions:

- The relationship between income inequality and social spending is interdependent and therefore it is very important to choose income inequality measurement in order to better understand the effect of income inequality on social spending
- There may be differences in income redistribution models due to factors such as institutions and electoral mechanisms.
- The democratic countries where different policies have been applied in terms of social expenditures are discussed

Following the study looks at some of the existing literature that explores this topic.

3. EMPIRICAL LITERATURE

Li, Xie, and Zou (2000), used panel data to assess the impact of government social spending on income distribution. They have empirically proved that income taxes and government public spending diminish income disparity as a result of their research. Gregorio and Lee (2002) while investigating the effect of education on income distribution, have included government social spending. The conclusion was that government social spending had reduced income disparity. Smeeding ve Osberg (2004) also attempted to explain the impacts of income disparity and trust on government social spending using panel data analysis. Other studies that showed that government social spending reduces income inequality are Adelman ve Robinson (1988), Lindert ve Williamson (1985), Brenner, Kaelble ve Thomas (1991), Papanek ve Kyn (1986). These and other studies prove the significant and negative relationship between social expenditures and income inequality for different selected countries. Despite the fact that there are many factors which can affect the income inequality in a country, social spending is one of the main determinants that can control or influence the income inequality. This study tries to contribute to the existing literature by observing this correlation in the two sets of countries with different social regimes.

4. METHODOLOGY AND DATA

The study looks at two datasets consisted of seven post-socialist European countries and six capitalist European countries. The dataset of the post-socialist countries includes Slovakia, Czechia, Hungary, Poland, Romania, North Macedonia and Bulgaria, for the period from 2011 to 2019. These countries represent a set of comparable post-socialist cases because of their similar political and economic changes that acquiring a European membership implies (despite the fact that North Macedonia is so far an accession candidate only). Because of data limitations and in order to make the panels balanced with same numbers of observations, the short period of nine years is chosen for observation. The dataset for the European capitalist countries consists of Norway, Netherlands, Sweden, Switzerland, Ireland and Portugal, observed for the same time period 2011-2019.

The dependent variable in this analysis is the Gini index for each country/year observation. The data are gathered from the Eurostat dataset. Since there are differences in measurement across datasets, using a single source is most appropriate. As a result, a complete dataset with no missing values from Eurostat for the chosen set of countries, was chosen for the years 2011-2019.

The independent variable is the social spending (without transfers) as % of GDP for each country. Here the data are taken once again from the Eurostat database, with the exception for the data for North

Macedonia which are missing in the Eurostat. They are instead taken from the State Statistical Office of the country in form of absolute values and then calculated as % of the GDP by the author.

First the study looks at the statistical analysis of the acquired datasets and tries to find if there are indicators for the correlation between the income inequality and the social expenditures as % of GDP by looking in the overall % changes through the years. Next, it employs a panel data analysis, since the data sets consist of pooled cross section of time series. Random effects model (REM) and fixed effects model (FEM) are estimated based on the panel data and then Hausman test is performed in order to determine the preferred model for each set of data.

Pooling requires control for unmeasured heterogeneity across cases by estimating either random-effects or fixed-effects regression models (Amemiya 1985; Halaby 2004). First, while FEM are the most conservative approach because they control for any unmeasured time invariant variation across cases by removing all between-country variation, Tuma and Hannan (1984) showed that REM are asymptotically more efficient relative to FEM, which is especially helpful in the context of small sample. The Hausman test (1978) - the textbook procedure to determine which approach is appropriate - is a test of the hypothesis that ßfe~ßre = 0, for all ß. Differences across the two approaches raise concern that the unit effects are correlated with the regressors, and therefore that the RE estimates of ß are plagued with heterogeneity bias. Should the FEM and REM specifications reveal no substantive differences in ß, there is little reason to worry about such bias. We estimated Hausman tests across all specifications, to see if we can reject the hypothesis for insignificant difference in ß across the two estimating procedures.

5. OVERVIEW OF THE RELATIONSHIP BETWEEN SOCIAL EXPENDITURES AND INCOME INEQUALITY

What factors impact social spending in the post-socialist welfare state? The official ideology of socialism portrayed it as a system that ensures social justice and equality by providing universal education, health care, subsidized housing, and cultural goods. While genuine socialist regimes did not eliminate inequities (Szelényi 1978), experts unanimously agree that during the communist era, income inequality was significantly lower than in other systems at comparable levels of economic development (Boswell and Chase-Dunn 2000, Heyns 2005). State-level efforts to decrease inequality were largely abandoned once communist regimes fell apart. Following 1989, Central and Eastern European post-socialist countries soon adopted market exchange as the guiding economic concept and capitalism as the favored economic organization system. They also began to integrate into the global economy by allowing foreign direct investment, which had previously been barred under the socialist era (Ko & Min, 2019).

5.1 Review of the Income Inequality Measured Through the Gini Coefficients

Since the onset of these overarching transformations, social inequalities have varied through the years, throughout the post-socialist countries. The trends are depicted in Table 1, which shows levels of income inequality from 2011 to 2019 for seven Central and East European post-socialist countries. In 2011, the average Gini index was 31 across these countries, but decreased only slightly to 29.9 a decade later. Nevertheless, when we observe the changes of the income inequality by country, more significant changes will be noticed for the same period. While countries like Poland, Slovakia and North Macedonia have managed to achieve significant improvements in the income inequality levels of their countries, others have a decade of struggling with stabilizing their inequality levels.

When looking in their averages from the last decade, Gini indices for Romania, North Macedonia and Bulgaria are close to the high levels we find in Anglo-Saxon countries. On the other hand, inequality levels in the Slovakia and Czechia after years of market reform resemble those of Scandinavian countries, known for their relatively equitable income distribution. These cross-country variations can probably be explained by different aspects of the post socialist transformations, but that analysis will be left for other studies.

Table 1. Review of the Gini index in the post-socialist countries

YEAR	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average
Slovakia	25.7	25.3	24.2	26.1	23.7	24.3	23.2	20.9	22.8	24.02
Czechia	25.2	24.9	24.6	25.1	25	25.1	24.5	24	24	24.71
Hungary	26.9	27.2	28.3	28.6	28.2	28.2	28.1	28.7	28	28.02
Poland	31.1	30.9	30.7	30.8	30.6	29.8	29.2	27.8	28.5	29.93
Romania	33.5	34	34.6	35	37.4	34.7	33.1	35.1	34.8	34.69
North Macedonia	39.4	38.8	37	35.2	33.7	33.6	32.4	31.9	30.7	34.74
Bulgaria	35	33.6	35.4	35.4	37	37.7	40.2	39.6	40.8	37.19
Average	31	30.7	30.7	30.9	30.8	30.5	30.1	29.7	29.9	30.47

The review of the growth and decline of the Gini index in the post-socialist countries is represented in Table 2. From the table can be seen that Bulgaria with 16.57% has the highest growth of Gini coefficient from 2011 to 2019, followed by Romania and Hungary with around 4% growth in the income inequality. This overall growth of the Gini index can present a threat to sustainable growth of the economies and the social welfare of the countries.

The highest overall decline of the Gini index from the observed countries, can be seen in the case of North Macedonia where the average decline for the observational period is -22.08%, followed by Slovakia with an overall decline of -11.28%. The single highest decline in the value of the Gini index is also registered in Slovakia in the year 2018 and 2019 when the Gini index has decreased for -9.91%. A fall in the Gini index might imply a reduction in economic and social inequality, as well as income segregation, which can contribute to the country's sustainable economic growth and social welfare improvement.

Figure 1. Gini indices in post-socialist countries

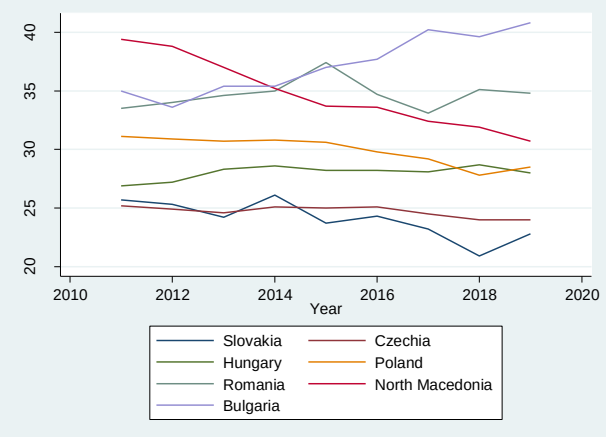
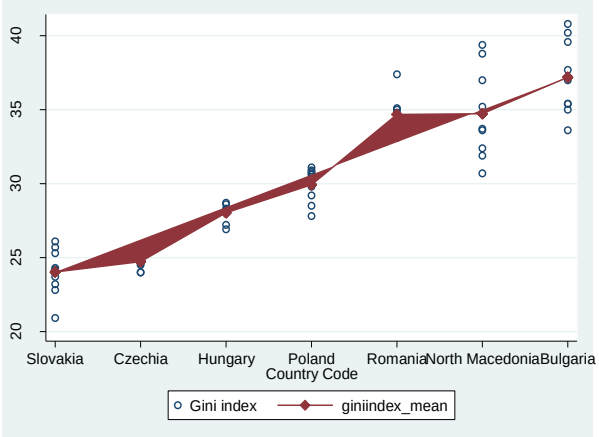


Figure 2. Mean values of Gini in post-socialist countries



The trend analysis of the Gini coefficients shows that Czechia has the most stable Gini indices, followed by Romania which apart from a slight increase in 2013, follows a narrow trend (Figure 1). North Macedonia and Slovakia show are significant decrease in their income inequality levels, while Bulgaria sky-rockets with the Gini indices in the last decade (Figure 1). The mean values of the Gini indices for the observed period of time are represented in Figure 2, where Bulgaria has the highest mean value of the Gini indices, followed by North Macedonia and Romania, then Poland, Hungary, and lastly in the best positions are Czechia and Slovakia.

Table 2. Review of the growth and decline of the Gini index in the post-socialist countries

YEAR	2012	2013	2014	2015	2016	2017	2018	2019	Overall % change
Slovakia	-1.56	-4.35	7.85	-9.20	2.53	-4.53	-9.91	9.09	-11.28
Czechia	-1.19	-1.20	2.03	-0.40	0.40	-2.39	-2.04	0.00	-4.76
Hungary	1.12	4.04	1.06	-1.40	0.00	-0.35	2.14	-2.44	4.09
Poland	-0.64	-0.65	0.33	-0.65	-2.61	-2.01	-4.79	2.52	-8.36
Romania	1.49	1.76	1.16	6.86	-7.22	-4.61	6.04	-0.85	3.88
North Macedonia	-1.52	-4.64	-4.86	-4.26	-0.30	-3.57	-1.54	-3.76	-22.08
Bulgaria	-4.00	5.36	0.00	4.52	1.89	6.63	-1.49	3.03	16.57

Following, the study observes the situation for the same time period but for selected European capitalist countries. The situation in the averages for all observed years shows that the situation is stable, starting with an average of 28.1 in 2011 to 28.4 in 2019. However, when we look closer in the specific countries, we will notice a completely different situation then the post-socialist countries. The majority of the selected capitalist countries, apart from Portugal and Ireland, have income inequalities which have sky-rocketed through the years. Still, when looking in their averages from the last decade, Gini indices for Portugal and Ireland are at the bottom of the list with highest income inequality levels compared to the peer countries.

If we compare the overall averages from the post-socialist countries and the capitalist countries, the later are in a better income inequality position, even though income inequality is more often associated with socialistic and communistic ideologies, rather than with capitalism.

Table 3. Review of the Gini index in the capitalist countries

YEAR	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average
Norway	22.9	22.5	22.7	23.5	23.9	25	26.1	24.8	25.4	24.09
Netherlands	25.8	25.4	25.1	26.2	26.7	26.9	27.1	27.4	26.8	26.38
Sweden	26	26	26	26.9	26.7	27.6	28	27	27.6	26.87
Switzerland	29.7	28.8	28.5	29.5	29.6	29.4	30.1	29.7	30.6	29.54
Ireland	29.8	30.4	30.7	31	29.7	29.6	30.6	28.9	28.3	29.89
Portugal	34.2	34.5	34.2	34.5	34	33.9	33.5	32.1	31.9	33.64
Average	28.1	27.9	27.9	28.6	28.4	28.7	29.2	28.3	28.4	28.40

The review of the growth and decline of the Gini index in the capitalistic countries is represented in Table 4. The % changes are confirming the observations from the absolute values. Portugal and Ireland as the only two countries with improving absolute values in the Gini coefficients, have also a negative

overall % change of -6.73 and -5.03 respectively. The rest of the selected capitalist countries are struggling with increasing income inequality, with Norway on top of that list with a rise of 10.92% change.

The single highest increase in the value of the Gini index is also registered in Norway in the year 2016 when the Gini index has increased for 4.603%, which is somewhat unexpected for a Scandinavian country.

Table 4. Review of the growth and decline of the Gini index in the capitalist countries

YEAR	2012	2013	2014	2015	2016	2017	2018	2019	Overall % change
Norway	-1.747	0.889	3.524	1.702	4.603	4.4	-4.98	2.419	10.92
Netherlands	-1.55	-1.18	4.382	1.908	0.749	0.743	1.107	-2.19	3.88
Sweden	0	0	3.462	-0.74	3.371	1.449	-3.57	2.222	6.15
Switzerland	-3.03	-1.04	3.509	0.339	-0.68	2.381	-1.33	3.03	3.03
Ireland	2.013	0.987	0.977	-4.19	-0.34	3.378	-5.56	-2.08	-5.03
Portugal	0.877	-0.87	0.877	-1.45	-0.29	-1.18	-4.18	-0.62	-6.73

The same conclusions can be drawn from the trend analysis where Norway has the sharpest increase of the Gini indices through the years, Portugal has a decrease, while the rest of the countries are relatively stable (Figure 3). Even though Portugal is the country with the best improvement in terms of the income inequality, it is still with the highest mean value of the Gini coefficient in comparison to the other selected capitalist countries. Similar situation is with Norway, which despite the sharp increase in the income inequality, it is still the country with the lowest mean value of the Gini indices from this set of countries.

Figure 3. Trend analysis of Gini in capitalist countries

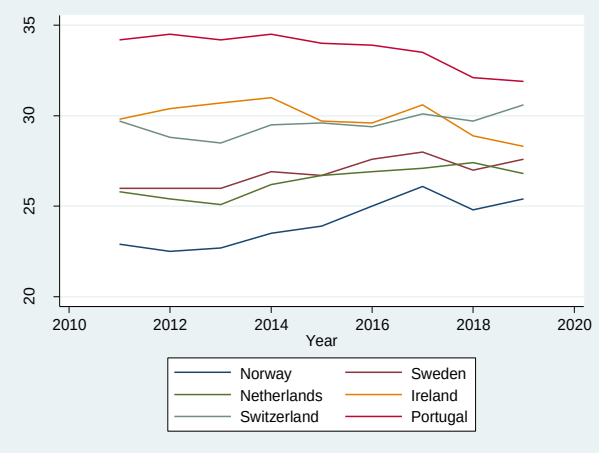
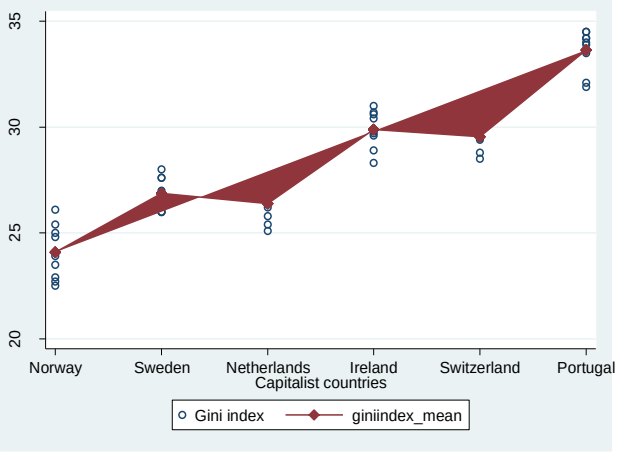


Figure 4. Mean values of Gini in capitalist countries



Studying trends in income inequality can help us better comprehend post-socialist shifts as well as changes in capitalist countries. Furthermore, the study encourages a closer look into how certain structural, political, and cultural factors have influenced social stratification through the years.

5.2 Review of the Social Expenditures

As the global effects of the financial and economic crisis became more apparent, the need for social transfers to the most vulnerable segments of the population grew. In recent years, the quantity of social

transfers has increased in line with the rise in the number of socially vulnerable persons. Social expenditures are often associated as one of the most significant determinants to income inequality. In order to confirm this relationship, the study looks at the social expenditures (excluding the transfers) as % of GDP in all countries, as well as the growth or decline in these social expenditures as % of GDP through the years. From the research results presented below it can be seen that North Macedonia and Poland with an average of 15% for the selected period of time, separate the highest percentage of their GDP as social protection expenditures. On the bottom part of the table, Bulgaria and Romania spend on average 11% form their GDP for the purposes of social protection, in comparison to the countries taken into consideration for the observed period. These results for the post-socialist countries correspond with the results from Table 2 for the overall % change in the Gini coefficients where Bulgaria and Romania had the highest increase in their income inequality levels. This can be seen as an indicator of the correlation between the income inequality and the social expenditures in the post-socialist countries.

Table 5. Review of the social transfers as a percentage of GDP in the post-socialist countries

YEAR	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average
North Macedonia	14.5%	14.9%	14.8%	14.9%	14.8%	15.0%	15.3%	15.2%	15.7%	15.0%
Poland	13.9%	14.0%	14.6%	14.5%	14.3%	15.2%	15.1%	14.9%	15.4%	14.7%
Slovakia	13.8%	13.9%	14.0%	14.0%	13.7%	13.9%	13.6%	13.2%	13.4%	13.7%
Hungary	15.2%	15.0%	14.7%	13.7%	12.8%	12.5%	11.9%	11.3%	10.7%	13.1%
Czechia	13.4%	13.6%	13.6%	13.2%	12.8%	12.6%	12.2%	12.2%	12.3%	12.9%
Bulgaria	11.1%	11.0%	11.9%	12.2%	11.9%	11.6%	11.1%	10.9%	10.6%	11.4%
Romania	12.0%	11.2%	10.7%	10.5%	10.6%	10.7%	10.8%	10.7%	11.0%	10.9%

Similar results are seen from the Table 6 for the overall % change of the social expenditures as % of GDP, where once again Poland is on the top of the table with 0.4% increase in the % share of GDP that goes for social expenditures, while at the bottom of the table are Bulgaria and Hungary, with negative 0.2% and 0.4% respectively as decrease of the % share of the countries' GDP that is spent on social expenditures. A positive surprise here is the positive % change in Romania which show a significant increase in the social expenditures as % of the GDP over the years.

Table 6. Review of the growth of social transfer expenditures in the post-socialist countries

YEAR	2012	2013	2014	2015	2016	2017	2018	2019	Overall % change
North Macedonia	0.46%	-0.14%	0.06%	-0.02%	0.13%	0.36%	-0.09%	0.45%	-0.01%
Poland	0.10%	0.60%	-0.10%	-0.20%	0.90%	-0.10%	-0.20%	0.50%	0.40%
Slovakia	0.10%	0.10%	0.00%	-0.30%	0.20%	-0.30%	-0.40%	0.20%	0.10%
Hungary	-0.20%	-0.30%	-1.00%	-0.90%	-0.30%	-0.60%	-0.60%	-0.60%	-0.40%
Czechia	0.20%	0.00%	-0.40%	-0.40%	-0.20%	-0.40%	0.00%	0.10%	-0.10%
Bulgaria	-0.10%	0.90%	0.30%	-0.30%	-0.30%	-0.50%	-0.20%	-0.30%	-0.20%
Romania	-0.80%	-0.50%	-0.20%	0.10%	0.10%	0.10%	-0.10%	0.30%	1.10%

Figure 5 shows the trend analysis of the social expenditures as % of GDP in the post-socialist countries. There is a significantly sharp decrease in the social expenditures as % of GDP for Hungary which had the highest negative % change from 2011 to 2019. Czechia also experience a decline with a small

negative overall % change. Romania and Bulgaria have the lowest mean values of social spending as % of GDP with no sight of improvement, apart from a slight increase in Bulgaria in 2013 and 2014.

Figure 5. Social spending in post-socialist

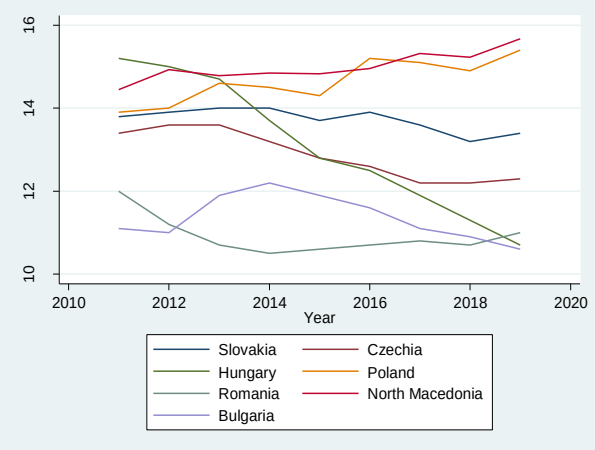
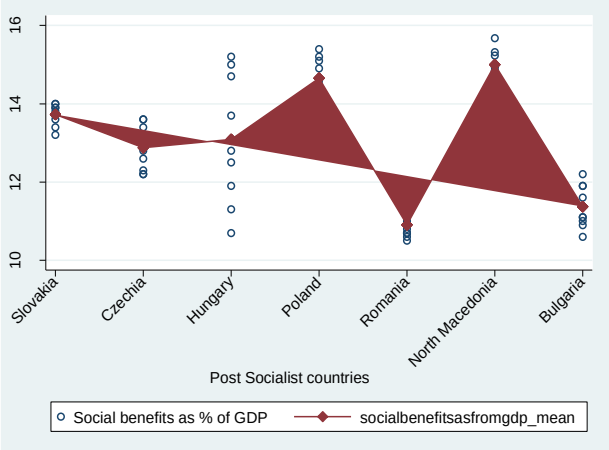


Figure 6. Mean values of social spending in post-socialist



Further on, the study looks at the situation in the capitalist countries and their level of growth or decline in the social expenditures as % of GDP. In Table 7 where the review of social spending as a percentage of GDP is represented for the selected European capitalist countries, there is one country which has a significant increase in their social expenditures, and that is Portugal. This corresponds with the results for the tables for the Gini coefficients which also showed that Portugal has the highest overall percentage change of improvement in their income inequality. Following is Norway with 14.1% of average social spending as % of GDP for the period 2009-2019, however this contradicts with the findings from the Gini coefficients tables since Norway was at the bottom with the highest increase in income inequality over the years.

Table 7. Review of the social transfers as a percentage of GDP in the capitalist countries

YEAR	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average
Norway	13.2%	13.2%	13.3%	13.8%	14.8%	15.4%	15.0%	14.2%	14.7%	14.2%
Sweden	13.2%	13.8%	14.1%	13.7%	13.2%	13.1%	12.8%	12.6%	12.3%	13.2%
Netherlands	11.3%	11.6%	12.0%	11.9%	11.7%	11.5%	11.1%	10.7%	10.5%	11.4%
Ireland	14.0%	13.9%	13.2%	11.8%	8.8%	8.4%	7.7%	7.1%	6.8%	10.2%
Switzerland	9.6%	9.7%	9.8%	9.8%	9.9%	10.0%	10.0%	9.7%	9.8%	9.8%
Portugal	17.2%	17.8%	18.6%	18.0%	17.6%	17.2%	16.6%	16.3%	16.2%	17.3%

The figures below show the change in the social benefits as % of GDP and the mean values in the capitalist countries. Ireland is again in a negative condition as a result of a steep decrease in the social expenditures, which corresponds with the low mean value compared to the other capitalist countries. Portugal is also showing a slight decline in the social spending, however it is not of a major concern because their mean value is significantly higher than the other selected capitalist countries.

Figure 7. Social spending in capitalist countries

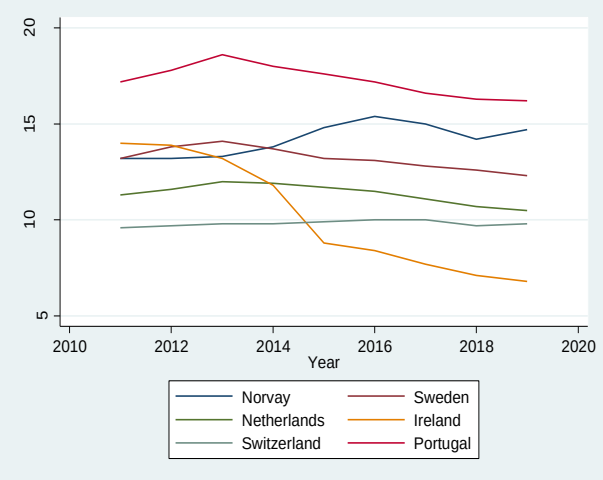
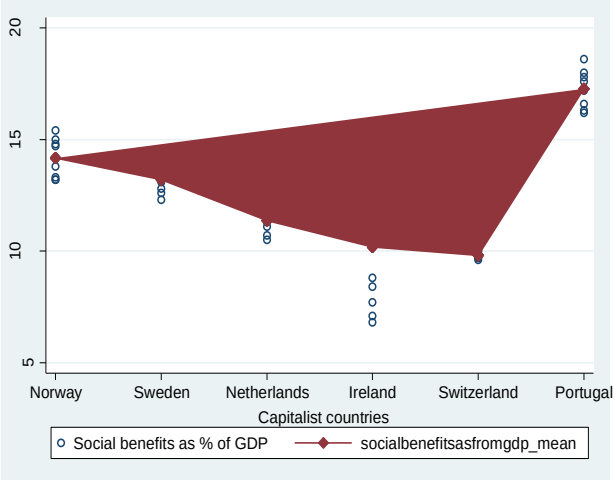


Figure 8. Mean values of social spending in capitalist



The situation in Table 8 where the overall growth/decline of the social expenditures are shown, shows that the best performing countries in income inequality from this dataset, Portugal and Ireland, are now with highest negative values of their overall % change in the social spending as % of GDP. This means that they have been decreasing their social expenditures as % of GDP through the years, and yet their income inequality levels have been improving. This contradicts with our assumptions and the findings for the post-socialist group of countries, which might indicate that the relationship of social expenditures and income inequality in the capitalist set of countries is not significant, i.e. one does not affect the other.

Table 8. Review of the growth of social transfer expenditures in the capitalist countries

YEAR	2012	2013	2014	2015	2016	2017	2018	2019	Overall % change
Switzerland	0.0%	0.1%	0.5%	1.0%	0.6%	-0.4%	-0.8%	0.5%	0.5%
Ireland	0.6%	0.3%	-0.4%	-0.5%	-0.1%	-0.3%	-0.2%	-0.3%	-0.9%
Sweden	0.3%	0.4%	-0.1%	-0.2%	-0.2%	-0.4%	-0.4%	-0.2%	-0.5%
Norway	-0.1%	-0.7%	-1.4%	-3.0%	-0.4%	-0.7%	-0.6%	-0.3%	-0.2%
Netherlands	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%	-0.3%	0.1%	0.0%
Portugal	0.6%	0.8%	-0.6%	-0.4%	-0.4%	-0.6%	-0.3%	-0.1%	-0.7%

5. EMPIRICAL ANALYSIS

In order to confirm the findings of the relationship between income inequality and social expenditures for the both set of countries, the study performs an empirical analysis with the same data for the same observed period of time.

The Fixed effects model and the Random effects model were conducted on both datasets. Based on the Hausman test, was concluded which of the models are preferred for each of the set of countries. When it comes to the set of post-socialist countries, the Random effects model is preferable in comparison with the Fixed effects model. This decision is based on the Hausman test which indicates that we cannot reject the null hypothesis at 5% significance level (Figure 11). The results from the preferred Random effects model (Figure 10) indicate that there is a negative relationship between the dependent and independent

variable, i.e. with every unit of increase in the social expenditures as % of the GDP, there is a 0.603 units of decrease in the income inequality level. The p value which is 0.041 confirms the significance of this relationship at a 5% significance level. These results from the panel data analysis confirm once again the conclusion from the statistical analysis that for the post-socialist set of countries, the increase in the social expenditures as a % of GDP results in decrease in the income inequality for each selected country, which is also in line with the literature that analyzes this relationship.

Figure 9. Fixed effects regression model for the post-socialist set of countries

```
Fixed-effects (within) regression               Number of obs     =         63
Group variable: countrycode                     Number of groups  =          7

R-sq:                                           Obs per group:
     within  = 0.0617                                         min =          9
     between = 0.1144                                         avg =        9.0
     overall = 0.1037                                         max =          9

                                                F(1,55)           =       3.61
corr(u_i, Xb)  = 0.1557                         Prob > F          =     0.0625

------------------------------------------------------------------------------
    giniindex |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
--------------+---------------------------------------------------------------
socialbenef~p |  -.5785952   .3043396    -1.90   0.063    -1.188505    .0313149
        _cons |   38.04655   3.989666     9.54   0.000     30.05108    46.04202
--------------+---------------------------------------------------------------
      sigma_u |  4.9694496
      sigma_e |  1.7369536
          rho |  .89113164   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(6, 55) = 71.88                     Prob > F = 0.0000
```

Figure 10. Random effects regression model for the post-socialist set of countries

```
Random-effects GLS regression                   Number of obs     =         63
Group variable: countrycode                     Number of groups  =          7

R-sq:                                           Obs per group:
     within  = 0.0617                                         min =          9
     between = 0.1144                                         avg =        9.0
     overall = 0.1037                                         max =          9

                                                Wald chi2(1)      =       4.17
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0412

------------------------------------------------------------------------------
    giniindex |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
--------------+---------------------------------------------------------------
socialbenef~p |  -.6033055   .2954878    -2.04   0.041    -1.182451     -.02416
        _cons |      38.37   4.359756     8.80   0.000     29.82503    46.91496
--------------+---------------------------------------------------------------
      sigma_u |  5.3290388
      sigma_e |  1.7369536
          rho |  .90396485   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Figure 11. Hausman test for the post-socialist set of countries

```
                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |     fixed        random       Difference          S.E.
-------------+------------------------------------------------------------------
socialbene~p |   -.5785952    -.6033055        .0247103        .0728665
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(1) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =        0.12
                Prob>chi2 =      0.7345
```

On the other side, for the capitalist set of countries, the Hausman test indicates that the Fixed effects model is preferable, since we reject the null hypothesis. The results from FEM indicate that the relationship between the variables for this capitalist countries is positive, i.e. with every unit of increase in the social expenditures as % of GDP, there is a 0.24 units increase in the income inequality level of the country. These findings correspond with the conclusions from our statistical analysis that this relationship in the capitalist countries are unexpected since they are in contradiction with the literature.

Figure 12. Fixed effects regression model for the capitalist set of countries

```
Fixed-effects (within) regression               Number of obs     =         54
Group variable: countrycode                     Number of groups  =          6

R-sq:                                           Obs per group:
     within  = 0.1301                                         min =          9
     between = 0.0703                                         avg =        9.0
     overall = 0.0740                                         max =          9

                                                F(1,47)           =       7.03
corr(u_i, Xb)  = 0.0554                         Prob > F          =     0.0109

------------------------------------------------------------------------------
    giniindex |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
--------------+---------------------------------------------------------------
socialbenef~p |   .2435662   .0918641     2.65   0.011     .0587595    .4283729
        _cons |   25.31578   1.169862    21.64   0.000     22.96232    27.66924
--------------+---------------------------------------------------------------
      sigma_u |  3.2347774
      sigma_e |   .8629794
          rho |  .93355648   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(5, 47) = 126.06                     Prob > F = 0.0000
```

Figure 13. Random effects regression model for the capitalist set of countries

```
Random-effects GLS regression                   Number of obs     =         54
Group variable: countrycode                     Number of groups  =          6

R-sq:                                           Obs per group:
     within  = 0.1301                                         min =          9
     between = 0.0703                                         avg =        9.0
     overall = 0.0740                                         max =          9
```

```
                                                Wald chi2(1)      =       7.46
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0063

------------------------------------------------------------------------------
    giniindex |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
--------------+---------------------------------------------------------------
socialbenef~p |   .2453498   .0898389     2.73   0.006     .0692687    .4214308
        _cons |   25.29318   1.850994    13.66   0.000      21.6653    28.92106
--------------+---------------------------------------------------------------
      sigma_u |  3.5981772
      sigma_e |   .8629794
          rho |  .94560659   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Figure 14. Hausman test for the capitalist set of countries

```
                 ---- Coefficients ----
             |      (b)           (B)             (b-B)     sqrt(diag(V_b-V_B))
             |     fixed        random       Difference          S.E.
-------------+----------------------------------------------------------------
socialbene~p |    .2435662     .2453498       -.0017836        .0191828
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(1) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =         0.01
                Prob>chi2 =       0.9259
```

In order to confirm once again the direction of the relationship between the social expenditures and the Gini coefficients, below are represented two scatter plots of their relationships and the fitted line. On the y axis is represented the Gini coefficient and on the x axis social benefits as % of GDP, whereas the fitted values (estimated responses) are represented by the fitted lines for both set of countries. Both figures confirm the conclusions from the panel data analysis that there is a negative relationship between the social spending as % of GDP and the Gini indices in the post-socialist countries, and a positive relationship in the capitalist countries.

Figure 15. Scatter plot of post-socialist countries

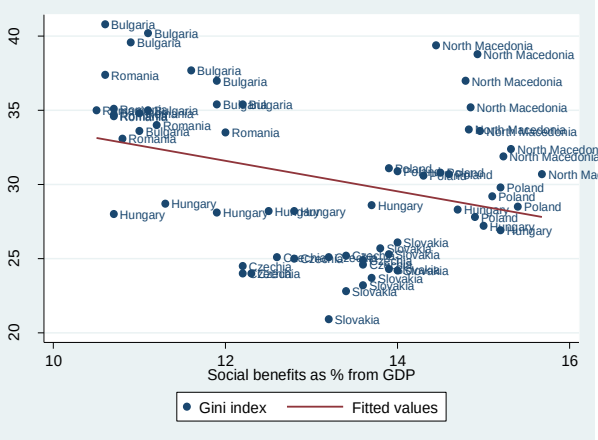
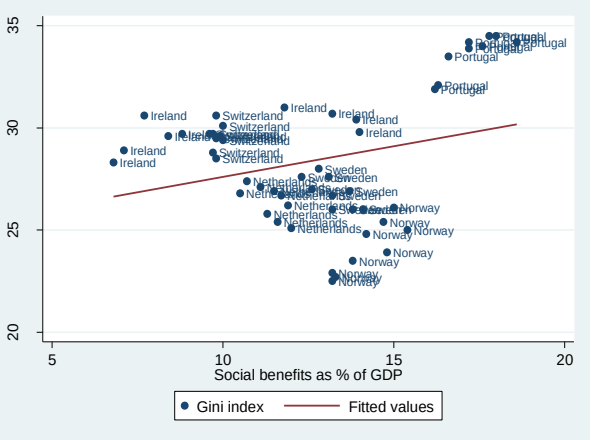


Figure 16. Scatter plot of capitalist countries



6. CONCLUSION

As a kind of social security, social expenditures are required for each economy and society to function properly. Social expenditures as a type of social security differ depending on the country's economic system and growth, but their primary goal remains the same.

One of the main outcomes of the establishment of an effective social security system is the reduction of poverty and the facilitation of efficient social redistribution of income among households. Today's economies face a severe issue in addressing global poverty and income inequality, and one way to do so is through the social welfare system. This role of the social welfare system as one of the major determinants to tackle income inequality has been changing through the years and the social regimes. Therefore, this paper tries to analyze the role that social expenditures have had on the growth or decline on income inequality over the last decade in two different set of countries – post-socialist European countries and capitalist European countries. The first dataset is composed of seven Central and East European post-socialist countries, while the second set of countries is composed of six European countries with capitalist social regimes. The observational period of time is 2011-2019, and the variables explored are the social expenditures as % of GDP as independent variable, and the Gini coefficients for each observed country as dependent variable. These secondary data are gathered from the Eurostat database, except for the data for North Macedonia, taken from the national State Statistical Office.

The results from the statistical analyses indicated that the correlation between the two variables is clearer in the set of post-socialist countries where the increase in the social expenditures as % of GDP through the years has resulted in a decreased income inequality in all the observed post-socialist countries. Having in mind that conventional socialism is led by the ideology of equal quality of life for every citizen, it is not surprising that these countries are still feeling the effects of the socialistic social regimes.

The situation is not the same with the second set of observed countries with capitalistic social regimes. Here the correlation between social expenditures as % of GDP and income inequality is not as clear and requires deeper analysis in order to determine the existence and the significance of this relationship.

For this reason, the study further employs a panel data analysis with fixed and random effects regression models. From the results received from the regression models and the Hausman tests, the study concludes that for the post-socialist countries the Random effects regression model (REM) is preferred, while for the capitalist countries the Fixed effects regression models (FEM) is preferred. The findings from REM indicate a negative relationship between the social expenditures as % of GDP and Gini coefficients with a 5% level of significance for the post-socialist countries, which corresponds with the existing literature. For the second set of capitalist countries, the FEM results show a negative relationship between the social expenditures as % of GDP and Gini coefficients with 1% level of significance, which is not in line with the existing literature. In order to confirm the findings, the study shows two visual representations of the relationships in the form of scatter plots which clearly represent in a graphical manner the direction of these relationships.

REFERENCES

Adelman ve Robinson (1988) Macroeconomic adjustment and income distribution: Alternative models applied to two economies, Published by Elsevier B.V., https://doi.org/10.1016/0304-3878(88)90069-7

Altan, Ömer Z. (2006) Sosyal Politika Dersleri. 4. Edition. Eskişehir: Anadolu University Publications.

Amemiya, Takeshi (1985) Advanced Econometrics

Boswell, T., & Chase-Dunn, C. (2000) The Spiral of Capitalism and Socialism: Toward Global Democracy. Lynne Rienner.

Brenner, Kaelble ve Thomas (1991) Income Distribution in Historical Perspective, ISBN: 9780521356473

Gregorio, Jose De ve Lee, Jong-Wha, (2002), "Education and Income Inequality: New Evidence From Cross Country Data". Review of Income and Wealth. Series 48, Number 3, pp. 10-15.

Halaby, C. (2004) Panel Models in Sociological Research: Theory into Practice., Annual Review of Sociology 30:507-44.

Heyns, B. (2005) "Emerging Inequalities in Central and Eastern Europe." Annual Review of Sociology 31:1 63-97.

Ilker, M. (2018) The effect of government social spending on income inequality in OECD: a panel data analysis, International Journal of Economics Politics Humanities and Social Sciences, Vol: 1 Issue: 3, ISSN: 2636-8137

Ko, H., & Min, K. (2019). Determinants of social expenditures in post-socialist countries. Economics and Sociology, 12(2), 253-264. doi:10.14254/2071-789X.2019/12-2/15

Li, Hongyi. Xie, Danyang and Zou, Heng-fu (2000) "Dynamics of Income Distribution". Canadian Journal of Economics. Vol. 33, No. 4, pp. 937-961.

Lindert, K. (2002), Survey of Social Assistance in OECD Countries. World Bank.

Lindert ve Williamson (1985), Growth, equality, and history, Explorations in Economic History, 1985, vol. 22, issue 4, 341-377

McMaken, R. (2015) Social Expenditures in the US Are Higher Than All Other OECD Countries, Except France", Mises Institute Publications.

Önen, Mustafa S., (2010), "Yerel Yönetimlerin Yoksullukla Mücadelesi: Malatya Belediyesi Örneği", Journal of Sayıstay. Vol.79, pp. 63-95.

OECD, OECD Employment Outlook, 2016. (www.oecd.org/employment/outlook.)

OECD, Social Expenditure Update (2016) (http://www.oecd.org/social/expenditure.htm.)

Papanek ve Kyn (1986) The effect on income distribution of development, the growth rate and economic strategy, Journal of Development Economics, 1986, vol. 23, issue 1, 55-65

Schwabish, J., Smeeding, T. and Osberg, L. (2004) Income Distribution and Social Expenditures: A Crossnational Perspective. Luxemburg Income Study (LIS) Working Papers Series. No: 350, pp. 5-23.

Szelényi, I. (1978) Social Inequalities in State Socialist Redistributive Economies. International Journal of Comparative Sociology 19 (l-2):63-87.

Tuma, N. B., and Michael T. H. (1984) Social Dynamics: Models and Methods. Academic Press