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RESEARCH ARTICLE / ARAŞTIRMA MAKALESİ

The Effects of Social Spending on Income Inequality in 30 OECD Countries*

30 OECD Ülkesinde Sosyal Harcamaların Gelir Eşitsizliği Üzerindeki Etkisi

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ABSTRACT

Social spending programs began to be implemented in the post-World War II period owing to the positive developments in economic and demographic indicators. In the following years, governments used social spending programs to eliminate income differences between income groups due to their increasing social benefit function. Hence, the redistribution of income from high-income groups to low-income groups occurs through taxation. The unfairly distributed income lead to not direct human capital and public resources for productive economic activities. Accordingly, governments try to minimize or remove the negative effects of income inequality by social spendings. The study aims at investigating the relationship between social spendings and income inequality in 2009, 2011, the years when the effect of the 2008 crisis observed in the world, and 2015 not being the crisis year by the OLS method by cross-section regression analysis in 30 OECD countries. The analysis results show that an increase in social spending reduces income inequality. Moreover, trade openness negatively affects income inequality, unemployment increases income inequality, and it is possible to interpret that the positive effect of social expenditures on income distribution decreased during the crisis years by compared to the year-based estimation results.

Keywords: Income inequality, Social spendings, Cross section data analysis

JEL Classification: D31, D63, E25, H53, I38

ÖZ

Sosyal harcama programları İkinci Dünya Savaşı sonrasındaki dönemde yaşanan olumlu ekonomik ve demografik gelişmeler sonucu uygulanmaya başlamıştır. Daha sonraki yıllarda ise hükümetler sosyal faydayı artırma fonksiyonundan dolayı sosyal harcama programlarını gelir grupları arasındaki gelir farklılıklarının giderilmesi amacıyla bir araç olarak kullanmıştır. Böylece, vergilendirme yoluyla gelirin yüksek gelirli gruplardan düşük gelirli gruplara transferiyle yeniden dağıtımı gerçekleşmektedir. Adaletsiz dağıtılan gelir, beşeri sermaye ve kamu kaynaklarının verimli ekonomik faaliyetlere yönlendirilmemesine yol açmaktadır.

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Bu nedenle hükümetler sosyal harcamalarla gelir eşitsizliğinin olumsuz etkilerini en aza indirmeye veya tamamen kaldırmaya çalışmaktadırlar. Çalışma 2008 krizinin etkisinin dünyada hissedildiği yıllar olan 2009, 2011 ve kriz yılı olmayan 2015 yıllarında seçilmiş 30 OECD ülkesindeki sosyal harcamalar ile gelir eşitsizliği arasındaki ilişkiyi incelemeyi amaçlamaktadır. Analiz sonuçları, sosyal harcamalardaki artışın gelir eşitsizliğini azalttığını göstermektedir. Aynı zamanda, ticari açıklığın gelir eşitsizliğini olumsuz yönde etkilediği, işsizliğin gelir eşitsizliğini artırdığı ve yıl bazlı tahmin sonuçları karşılaştırıldığında ise, sosyal harcamaların gelir dağılımına yönelik olumlu etkisinin kriz yıllarında azaldığı yorumunu yapmak mümkündür.

Anahtar kelimeler: Gelir eşitsizliği, Sosyal harcamalar, Yatay kesit veri analizi
JEL Sınıflandırması: D31, D63, E25, H53, I38

1.Introduction

Economic performance depends not only on the increase in production but also on the distribution of the disposable income generated by the production. In this context, the fairly distributed income becomes a very important issue for economies. The unfairly distributed income causes many problems both economically and socially. The high inequality in income distribution is considered as a strong disincentive to the development and welfare of economies. High-income inequalities lead to high poverty, especially in countries with middle-income levels. In addition to being an important problem, the increasing poverty rates also pave the way for the formation of a vicious circle by preventing the poor from contributing to the growth process. From this point of view, income inequality is one of the main reason for the vicious cycle of economic recession and poverty in many developing countries (Goni, Lopez, & Serven, 2008, p. 1).

Many developed countries have started to implement social spending programs being components of social welfare state practices because it is seen the positive developments in the economic indicators and the high share of the working population affecting positively financial possibility in the post-World War II period. In the following process, it emerged that social spending programs have important economic functions as well as social utility functions. Firstly, since the financing of social spendings is largely tax revenues, the tax revenues from high-income groups are transferred to low-level income groups through social spendings, and thus, the income is redistributed in the economy (D'Agostino, Pieroni, & Scarlato, 2020, p. 313). Secondly, social spendings increase the disposable income of low-level income groups and ensure that they benefit more from basic needs such as education, health and culture, and converge them to upper-income groups as a level of utilization of these services, and thus, they have a positive effect on the human capital affecting the level of production in the economy (Baldacci, Clements, Gupta, & Cui, 2008, p. 1317, 1336).

Nowadays, governments aim at using social spendings for income redistribution. Income generated by economic activities (surplus-value of

production) is divided up by labour and capital owners. Income inequality occurs when people representing a small share in the total population have a large portion of income. In other words, if the income is not distributed fairly, an increase in income difference between the upper-income group and the lower-income group leads to income inequality. As a result of income inequality, there are important differences between people's living standards. Social spendings to be used effectively reduce the negative effects of income inequality by redistributing income and improving living standards.

Income inequality has many negative effects on national economies. Therefore, it is an important indicator to be used to measure the development levels of countries. Examined negative effects of income inequality, firstly, the income in the economy cannot be distributed fairly in the society due to income inequality, and thus, significant income level differences occur between the upper-income group and the lower-income group. Income inequality may affect negatively human capital, which is one of the dynamics of economic development, and the growth rate of the economy since it decreases the purchasing power of the lower-income group from year to year and the ability to benefit from basic services such as education and health (Breunig & Majeed, 2020, p. 83). Secondly, in an economy with income inequality, the upper-income groups may have an impact on the government and lead to a negative impact on growth through corruption, inefficient allocation of public resources (Kriegera & Meierrieks, 2016, p. 118).

Policymakers have also major concerns about increasing inequality in income distribution. The high unemployment by the financial crisis, the rapid income increases of high-income groups compared to other income groups in the recent period, the negative effects of fiscal consolidation on low-income groups are only some of the mentioned concerns. Income inequality has increased especially in developed countries after the 1980s. In this period, increasing inequality between regions in economies, globalization affecting negatively the wages of low-skilled workers, technological change supporting high-skilled workers, institutional and regulatory reform decreasing the bargaining power of labor and increases in the labor force participation of low-skilled workers can be listed as important factors

of income inequality. Moreover, high economic growth in many developing economies is seen as a cause for increasing income inequality (Bastagli, Coady, & Gupta, 2012, p. 4).

High-level income inequality shows that land and human capital are unfairly distributed, and therefore, it prevents a significant rate of the population participating in the growth process. In addition to this, high-income inequalities also indicate that the fiscal policy cannot fulfill the redistribution function of social spendings used to be effective in social benefit. It demonstrates that the governments in the industrial countries are successful in income redistribution, but in the developing countries, the governments are a part of the problem rather than the solution. It is suggested as a solution that interventions increase the equality of opportunity by providing access to areas such as the education and health sectors. However, it is not seen as a solution in the long term, so activating the redistribution function of the fiscal system by financial reforms can be preferred as another way (Goni et al., 2008, p. 2).

Governments prefer more to achieve income equality by using fiscal policies despite many factors eliminating the income inequality at macro and micro level. Fiscal policies play an important role in reducing income inequality both in developed economies and in developing economies where tax and transfer expenditures are high levels (Bastagli et al., 2012, p. 11). The fiscal policy used to reduce income inequality is implemented through transfer expenditures, especially in developed economies. In recent years, income taxes and transfer expenditures have been used as an important tool to reduce income inequality in developed economies. Public pensions and family benefits constitute the majority of the income redistribution among the transfer expenditures. For all these reasons, it is clear that social spendings are crucial in decreasing income inequality.

Social spendings consist of public expenditures in the fields of pension, unemployment insurance, housing, social protection, health and education. Basic services including cash and direct in-kind transfers such as child benefits, mother/child support programs, food aid, school supplies, food and energy support for

households, education and health benefits for the poor are covered by public social spendings (Grosh, Ninno, Tesliuc, & Ouerghi, 2008, p. 1). This study aims at investigating the effects of social spendings on income inequality in 30 OECD countries. While the study examines the relationship between social spendings and income inequality, it is expected to contribute to the existing literature in two ways. Firstly, previous studies have often used panel and time-series analyses. Limited studies examined the relationship between social spending and income inequality by using cross-section data analysis. This study tries to fill the existing gap in this area in the literature by using cross-section data analysis. Secondly, limited studies compare the effects of social spendings on income inequality in the existing literature by analyzing the year base and comparing elasticities between crisis years and other years. This study tries to fill the existing gap in the literature by comparing the effect levels of social spendings on income inequality in 2009, 2011 and 2015.

In this study, 30 OECD countries are analyzed by the OLS method by cross-section regression analysis. In Chapter 2, previous studies are mentioned. In Chapter 3, methodology, dataset, and the model are given. In Chapter 4, the empirical results are interpreted. In Chapter 5, the results are discussed.

2. Literature Review

Several studies examine the relationship between social spendings and income inequality. Doerrenberg and Peichl (2014) investigate the relationship between social spendings and income inequality in OECD countries by using the Fixed Effects Model and panel data analysis. The findings indicate that social spendings reduce income inequality more than taxation. D'Agostino et al. (2020) analyze the impact direction between social spendings and income inequality in 26 OECD countries between 1980-2015 by using panel data regression. Analysis results show that social spendings reduce income inequality. Afonso, Schuknecht and Tanzi (2008) examine income distribution determinants and public spending efficiency in 26 OECD countries by Data Envelopment Analysis. Analysis findings prove the positive effect of social spendings on income distribution.

Sanchez and Perrez-Corral (2018) investigate the relationship between social spendings and income inequality in 28 European countries between 2005 and 2014 by the System GMM method and panel data analysis. The analysis results show that health and social spendings in developing countries hurt income inequality, whereas social spendings provide only the redistribution function in other countries. Niehues (2010) analyzes the impact of social spendings on income inequality in 24 European countries by using the System GMM method and panel data analysis. The results demonstrate that social spendings reduce income inequality and, unemployment benefits and public pensions also decrease income inequality, while other social benefits don't significantly reduce income inequality.

Eroğlu, Altaş, Ün and Ulu (2017) examine the relationship between social spendings and income distribution in 21 OECD countries from 2004 to 2011 by using panel data analysis by cointegration, causality and fixed effects model methods. Analysis results display that social spendings decrease income inequality. Besides, it is found that unemployment and population growth affect negatively income inequality, and there is negative effects of openness, education expenditures, the elderly population and participation in education on income inequality. Ulu (2018) investigates the impact direction between social spendings and income inequality in 21 OECD countries from 2004 to 2011 by using panel cointegration and causality methods. The results indicate that social spendings negatively affect income inequality and are more effective in reducing income inequality than education expenditures, and there was a positive relationship between unemployment, population growth and income inequality. In addition, it is found that trade openness, education expenditures, elderly population, participation in education decrease income inequality.

Cammeraat (2020) studies that the effect direction of social spendings on poverty, income inequality and GDP growth in 22 Member States of the European Union from 1990 to 2015 by using panel data analysis by OLS and TSLS regressions. The findings show that social spendings negatively affect poverty and income inequality. However, it isn't found a relationship between social spendings and GDP growth. İlgün (2015) examines the impact of social spendings on income

inequality in 17 OECD countries between 1995 and 2012 by panel data analysis. The results of the study demonstrate that social spending programs reduce income inequality. Doumbia and Kinda (2019) investigate whether reallocating public spending decrease income inequality in 83 countries by panel data analysis by Fixed Effect Model. The results demonstrate that social spending negatively related to income inequality.

Aaberge, Eika, Langørgen and Mogstad (2019) analyze the effects of cash and in-kind transfer being components of social spendings and income inequality in Norwegian local governments between 1982 and 2013 using decomposition methodology and a cross-sectional dataset. The analysis results show that cash and in-kind transfer hurt income inequality, and equalizing effect of the in-kind transfer is less than cash transfer. Ospina (2010) investigates the redistribution effect of social spending components in Latin American countries by using TSLS and GMM method by panel data analysis. The analysis findings indicate that education and health expenditures reduce income inequality.

Bouvet (2010) investigates per capita income inequality in 197 European countries from 1977 to 2003 by using Panel OLS. The estimation results denote that social transfers increase income equality. Fuest, Niehues and Peichl (2009) study the relationship between tax-benefit systems and income inequality in 26 European countries in 2007 by decomposition methodology and cross-sectional data analysis. They find result that social contributions are one of the most significant factors for reducing income inequality. Muinelo-Gallo and Roca-Sagalés (2013) examine 21 high-income OECD countries for analyzing relationship fiscal policy and income inequality by SEM and SUR model. Analysis results demonstrate that social spendings are negatively associated with income inequality. Holzner (2010) analyze the effects of social spendings on income inequality using GLS and SUR methodologies. The findings indicate that health, education and social protection spendings reduce income inequality.

As a result, the number of studies using cross-section data analysis is insufficient in the existing literature. Furthermore, studies rarely analyze income equalizing

effects of social spendings by comparing to crisis and other years. This study attempts to fill above these gaps in the literature by comparing to 2008 crisis years (2009 and 2011) and 2015 by using cross-section data analysis.

3. Dataset, Variables and Empirical Model

This study covers 30 OECD countries (see Table 1 for details). The dataset from 2009, which is important because the negative effects of the 2008 global crisis were fully felt in the world, 2011 year, which the negative effects of the 2008 global crisis began to reduce, and 2015, which is not a crisis year in the world, are analyzed by the OLS method by cross-section regression analysis. Datasets covering the Gini coefficient, the ratio of imports and exports to GDP and the rate of social spendings to GDP are obtained from OECD datasets, and the unemployment rate dataset is achieved from the World Bank datasets.

3.1. Methodology

In this study, the cross-section regression analysis by the Ordinary Least Squares (OLS) method is used to determine the direction of the relationship between social spendings and income inequality. In the OLS method, the population regression function can be written as follows (Wooldridge, 2013, p. 71):

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \ldots + \beta_k x_k + u. \quad (1)$$

In the population regression function in Equation 1, the symbols from x_1 to x_k represent explanatory variables, and β_0, β_1, β_2 *and* β_k represent the constant term, the parameter relating to x_1, the parameter relating to x_2 respectively, and the other consecutive parameters have similar relationships. Since there are k independent and constant terms, k + 1 population parameters exist. The variable u is called the error term c not to be included variables in the model. Estimation of the parameters by the OLS method is made by the sample regression function. The estimated OLS equation can be written in the sample regression format as follows (Gujarati & Porter, 2009, p. 192):

$$\hat{y} = \hat{\beta}_0 + \hat{\beta}_1 x_1 + \hat{\beta}_2 x_2 + \hat{u}_t . \quad (2)$$

$\hat{\beta}_0$, $\hat{\beta}_1$ and $\hat{\beta}_2$ symbols in equation 2 represent the estimators of β_0, β_1 *and* β_2 parameters respectively. In the OLS method, the estimators are derived by minimizing the sum of the squares of the residuals. In this way, the variables y, x_1 and x_2 having n observations and the $\hat{\beta}_0$, $\hat{\beta}_1$ and $\hat{\beta}_2$ estimators are derived simultaneously as follows (Wooldridge, 2013, p. 73):

$$\sum_{i=1}^{n} (\hat{y} - \hat{\beta}_0 - \hat{\beta}_1 x_{i1} - \hat{\beta}_2 x_{i2})^2 . \quad (3)$$

The sample regression function with k independent variables and constant terms is demonstrated as follows (Gujarati & Porter, 2009, p. 853):

$$\hat{y} = \hat{\beta}_0 + \hat{\beta}_1 x_1 + \hat{\beta}_2 x_2 + \ldots + \hat{\beta}_k x_k + \hat{u}_t . \quad (4)$$

The minimization equation to be used in obtaining the OLS estimators is as follows (Wooldridge, 2013, p. 73):

$$\sum_{i=1}^{n} (\hat{y} - \hat{\beta}_0 - \hat{\beta}_1 x_{i1} - \hat{\beta}_2 x_{i2} - \ldots - \hat{\beta}_k x_{ik})^2 . \quad (4)$$

Since the minimization problem has k + 1 unknown estimators, it can be solved by k + 1 linear equations (Wooldridge, 2013, p. 73):

$$\begin{aligned}
&\textstyle\sum_{i=1}^{n} (\hat{y} - \hat{\beta}_0 - \hat{\beta}_1 x_{i1} - \hat{\beta}_2 x_{i2} - \ldots - \hat{\beta}_k x_{ik}) = 0 \\
&\textstyle\sum_{i=1}^{n} x_{i1} (\hat{y} - \hat{\beta}_0 - \hat{\beta}_1 x_{i1} - \hat{\beta}_2 x_{i2} - \ldots - \hat{\beta}_k x_{ik}) = 0 \\
&\textstyle\sum_{i=1}^{n} x_{i2} (\hat{y} - \hat{\beta}_0 - \hat{\beta}_1 x_{i1} - \hat{\beta}_2 x_{i2} - \ldots - \hat{\beta}_k x_{ik}) = 0 \\
&\vdots \\
&\textstyle\sum_{i=1}^{n} x_{ik} (\hat{y} - \hat{\beta}_0 - \hat{\beta}_1 x_{i1} - \hat{\beta}_2 x_{i2} - \ldots - \hat{\beta}_k x_{ik}) = 0 .
\end{aligned} \quad (6)$$

Equation 6 is also called the first-order condition. Residuals and specification diagnostic tests should be applied after the estimators are derived in the OLS multiple cross-section regression.

3.2. Explanatory Variables and Empirical Model

One of the most important stages in analyzing the relationship between social spendings and income inequality is the choice of variables in the model. The most commonly used indicator to measure income inequality is the Gini coefficient. The Gini coefficient is an indicator positively associated with income inequality. The social spendings variable is used as the ratio to GDP due to purifying nominal effects. In econometric theory, control variables are included to make the result significant and to prevent endogeneity in analyzing the model. In this study, 2 control variables are included: unemployment rate and trade openness (the ratio of total foreign trade to GDP).

The unemployment rate is an important variable that increases income inequality. In Walrasian Theory, involuntary unemployment affects income distribution by disequilibrium (Howard, 1988, p. 193). Accordingly, as the unemployment rate increases, the income level of many people decreases, and therefore, income inequality increases. Also, it increases social spendings due to requiring the redistribution of income. Trade openness is also an important variable affecting income inequality. According to Hecksher-Ohlin theory, developed countries have usually foreign trade balance where exports are higher than imports since they are more advantageous to technology and skilled labor (Meschi & Vivarelli, 2009, p. 287). Hence, the demand for qualified labor increases in developed countries and the number of companies producing labor-intensive products decreases because they cannot compete.

Table 1: Data Sources, Definitions of Variable and Analyzing Countries

Variables	Measurement	Data Sources
Gini	Gini Coefficient	OECD
Soc	The Ratio of Social Spendings to GDP (Social Spendings/GDP)	OECD
Trade	The Ratio of Export Plus Import to GDP ((Export+Import)/GDP)	OECD
Unemp	Unemployment Rate, Total (% of Total Labor Force) (National Estimate)	World Bank
Analyzing Countries	Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Korea, Netherlands, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom, USA, Estonia, Israel, Slovenia, Latvia and Lithuania	

The increase in trade openness leads to a reduction in the demand for unqualified labor and the wage of unskilled labor in developed countries, and thus, the income inequality increases in developed countries, while the increase in trade openness raises the wage level of the unqualified labor force in developing countries due to increases in the demand for unqualified labor, and therefore, income inequality reduces in these countries (Meschi & Vivarelli, 2009, pp. 287). The model to be used in the empirical analysis is as follows:

$$gini_t = soc_t + trade_t + unemp_t + \varepsilon_t \quad (7)$$

where ε_t is error term.

4. Empirical Results

2009 is a substantial year in the 2008 global crisis since the negative effects of the 2008 global crisis were fully felt in the world. In Table 2, OLS estimation results are given by using the dataset in 2009. The OLS estimation results indicate that all variables are significant at 1% level. The ratio of social spendings to GDP increasing by 1% decreases the Gini coefficient by 0.003851. Similarly, trade openness

increasing by 1% reduce the Gini coefficient by 0.000677. Besides, a 1% increase in the unemployment rate increases the Gini coefficient by 0.006182. As a result, it is seen that social spendings and trade openness hurt income inequality, while unemployment increases income inequality in 2009. The R^2 value, which indicates the measuring power of the dependent variable in the established model, is 0.645, and it indicates that the model has a very high measuring power for cross-section data analysis. The F test, which tests the significance of all independent variables, has a 0.000005 probability value showing all variables are statistically significant.

Table 2: OLS Estimation Results By Using 2009 Dataset

Dependent Variable: Gini				
Variable	**Coefficient**	**Std. Error**	**t-statistics**	**Prob.**
Soc	-0.003851	0.001036	-3.718899	0.0010
Trade	-0.000677	0.000154	-4.385590	0.0002
Unemp	0.006182	0.001466	4.215943	0.0003
constant	0.391214	0.029296	13.35372	0.0000
R^2 = 0.645910	Adj. R^2= 0.60505	F-Statistic= 15.80922	Prob.(F-Stat.)= 0.000005	
Durbin Watson Statistics= 1.600250				
Residual Diagnostics				
Histogram Normality Test				
Skewness= 0.329690	Kurtosis= 2.254598	Jarque-Bera= 1.238008	Prob.= 0.538480	
Breusch-Godfrey Autocorrelation LM Test				
F Statistics= 0.813405	Prob. F(2,24)= 0.4552	Obs. R^2= 1.904424	Prob. Chi-Square(2)= 0.3859	
Heteroskedasticity Test: Breusch-Pagan-Godfrey				
F Statistics= 0.462550	Prob. F(3,26)= 0.7718	Obs. R^2= 1.520010	Prob. Chi-Square(3)= 0.6777	
Stability Diagnostics: Ramsey RESET Test (Functional Form Prob.)				
	Value	**Df**	**Prob.**	
t-statistics	0.883595	25	0.3853	
F-statistics	0.780741	(1, 25)	0.3853	
Likelihood ratio	0.922557	1	0.3368	

In 2011, the negative effects of the 2008 global crisis began to reduce, and therefore, the economic recovery process accelerated. Table 3 contains OLS estimation results obtained through the dataset in 2011. Examined the table, all variables have a significance level at 1% similar to results in Table 3. The ratio of

social spendings to GDP increases by 1% the decreases Gini coefficient by 0.003642, and trade openness increasing by 1% decreases the Gini coefficient by 0.000586. Unlike these results, the unemployment rate increasing by 1% rises the Gini coefficient by 0.004556. To sum up, social spendings and trade openness affect negatively income inequality, and unemployment increases income inequality in 2011. The R^2 value is 0.597, and it has a very high level of explanatory power in the cross-section data analysis. The F test has a probability value of 0.000024, and it ensures that all variables are statistically significant.

Table 3: OLS Estimation Results By Using 2011 Dataset

Dependent Variable: Gini				
Variable	**Coefficient**	**Std. Error**	**t-statistics**	**Prob.**
soc	-0.003642	0.000998	-3.648319	0.0012
trade	-0.000586	0.000126	-4.663248	0.0001
unemp	0.004556	0.001225	3.718159	0.0010
constant	0.398706	0.027141	14.69002	0.0000
R^2= 0.597077	Adj. R^2= 0.550586	F-Statistic= 12.84283	Prob.(F-Statistic)= 0.000024	
Durbin Watson Statistics= 1.655607				
Residual Diagnostics				
Histogram Normality Test				
Skewness= -0.128907	Kurtosis= 1.995209	Jarque-Bera= 1.345092	Prob.= 0.510407	
Breusch-Godfrey Autocorrelation LM Test				
F Statistics= 0.463465	Prob. F(2,24)= 0.6346	Obs. R^2= 1.115578	Prob.ChiSquare(2)= 0.5725	
Heteroskedasticity Test: Breusch-Pagan-Godfrey				
F Statistics= 0.339014	Prob. F(3,26)= 0.7973	Obs. R^2= 1.129333	Prob.ChiSquare(3)= 0.7700	
Specification Test: Ramsey RESET Test (Functional Form Prob.)				
	Value	**Df**	**Prob.**	
t-statistics	1.616771	25	0.1185	
F-statistics	2.613948	(1, 25)	0.1185	
Likelihood ratio	2.983356	1	0.0841	

Table 4 shows the obtained OLS estimation results by using the 2015 dataset. The OLS estimation results are analyzed, soc, unemp and trade variables are significant at 5% level. A 1 % increase in the ratio of social spendings to GDP reduces Gini coefficient by 0.004759. Moreover, trade openness increasing by

1% decreases Gini coefficient by 0.000558. In addition, a 1% increase in the unemployment rate rises the Gini coefficient by 0.002904. Consequently, social spendings and trade openness affect negatively income inequality, while unemployment increases income inequality. The R^2 value is found 0.616, and it is a very high value in cross-section data analysis. The F test has a 0.000013 probability value indicating all variables are statistically significant.

Table 4: OLS Estimation Results By Using 2015 Dataset

Dependent Variable: Gini				
Variable	**Coefficient**	**Std. Error**	**t-statistics**	**Prob.**
soc	-0.004759	0.000977	-4.870631	0.0000
trade	-0.000558	0.000118	-4.709522	0.0001
unemp	0.002904	0.001163	2.496319	0.0192
constant	0.442308	0.026577	16.64259	0.0000
R^2= 0.616544	Adj. R^2= 0.572299	F-Statistic= 13.93480	Prob.(F-Statistic)= 0.000013	
Durbin Watson Statistics= 1.736702				
Residual Diagnostics				
Histogram Normality Test				
Skewness= -0.252947	Kurtosis= 3.082339	Jarque-Bera= 0.328386	Prob.= 0.848578	
Breusch-Godfrey Autocorrelation LM Test				
F Statistics= 0.078372	Prob. F(2,24)= 0.9249	Obs. R^2= 0.194660	Prob.ChiSquare(2)= 0.9073	
Heteroskedasticity Test: Breusch-Pagan-Godfrey				
F Statistics= 0.843546	Prob. F(3,26)= 0.4825	Obs. R^2= 2.660968	Prob. Chi Square(3)= 0.4469	
Specification Test: Ramsey RESET Test (Functional Form Prob.)				
	Value	**Df**	**Prob.**	
t-statistics	0.814079	25	0.4233	
F-statistics	0.662725	(1, 25)	0.4233	
Likelihood ratio	0.784912	1	0.3756	

The residual diagnostics and specification tests must be checked in the estimated models due to the OLS estimation results to be reliable. The residuals have a normal distribution and no autocorrelation and heteroskedasticity problems. Hence, it is concluded that residual diagnostics ensure OLS assumptions. The Ramsey RESET specification test demonstrates that the functional form of the estimated models is appropriate. In 2009 and 2011, social spendings reduce less

income inequality compared to 2015. These results may enable us to make interpretations that the negative effect of social spendings on income inequality decreases during the crisis period and social spendings should be increased to reduce income inequality during the crisis period.

5. Conclusion

In the economies, labor and capital owners being production factors share the income emerging economic activities. The unfairly distributed income leads to irregularities in the income distribution and the income difference increases between the lower-income group and the upper-income group. Hence, it affects negatively human capital and the effective distribution of public resources. Governments try to reduce income inequality by social spendings with redistributing income function due to the negative effects on growth. Social spendings, which is the welfare state practices, are initially applied due to the social benefit function and in the later process, they are important to accelerate the economic development process due to their positive effects on human capital and the effective distribution of public resources. Thus, the level of human capital is tried to be increased by increasing the income of the lower-income group, and at the same time, it is tried to prevent the upper-income group causing ineffective use of public resources due to possible corruption.

In this study, the relationship between social spendings and income inequality is investigated by the OLS method by cross-section regression analysis. The results show that social spendings affect negatively income inequality, in other words, it affects positively income equality. Thus, it can be said that the income redistribution function of social spendings is fit for its purpose. The other estimation results give the results that trade openness reduces income inequality and unemployment increases income inequality. The fact that trade openness reduces income inequality demonstrates that labor-intensive production is dominant in analyzing 30 OECD countries and therefore, there is an increasing demand for unskilled labor. Unemployment increases the income difference between the lower-income group and the upper-income group, as expected. The estimation results obtained by the

dataset in 2009, 2011 and 2015 are compared, it may be interpreted that the negative impact of social spendings on income inequality during the crisis period has decreased, and social spendings should be increased to reduce income inequality during the crisis period. Concluding remarks, social spendings are an important factor in both reducing income inequality and accelerating economic development. Efficient distribution of social spendings will both further reduce income inequality and accelerate the economic development process.

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