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Economic Nature of Social Inequality, The Impacts of Education and Health Expenditures, and Unemployment on Income Inequality in Turkey and Selected OECD Countries*

Sosyal Eşitsizliğin İktisadi Doğası, Türkiye ve Seçilmiş OECD Ülkelerinde Eğitim ve Sağlık Harcamaları ile İşsizliğin Gelir Eşitsizliği Üzerine Etkileri

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ÖZ

Gelir eşitsizliği, gelişmekte olan ülkelerde olduğu gibi, gelişmiş ülkelerde de çözüm bekleyen ve üzerinde tartışılan önemli sorunlar arasındadır. Bu ampirik çalışmada, kamu eğitim harcamaları ile sağlık harcamalarının ve işsizliğin gelir eşitsizliği üzerindeki etkilerini 2002-2018 periyodu için Türkiye dahil toplam 15 seçilmiş OECD ülkesinden oluşan panel veri seti kullanarak araştırılmıştır. Analizin sonuçları, seçilmiş OECD ülkelerinde kamu eğitim harcamalarının Gayrisafi Yurtiçi Hasılaya (GSYİH) oranı ve sağlık harcamalarının GSYİH'ye oranındaki artışların gelir dağılımındaki eşitsizliğe azaltıcı anlamda katkı sağladığını, işsizlik oranındaki artışın ise gelir eşitsizliğini artırdığını ortaya koymuştur.

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ABSTRACT

Income inequality is one of the important problems that await solution and discussed in developed countries as well as in developing countries. In this empirical study, the impacts of government education expenditures, health expenditures, and unemployment on income inequality has been investigated using panel data set consisting of total 15 selected OECD countries including Turkey for the period of 2002-2018. The results of the analysis revealed that increases in the ratio of government education expenditures to Gross Domestic Product (GDP) and health expenditures to GDP contribute to reducing inequality in income distribution, while increase in unemployment rate increase income inequality for the selected OECD countries.

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1. Introduction

Income distribution inequality, as one of the main economic, social, and political problems of countries, is one of the important issues of interest to both economists and policymakers. The problem of income inequality is among the foremost issues in international economic debates. Although inequality is common in developing countries, it is also common in various developed industrialized countries. (Stiglitz, 2013; Piketty, 2014; Collins, 2016). There are many factors that cause income inequality. The main ones are the lack of homogeneity of the labor force due to differences in education and talent between individuals in society, the structure of the market, unequal distribution of resources, differences in development between regions, technological change, inflation, globalization, employment conditions, and unemployment (Sileika and Bekeryte, 2013).

In every country and economic system there have always been more or less differences in income between individuals. It is not possible to achieve absolute equality in income distribution, as the education levels, skills, and duties of individuals in the society vary which cause different levels of income (Parasız, 1996). Forming and maintaining a social peace environment in a country depends on a fair distribution of income to a great extent. A fair distribution of income in the country is generally not possible. Therefore, it is necessary to intervene in the distribution of income by the state (Uysal, 2007). It has been found in many studies that access to quality education and ensuring equality in education significantly affect the trend of income inequality. Although it is often argued that developments in education affect income distribution inequality, and education expenditures and income inequality are closely related (Checchi, 2000; Berry and Glaeser, 2005; Shapiro, 2006), theoretical studies show that this relationship is not always clear and has a long way to be perfectly understood (Gregorio and Lee, 2002). Facilitating access to education increases the opportunity for the lowest income group to earn income, thus reducing income inequality. According to Shultz (1971), workforce should not be considered as a homogeneous factor because individuals receive different levels of education, and accordingly they have different qualifications, skills, and expertise. Education policies that promote equal opportunities are key to reducing income inequality and facilitating access to jobs with higher income. Education policies cannot deal with income inequality alone, it is also important to have more comprehensive policies (Alvaredo et al., 2019).

Another of the most important factors affecting income inequality is health expenditures. Because spending on health services increases opportunities for employment of healthy individuals. The preference of healthy individuals in employment causes the poor to experience a loss of income and an increase in the unequal distribution of income. From this point of view, an improvement in income distribution can be achieved if the poor part of society has better health and educational conditions and a better income-generating profession.

Currently, employment and unemployment, which have both economic and social consequences, have become one of the most important problems of all countries. One of its reasons is that the transition from a labor-intensive production system to a capital-intensive production system increases the demand for skilled labor, while leaving unqualified and less skilled labor unemployed. Consequently, this situation deepens income distribution inequality (Öztürk, 2017).

When examining the effects of education expenditures on income inequality in the literature, it is seen that the findings are not unique. While some researchers have reached the conclusion that education reduces income inequality, some researchers have found that there is no relationship between education expenditures and income inequality or that education expenditures increase income inequality. In the literature, there are many studies that investigate education and health expenditures and unemployment separately or human capital factors on income inequality, but this study contributes to the literature in this sense by investigating the impacts of these three variables together on income inequality. In this study, the impacts of both education and health expenditures, and unemployment on Gini coefficient as a measure of income distribution inequality were investigated together by using panel data for selected OECD countries including Turkey between 2002-2018 years.

2. Literature Review

In the literature, it has been emphasized that one of the most important factors affecting the level of income inequality is education. High expenditure on education which is usually used by policymakers as an effective tool to reduce income inequality also supports this view.

Earlier studies show that there is a close relationship between income inequality and education (Mincer, 1958; Schultz, 1961, 1963; Becker, 1962). According to Becker and Chiswick (1966), investments in education can be effective in balancing income distribution. Education provides an increase in social and personal incomes by increasing skill levels, and thus reduces income inequality (Becker and Chiswick, 1966; Mincer, 1970). Chiswick (1971), Tinbergen (1972), and Checci (2000) studied empirically the standard deviation of the average duration of education as education index and Gini coefficient as an index of income inequality.

In more recent studies, Gregorio and Lee (2002), in their study by panel data analysis, examined the impacts of education on income inequality and found that higher education participation and more equal education have

effect on a more equal income distribution. Barro (2000), Alderson and Nielsen (2002), and Wells (2006) found that higher secondary school enrollment contributes to reduce income inequality. Gylfason and Zoega (2003) found that public education spending provides better education, which in turn reduces income distribution inequality. In a study for Taiwan case, it was found that less inequality in education can lead to less income inequality, and also a higher level of average schooling can lead to reduce income inequality (Lin, 2007). Jun, et al. (2009), studied the relationship between income inequality and education inequality for China case. Their findings revealed that there is a relationship between education and income inequality through human capital transmission mechanism; however this mechanism has not a two-way relationship. Income inequality cause educational inequality, but less educational inequality does not contribute to reduce income inequality. However, education expansion was found to contribute to reduce inequality in education and income. Pose and Tselios (2009) found in their study by including European Union countries that greater inequality in education may result in a more unequal income distribution. Mughal and Diawara (2011) discussed that primary education does not have impact on income inequality, while secondary and tertiary education have a reducing impact on income inequality. In another study conducted to investigate the relationship between income inequality and education inequality in Bahrain, it was found that the inequality in the income distribution causes education inequality between the income-classes which in turn increases income gap for the future generations (Abdelbaki, 2012). Dabla-Norris et al. (2015) have argued that improving educational qualifications is the factor that has a significant impact on income inequality.

There is not a clear-cut consensus on the extent, direction and sign of the relationship between human capital and income distribution inequality. Jimenez (1986) argued that public spending on education has no benefit to poor population, accordingly, does not affect income inequality positively. In a study by Ram (1989), it was that found there is no meaningful relationship between education and income inequality. In a cross-section study conducted to examine the impacts of educational variables on income inequality using data of 59 countries, it was found that the dispersion of schooling cause a more unequal income inequality (Park, 1996). A higher level of human capital was found to have a disequalizing relationship with the income distribution; (Digdowiseiso, 2009).

When the health expenditures and income inequality relationship literature is examined, healing effect of health expenditures on income distribution draws attention. In the income inequality literature, there are some studies that health expenditures is not taken as a single variable but with other variables such as education and defense. This study, contributes to the literature by providing findings the impacts of education, health, and unemployment on income inequality together.

Aksoğan and Elveren (2012) studied the case of Turkey to investigate the relationship between defense, health, education expenditures with income inequality and found in their study that education expenditures lead income inequality while health expenditures have an equalizing effect on income distribution in Turkey. In their study, by including 150 countries, Claus et al. (2012) concluded that spending on education, health and social protection positively affect income distribution. According to O'Donnell et al. (2013), health can affect income distribution through various channels. In this context, the labor productivity of people suffering from certain diseases is lower, which often leads to lower wages. In another study by Lusting (2015) conducted by including 13 developing countries, it was found that the impact of government education and health spending on income redistribution is positive. Anderson et al. (2017) found that reveal that public education and health expenditures have a reducing effect on income inequality and found to be statistically significant. Şantaş et al. (2019) studied Turkey case to examine health expenditures and income distribution relationship by using causality test and revealed that there is a one-way causality from health expenditures to income distribution, and health expenditures were found to reduce income inequality.

Empirical studies that addressed the unemployment and income inequality relationship generally emphasize the disequalizing effect of unemployment on the income distribution.

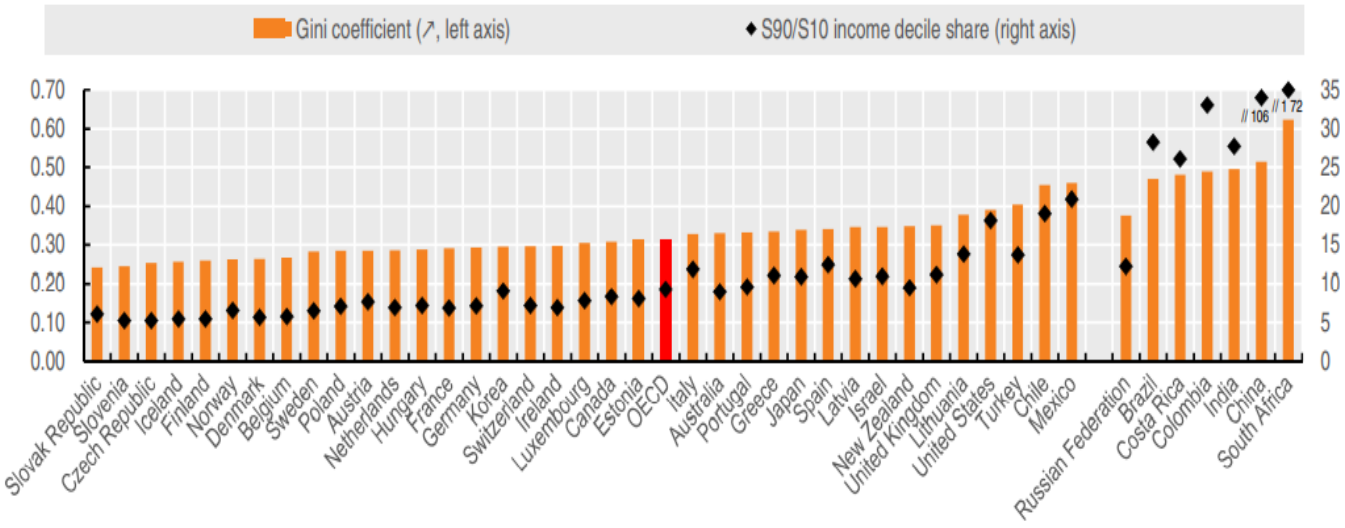
Ward et al. (2009), in their study for the countries of European Union, showed a positive relationship between income distribution inequality and unemployment rate. Odeh and Okoye (2014), found in their study conducted for Nigeria case that a large part of the population living under the poverty line due to high unemployment is the major reason of inequality of income distribution in an economy. Deyshappriya (2017) investigated macroeconomic factors that affect income inequality by panel data analysis covering the period 1990-2013 with 33 Asian countries, and found that education and labor force participation rates reduce income inequality, while inflation, political risk and unemployment increase income inequality.

On the other hand, Gustafsson and Johansson (1999) examined the factors that affect the income distribution by using panel data consisting of 16 OECD countries. Their findings revealed that while there are many factors affecting income inequality, there is no relationship between income inequality and unemployment rate.

3. Income Inequality in OECD Countries

Gini coefficient is quite variable among OECD countries. The lowest Gini coefficient was observed in the Nordic and

Central European countries, while the countries with the highest income inequality are Mexico, Chile, Turkey, and the United States. According to the information obtained from the OECD database, from the mid-1980s to 2012, it was observed that income inequality increased in 16 of the 18 countries with long-term data available.



Gini coefficient of OECD members and OECD average are shown in Figure 1. Gini coefficient OECD average is 0.32 in 2016. In the last four decades, the gap between the richest 10% and the poorest 10% has widened in most OECD countries. In the OECD average, the difference between the income earned by the richest 10% population and the income earned by the poorest 10% population increased from 7 in the 1980s to 9.3 in 2016. This ratio varies considerably among OECD countries; while it is 5.2 in the Czech Republic and Slovenia, it is around 20 in Mexico and Chile, approximately four times higher than in these countries (OECD, 2019).

Figure 1. Gini Coefficient in OECD countries (2016 or the latest data available)
Source: OECD Income Distribution

3.1 Education, Health Expenditures and Unemployment in OECD Countries

According to the vision of OECD, education policies that support upper secondary education and tertiary education graduation rates play a fundamental role in the relationship between education and income inequality. Depending on this, quality improvement in the education system is effective in reducing income inequality. In all OECD countries, a significant part of national resources is used as an investment in education. In 2017, the OECD average of expenditures realized on non-tertiary education to GDP ratio was 3.5%, 3.1% of which was financed from public resources and 0.4% from private resources (OECD, 2020).

Health spending in OECD countries has been increasing over the years. Growth in health spending in OECD average was 2.7% in 2016 which was the highest level since 2009 despite still being below pre-crisis levels. The ratio of health expenditures to GDP was around 8% in the OECD average during period of 2002-2018 and realized as 8.8% as of 2018.

When the trends of unemployment in OECD countries is examined, record increases in unemployment rates have been observed in most of the OECD countries after the 2008-2009 global crisis. Across the OECD, an average of 7% of the active working age population was unemployed in 2017.

4. Data and Methodology

The impacts of government education expenditures, health expenditures, and unemployment on income inequality have

been investigated using panel data set consisting of total 15 selected OECD countries including Turkey for the period of 2002-2018 years. The countries included in the study have been selected by considering the data constraints in the dependent and independent variables.

In selection OECD countries included in the study, the following factors have been taken into consideration. Countries with significant data constraints in Gini coefficient variable and the government education expenditures to GDP ratio variable for the 2002-2018 period have not been included in the analysis. As Gini threshold value; the OECD countries with Gini coefficient which are close to the OECD average (0.32) have been chosen. For government education expenditures to GDP ratio, based on the average for the period of 2002-2018, the threshold value has been chosen as between 4% and 6% and the countries within this range has been selected. The regression model is as follows:

$$GINI_{it} = \beta_0 + \beta_1 EDU_{it} + \beta_2 HLTH_{it} + \beta_3 UNEMP_{it} + \varepsilon \quad (1)$$

In the regression model;

GINI : Gini coefficient as a measure of income distribution inequality

EDU : The ratio of government expenditures on education to GDP (%)

HLTH : The ratio of health expenditures to GDP (%)

UNEMP : Unemployment rate (%)

ε : The error term.

4.1 Description of Variables

The dependent variable in the regression model is Gini coefficient as a measure of income inequality. Gini coefficient has a value between 0 and 1; 0 denotes absolute equality, while 1 denotes absolute inequality. As income distribution inequality increases, Gini coefficient will be higher. Gini coefficient is calculated based on Lorenz curve which is a graphical representation of inequality. When Lorenz curve moves away from the absolute equality line, the inequality increases.

The independent variables included in the model in this study are the ratio of government education expenditures to GDP, the ratio of health expenditures to GDP, and unemployment rate. The unequal distribution of education and, accordingly, the non-homogeneous distribution of the labor force leads to increase in income inequality. Health, on the other hand, is another important factor that affects the labor force and income inequality. One of other main causes of income inequality is unemployment. The inability of the working age population to be employed prevents people from having an income which leads to income inequality. Unemployment leads to a deterioration in the balance of production and consumption, decrease in investment, and a further deepening of poverty and income inequality.

4.2 Data Analysis and Results

In the study, Gini coefficient, the ratio of government education expenditure to GDP (%), the ratio of health expenditure to GDP (%) and unemployment rate have been used based on annual data obtained from the World Bank database. Due to data constraints in the World Bank database for Turkey for government education expenditures, only this data was taken from the TurkStat database. In addition, since education expenditures data in World Bank database for 2018 is missing, this data for 14 countries other than Turkey was obtained from the EuroStat database (Table 1).

Table 1. Variables and Data Sources

Variable	Abbreviation of variables	Data Source
Gini coefficient	GINI	World Bank
The ratio of government education expenditures to GDP (%)	EDU	World Bank, EuroStat, Turkey data: Turkstat
The ratio of health expenditures to GDP (%)	HLTH	World Bank
Unemployment rate (%)	UNEMP	World Bank

Descriptive statistics of variables are shown in Table 2.

Table 2. Descriptive statistics of variables

Variable	Number of observations	Average	Max.	Min.	Std. Dev.
GINI	173	36.16	51.50	27.60	5.10
EDU	173	4.90	6.98	3.02	0.62
HLTH	173	7.62	16.35	4.12	2.26
UNEMP	173	8.91	26.09	2.92	4.56

Firstly, Hausman test was conducted to decide whether random or fixed effects is present in the model. The null hypothesis favors random effects in the model against fixed effects, and according to the alternative hypothesis, there are fixed effects in the model. According to the Hausman test result, since p>0.05, the H0 hypothesis, which states that random effects are present in the model, could not be rejected (Table 3).

Table 3. Hausman Test Result of Regression Model

H_0: Random effects are present. **H_1:** Random effects are not present.	
Test statistics: chi2(3)	**Prob value**
2.69	0.44

It has been aimed to investigate the effects of the expenditures in education and health areas and unemployment on income inequality through this regression model. The panel data includes 15 OECD countries

including Turkey, for 2002-2018 period. The results of the panel regression model are shown in Table 4.

Table 4. Panel Regression Results

Variable	**Coefficient**	**Standard error**	**t-stat.**	**p-value**
EDU	-0.401836	0.203352	-1.976059	**0.0499**
HLTH	-0.793431	0.191060	-4.152785	**0.0001**
UNEMP	0.182118	0.033375	5.456673	**0.0000**
C	42.55196	1.666915	25.52737	**0.0000**
R^2	0.946710	Durbin-Watson stat		0.855753
Adjusted R^2	0.940865	F-statistic	161.9757	
		p(F-statistic)	0.000000	

When the p-values of the independent variables were examined, it was found that $p<0.05$ for all variables. The R2 value, which indicates the regression model fit, was found to be high at 0.95. Among the independent variables included in the analysis, the independent variables affecting the Gini coefficient the most were found as the ratio of health expenditures to GDP (β:-0.793) and the ratio of government education expenditures to GDP (β:-0.402). It was concluded that the coefficients of both variables were negative, as expected. Accordingly, 1 unit increase in government education expenditures will reduce income inequality by 0.4%, and 1 unit increase in health expenditures will reduce income distribution inequality by 0.79%. When the effect of unemployment level on income inequality is examined, the coefficient turned out to be positive as expected (β:0.182), consequently, it was revealed that 1 unit increase in unemployment rate will increase income distribution inequality by 0.18%.

5. Conclusion

Income inequality is one of the most important issues in the focus of economic debates from the past to the present, and among the most important problems not only in developing countries, but also in developed countries. Both in academic writing and in social debates, the increase in inequality in income distribution is seen as a serious social problem. Considering the social consequences of income inequality, when income inequality reaches significant levels in a country, it can cause social unrest, causing an increase in crime rates in society. In OECD countries, the rapid rise of income inequality from 1980s to the present is remarkable. Over about the past four decades, the difference between the richest and the poorest in most OECD countries has steadily increased.

According to the empirical results of the panel data analysis in this study, expenditures on education and health has a reducing effect on income distribution inequality. On the other hand, an increase in the unemployment rate, which is one of the main causes of income inequality, increases income distribution inequality. The results of the study have been found to be consistent with findings in the income distribution inequality literature. The findings of the study also indicate that the effects of the education and health expenditures to GDP ratios on income inequality which are among the human capital factors are higher than the effect of unemployment on income inequality. Hence, these results should be taken into account by policy makers when determining policies implemented to reduce income inequality and allocating resources.

While many factors affect the income distribution such as the demographic situation of the country, the structure and distribution of the labor force, inflation, growth and stability of the country's economy, the distribution of wealth, education, health, globalization and migration, it is important to implement policies that are effective in income redistribution to reduce income inequality.

Reducing education inequality among individuals, regions, or genders plays an important role in reducing inequality in income distribution. Regardless of the level of economic development in a country, regulating economic and social policies aimed at easier access of individuals to education and health care, and focused on the poor and middle-income groups, can help increase the share of income of these income groups. Policies organized for this purpose play an important role in reducing income inequality. The policies that promote human capital investments can stimulate less inequitable income distribution. In this context, various government interventions to reduce income inequality, such as the dissemination of vocational training schools for the development of human capital and the increase of courses for skill development, are issues that need to be focused on in combating the problem of income inequality.

Given that unemployment is an important cause of income inequality, policies in education and health may not be enough to combat the problem of income inequality alone. Policy regulators should focus on education and health policies, as well as employment policies, under each country's own economic conditions for the solution of income inequality. Relying on the findings of the study as for the relationship between unemployment and income inequality; it is important that policies that will reduce unemployment can be implemented to reduce income distribution inequality.

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