The Effect of Regime on the Economic Growth and the Income Inequality

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Abstract

An information that is not contained in the article should not be involved in abstract. While the global economy is growing, income inequality is increasing. Income inequality is an important element that negatively affects human life both economically and socially. In this study, the relationship between economic growth and inequality was compared in terms of management forms. Thus, it was desirable to give a different perspective to the literature on economic growth and income inequality. In the Economist 2021, 167 countries created an index of democracy, scoring between 0 and 10 based on 60 indicators. In the study covering the period 2006 - 2020, countries; from worst to best, respectively; authoritarian regime, hybrid regime, flawed democracy and full democracy are divided into categories. For this purpose, a study was conducted in the special case of fully democratic North America and autocratic Sub-Saharan African countries. Empirical analysis using the Panel data model covers the period 2006-2020. The variables were chosen because they were dealt with by the link between income inequality (Gini, dependent) and economic growth (GDP, independent) and regime (RE, independent), respectively. Study results by; A positive correlation has been found between economic growth and income inequality for North American countries. In Sub-Saharan countries ruled by an authoritarian regime, this relationship was found to be very weak.

Key Words: *Income Inequality, Regime, Economic Growth, Panel Data Methodology, North America, Sub-Saharan Africa*

Yönetim Biçiminin Ekonomik Büyüme ve Gelir Eşitsizliği Üzerindeki Etkisi

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Öz

Küresel ekonomi büyüdüğü halde gelir eşitsizliği artmaktadır. Gelir eşitsizliği hem ekonomik hem de sosyal anlamda insan yaşamını olumsuz etkileyen önemli bir unsurdur. Bu çalışmada ekonomik büyüme ve eşitsizlik arasındaki ilişki yönetim biçimleri bakımından karşılaştırılmıştır. Böylece ekonomik büyüme ve gelir eşitsizliği konusunda literatüre farklı bir bakış açısı kazandırılmak istenmiştir. The Economist 2021'de 167 ülke, 60 göstergeye dayanarak 0 ila 10 arasında puanlama yaparak demokrasi endeksi oluşturmuştur. 2006-2020 Dönemini kapsayan çalışmada, ülkeler en kötüden en iyiye sırasıyla; otoriter rejim, hibrit rejim, kusurlu demokrasi ve tam demokrasi şeklinde kategorilere ayrılmıştır. Bu amaçla tam demokratik Kuzey Amerika ile otokratik Sahra-altı Afrika ülkeleri özelinde bir çalışma yapılmıştır. Panel veri modeli kullanılarak yapılan ampirik analiz 2006-2020 dönemini kapsamaktadır. Değişkenler sırasıyla gelir eşitsizliği (GINI, bağımlı), ekonomik büyüme (GSYİH, bağımsız) ve Rejim (RE, bağımsız) olarak belirlenmiştir. Çalışma sonucunda elde edilen bulgulara göre; Kuzey Amerika ülkeleri için ekonomik büyüme ile gelir eşitsizliği arasında pozitif bir ilişki tespit edilmiştir. Otoriter rejimle yönetilen Sahra-Altı ülkelerde ise bu ilişkinin çok zayıf olduğu görülmüştür.

Anahtar Kelimeler: *Gelir Eşitsizliği, Yönetim Biçimi, Ekonomik Büyüme, Panel Veri Metodolojisi, Kuzey Amerika, Sahra-altı Afrika.*

Introduction

The Economist 2021, 167 countries have constituted Index of Democracy by giving points from 0 to 10 by using 60 indicators as the base. In the study involving the period of 2006-2020, the countries have been categorized from the worst to the best respectively as Authoritarian Regime, Hybrid Regime, Democracy. In accordance with this data, the autocratic countries and the democratic countries have been dealt with in terms of their regime. Sub-Saharan Africa have been chosen on behalf of the "Authoritarian Regime". North America that Democracy implemented have been scrutinized as well. Therefore, it is aimed to compare the countries in terms of income inequality, regime and economic growth.

It's a fact that economic growth increasingly continues in the global world. On one hand; developing of the facilities such as communication, transportation and so on, on the other hand; changing over to automatization in manufacturing and in addition to these; intensifying of the capital movements at interest have led to the income growth globally. The income growth is something good; however, being fair in sharing is significant, as well. The case of income inequality becomes inevitable if there is no fair sharing. Unfortunately, this is one of the realities of today's world.

It's not too easy to measure inequality among countries globally. Is it enough to focus on just the financial inequalities? Otherwise, is it required to take into consideration the life quality? Financially, the inequality has three basic criteria's; and these are the wage gaps, the inequalities in the consumption amounts and the differences in the distribution of wealth (McKay, 2002). When the income is identified as the consumed amount of goods and services of the individual with the condition of saving the same prosperity at the beginning and the end of the period and the wealth is identified as the savings from the individual's income, the primary element of the economic or financial inequality becomes the income. For this reason, generally, the term 'inequality' means income inequality. The consumption is generally related to the income, and so the living standards of humans can be understood with their consumptions; therefore, the income identifies the development level. Be-

sides, richness, wealth or accrued funds is another criterion which determines the life standard. *"Gini's Index"* is the most commonly used inequality measurement in the process of identifying the financial inequality (Armağan , 2018, p.34). Gini's Index is a coefficient indicating whether the national income distribution in a country is fair or not. It takes a value between 0-1. It's understood that the more the coefficient is near to (zero) 0, the more it indicates the fair income distribution; but the more it is near to (one) 1, the more it indicates the increase of inequality in the income distribution.

The regime of the countries also become one of the most important factors affecting the economic magnitude and income distribution. Democracy is undermined, as economic inequality ineluctable translates into politic disparity (Stiglitz, 2012). The more the regime becomes authoritarian (anti-democratic), the more the sharing becomes unfair (Teo, 2019, p.25). While the ruling class and the notables live in the prosperity, a major part of the public lives in poverty. Notwithstanding, in the countries whose regime is non-rigid (democratic), since there is a harmony which is specified by laws between the ruling class and the public, the level of welfare becomes high in terms of the income distribution. Especially, the relationship of the economic growth and the income inequality with the regime has become much more critical by the global economic activities which started in the 1980s. While the capital flows which are expressed as generally direct and indirect investments are making selection, the polities of it, during the preference of the country in the matter of making investments, is taken into consideration. Within this context, democratic countries are preferred more particularly. And this also increases the national incomes of democratic countries. The incremental revenue is distributed among the overall of the community by means of either the government (transfer expenditures, subsidies) or the private sector (increasing of the employment opportunities). In democratic countries, another dimension of the running of the mechanism of fair income distribution appears during the redistribution of income-wealth. The redistribution of income-wealth is mostly stated as the income acquired by labour factor, as well. One of the major issues of the underdeveloped economies is also that the allocation taken from the total income by the labour factor is less.

Lots of studies whose subject are economic growth and the revenues inequality have been done so far. In this paper, Relationship between economic growth and the revenues inequality in terms of the regime in the countries are both compared. That's why it is intended to be brought a varied perspective into the literature on the topic of economic growth and the revenues inequality.

Our hypothesis puts forward the fact that the income acquired as a result of the economic growth in the countries governed by democracy is shared fairer than the countries autocratic. The correlation of "Regime", "Gini Coefficient" and "Economic Growth" belonging to the North America and the Sub-Saharan Africa in terms of their polities has been tested with the panel data methodology. The empirical analysis involves the period of 2006-2020. The data of this paper are taken from the web pages of United Nations Development Programme (UNDP), International-al Monetary Fund (IMF), The World Bank, Organisation for Economic Co-operation and Development (OECD). It has been benefited from the Eviews-11 Programme for the analyses.

The Theoretical Underpinnings and the Income Inequality from a Historical Perspective

Nowadays, the income inequality is extremely high in global level, and at the beginning of 21st century, %1 of the richest people in the world possesses at least %56 of the total income (Howard and Carter, 2018, p.45). From the end of World War II to 1970s, the economic growth and the welfare level has dramatically increased. The wage gap between the ones whose income level is high and the ones whose income level is middle and lover hasn't changed too much in this period. However, since the 1970s, the revenue gap has extended with the slowing down of economic growth. In this period, the increase of household income in the middle and lower class has slowed down obviously. According to the data of the survey; in 1989, the wealth share of the highest-income group with %1 is less than %30. (Stone, et al. 2018, p.23). On average, income inequality increased %11 between the years 1990 and 2010in developing countries (UNDP, 2018). 2000–08 and then began to rise following the

global financial crisis, raising the riches of many of the richest countries, and of many of the richest people. (Shorrocks, Davies and Lluberas, 2018, p.4). According to Oxfam, the dichotomy between the global billionaires and the other half of humanity has been gradually increasing. In 2009, while the income of %50 of the world's poorest people was equal to the wealth of 380 billionaires, this number declined to 42 billionaires in 2017 (INEQUALITY, 2019). It's wrong to think that inequality has increased everywhere. While inequality has increased in many countries, it has also decreased in many ones. While the inequality is at a high level in almost all the Sub-Saharan countries, it's in low levels in the North America economies (Figure,1).
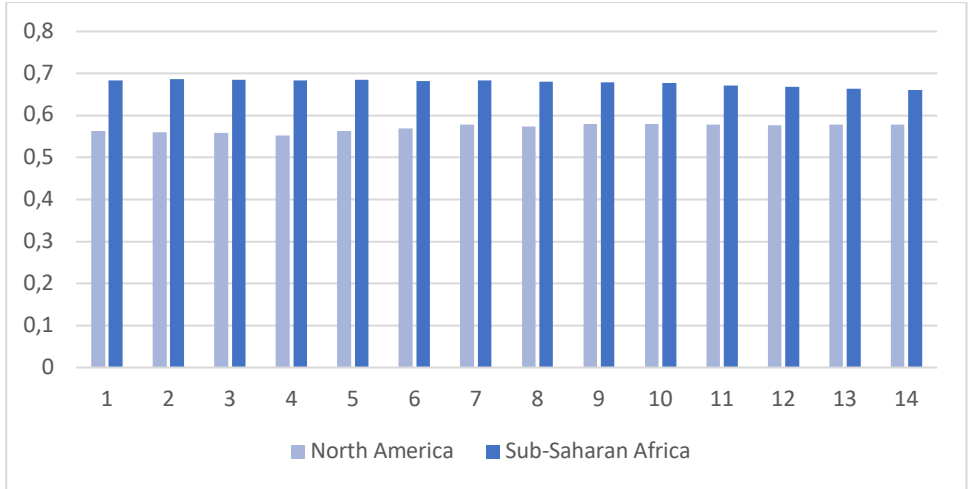
Figure 1. Income Inequality (Gini Coefficient) (World Inequality Database)

It is observed that positive savings habits in developed countries and the increase in the share of upper income groups are accompanied by increases in per capita income. Despite this, the weakness in the political and social systems of undeveloped countries indicates low-income classes (Kuznets, 1955, p.56).

Literature Research

In literature, there are several studies respecting economic growth and income inequality. Nevertheless, the studies which are associated with direct democracy are very few in terms of handling the matter. Therefore, the literature (views in favour, against, and other) consists of three parts (Galor 2011; Galor and Moav 2004, p.1001)

Democracy and Income Inequality, Views in Favour and Views Other

Barro (1996), the view that economic development stimulates democracy is known as the Lipset Hypothesis. Lipset (1959), Lipset had advocated that democracy is rooted not only on social circumstances but also the circumstance of materialization of economic growth. In this context, democratization is a fact executed with economic growth. According to Tavares and Wacziarg (2001), political instability leads to a feeling of insecurity on the policy to be followed in the future and causes the people in power to exhibit a looting behaviour towards the private sources in the economy. In democratic regimes, the courage for the emergence of extremism and the takeover of the power through illegal methods is diminished by determining the change of political power in advance with transparent rules and creating an open discussion environment on policies and politicians to be elected. According to Doğan (2005), democracy is the most fundamental institution for economic development/growth. Democratic values such as freedom of expression and forming associations, the existence of multi-party elections, the protection of human rights and the existence of the separation of powers create the institutional framework and process where the economic development will take part. Democracy facilitates the transfer of economic authority, offers a stable investment environment and accelerates the mobilization of national energy and resources for economic development/growth. Likewise, democracy enables a rise in the growth rate by increasing human capital accumulation and decreasing income inequality. Barro (1994), examined the relationship between democracy and economic growth for 100 countries in the period from 1960 to 1990. The findings obtained re-

vealed that the positive effect of democracy on economic growth depended on the supremacy of law, free market, low public expenditures and high human capital. Din and Khan (2017), analysed the interaction among democracy, income inequality and economic growth during 1963-2016 using 3SLS and alternative estimation methods. Their findings suggest that democracy, income inequality and economic development are endogenously interlinked in Pakistan.

Views Against Democracy and Income Inequality

Nikoloski, (2015), has investigated the relationship between democracy and income inequality. In the research which has been done by the panel data analysis approach for the period of 1962-2006, any evidence couldn't be found in respect of the fact that democracy is relevant to the income distribution. Koçak and Uzay (2018), For the period 1995-2013, he investigated the impact of democracy on economic growth by dividing countries into high-, middle- and low-income groups. Reisinezhad (2018), has investigated the relationship between economic growth and income inequality by using panel data methodology for the period of 1975-2015. One of the obtained finding is also that income inequality is relatively more intense in a democratic country comparing with an anti-democratic country. It is also possible to see the US and India, which are classified as free or democratic countries by the Regime and Freedom House indices, as well as the countries such as Thailand and Egypt that fall into the categories of non-free or non-democratic countries Davies, Lluberas and Shorrocks (2017). The examinations of Scheve and Stasavage (2017), also reveal that there is no data supporting the idea that democracy brings along a more equal distribution of wealth, or that wealth inequality is specific to anti-democratic regimes. Beşkaya and Manan (2009), investigated the relationship between democracy and economic performance for Turkey. As a result of the analyses, it was revealed that the relationship between democracy and economic performance was uncertain because it was positive in some models established and negative in others. Yay (2002), investigated the relationship between democracy and economic growth in the period of 1971-1990 for 74 underdeveloped and developing countries. The findings obtained show that there

was no significant relationship between democracy and economic growth. In the study of Helliwell (1994), the relationship between democracy and economic growth wasanalyzed on 125 countries in the period of 1960-1985. In the study, it was concluded that the income per capita had no significant effect on democracy.

Views Other Income and Inequality

For Piketty (2014) the relation appears explicit: capital income is over uneven diversified than labour income, so a transfer from labour income to capital income will enhance disparity. In his study, Kuznets (1955) explains the relationship between economic growth and income distribution and suggests that income inequality will increase in the initial stages of economic growth and decrease in the later stages. Kandek and Kajling (2017), has investigated the relationship between the regional economic disparities and the local economic growth in 357 metropolises. A series of OLS (Ordinary Least Squares) regressions between the years 2010-2015 has been implemented by the data collected from USA Census Bureau and some other databases. The research results indicate that there is a negative and unimportant relation between Gini Coefficient and per capita economic growth. Adinde and Chisom (2017), have done an empirical study of economic growth and income inequality in Nigeria. The results indicate that the magnitude gross domestic product (GDP) causes income inequality in Nigeria. Finally, the multiple regression analysis to guess the relation among Gini Coefficient, GDP and the other explanatory variables is used. The results indicate that GDP, consumer price index (CPI), population increase and education are the real determinants of the income inequality in Nigeria. Wahiba and Weriemmi (2014), have investigated the qualification of the relation between income inequality and the economic growth in Tunisia for the period of 1984-2011.Findings in the direction that income inequality has a negative influence on economic growth is obtained. Shin (2012), has investigated theoretically the relation of income inequality and economic growth with a stochastic optimal growth model. The obtained results are in the direction of the fact that a higher inequality would defer the growth in early phases of the economic development and encourage the growth in a near steady condition.

İsagiller (2007), has investigated the interrelations between income distribution and the economic growth relevant to several countries. As a result of the study, it has been seen that growth hasn't had any effect on income distribution. Keskin (2017), has analysed the relation between the income distribution and the economic growth by using the data of cross-section study. Besides, in the study, he has researched the Gini Coefficient which maximizes GDP growth rate of countries. The obtained findings as the result of study indicate that it is required the developing countries to carry out policies which decrease the inequality of income distribution to increase the economic growth rate and the developed countries to avoid from the policies which decrease the inequality of income distribution, as well. Rabiul (2017), has investigated both empirically and theoretically the effect of the income inequality in Japan on the economic growth by using the time-series data belonging the period of 1960-2015. The empirical results consistently indicate that income inequality prevents Japan's economic growth considerably. Besides, a great deal of inequality has been relatively decreasing the investments, education and the protection of proprietary rights, and this also prevents economic growth. Brueckner and Lederman (2017), have investigated the relationship between the income inequality and GDP per capita for the low, middle and high-income countries in the world. The obtained results indicate that the transitional growth increases with higher income inequality in low-income counties. In high-income countries, inequality has a critical negative effect on transitional growth. For the middle-income countries, it has been obtained that findings in the direction of the fact that a %1 increase in Gini Coefficient has decreased the GDP per capita more than %1 during the 5 years period. Peterson (2017), in their study named "Is Economic Inequality Really a Problem? A Review of the Arguments," have reached the result in the direction that income inequality slows the economic growth in the world. Voitchovsky (2005), has investigated the importance of the way of income distribution as the determinant of the economic growth for Luxembourg. According to the obtained results, it has been seen as a positive relationship between income inequality and economic growth. Hsing (2005), has investigated the effect of income inequality on economic growth in the USA. The findings are in the direction that the deterioration of inequality will be harm-

ful to economic growth. Delbianco (2014), has investigated the relationship between the inequality of income distribution and the economic growth for the Latin America and the Caribbean countries. Generally, in the result of the study, findings in the direction show that inequality is harmful to economic growth. Majumdar and Keklik (2009), have investigated the effect of economic growth on income inequality. The obtained results indicate that economic growth has a negative influence on income inequality. Majeed (2016), has investigated the effect of income inequality on the economic growth in Pakistan by using the annual time-series data between the years of 1975-2013. He has obtained findings in the direction that the growth process hasn't decreased the poverty. Nemati and Raisi (2015), have investigated the relationship between the GDP and Gini Coefficient by using panel data methodology for 28 developing counties in the period 1990-2010. According to the result of the investigation, while the income inequality increases in the early stages of the growth, it decreases in the next stages.

Empirical Analysis

Method

It's used Panel Data Model in research. The study is made with Hausman's test technique. First of all, fixed and random effects models are used. Test of hypothesis by comparing the value of significance level which is obtained with Hausman's test and Table value (α) is implemented.

Panel Data Analysis

Recently, panel data is used in most of the economic studies including econometric analysis. Because panel data models provide a rich environment for the development of forecasting techniques and theoretical results (Greene, 2003, p.57). Panel data models examine the effects of cross-section and time series. Therefore, it provides multiple observations for each series (Hsiao, 2003, p.45). One of the most important fea-

tures of panel data analysis is the determination of unobservable or imponderable effects on the dependent variable (Baltagi, 2005, p.64).

Panel data models observe the effects of the cross-section and time-series. These effects can be fixed or random. While the fixed effects accept the relation between the explanatory variables of individual group/time in the regression equation, the random effects refuse the relation between the explanatory variables of individual group/time (Park, 2010, p.65). In fixed-effects models, all the observation values are brought close together. Thereafter, the prediction of a revised model has been made by subtracting the cross-section values from the average. In the random-effects method, modelling is made by subtracting the constant term of the whole cross-section value from the population randomly (Kutlar, 2017, p.84).

In panel data analysis, if the cross-section data and the time frame are equal, then stabile panel data analysis is made. If the data differs from this angle, it is described as instable panel data model. Generally, the panel data regression equation is as follows (Gujarati, 2004, p.87);

$$Y_{it} = \beta_1 + \beta_2 X_{2it} + \beta_3 X_{3it} + e_{it} \tag{1}$$

In the equation, 'i' refers to the cross-section data and 't' refers to the variables belonging to the time frame data. Primarily, the horizontal cross-section dependency developed by (Pesaran, 2006, p.23) was examined for the overall panel. Then the panel unit root test was performed. Because the panel data models contain time series values, the stability of the series should be tested.

Testing Horizontal Section Dependency

Examination of horizontal cross-section dependency among the countries in the panel is of great importance for obtaining healthy results. For this purpose, the horizontal cross-section dependency test was performed before starting the analysis. In the study, CDIm and CD tests were performed for the cross-sectional dependence (Pesaran, 2004, p.1-50). The equations for the tests are listed below;

$$CD_{LM} = \sqrt{\frac{1}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{J=i+1}^{N} (T\hat{\rho}_{ij}^2 - 1) \tag{2}$$

$$CD = \sqrt{\frac{2T}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{J=i+1}^{N} \hat{\rho} \, ij \tag{3}$$

Panel Unit Root Analysis

Panel unit root tests are tests developed to determine whether panel data are stationary over time. In cases where there is no correlation between units in panel data analysis, Levin, Lin, Chu (2002), Im, Peseran, Shin (2003) and Fisher (ADF, PP), Hadri (2000) and Breitung (2000), first group tests are applied (Sarıkovanlık, 2017). In this study, Levin, Lin, Chu (2002); Fisher (ADF, PP), and Im, Peseran, Shin (2003) tests were used for unit root analysis.

Levin, Lin, Chu, Im Peseran and Fisher (ADF, PP) panel unit root tests hypotheses are as follows:

H_0: There is a unit root in the series.

H_1: There is no unit root in the series.

The equation for Levin, Lin and Chu panel unit root test is as follows (Baltagi, 2005, p.240);

$$\Delta Y_{it} = py_{i,t-1} + \sum_{L-1}^{pi} \theta_{iL} \Delta y_{it-L} + \alpha_{mi} d_{mt} + \varepsilon_{it} \tag{4}$$

In formula d_{mt} deterministic variables vector, α_{mi} is the coefficient vector of the model.

Im Peseran Shin unit root test, is formulated in its simplest form below (Sarıkovanlık,2017, p.188-189);

$$\Delta Y_{it} = (\rho_i - 1) Y_{i,t-1} + \mu_{it} \tag{5}$$

The hypotheses of Im Peseran Shin panel unit root tests are as follows:

H_0: There is a unit root in the series.

H_1: There is no unit root in the series.

The equation for Fisher (ADF, PP) panel unit root tests is as follows (Giray, 2011, p.135);

$$\Delta y_{it} = \alpha y_{it-1} + \sum_{j-1}^{p_i} \beta_{ij} \Delta y_{it-j} + x'_{it} \delta + \varepsilon_{it} \tag{6}$$

$I_f H_0: \alpha = 0$ there is a unit root.

$I_f H_1: \alpha < 0$ there is no unit root.

The Hausman Test, Use in Panel Data Analysis

One of the tests used for a proper model choice in panel data analysis is Hausman's test technique. It's identified which test technique will be used between the fixed and random effects models by this test (Karlsson, 2014). If the econometric model is considered to have no unit or time effects, the "Pooled Regression Model" may be preferred. However, if unit or time effects are considered to exist, the Fixed Effects Model or Random Effects Model can be used. For this, Hausman test is performed. The Hausman test is occasionally defined as a test for a model misstep. In panel data analysis, the null hypothesis is that the preferable model has random effects; the alternating hypothesis is that the model as fixed effects. Especially, the tests indicate if there is a correlation between the unparalleled errors and the regressors in the model. The null hypothesis is that there is no correlation between the two (Statistics of How To, 2019).

The equation belonging to the fixed effects model is as follows (Torres, 2007);

$$Y_{it} = \beta_1 \times_{it} + \alpha_i + e_{it} \tag{7}$$

1. αi (i = 1…. n) is unknown intersection point for each entity.
2. Yit, i = cross-section and t = variable depending on time
3. Xit represents an independent variable.
4. β1 is the coefficient of independent variable.
5. eit is an error term (Torres, 2007).

Random effects models are also stated as multilevel or mixture of models, as well (Clarke et al. 2010). The equation belonging to the model is as follows (Lipps and Kuhn, 2016);

$$Y_{it} = \alpha + \beta_1 X_i + \alpha_i + e_{it} \tag{8}$$

6. αi: The residual value belonging to fixed characteristics which haven't been observed.

Empirical Results

Data Set

The data of this paper are taken from the web pages of United Nations Development Programme (UNDP, 2020), International Monetary Fund (IMF, 2021), (World Bank, 2021), (OECD, 2021). The variables are respectively chosen as It has been dealt with the connection between the Income inequality (GINI, dependent) and the economic growth (GDP, independent) and Regime (RE, independent). Our model involves North America and Sub-Saharan Africa; The study involves a period of 2006-2020. It has been benefited from the Eviews-11 Program. The model of the study is as follows;

$$GINI = f(RE, GDP) \tag{9}$$

In analyses, "Fixed Effects Model" should be used. Fixed effects model is a method which is preferred by lots of researchers. In the hypothesis of fixed effects model, the hypothesis "It's not possible that the unit effects are unrelated to the explanatory expressions in the model" is dominant.

One way to take into consideration the "individualities" of each one of cross-sections is to allow that the stability coefficients are different; and in contrast with this, the slope coefficients are the same for each country. This model is the Fixed Effects Model. The term 'fixed effects' herein derives from that the 'fixed' is different for each one of sections; however, the 'fixed' of each one of the sections doesn't change during time. In this model, the slope coefficients are the same for both time and section. To differentiate from the fixed effects among the countries, it's benefited from the equation herein below;

$$Y_{it} = \alpha_1 + \alpha_2 D_{2i} + \alpha_3 + \beta \times_{2it} + e_{it} \tag{10}$$

The tested hypothesis is written as follows:

H0: Independent variables are ineffective upon the dependent variable (Coefficient of the independent variable is zero).

H1: Independent variables are effective upon the dependent variable (Coefficient of the independent variable is different from zero).

If the prop value belonging to the variables is under 5%, it might be said that the coefficient is different from zero in the level of significance of 5%. Namely, H0 hypothesis is refused. In another saying, confirmed that the independent variable has an impact on the dependent variable. An estimation result in this way becomes as in Table 6 and Table 12.

Panel Data Analysis for Developed Countries (North America)

In this section, the results of the analyses are presented. First, descriptive statistics for the variables used in the model are given for the 2006-2020 period Table 1.

Descriptive Statistics

Table 1. Descriptive Statistics

	GINI	RE	GDP
Average	62.06238	45.34584	48.26573
Median	63.74054	47.35943	71.45763
Maximum	79.54784	68.76183	83.35837
Minimum	32.67439	41.28657	19.65309
Standarddeviation	8.347590	9.126245	19.16328
Skewness	-0.897645	-1.73629	-1.42682
Jarque-Bera	24.75890	26.82469	51.35626

Table 2. Horizontal Dependency Test Results

Variables	CDlm		CD	
	Test Statistics	Probability	Test Statistics	Probability
GINI	-0.876	0.203	2.504	0.218
RE	-0.942	0.162	2.236	0.305
GDP	-0.467	0.073	3.263	0.092

In Table 2, the probability values of the variables were greater than 0.05 accordingly, there is no horizontal cross-section dependency among the variables.

Panel Unit Root Test Results and Evaluation

Logarithms of GINI, RE, and GDP variables were taken and unit root test and other tests were performed using the logarithmic values of the variables. The appropriate delay length which resolved the autocorrelation problem was found according to the Schwarz information criterion. It was observed that the series were not stationary in their level values. The series were made stationary by taking the first differences. The results are as shown in Table3.

Table 3. RE, GINI and GDP Panel Unit root Test

	GINI		RE		GDP	
Method	tStatistic	PVal.	tStatistic	PVal.	tStatistic	PVal.
Levin,Lin**	-2.5264	0.0002	-7.29743	0.0000	-6.4839	0.0000
Pes. Shin**	-8.02621	0.0061	-12.8591	0.0002	-6.92652	0.0000
ADF**	74.89363	0.0023	113.521	0.0001	203.776	0.0000
PP**	133.608	0.0000	-21.572	0.0010	211.472	0.0000

**, 5% indicates significance levels.

As seen in Table 3 it is seen that in the unit root test results applied to the levels of the variables, series that will be utilized in econometric analysis of t statistics and probability results are not stationary at the level I (0). For this reason, the primary differences of the series are taken I (1) to ensure stability.

Panel Data Estimation Model is established (Table 4).

Table 4. Pooled Prediction Results Advanced Countries

Dependent Variable: GINI?				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
RE?	0.726531	0.258603	9.547392	0.0000
GDP?	0.970942	0.119539	8.122391	0.0000

According to the obtained results Table 4, it is not a matter of any modelling error. Coefficients of the variables have sufficient significance level. Namely, our model is significant. After this step, parameters will be estimated with the fixed and random effect models which are used to see the individual effects in panel data. Firstly, it is required to decide which one of these two models (fixed effect and random effect) is valid

statistically. For this, Hausman's test will be applied. In Hausman's test, it is set in the way that "random effect model" for the null hypothesis and "fixed effect model" for the alternative hypothesis should be used. It is required to be done Random Effect Test before Hausman's Test. Random effect model is seen as in Table 5. Within the frame of the obtained equation, Correlated Random Effects – Hausman's Test is applied.

Table 5. Hausman Test Result

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	144.60569	1	0.0000

From the output given in Table 5, Prob. (significance level) value and Table value (α) are compared. In our example; since Prob. = 0.000 < 0.050, H0 hypothesis is refused. Namely, there isn't a random effect. In that case, it's required to estimate the model with the fixed effect. The estimation results of the fixed effect are given herein below;

Table 6. Fixed Impact Result

Dependent Variable: GINI?				
Variable	**Coefficit**	**Std.Error**	**tStatistic**	**Prob.**
C	35.02104	0.182002	192.4212	0.0000
GDP?	- 0.25530	0.007075	-0.039773	0.0484
RE?	-0.62251	0.019023	-1.308639	0.0023
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.950873	Durbin-Watson		2.002702
Prob(F-statistic)	0.000000	F-statistic		138.6562

Modified Bhargava et al. Durbin-Watson statistics are close to 2.0 there is no autocorrelation. But it is found that there was an error in the varying variance and between units' correlation. All standard errors are as corrected by White method. The final fixed effects model is estimated and its results are has shown in Table 6. According to the values of estimation results in Table 6, the Regime (RE) and GDP is effective upon the GINI index. Besides, the coefficient of the variable RE affects positively and significantly in the level of significance of 5%. The effect of this variable is an effect which is expected to assign and to be powerful. This coefficient means that an improvement in the level of 1% occurring in the

regime causes just a decrease of 0, 62 % in the inequality of income distribution. Similarly, means that an improvement in the level of 1% occurring in the economic growth causes a decrease of 0,25 % in of the income inequality.

Panel Data Analysis for Underdeveloped Countries (Sub-Saharan Africa)

In this section, the results of the analyses are presented. First, descriptive statistics for the variables used in the model are given for the 2006-2020 period Table 7.

Descriptive Statistics

Table 7. Descriptive Statistics

	GINI	RE	GDP
Average	74.32960	62.79064	65.39100
Median	67.32120	71.83012	65.21033
Maximum	79.56592	91.83509	87.40483
Minimum	42.83952	22.93173	39.40483
Standarddeviation	12.153972	19.29299	9.153972
Skewness	-0.970582	-0.40691	-0.73910
Jarque-Bera	43.72064	52.09235	32.93021

Table 8. Horizontal Dependency Test Results.

Variables	CDlm		CD	
	Test Statistics	Probability	Test Statistics	Probability
GINI	-0.827	1.236	4.821	1.002
RE	-0.692	0.859	3.625	0.894
GDP	-0.627	0.604	3.582	0.209

In Table 8, the probability values of the variables were greater than 0.05 accordingly, there is no horizontal cross-section dependency among the variables.

Panel Unit Root Test Results and Evaluation

Logarithms of GINI, GDP and RE, variables were taken and unit root test and other tests were performed using the logarithmic values of the vari-

ables. The appropriate delay length which resolved the autocorrelation problem was found according to the Schwarz information criterion. It was observed that the series were not stationary in their level values. The series were made stationary by taking the first differences. The results are as shown in Table 9.

Table 9. Panel Unit root Test (First Difference of the Series is Taken)

	GINI		RE		GDP	
Method	tStatistic	P.Val.	tStatistic	P.Val.	tStatistic	P.Val.
Levin, Lin***	-19.3911	0.0010	-9.12263	0.0000	14.7194	0.0000
Pesaran, Shin **	-11.2174	0.9854	-15.6387	0.0010	11.9058	0.0010
ADF **	82.7456	0.4834	98.487	0.0001	98.1040	0.0000
PP **	99.9732	0.0001	-19.425	0.0000	- 56.1643	0.0020

***, 1%, **, 5% indicates significance levels.

As seen in Table 9, it is seen that in the unit root test results applied to the levels of the variables, series that will be utilized in econometric analysis of t statistics and probability results are not stationary at the level I (0). For this reason, the primary differences of the series are taken I (1) to ensure stability.

Table 10. Pooled Forecast Results Developed Countries

Dependent Variable: GINI?				
Variable	Coefficit	Std. Error	t-Statistic	Prob.
RE?	0.438043	0.046204	9.480630	0.0000
GDP?	0.362916	0.002839	8.396201	0.0001

According to the obtained results Table 10, it's not a matter of any modelling error. Coefficients of the variables have a sufficient significance level. Namely, our model is significant. After this step, parameters will be estimated with the fixed and random effect models which are used to see the individual effects in panel data. Firstly, it is required to decide which one of these two models (fixed effect and random effect) is valid statistically. For this reason, Hausman's test will be applied. In Hausman's test, it is set in the way that it should be used "random effect model" for the null hypothesis and "fixed effect model" for the alternative hypothesis. Random Effect Test before Hausman's Test is required to be done. Random effect model is seen as in Table 11. Within the frame

of the obtained equation, Correlated Random Effects – Hausman's Test is applied.

Table 11. Hausman Test Result

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	16.429202	1	0.0001

From the output given in Table 11, Prob. (significance level) value and Table value (α) are compared. In our example; since probability value of Cross-section random series is Prob. = 0.001 < 0.050, H0 hypothesis is refused. Namely, there isn't a random effect. In that case, it's required to estimate the model with the fixed effect. The estimation results of the fixed effect are given hereinbelow.

Table 12. Fixed Impact Result

Dependent Variable: GINI?				
Variable	Coefficit	Std.Error	tStatistic	Prob.
C	39.12464	0.902108	43.37022	0.0000
RE?	-0.051289	0.013801	-1.035304	0.0348
GDP?	0.110038	0.004852	1.638203	0.1521
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.212246	Durbin-Watson		1.99803
F-statistic	35.92882	Prob(F-statistic)		0.00005

A modified Wald test was applied to search for the Changing variance problem and inter-unit correlation. Such a situation was determined to be absent. Also, Modified Bhargava et al. Durbin-Watson statistics are close to 2.0 there is no autocorrelation. According to the values of estimation results in Table 12, the RE has an impact upon the GINI index. The effect of this variable is an effect which is expected to assign but weak as quantity. This coefficient means that an improvement in the level of 1% occurring in the regime causes just a decrease of 0,05 % in the inequality of income distribution. In Table 12, being 0,212 of R2 value states that the independent variable could explain 21% of variations as an independent variable. The analysis of the regime–growth relationship shows that there is no significant relationship between the RE and GDP growth.

Discussion and Conclusion

The results obtained by making panel data model, for the democracy countries (North America); the RE and the GDP is effective upon the GINI index. The effect of this variable is an effect which is expected to assign and to be powerful. This coefficient means that an improvement in the level of 1% occurring in the regime causes a decrease of 0, 62 % in the inequality of income distribution. Similarly, means that an improvement in the level of 1% occurring in the economic growth causes a decrease of 0, 25 % in of the income inequality.

The results for the autocratic countries (Sub-Saharan Africa); the RE has an impact upon the GINI index. The effect of this variable is an effect which is expected to assign but weak as quantity. This coefficient means that an improvement in the level of 1% occurring in the regime causes just a decrease of 0,05 % in the inequality of income distribution. In Table 12, being 0,212 of $R2$ value states that the independent variable could explain 21% of variations as an independent variable. The analysis of the regime–growth relationship shows that there is no significant relationship between the regime and GDP growth.

Results from this study provide, overlap with theories supporting our findings. Kalliovirta and Malinen (2018), find that the effect of inequality on growth depends on regimes of inequality and it is very heterogeneous across countries. (Gradstein, et al. 2001) Have made an empirical study by using data belonging to the covering 126 countries in 1960-98. In societies that value equality highly, there is less distributional conflict among income groups, so democratization may have only a negligible effect on inequality. But in societies that value equality less, democratization reduces inequality through redistribution as the poor outvote the rich. (Artan and Kalaycı, 2014, p.88) While the rise in the level of democracy reduces income inequality in developed countries; it raises the income inequality in developing countries. (Ahmad, 2017, p.54) for a sample of countries up to 115 over 1970–2014 period, showed he the freedom-induced inequality is attenuated in the presence of a democratic regime in the countries under study. (Acemoğlu et al. 2017, p.43) They did research for 184 countries. Them findings indicate that there is a significant

and robust effect of democracy on tax revenues as a fraction of GDP, but no robust impact on inequality. (Acaravcı et al. 2017, p.74) They researched the causal relationships between income distribution, democracy, real income and trade openness in Balkan States for 1996-2010 period by using the second-generation panel data methods under cross-sectional dependence. The results can be summarized as follows: There exist causal relationships from democracy, real income and trade openness to income distribution. Democracy and trade openness have more powerful common effects on income distribution.

In fact, it cannot be stated that the primary income distribution is not very good in many countries which are in a good position in terms of income inequality. In developed countries, primary income distribution is only improved with public intervention. The reason is that democratic legal rules and practices regarding human rights are guaranteed by law in developed countries. For example, OECD countries try to reduce income and inequality with tax and transfer policies (Cural, 2009,p.73).

In the Middle East and Sub-Saharan African countries, there are political turmoils since 2011, though in different forms. The main reason for these turmoils is closely related to the underdevelopment and poverty of countries. The inequality in income distribution, which is an important problem of the whole world and is deeply felt in this group of countries, also creates the need for economic and political arrangements (Güzel and Çetin, 2018, p.91).

The most important reasons of fair distribution of the income obtained as a result of the economic growth in democratic countries among all segments of society are being common of non-governmental organizations like the trade unions defending employees' rights, existing of individual right to legal remedies, transparent regime, running of accountability mechanism, and being guaranteed with laws of the essential elements of democracy like proprietary rights. Within this context, the more the underdeveloped countries which the authoritarian regime is dominant adopt to the democracy, the more their economies will grow, and therefore, thanks to the fair income distribution, prosperity level of people will increase.

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