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Original Article

The Relationship between Democracy and Economic Growth in Developed and Developing Countries: Panel Data Analysis

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Abstract *- The question of whether there is a positive relationship between democracy and economic growth has always been debated. There are different approaches to this subject. This study was carried out to make a contribution to the debate on this issue. The study aims to investigate the relationship between democracy and economic growth from the perspective of developed and developing countries. In this study, Turkey, India, Brazil, Russia, Mexico, Indonesia, and South Africa were included in the sample group of developing countries, and Germany, France, England, Belgium, Canada, Japan, and Denmark were included in the sample group of the developed countries. The analysis of the study was carried out with panel data analysis. In the developed countries group, a bidirectional causality was found between democracy index and growth. Both variables are influenced by the past values of each other. In the developing countries group, while there was no causality from the democracy index variable to the growth variable, there was a causality from the growth to democracy index variable. Thus, unidirectional causality in the developing countries was obtained. Study findings are discussed in the results section.*

Keywords *- Democracy Index, Economic Growth, Economic Development, Panel Data Analysis*

I. INTRODUCTION

The concept of democracy, first seen in the Greek Polis state, means "rule by the people" etymologically (Aktaş, 2015, 87). However, it has become an important concept used to describe different practices with the emergence of the unique characteristics of government systems and economic systems in keeping with the age (Ural, 1998, 451). Therefore, the democracy concept in the early ages and today's concept of democracy refer to different definitions. It even differs for each community in these periods. In fact, each community has created names of similar types for its democracy, such as Islamic democracy, secular democracy, and political democracy. However, it would be more accurate for our article to consider the concept of democracy in contemporary terms today. Therefore, in addition to exercising legal rights, it is necessary to integrate the social and cultural structure into this contemporary understanding. It should be considered a much more libertarian understanding in line with the economic freedom harmonized with the social structure that formed in parallel with the use of legal rights, which are owned especially in this age, characterized with the globalized economy dominated by the free market economy worldwide.

Moreover, within the scope of a free-market economy, the concept of economic growth is also an important long-term goal for all countries of the world. The increase in national income, which is the monetary expression of all goods and services in a country during a specific period, is defined as "economic growth". In other words, while economic growth roughly refers to the numerical increase in the economy, development points out a total transformation and social improvement in the economy. Economic development is the transformation of a country's production structure to produce high-value-added products, which leads to improved living standards (levels of welfare) by distributing the resulting products among the income groups of the society in an equitable manner (Arslan, 2013, 46).

At this point, providing legal rights to the citizens and giving them a right to have a say in both the economy and the political platform is only possible in a democratic platform of democratized countries. The author believes that the improved economic welfare of individuals through economic growth, the choice of actors that will make rational decisions in the political arena of countries will only be more accurate in a democratic system. Accordingly, the Nordic countries, which achieved economic growth together with democratization and raised both the levels of quality of life and the levels of welfare, are shown as an example to other societies of the world in this regard.

When the development and institutionalization process of democracy is examined, it is observed that

downturns are seen in democracies in times of economic bottlenecks and crises in countries around the world, whereas concrete steps are observed to be taken in terms of democracy and human rights in times of development.

Studies suggesting that there is a link between democracy and development are noteworthy. Although the existence of a relationship between the two concepts is acknowledged, there are different ideas as to which one is decisive. According to some researchers, it is not possible for democracy to be established without economic development and without achieving a certain level of the economy. According to them, establishing democracy is only related to the degree of economic development. Some believe the opposite of this approach. According to them, the development of countries would not be possible without democracy (Ökten, 2007:91).

The question of whether there is a positive relationship between democracy and economic growth has always been debated. There are different approaches to this subject. The first of these approaches suggests that Western countries have developed through democracy. As opposed to the first approach, the second approach suggests that Eastern countries such as China and Korea have achieved rapid economic growth with authoritarian regimes. The proponents of the second approach also show evidence of economies that have achieved rapid economic growth with authoritarian regimes in the past, suggesting that there is no relationship between democracy and economic growth (Eğilmez, 2019). The Democracy Index has been prepared by The Economist magazine since 2006. Countries in the index are classified under four groups. These include Full Democracies, Flawed Democracies, Mixed Regimes, and Authoritarian Regimes. Since the democracy index data has been published regularly since 2010, the data used for analysis in the study cover the 2010-2018 period.

II. LITERATURE REVIEW

Most theoretical and empirical studies that address the relationship between democracy and growth agree that there is a significant relationship between democracy and economic growth. It shows that democratic practices have a major contribution to accelerating economic growth and development. In addition, the democratic society structure of an economy has a positive effect on economic growth. Studies show that the relationship between democracy and economic growth dates back to the 19th century. Lipset argued that the level of growth in economies had a positive effect on the sustainability of democracy in the early years when the relationship between democracy and economic growth and development was discussed (Lipset, 1959: 75).

The studies on the relationship between democracy and economic growth can be classified under three headings. These are the Confrontational approach, the Cohesion approach, and the Skeptical approach.

- Confrontational Approach: This approach suggests that democracy imposes high costs on the economies of developing countries. According to this approach, the concepts of democracy and economic growth are considered to be two concepts that contradict each other and cannot be achieved together.
- Cohesion Approach: The cohesion approach suggests the view that the democratization steps and processes are complementary and supportive to economic growth.
- Skeptical Approach: This approach suggests that economic growth cannot be linked to democratization steps and processes.

Table 1 summarizes the studies investigating the relationship between democracy and economic growth. The literature presented in Table 1 covers all three approaches mentioned above.

Table 1. Studies on the Relationship between Democracy Index and Growth

Author	Research Topic	Date of the Data	Method	Finding
Erdem and Çelik (2019)	Relationship Between Human Development And Economic Growth	1995-2014	Panel Data Analysis Method	In their study, Erdem and Çelik found that it would be more beneficial for African countries to focus on education and health investments rather than just considering income in order to achieve economic growth.
Başar and Yıldız (2019)	The Effects of Economic Growth on Democratization	1923-2003	Panel Data Analysis	In their study, Başar and Yıldız found that economic growth in Turkey positively affected democratization in the period 1923-2003, but the relationship could not be maintained for shorter periods.
Altner, Bozkurt and Toptaş (2018)	Globalization and Economic Growth	1990-2015		In their study, Altiner et al. found that there is a one-way causality relationship from political globalization to economic growth and from economic growth to social globalization. Another conclusion they found is that there is no causal relationship between economic growth and the overall and economic globalization index.

Barış and Erdoğmuş (2018)	Relationship Between Democracy and Economic Growth in the 21st Century		Literature Review	They found support for the cohesion approach, which states that there is a positive relationship between democracy and economic growth.
Şahin (2017)	Relationship between Democracy and Economic Growth in Transition Economies	1995-2015	Panel Data Analysis Method	He points out the existence of a statistically significant and long-term relationship between the democracy index and the economic growth variable. While there was no causal relationship between democracy and economic growth in the short term, a two-way causality relationship was found between democracy and economic growth in the long term. Developments in democracy were found to increase economic growth, and economic growth was found to promote the development of democracy. As the most significant result of the study, the democratization process was found to be complementary and supportive to economic growth.
Williams (2017)	Does Democracy Dampen the Effect of Finance on Economic Growth?",	1982-2011	Dynamic panel analysis	** In the study, he found that democracy does not improve the effects of financial development on economic growth.
Koçak and Uzay (2017)	Relationship between Democracy and Economic Growth in Turkey	1975-2014		In their study, Koçak and Uzay found that democracy has a positive and statistically significant effect on economic growth. They also found that improvement in the level of democracy of countries is an important factor in economic growth.
Kalay and Çetin (2016)	Political Stability and Economic Growth in African Countries	2000-2011	The hypothesis was tested using the Granger causality test and panel data.	A one-way relationship was identified from economic growth to political instability. Political instability was found to directly affect income distribution and military spending. It was found to affect economic growth through military spending.
Akıncı (2015)	The Relationship between Democracy and Political Stability and Development		Literature Review	Acting with political ambition, coalition governments do not give the opportunity for optimum use of resources. The coalition period is called "the lost years". Acting with political ambition, coalition governments hamper optimum use of resources.
Rachdi and Saidi (2015)	Democracy and Economic Growth	1983-2012	Panel Data Analysis	They found that democracy has a strong negative effect on the economic growth of MENA countries.
Masaki and Walle (2014)	The Impact of Democracy on Economic Growth in Sub-Saharan Africa	1982-2012	Panel Data Analysis	In their study, Masaki and Walle found that democracy strongly influences economic growth positively.
Jaunky (2013)	Democracy and Economic Growth in Sub-Saharan Africa	1980-2005	Panel Data Analysis	It was found that democracy has a positive effect on economic growth in the short term and that democracy and economic growth have a positive effect on each other in the long term.
Başar and Yıldız (2012)	A Study on the Effect of Economic Growth on the Democratization	1993–2005	Panel Data of the period 1993-2005 was used to investigate the impact of growth on democratization in 59 countries.	As a result of the study, it was found that the democratization process in countries is positively affected as the income level and growth rate increase in countries. The study also yielded results in accordance with the views in the literature that democratization is negatively affected by inflation. Another result is that an increase in human capital contributes to democratization.

Çukurcayır and Tezcan (2011)	Democratization and Economic Development	2011	Literature Analysis	In their study, Çukurcayır and Tezcan found that democracy and democratic practices have an active role in the acceleration of economic growth and development and that economic growth and development have distinct importance in the increase in the level of democracy and in the formation of a social structure. One of the important results of the study was that there was not a "substitution" relationship between democracy and economic development, but rather a "complementarity" relationship and that there was a mutual interaction between the two.
Beşkaya and Manan (2009)	Time Series Analysis of the Relationship between Economic Freedom and Democracy and Economic Performance	1970-2005	The Neoclassical Growth Model was Used.	In their study, Beşkaya and Manan found a positive relationship between economic freedoms and economic performance, but they could not reach a definite conclusion on the effect of democracy on economic performance.
Papaioannou and Siourounis (2008)	Democratization and Growth	1960-2003	Panel Data Analysis	In their study, panel data estimates indicated that average democratization was associated with a 1% increase in annual growth per capita.
Jamali et al. (2007)	The Effect of Political Regimes and Technology on Economic Growth	1990-1999	Panel Data Analysis	In their study, they found that the preservation of property rights, namely democracy, promotes economic growth.
Doğan (2005)	Democracy and Economic Development		Literature Review	In his 2005 study, Doğan stated that democracy should be considered fundamental for economic development. This is because democracy has strong ties to both political and civil liberties, and he also emphasized that it contributes to social and economic development. Dogan stated that democracy contributes more to economic development than autocracies since it is more successful in managing social conflicts, ensuring political stability, and preventing social disasters.
Oliva and Rivera-Batiz (2002)	Political Institutions, Capital Flows, and Developing Country Growth	1970-1994	Exploratory Causality Tests	In their study, they found that democracy affects economic growth positively. This effect has often been found to be statistically significant.
Tavares and Wacziarg (2001)	How Democracy Affects Growth	in 65 developed and developing countries	Panel Data Analysis	He has found that democracy is improving human capital accumulation. In addition, it also appears to support economic growth through a decrease in inequality in income distribution. In terms of total impact, democracy has been found to have a negative effect on economic growth.

III. ECONOMETRIC ANALYSIS

A. Data and Method

In this study, Turkey, India, Brazil, Russia, Mexico, Indonesia, and South Africa were included in the sample group of developing countries, and Germany, France, England, Belgium, Canada, Japan, and Denmark were included in the sample group of the developed countries. The dependent and independent variables for both groups of countries are given in Table 2. In particular, it is difficult to find democracy index data in the form of a long-term time series for underdeveloped or developing countries. Therefore, the analysis was carried out using annual data for the period 2010-2018.

Table 2. Introduction of the Variables Used in the Analysis

Variable	Var. Name	Definition
Democracy Index (%)	DEM_END	Independent variable
Growth (%)	BUY	Dependent variable

The dataset used was formed using the annual data for the 2010-2018 period from the www.spk.gov.tr and https://infographics.economist.com/2018/DemocracyIndex/databases. The R software and Eviews 10.0 package program were used for estimation of the empirical model created within the scope of panel data analysis. In the first phase, the cross-section dependence and homogeneity tests were performed, stationarity was tested using the first generation unit root tests of Im et al. (2003), Maddala and Wu (1999), and Choi (2001), and the CIPS second-generation unit root test, the panel regression analysis was applied to reveal the relationships

Table 3. Descriptive Statistics and Correlation Matrix for the Dataset

DEVELOPING COUNTRIES			**DEVELOPED COUNTRIES**		
Descriptive statistics	BUY	DEM_END	**Descriptive statistics**	BUY	DEM_END
Mean	3.848508	6.336984	**Mean**	1.701984	8.307143
Median	3.663000	6.900000	**Median**	1.734000	8.310000
Maximum	11.11300	7.920000	**Maximum**	4.192000	9.520000
Minimum	-3.546000	2.940000	**Minimum**	-0.115000	3.380000
Std. deviation	2.922254	1.406749	**Std. deviation**	0.925660	0.939899
CORRELATION MATRIX			**CORRELATION MATRIX**		
	BUY	DEM_END		BUY	DEM_END
BUY	1.000000	0.12265	BUY	1.000000	0.363678
DEM_END		1.000000	DEM_END		1.000000

B. Cross-sectional Dependence and Homogeneity Tests

In the panel data analyses, first, the homogeneity of the variables should be tested. The homogeneous or heterogeneous nature of the variables changes the unit root tests to be applied. The cross-sectional dependence between the series was analyzed using the LM CD test, developed by Pesaran (2004), and the LM adj. test, which its skew was corrected by Pesaran et al. (2008), and the test results were presented in Table 3. Since the probability values of the test results were less than 1% and 5%, the null hypothesis (no cross-sectional dependence) was rejected, and it was accepted that there was a cross-section dependence between the series. Furthermore, the homogeneity of the coefficients was tested using the delta tilde and corrected delta tilde tests of Pesaran and Yamagata (2008), and the test results were presented in Table 4. Since the probability values of the test results were less than 1% and 5%, the null hypothesis (slope coefficients are homogeneous) was rejected, and the coefficients were determined to be heterogeneous.

Table 4. Cross-sectional dependence and homogeneity test results

DEVELOPED COUNTRIES		
Cross-sectional dependence test (H_0: There is no cross-sectional dependence)		
Test	**Test statistics**	**p-value**
LM (Breusch and Pagan (1980)	40.752	0.000
LM_{adj} (Pesaran et al. (2008)	39.561	0.013
LM CD (Pesaran (2004)	39.066	0.000
Homogeneity Test (H_0: Slope coefficients are homogeneous)		
Test	**Test statistics**	**p-value**
Delta_tilde	9.752	0.000
Delta_tilde_adj	9.113	0.001
DEVELOPING COUNTRIES		
Cross-sectional dependence test (H_0: There is no cross-sectional dependence)		
Test	**Test statistics**	**p-value**
LM (Breusch and Pagan (1980)	33.901	0.004
LM_{adj} (Pesaran et al. (2008)	30.674	0.000
LM CD (Pesaran (2004)	30.022	0.000
Homogeneity Test (H_0: Slope coefficients are homogeneous)		
Test	**Test statistics**	**p-value**
Delta_tilde	8.349	0.000
Delta_tilde_adj	8.114	0.000

C. Unit Root Test Results

First-generation unit root tests are divided into homogeneous and heterogeneous models. Since the coefficients were heterogeneous, Im, Pesaran, and Shin (2003), Maddala and Wu (1999), Choi's (2001) first-generation unit root tests were used.

Table 5. Panel Unit Root Test Results

	DEVELOPED COUNTRIES					
	Maddala&Wu Test		**Im, Pesaran & Shin Test**		**Choi Test**	
	Level	**1st order difference**	**Level**	**1st order difference**	**Level**	**1st order difference**
Variables	**Trend+stationary**	**Stationary**	**Trend+stationary**	**Stationary**	**Trend+stationary**	**Stationary**
DEM_END	0.197	0.003*	0.201	0.014*	0.213	0.001*
BUY	0.126	0.000*	0.156	0.000*	0.185	0.000*
	DEVELOPING COUNTRIES					
	Maddala&Wu Test		**Im, Pesaran & Shin Test**		**Choi Test**	
	Level	**1st order difference**	**Level**	**1st order difference**	**Level**	**1st order difference**
Variables	**Trend+stationary**	**Stationary**	**Trend+stationary**	**Stationary**	**Trend+stationary**	**Stationary**
DEM_END	0.145	0.000*	0.171	0.000*	0.176	0.001*
BUY	0.168	0.000*	0.180	0.000*	0.188	0.000*

* Static variable for 0.05

Note: Probability (p) values are given in the table. The null hypothesis states that there is a unit root. The optimal lag length was found using the Schwarz information criterion.

As shown in Table 5, all variables have unit roots at their level values. In contrast, first-order difference series do not have unit-roots. Therefore, all variables were found to be I(1). In other words, they were found to be stationary for the first-order difference. First-generation unit root tests are based on the assumption that the cross-section units of the panel are independent and that all cross-section units are affected at the same level from a shock on one of the units of the panel. However, it's a more realistic approach to assume that each unit is affected at different levels, from a shock to one of the cross-section units of the panel. To address this deficiency, second-generation unit root tests were developed that analyze stationarity by taking into account the dependence between cross-sectional units. If the presence of cross-section dependence in the panel data set is rejected, then the 1st generation unit root tests can be used. However, if the panel data have a cross-section dependence, then the use of 2nd generation unit root tests allows more consistent, effective, and powerful estimations. In this study, 2nd generation unit root tests should be used because of the cross-section dependence. Of the second-generation unit root tests, the CADF was used. The results of the CADF test, developed by Pesaran (2007), are presented in Table 5.

Table 6. Panel CADF Unit Root Test Results

DEVELOPED COUNTRIES				
Variables	**Level**		**1st order difference**	
	Stationary	**Stationary + Trend**	**Stationary**	**Stationary + Trend**
DEM_END	-1.126	-1.130	-9.569*	-9.664*
BUY	-1.107	-1.099	-9.863*	-9.855*
DEVELOPING COUNTRIES				
Variables	**Level**		**1st order difference**	
	Stationary	**Stationary + Trend**	**Stationary**	**Stationary + Trend**
DEM_END	-1.182	-1.159	-8.524*	-8.785*
BUY	-1.037	-1.125	-8.668*	-8.901*

* Ho red stationary variable for 1% and 5%

In CADF tests, the maximum lag length was taken as 1, and the optimal lag length was determined according to the Schwarz information criterion. The null hypothesis was found to be rejected at the level of 1% and 5% significance. The unit root test results show that the series is not stable at the level. In other words, they have a unit root, while the variables are stable at the level of I(1).

D. Panel Cointegration Analysis

In this study, the LM Bootstrap panel cointegration test, developed by Westerlund and Edgerton (2007), was used to determine the long-term relationship between the variables. The LM Bootstrap panel cointegration test is based on the Lagrange multiplier test, developed by McCoskey and Kao (1998). The LM statistic is calculated by the following equation:

$$LM_N^+ = \frac{1}{NT_2}\sum_{i=1}^{N}\sum_{t=1}^{T} W_i^{-2} S_{i,t}^2 \quad (1)$$

Here, $S^2_{i,}t$ refers to the partial sums of error terms, while W^{-2}_i refers to the long-term variances of error terms. The main advantages of the test are that it allows cross-sectional dependence, determines the cointegration relationship for all the countries in the panel, allows for autocorrelation and varying variance in the cointegration equation, and yields effective results in small samples. The null hypothesis of the test states that there exists a cointegration relationship for all the countries in the panel, and bootstrap simulation is used to calculate it. Bootstrap critical values are used in case of cross-section dependence. LM test statistics and probability values are calculated using the bootstrap. The calculated LMN+ test statistic was used to test the H_0 hypothesis, which postulates that there is cointegration.

Table 7. Westerlund and Edgerton LM Bootstrap Cointegration Results

	DEVELOPED COUNTRIES					
	Stationary			**Stationary and Trend**		
LM_N^+	Statistics	Asymptotic p-value	Bootstrap p-value	Statistics	Asymptotic p-value	Bootstrap p-value
	0.823	0.165	0.437	1.234	0.189	0.438
	DEVELOPING COUNTRIES					
	Stationary			**Stationary and Trend**		
LM_N^+	Statistics	Asymptotic p-value	Bootstrap p-value	Statistics	Asymptotic p-value	Bootstrap p-value
	0.961	0.173	0.531	1.197	0.153	0.385

Note: The bootstrap probability values were obtained from a distribution with 10,000 repetitions. Asymptotic probability values were obtained from the standard normal distribution. The lag value was taken as 1.

Looking at the results in Table 7, it is observed that there is a cointegration relationship between the series (p>0.05). In this case, the series act together in the long run. After deciding that there is cointegration in the series, the coefficients in the model can be estimated with the cointegration predictors. The coefficients obtained using the horizontal FMOLS and DSUR estimation are presented in Table 7. While the FMOLS estimator considers only heterogeneity, the DSUR estimator considers heterogeneity and cross-section dependence together.

Table 8. Coefficient Estimation Results of the Cointegration Model

• **DEVELOPED COUNTRIES**			• **DEVELOPING COUNTRIES** •	
• Dependent variable: FBUY		• FDEM_END	• Dependent variable: FBUY	• FDEM_END
Method	DSUR	0.6768*	• DSUR	• 0.4332*
	FMOLS	0.5935*	• FMOLS	• 0.3869*

* Significant variable for 0.05

In the developed countries group, the model was found to estimate a 67.68% and 59.35% increase in the BUY variable for a 1-unit increase in the DEM_END variable for the DSUR and FMOLS methods, respectively. In the developing countries group, the model was found to estimate a 43.43% and 38.69% increase in the BUY variable for a 1-unit increase in the DEM_END variable for the DSUR and FMOLS methods, respectively.

E. Pairwise Granger Causality Test

According to Granger (1969), Granger causality means that past values of one variable (X) affect the future values of another variable (Y).

Table 9. Pairwise Granger Causality Test Results

DEVELOPED COUNTRIES			
Null Hypothesis:	Obs	F-Statistic	Prob.
DEM_END does not Granger Cause BUY	49	4.59522	0.0154
BUY does not Granger Cause DEM_END		5.45188	0.0077
DEVELOPING COUNTRIES			
Null Hypothesis:	Obs	F-Statistic	Prob.
DEM_END does not Granger Cause BUY	49	0.31095	0.7344
BUY does not Granger Cause DEM_END		2.90429	0.0254

In the developed countries group, a bidirectional causality was found between DEM_END and BUY. Both variables are influenced by the past values of each other. (DEM_END↔BUY).

In the developing countries group, there was no causality from the DEM_END variable to the BUY variable ($p>0.05$), while there was a causality from the BUY to the DEM_END variable. Thus, unidirectional causality was obtained (DEM_END→BUY).

IV. CONCLUSION

This study investigates the relationship between democracy and economic growth in developed and developing countries. In the developed countries group, a bidirectional causality was found between democracy index and growth. Both variables are influenced by the past values of each other. From the perspective of developed countries, a significant relationship was found between democracy and economic growth. It is seen that democratic practices have a major contribution to accelerating economic growth and development in developed countries. In addition, the democratic society structure of an economy has a significant impact on economic growth. In the developing countries group, while there was no causality from the democracy index variable to the growth variable ($p>0.05$), there was a causality from the growth to democracy index variable.

Thus, unidirectional causality in the developing countries was obtained. From the perspective of developing countries, it is seen that democracy does not have an effect on growth but that democracy and democratic elements increase economic growth in developing countries.

The results showed that the democratic society structure has a significant impact on economic growth and that democracy was closely related to economic development. It may be recommended for future studies to carry out research investigating the relationships between democracy and the dimensions of national income and level of welfare per capita.

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