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DEMOCRACY AND ECONOMIC GROWTH: EVIDENCE FROM EMERGING MARKET ECONOMIES

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ABSTRACT

It is believed that wealth of countries also increases as the level of democratization increases, *vice versa*. Effects of democracy on the economic structure have been discussed for a long time. In economic growth literature, it can be seen that the effect of democracy has been frequently examined within the scope of economic growth. But, it can be seen that there is no consensus in studies on relationship between democracy and economic growth. In the present study, the effect of democracy on the economic growth was examined via panel data method by using 1972-2016 annually data of 8 emerging market economies. During the analyses, the real GDP represented the economic growth and Freedom House freedom index represented the level of democracy. In this study, the cross sectional dependency was tested using CDLM₁ and CDLM_{adj}, stationarity of series by using CADF unit root test, and long-term relationships by using Westerlund and Edgerton (2007) cointegration test and long-term relationship was found between the series. The coefficients were estimated using Panel AMG method. The findings indicated that the increase in level of democracy affected the economic growth positively in some countries and negatively in some other countries. Moreover, the causality between the variables was examined by using the test of Emirmahmutoğlu and Köse (2011). Bidirectional causality was observed in most of panel. According to the results, it was found that the increase in democratization level in Brazil, Chile, India, and Turkey positively affected the economic growth. But, in Argentina, China, Indonesia, and South Africa, the increase in democratization level has negative effects on the economic growth. In

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emerging countries such as Turkey, the sustainable economic growth depends on the presence of strong economic institutions.

STRUCTURED ABSTRACT

It is believed that wealth of countries also increases as the level of democratization increases, *vice versa*. Effects of democracy on the economic structure have been discussed for a long time. In economic growth literature, it can be seen that the effect of democracy has been frequently examined within the scope of economic growth. But, it can be seen that there is no consensus in studies on relationship between democracy and economic growth. Although there is no single definition, on which there is an absolute consensus, democracy can be defined from general perspective as the self-governance of society. Democracy has many advantages over the other management systems since it offers the chance of cooperating with a wide population in organizing the public operations, ensuring the accountability of public administrators, and providing comprehensive rights to the citizens. The level of democracy varies between the countries. This necessitates measuring democracy.

It can be seen that democracy has been measured using indices since 1980s. Some of these indices are Arat Democracy Index, Banks Democracy Index, Bollen Liberal Democracy Index, Poe and Tate Democracy Index, Polity Index, Vanhannen Index, and etc. Besides these ones, another index that is most widely known and was used in present study is the Freedom House Index. Under the title of Freedom in the World, 195 countries and 14 regions are analyzed in terms of the democratization by using the annual reports employing scores between 1 and 7.

It is generally reported that there is a positive relationship between economic growth and democracy. But, this relationship is more complex than it seems. The reason for this complexity is that the countries throughout the world have different politic and economic outlooks. Democracy's relationship with economic growth can be analyzed based on three approaches. Compatibility Approach, Conflict Approach and Skeptical Approach.

In studies discussing the effects of democracy on economic growth in national and international literature are observed to achieve different results in terms of aforementioned approaches. Studies using different index types show heterogeneity in terms of econometric analysis, selected country/countries, dataset, analysis methods, and results.

In this study, 8 countries (Argentina, Breezily, Chile, China, India, Indonesia, South Africa, and Turkey) among the emerging market economies were taken into consideration in order to measure the effects of democracy on the economic growth. Within the scope of analysis to be implemented, the annual data covering the period between 1972 and 2016 were utilized. The dependent variable of study representing the economic growth was real GDP in constant 2010 U.S. dollars obtained from World Bank. For the variable democracy that was explanatory variable, the freedom rating index (DEM) defined as the average of politic rights index and civil freedom index prepared by Freedom House was used.

The analysis section of this study consists of 6 steps from methodological aspect. First of all, the cross sectional dependence was examined in cointegration equation and variables used in model. After determining the cross sectional dependence by using $CDLM_1$ and $CDLM_{adj}$ tests, then the second generation CADF unit root test developed by Pesaran (2007) was used in order to examine if the series were stationary or not. In the next step, the Delta test developed by Pesaran and Yamagata (2008) was used in order to examine slope homogeneity. In the fourth step, the long-term relationships between variables were examined by using Westerlund and Edgerton (2007) cointegration test, and the coefficients of long-term relationships were estimated by using panel AMG (Augmented Mean Group) method developed by Eberhardt and Bond (2009). In the last step, in order to estimate the short-term relationships, the causality test developed by Emirmahmutoglu and Köse (2011) was used.

According to the results, it was found that the increase in democratization level in Brazil, Chile, India, and Turkey positively affected the economic growth. But, in Argentina, China, Indonesia, and South Africa, the increase in democratization level has negative effects on the economic growth. Moreover, given the causality analysis results as a whole, it was determined that there is bidirectional causality relationship between democracy and economic growth in general. But, according to the results of causality test performed separately for each country, it was observed that democracy is the reason for economic growth in Chile, India, and China, whereas economic growth is the reason for democracy in China and Indonesia.

In countries such as Turkey, where democracy couldn't be completely established, certain measures need to be taken in order for democracy to have positive effect on economic growth. First of all, the existing democratic structure should be protected and the method to improve the quality of democracy should be employed. For instance, certain groups should be prevented from using the resources in parallel with their own interests by making use of democracy. Moreover, in addition to the fundamental rights and liberties as the prerequisite of democracy, some of these measures are to protect the proprietary rights, to prevent the corruption that the political authority involved by passing beyond its legal limits, and to prefer consensus policies over social conflicts.

Keywords: Democracy, Economic Growth, Freedom House, Panel Data Analysis.

DEMOKRASİ VE EKONOMİK BÜYÜME: YÜKSELEN PİYASA EKONOMİLERİNDEN KANIT

ÖZET

Demokratikleşme derecesi arttıkça ülkelerin zenginliğinin arttığı ya da zenginleştikçe ülkelerin demokratikleştiği düşünülmektedir. Demokrasinin ekonomik yapı üzerine olan etkisi uzun zamandır tartışılagnelen bir konudur. Ekonomik büyüme literatürüne bakıldığında,

ekonomik büyümenin belirleyicileri kapsamında sıklıkla demokrasinin etkisinin incelendiği görülmektedir. Ancak demokrasi ve ekonomik büyüme ilişkisi hakkında yapılan çalışmalarda bir görüş birliği olmadığı ifade edilebilir. Çalışmada, demokrasinin ekonomik büyüme üzerindeki etkisi seçilmiş 8 yükselen piyasa ekonomisinde 1972-2016 dönemi verileri kullanılarak panel veri tekniğiyle araştırılmıştır. Analizlerde ekonomik büyümeyi temsilen reel GSYİH, demokrasi düzeyini temsilen Freedom House özgürlük endeksi kullanılmıştır. Çalışmada yatay kesit bağımlılığı $CDLM_1$ ve $CDLM_{adj}$, serilerin durağanlığı CADF birim kök testiyle, uzun dönemli ilişkiler Westerlund ve Edgerton (2007) eşbütünleşme testiyle incelenmiş ve seriler arasında uzun dönemli ilişki belirlenmiştir. Katsayılar Panel AMG yöntemiyle tahmin edilmiştir. Bulgular bazı ülkelerde demokrasi düzeyindeki artışın ekonomik büyümeyi olumlu bazılarında ise olumsuz etkilediğini göstermiştir. Ayrıca değişkenler arasındaki nedensellik Emirmahmutoglu ve Köse (2011) testiyle incelenmiştir. Panelin geneli için çift yönlü nedensellik gözlemlenmiştir. Elde edilen bulgulara göre, Brezilya, Şili, Hindistan ve Türkiye’de demokrasi düzeyindeki artışın ekonomik büyümeyi olumlu etkilediği görülmüştür. Ancak Arjantin, Çin, Endonezya ve Güney Afrika’da ise demokrasi düzeyindeki artışın ekonomik büyüme üzerinde olumsuz etkilere sahip olduğu belirlenmiştir. Türkiye gibi gelişmekte olan ülkelerde sürdürülebilir ekonomik büyüme sağlam ekonomik kurumların varlığına bağlı olarak ortaya çıkacaktır.

Anahtar Kelimeler: Demokrasi, Ekonomik Büyüme, Freedom House, Panel Veri Analizi.

1. Introduction

Even in the oldest economic researches, the economic development of countries has been one of the most attention-grabbing subjects. Basically, the economic growth is achieved as a result of increase in production factors either quantitatively or qualitatively. The factors altering the production factors and thus influencing the economic growth range from education and technology to healthcare and transportation, and they keep renewing.

Nowadays, the economic and politic institutions are among the attention-grabbing determinants of economic growth. The importance of institutions in economic growth is expressed via inclusionary economic-politic institutions and exclusionary economic-politic institutions. The factor determining the allocation of resources, investments, and innovation in an economy is the economic institutions. But, what determines how the economic institutions operate and how a development process these institutions pass through is the politic institutions. The inclusionary economic institutions protecting the proprietary rights, ensuring equal rights for everybody, and encouraging the investment to new skills provide more contribution to the economic growth when compared to exclusionary economic institutions constructed based on taking the resources from the majority in favor of minorities do. The exclusionary institutions that cannot ensure the public order or solve the disputes or reward the innovation can never provide the equal rights and encourage the sustainable economic growth. The exclusionary institutions are the politic structures that take the resources from society and serve these resources to the use of few people. The structure replacing the exclusionary and exploitative politic system is the democracy (Acemoğlu 2012, 3).

Although there is no single definition, on which there is an absolute consensus, democracy can be defined from general perspective as the self-governance of society. Democracy has many

advantages over the other management systems since it offers the chance of cooperating with a wide population in organizing the public operations, ensuring the accountability of public administrators, and providing comprehensive rights to the citizens (Schmidt 2001, 13). The level of democracy varies between the countries. This necessitates measuring democracy.

It can be seen that democracy has been measured using indices since 1980s. Some of these indices are Arat Democracy Index, Banks Democracy Index, Bollen Liberal Democracy Index, Poe and Tate Democracy Index, Polity Index, Vanhannen Index, and etc. Besides these ones, another index that is most widely known and was used in present study is the Freedom House Index. Under the title of Freedom in the World, 195 countries and 14 regions are analyzed in terms of the democratization by using the annual reports employing scores between 1 and 7 (Freedom House, 2017).

It is believed that wealth of countries also increases as the level of democratization increases, *vice versa*. Effects of democracy on the economic structure have been discussed for a long time. It is generally reported that there is a positive relationship between economic growth and democracy. But, this relationship is more complex than it seems. The reason for this complexity is that the countries throughout the world have different politic and economic outlooks. Democracy's relationship with economic growth can be analyzed based on three approaches. First of these approaches is the *Compatibility Approach* and it is based on the idea that democracy completes the economic growth. In this approach, the authority is accepted for the economic growth but the authority that would damage the citizens' rights and freedoms and take the economy and politics under control is excluded. Thus, under favor of the institutions to be achieved, the economic growth would increase as a result of risk-free investment options, less fragility, higher accountability and transparency, protection in proprietary rights, fairness in resource allocation, and perfect competition. On the contrary with Compatibility Approach, the *Conflict Approach* considers the democracy and economic growth as rivals. This approach assumes that an authoritarian regime is necessary for rapid and successful growth. It argues that democratic systems that emerge before countries reach at a certain level of wealth cannot completely fulfill their functions since the fragility of politic institutions in underdeveloped and emerging countries would cause negativities in resource utilization, segment structure, and psychological and institutional modernization and this would affect economy. Moreover, it is advocated that, rather than the long-term economic decisions, daily needs of people would be prioritized and this would prevent the large-scaled investment needed for economic development. Finally, in *Skeptical Approach*, it is alleged that there is no systematic relationship between democracy and economic growth. Economic growth can be achieved via democracy or contrary methods (Yay 2002, 5-7; Sirowy and Inkeles 1990, 132-134; Koçak and Uzay 2017, 707-710).

In studies discussing the effects of democracy on economic growth in national and international literature are observed to achieve different results in terms of aforementioned approaches. Studies using different index types show heterogeneity in terms of econometric analysis, selected country/countries, dataset, analysis methods, and results.

Some of the studies reporting that democracy has positive effects on the growth are Leblang (1996), Leblang (1997), Feng (1997), Rodrik (2000), Gounder (2002), Dollar and Kraay (2003), Ray and Ray (2011), Başar and Yıldız (2012), Demirkan and Kaya (2012), Heid and. (2012), Benhabib et al. (2013), Jaunky (2013), Acemoğlu et al. (2014), Acaravcı and Erdoğan (2015), Heshmati and Kim (2017), Koçak and Uzay (2017), and Şahin (2017). Some of the studies reporting that the effect of democracy changes temporally or shows up when a certain threshold is passed are Lipset (1959), Neubauer (1967), Jackman (1973), Ken Farr et al. (1998), Nelson and Singh (1998), Fidrmuc (2001), Huntington (2006), Williamson and Mathers (2011), Sakyi and Adams (2012), Artan and Hayaloğlu (2014), and Saatçioğlu and Karaca (2015).

Kim (1971), De Haan and Siemann (1995), Barro (1996), Perotti (1996), Tavares and Wacziarg (2001), Yay (2002), Butkiewicz and Yanikkya (2006), Drury et al. (2006), Narayan and Smith (2006), Doucouliagos and Ulubaşoğlu (2008), Haggard and Tiede (2011), Acaravcı et al. (2015), Rachdia and Saidib (2015), and Şahin (2016) are the authors, who have proven that democracy has negative or no effect on the growth.

In the next section of this study, the dataset and econometric model to be used in empirical analysis in order to examine the effect of democracy on economic growth are introduced. In third section, analysis results are presented, and the general assessment is presented in conclusion section. In present study, it was aimed to contribute to the literature on effects of democracy on economic growth from the aspects of both of country sets to be examined and econometric method to be employed.

2. Dataset and Econometric Method

In this study, 8 countries (Argentina, Breezily, Chile, China, India, Indonesia, South Africa, and Turkey) among the emerging market economies were taken into consideration in order to measure the effects of democracy on the economic growth. Within the scope of analysis to be implemented, the annual data covering the period between 1972 and 2016 were utilized. The dependent variable of study representing the economic growth was real GDP in constant 2010 U.S. dollars obtained from World Bank. For the variable democracy that was explanatory variable, the freedom rating index (DEM) defined as the average of politic rights index and civil freedom index prepared by Freedom House was used. The political rights cover the points such as right to elect and to be elected, free and fair electoral process, government policies freely determined by the elected politicians, and transparent and accountable operation of government. Civil liberties cover the establishment of freedom such as freedom of expression and belief, academic freedom, freedom of education system, associational and organizational rights, rule of law, personal autonomy and individual rights. Based on these data, the “freedom rating” index indicates the democratization level of a country. The freedom index is between 1 and 7, and 1 represents the greatest degree of freedom and 7 the smallest degree of freedom. The freedom rating between 1.0 and 2.5 indicates that the relevant country is free, which means that the country has high level of democracy. The values between 3.0 and 5.0 indicate partial democracy (partly free), whereas the values between 5.5 and 7.0 indicate that the country has no democracy (not free) (Freedom House, 2017).

The analysis section of this study consists of 6 steps from methodological aspect. First of all, the cross sectional dependence was examined in cointegration equation and variables used in model. After determining the cross sectional dependence by using $CDLM_1$ and $CDLM_{adj}$ tests, then the second generation CADF unit root test developed by Pesaran (2007) was used in order to examine if the series were stationary or not. In the next step, the Delta test developed by Pesaran and Yamagata (2008) was used in order to examine slope homogeneity. In the fourth step, the long-term relationships between variables were examined by using Westerlund and Edgerton (2007) cointegration test, and the coefficients of long-term relationships were estimated by using panel AMG (Augmented Mean Group) method developed by Eberhardt and Bond (2009). In the last step, in order to estimate the short-term relationships, the causality test developed by Emirmahmutoğlu and Köse (2011) was used.

3. Panel Data Analysis

3.1. Cross Sectional Dependence Test and Results

In panel data models, it is one of the general assumptions that the error terms are independent in terms of the individuals. This indicates that all of the cross section units are equally affected or not affected from any shock to any of the individuals constituting the panel. But, in the globalizing world

of today, it is more realistic that the individuals (countries) are not equally affected from the shock to another country since they are commercially and financially in relation with each other. From this aspect, if there is a cross sectional dependence between the series, then the results of analyses would be inconsistent and biased (Tatoğlu 2013, 9; Mercan 2014, 35). For this reason, firstly the cross sectional dependence was tested and then other analyses were performed in this study.

$$\frac{\sum_{t=1}^T e_{it}e_{jt}}{(\sum_{t=1}^T e_{it}^2)^{1/2}(\sum_{t=1}^T e_{jt}^2)^{1/2}} \quad (1)$$

$e_{it}=y_{it}-\hat{\beta}'_i x_{it}$ is the estimation of u_{it} based on OLS method. $CDLM_1$ test can be applied for cross sectional units without requiring any special condition. But, when $N>T$, the biased results can be obtained in empirical applications. By the correction made by Pesaran et al. (2008) to the LM statistics, this problem was overcome;

$$CDLM_{adj} = \sqrt{\frac{2}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^N \left[\hat{\rho}_{ij}^2 \left(\frac{(T-k)\hat{\rho}_{ij}^2 - \mu_{Tij}}{v_{Tij}} \right) \right] \sim N(0,1) \quad (12) \quad (2)$$

Where, μ_{Tij} refers to the mean and v_{Tij} refers to the variance. Called Bias-Adjusted $CDLM$ ($CDLM_{adj}$) test, this test can estimate the cross sectional dependence without any deviation when $N>T$ or $T>N$. The hypothesis tests were;

H_0 : For each i unit, u_{it} error term is independent with mean value of 0 and constant variance. This means that there is no cross sectional dependence.

H_a : There is cross sectional dependence (Pesaran et al. 2008, 1-4). In the present study, cross section dependency was tested by applying the $CDLM_1$ and $CDLM_{adj}$ tests for the variables and cointegration equation.

Table 1. Results of Cross-Sectional Dependence Test

Variables	$CDLM_1$	Probability	$CDLM_{adj}$	Probability
GDP	50.993*	0.005	17.035*	0.000
DEM	90.281*	0.000	11.709*	0.000
Equation	65.245*	0.000	26.526*	0.000

Note: *, ** and *** refer to cross sectional dependence at the significance level of 1%, 5%, and 10%, respectively.

As seen in Table 1, since the probability values of GDP and DEM variables and cointegration equation in $CDLM_1$ and $CDLM_{adj}$ tests were less than 0.01, H_0 hypothesis was rejected at 1% significance level and it was determined that there was cross sectional dependence in series. Based on these findings, the second generation unit root test taking the cross sectional dependence into consideration was applied for GDP and DEM variables.

3.2. Stationarity Test and Results

Before analyzing a time series, it is necessary to examine if the series is stationary or not. In the present study, it was determined that there was cross sectional dependence between GDP and DEM variables and, among the second generation unit root tests, the CADF (Cross-sectional Augmented Dickey Fuller) unit root test developed by Pesaran (2007) was utilized.

Pesaran (2007) CADF test is an alternative to the standard Augmented Dickey-Fuller (ADF) regression augmented with cross section averages of lagged levels and first-differences of individual

series. By using this test, the new asymptotic results can be achieved for both individual cross sectionally augmented ADF (CADF) statistics and their simple averages. The main equation used in CADF test is:

$$y_{it} = (1 - \phi_i)\mu_i + \phi_i y_{i,t-1} + u_{it},$$

$$i = 1, \dots, N; t = 1, \dots, T \quad (3)$$

In Equation (3), the initial value y_{i0} has a density function with finite mean and variance and the error term u_{it} has a single-factor structure:

$$u_{it} = \gamma_i f_t + \varepsilon_{it} \quad (4)$$

Here, f_t is the unobservable common effect and ε_{it} is the individual specific error. Thus, the equations (3) and (4) can be expressed as follows:

$$\Delta y_{it} = \alpha_i + \beta_i y_{i,t-1} + \gamma_i f_t + \varepsilon_{it} \quad (5)$$

$\alpha_i = (1 - \phi_i)\mu_i$, $\beta_i = -(1 - \phi_i)$ and $\Delta y_{it} = y_{it} - y_{i,t-1}$. Accordingly, the unit root hypothesis $\phi_i = 1$ can be expressed as follows:

$$H_0: \beta_i = 0 \text{ (for all } i) \quad (6)$$

$$H_1: \beta_i < 0, i = 1, 2, \dots, N_1, \beta_i = 0, i = N_1 + 1, N_1 + 2, \dots, N \quad (7)$$

Here, H_0 hypothesis was established as “not each of units is stationary” and H_1 hypothesis as “some of cross sectional units are stationary”.

Through CADF test, stationary can be determined for each cross section unit in the series forming the panels. But it is difficult to test the stationarity for entire cross section unit in other words the panel by using CADF, the arithmetical average of CADF statistics specific to each cross section was calculated, and thus the panel-specific CIPS method is achieved. CIPS statistics is calculated as follows:

$$CIPS(N, T) = \bar{t} = N^{-1} \sum_{i=1}^N t_i(N, T) \quad (8)$$

$t_i(N, T)$ is the CADF statistic of i^{th} cross section unit. The stationarity is tested by comparing both of the CADF statistics calculated for each country and the CIPS test statistics obtained for entire panel with the critical table values calculated by Pesaran using Monte Carlo simulations. If the calculated CADF or CIPS statistics are higher than critical value as an absolute value, then the main hypothesis is rejected and it might be concluded that there is no unit root for the each cross section unit or the panel (Pesaran 2007, 265-203).

The CADF panel unit root test results obtained in order to determine the stationarity of variables in model are presented in Table 2.

Table 2. Stationarity Test Results

	Level				First Difference			
	GDP	Lag	DEM	Lag	GDP	Lag	DEM	Lag
Argentina	-4.0867**	1	-2.2060	1	-5.2794*	1	-3.6577***	1
Brazil	-2.9790	2	-2.4960	1	-3.8064**	1	-4.7356*	1
Chile	-1.3555	3	-1.7057	3	-3.0853	1	-3.5460**	1
China	-1.8655	4	-2.3441	3	-3.4045	1	-3.1916	1
India	-1.4229	1	-2.4051	1	-5.9506*	1	-5.3707*	1
Indonesia	-2.0369	1	-2.1119	1	-3.7384**	1	-3.9861**	1
South Africa	-2.1844	1	-1.7332	2	-3.2904***	1	-4.0574**	1
Turkey	-2.8366	1	-2.8071	1	-4.1025**	1	-3.8300**	1
CIPS	-2.3459		-2.2261		-4.0822*		-4.0469*	

Note 1: Lag indicates the lag length and is determined according to Schwarz information criteria.

Note 2: Critical values of CADF statistics were taken from Table 1c in Pesaran (2007). The critical values -4.49*, -3.78** and -3.44 *** indicate significance levels of 1%, 5%, and 10%, respectively.

Note 3: Critical values of CIPS statistics were taken from Table 2c in Pesaran (2007). The critical values -3.06*, -2.84** and -2.73 *** indicate significance levels of 1%, 5%, and 10%, respectively.

As seen in Table 2, it was determined in CADF unit root test that the series were not stationary at level. From the aspect of each cross section unit, GDP variable was observed to be non-stationary at level in all the countries except for Argentina. DEM variable was found to be non-stationary at level for all the countries. It was determined that GDP series became stationary at first differences for all the countries, except for China and Chile. DEM series became stationary at first differences for all the countries, except for China. Given CIPS statistics enabling the evaluation for all the units constituting the panel, it was determined that all the variables were non-stationary in terms of level values but they became stationary when the primary differences were taken.

3.3. Slope Homogeneity Test and Results

Since the homogeneity and heterogeneity of slope coefficients play important role in selection of cointegration test to be implemented, coefficient estimation test, and causality test, it is necessary to determine if the slope coefficient of each country is homogeneous prior to the cointegration tests. From this aspect, the homogeneity of slope coefficients can be examined by using Delta ($\hat{\Delta}$) Test developed by Pesaran and Yamagata (2008). For the large samples, the $\hat{\Delta}$ test shown below can be used, whereas $\hat{\Delta}_{adj}$ test can be used for small samples:

$$\hat{\Delta} = \sqrt{N} \left(\frac{N^{-1} \hat{S} - k}{\sqrt{2k}} \right), \quad (9)$$

$$\hat{\Delta}_{adj} = \sqrt{N} \left(\frac{N^{-1} \hat{S} - E(\hat{z}_{iT})}{\sqrt{\text{Var}(\hat{z}_{iT})}} \right) \quad (10)$$

$$Y_{it} = \alpha_i + \beta_i X_{it} + \varepsilon_{it}, \quad i = 1 \dots N, \quad t = 1 \dots T \quad (11)$$

The null and alternative hypotheses used in tests for estimating Equation (11) were as follows:

$H_0: \beta_i = \beta$ indicates that the slope coefficients are homogenous.

$H_a: \beta_i \neq \beta$ indicates that the slope coefficients are non-homogenous.

Table 3. Homogeneity Test Results

	Test Statistics	Probability
$\hat{\Delta}_{\text{Delta_tilde}}$	19.649*	0.000
$\hat{\Delta}_{\text{adj_Delta_tilde_adj}}$	20.323*	0.000

Note: *, ** and *** refer to the homogeneity of slope coefficients at significance levels of 1%, 5%, and 10%, respectively.

According to the results seen in Table 3, since the probability values of tests are less than 5%, the H_0 hypothesis was rejected and it was determined that the slope coefficients of all the countries were heterogeneous.

3.4 Cointegration Test and Results

Since there was cross sectional dependency between the cross section units in this study, the Westerlund and Edgerton (2007) cointegration test was utilized in this parallel.

In their study, Westerlund and Edgerton (2007) provided a new panel cointegration test based on Langrange Multiplier test of McCoskey and Kao (1998) having the null hypothesis of cointegration. Since the test of McCoskey and Kao (1998) does not take the cross sectional dependency into consideration, they utilized the bootstrap method in order to improve the test performance. In order to maintain the cross sectional dependence, bootstrap draws were performed from the empirical distribution together with the regression errors. Since the test that they developed takes the dependence between and within the cross section units into consideration and it gives good results for the small samples, it is generally considered to be sufficient (Westerlund and Edgerton 2007, 185-186).

In this test;

$$y_{it} = \alpha_i + x'_{it}\beta_i + z_{it}, \quad t = 1, \dots, T \quad i = 1, \dots, N \quad (12)$$

x_{it} vector has the K dimensions and contains the variables assumed to have pure random walk process. The error term z_{it} is assumed to include following data components:

$$z_{it} = u_{it} + v_{it}, \quad v_{it} = \sum_{j=1}^t \eta_{ij}, \quad (13)$$

In this equation, η_{ij} is the independent and identically distributed error term having zero mean and variance of σ_i^2 .

The vector $w_{it} = (u_{it}, \Delta x'_{it})$ is a linear process that satisfy the following:

$$w_{it} = \sum_{j=0}^{\infty} \alpha_{ij} e_{it-j} \quad (14)$$

In this equation, e_{it} is an independent identically distributed mean zero error, whereas α_{ij} is assumed to capture the usual summability conditions. Since α_{ij} varies between the cross section units, this model assumes that there is a completely heterogeneous serial correlation. In order to make cross sectional dependence suitable, the stacked time series vector $e_t = (e'_{1t}, \dots, e'_{Nt})$ is taken into consideration for achieving the positive definite covariance matrix ($\text{var}(e_t) = \Omega$). The hypotheses of test are as follows;

$H_0: \sigma_i^2 = 0$, for all i , meaning that there is a cointegration relationship between the series.

$H_1: \sigma_i^2 > 0$, for some of i , meaning that there is no cointegration relationship between the series.

In case of cross sectional independence, this hypothesis can be used in order to test the following test statistics:

$$LM_N^+ = \frac{1}{NT^2} \sum_{i=1}^N \sum_{t=1}^T w_i^{-2} S_{it}^2 \quad (15)$$

S_{it} is the partial sum process of z_{it} 's estimation using FMOLS ($\hat{z}_{it}$), whereas $\hat{w}_{it}$ is the estimated long-term variance of u_{it} conditional on Δx_{it} . The problem in this test is that the results are dependent to Ω being block-diagonal and e_{it} is cross sectionally independent. Another problem is that even though there is no cross sectional dependence between the error terms, the test is excessively sensitive to the serial correlation. For this reason, making an interpretation based on the asymptotic normal critical values might be significantly misleading in small samples. In order to overcome these problems, it is better to use bootstrap critical values.

When w_{it} satisfies the required conditions, the following autoregressive presentation is accepted.

$$\sum_{j=0}^{\infty} \phi_{it} w_{it-j} = e_{it} \quad (16)$$

At this point, first step for the bootstrap scheme is to estimate ϕ_{it} by using $\hat{w}_{it} = (\hat{z}_{it}, \Delta x'_{it})$ instead of w_{it} and p_i lags. Then the residuals can be computed:

$$\hat{e}_{it} = \sum_{j=0}^{p_i} \hat{\phi}_{it} \hat{w}_{it-j} \quad (17)$$

Parameter estimation $\hat{\phi}_{it}$ are chosen by using empirical Yule-Walker equations, it will be possible to take the reciprocal of auto-regression.

In the second step, the random sample e_t^* is taken from empirical distribution. And then, by using the equation above with w_{it}^* and e_{it}^* instead of $\hat{w}_{it}$ and $\hat{e}_{it}$, w_{it}^* is generated repetitively from e_t^* .

In the third and last step, w_{it}^* is divided in form of $w_{it}^* = (z_{it}^*, \Delta x_{it}^*)$ and the bootstrap samples x_{it}^* and y_{it}^* are generated:

$$y_{it}^* = \hat{\alpha}_i + x_{it}^* \hat{\beta}_i + z_{it}^*, \quad x_{it}^* = \sum_{j=1}^t \Delta x_{ij}^* \quad (18)$$

In this equation, $\hat{\alpha}_i$ and $\hat{\beta}_i$ are the FMOLS estimation of α_i and β_i . By obtaining bootstrap samples y_{it}^* and x_{it}^* , the bootstrap test statistics is analogously computed to its sample counterpart. If this process is repeated for S period, then the bootstrap distribution of test statistics is obtained (Westerlund and Edgerton 2007, 186-188). Under the light of these explanations, the cointegration relationship between the series was compared with Westerlund and Edgerton (2007) LM Bootstrap Panel Cointegration test. The results are presented in Table 4.

Table 4. Cointegration Test Results

<i>Westerlund and Edgerton (2007)</i>	<i>LM Statistics</i>	<i>Asymptotic Distribution</i>	<i>Bootstrap Distribution</i>
LM_N^+	32.010	0.000	0.110

Given the results in Table 4, since there is a cross sectional dependency in model, the probability values of bootstrap distribution were taken into consideration instead of those of asymptotic distribution. According to the results of Westerlund and Edgerton (2007) cointegration test, the hypothesis “there is a cointegration between the series for all i ” cannot be rejected. Thus, accordingly, it was determined that there is cointegration between the variables.

3.5 Estimation of Long-Term Cointegration Coefficients

After determining the presence of long-term relationship between the series by using Westerlund and Edgerton (2007) cointegration test, the panel AMG (Augmented Mean Group) method was used in obtaining the long-term coefficients of this model. In this method, the mean slope coefficient can be estimated by taking the cross sectional dependence and slope coefficient heterogeneity. Moreover, this method can be used when there is an endogeneity problem indicating that there is a relation between independent variables and error terms (Eberhardt and Bond 2009, 1-2). Since the cross sectional dependence between the variables was determined, that the slope coefficients of variables were heterogeneous and that there was a cointegration relationship between the series, the coefficient estimations computed by using AMG method for every country are presented in Table 5.

Table 5. Cointegration Coefficient Estimation Results

	<i>Variable Coefficient</i>	<i>Standard Error</i>	<i>Possibility</i>
<i>Argentina</i>	0.014*	0.005	0.002
<i>Brazil</i>	-0.029*	0.005	0.000
<i>Chile</i>	-0.021*	0.004	0.000
<i>China</i>	0.027*	0.011	0.010
<i>India</i>	-0.017**	0.007	0.021
<i>Indonesia</i>	0.037*	0.004	0.000
<i>South Africa</i>	0.011*	0.003	0.000
<i>Turkey</i>	-0.009**	0.036	0.013

Note: *, ** and *** indicate that there is cointegration in series at significance levels of 1%, 5%, and 10%.

According to the estimation results, the effect of democracy on economic growth is positive in some of the countries and negative in some others. It was determined that the increase in democratization levels positively affected the economic growth in Brazil, Chile, India, and Turkey and negatively in Argentina, China, Indonesia, and South Africa. According to these results, it can be stated that the “Conflict Approach” emphasizing the need for an autocratic regime until achieving a certain level of wealth from theoretical aspect is valid for Argentina, China, Indonesia, and South Africa. For Brazil, Chile, India, and Turkey, “Compatibility Approach” arguing that the increase in

democratization level reduces the investment risk and thus the vulnerability, improves the property rights, ensures the transparency and accountability in governance, and regulates conditions of competition is valid.

3.6. Causality Test and Results

In order to examine the causality relationship between the variables in this study, causality test of Emirmahmutoğlu and Köse (2011) was performed. This test is a simple Granger causality test depend on Meta-analysis in heterogeneous mixed panels. The advantage of this test is that it can be used even in presence of cross sectional dependency in heterogeneous panels and when there is no cointegration relationship between the variables.

This test is based on Toda-Yamamoto Granger causality test, and Wald statistics has asymptotic chi-square distribution with q degrees of freedom if the variables are stationary in VAR (Vector Autoregressive Models) system. But, if the variables are integrated and there is cointegration, the standard asymptotic theory is not suitable for testing the hypothesis in VAR model. If the variables are integrated in their first order differences and they are cointegrated among each other, the VAR model in first differences of variables can be estimated so that the standard asymptotic theory is accurate for testing hypothesis in the VAR system. If the variables are cointegrated, the method for testing the Granger non-causality is to use the Vector Error Correction Model (VECM). But, in many of the studies, it is not possible to know a priori if the variables are stationary or cointegrated. For this reason, before estimating the correct VAR model, the pre-tests are required in order to determine the variables' cointegration level. Toda and Yamamoto (1995) developed an alternative approach testing the coefficient limitation of VAR model for cointegrated or integrated process. This approach ensures the Wald test with standard asymptotic chi-square distribution. When a VAR ($p+d_{max}$) model is estimated, it was recommended to use modified Wald test (MWALD) in lag augmented VAR (LA-VAR) model. p is the lag order and d_{max} refers to the maximum cointegration level. The only prior information required for LA-VAR approach is the maximum cointegration level. Since pre-test for unit root and cointegration level are not needed, in this way pre-test bias and size distortion can be prevented.

In heterogeneous mixed models having null hypothesis " $H_0 = A_{1,2,ij} = 0$ " indicating that there is no causality relationship in panel, VAR model ($k_i + d_{max}$) is estimated as follows:

$$z_{i,t} = \mu_i + A_{i1}z_{i,t-1} + \dots + A_{ik_i}z_{i,t-k_i} + \sum_{j=1}^{k_i+d_{max}} A_{i1,j}z_{i,t-j} + u_{i,t}$$

$$i = 1, 2, \dots, N \quad t = 1, 2, \dots, T \quad (19)$$

After the estimation of model, Fisher test statistics is used for testing the hypothesis that there is no Granger causality in heterogeneous panels:

$$\lambda = -2 \sum_{i=1}^N \ln(p_i) \quad i = 1, 2, \dots, N \quad (20)$$

In Equation (20), p_i refers to p -value of Wald statistics of the i^{th} individual cross section. This test statistic has chi-square distribution with $2N$ level of freedom. Moreover, this test is valid when N is fixed as $T \rightarrow \infty$. But, the Fisher test statistics lose its validity when there is a cross sectional dependency in panels. In order to solve this problem, the bootstrap method is utilized. In accordance with the cross sectional dependence in panel, the empirical distribution of test statistics can be obtained by following the bootstrap method. In this way, the $k_i + d_{max}$ lag VAR model is estimated in heterogeneous mixed panels:

$$x_{i,t} = \mu_i^x + \sum_{j=1}^{k_i+d_{max}} A_{11,ij}x_{i,t-j} + \sum_{j=1}^{k_i+d_{max}} A_{12,ij}y_{i,t-j} + u_{i,t}^x \quad (21)$$

$$y_{i,t} = \mu_i^y + \sum_{j=1}^{k_i+d \max_i} A_{21,ij} x_{i,t-j} + \sum_{j=1}^{k_i+d \max_i} A_{22,ij} y_{i,t-j} + u_{i,t}^y \quad (22)$$

In these equations, $dmax$ refers to the maximum cointegration level in the system for each i . These equations are passed through various processes and then the bootstrap critical values of Fisher test statistics are obtained (Emirmahmutoğlu and Köse 2011, 870-872). All of the results of Emirmahmutoğlu and Köse (2011) causality test are presented in Table 6, and the results of each cross section unit are presented in Table 7.

Table 6. Causality Test Results of Entire Panel

Null Hypothesis	Statistics	Possibility
<i>DEM is not the Granger cause of GDP</i>	29.1713**	0.023
<i>GDP is not the Granger cause of DEM</i>	32.6017*	0.008

Note: *, **, and *** refer to the significance levels of 1%, 5%, and 10%, respectively.

According to the results indicating the causality relationship between DEM and GDP variables in entire panel, the null hypothesis “DEM is not the Granger cause of GDP” was rejected at the significance level of 5%. Moreover, the null hypothesis “GDP is not the Granger cause of DEM” was rejected at the significance level of 1%. Accordingly, a bidirectional causality relationship was found between democracy and economic growth.

Table 7. Causality Test Results of Countries

Country	k_i	DEM → GDP		GDP → DEM	
		Coefficient	P-value	Coefficient	P-value
<i>Argentina</i>	2	1.295	0.426	1.354	0.415
<i>Brazil</i>	1	0.172	0.680	0.001	0.980
<i>Chile</i>	3	9.006***	0.091	1.948	0.425
<i>China</i>	3	8.803***	0.094	21.374**	0.011
<i>India</i>	3	12.143***	0.051	5.054	0.202
<i>Indonesia</i>	1	0.0165	0.898	3.600***	0.065
<i>South Africa</i>	2	0.851	0.518	1.900	0.335
<i>Turkey</i>	1	0.895	0.349	0.027	0.870

Note: *, **, and *** refer to the significance levels of 1%, 5%, and 10%, respectively.

According to the Granger causality test results in Table 7, it can be seen that the null hypothesis “DEM is not the Granger cause of GDP” cannot be rejected for countries other than Chile, China, and India. Moreover, it was also found that the null hypothesis “GDP is not Granger cause of DEM” cannot be rejected for countries other than China and Indonesia. According to these reasons, examining the results by the country, it was determined that there is bilateral causality between democracy and economic growth in China. It was found that there was unidirectional causality relationship from democracy to economic growth in Chile and India and from economic growth to

democracy in Indonesia. In other countries, no causality relationship was observed between democratization and economic growth.

4. Discussion and Conclusion

In economic growth literature, it can be seen that the effect of democracy has been frequently examined within the scope of economic growth. But, it can be seen that there is no consensus in studies on relationship between democracy and economic growth.

In this study, the effect of democracy on economic growth was examined for 8 emerging market economies by using panel data analysis. Within the scope of analyses, Westerlund and Edgerton (2007) LM Bootstrap cointegration test was utilized in examining the long-term relationship, whereas coefficient estimations were made using Panel AMG method in order to estimate the long-term effects. Moreover, the causality relationship between the variables was examined using Emirmahmutoğlu and Köse (2011) panel causality test. The presence of cointegration relationship between the series was determined under the lights of obtained results, and the coefficients were separately estimated for every country. According to the results, it was found that the increase in democratization level in Brazil, Chile, India, and Turkey positively affected the economic growth. But, in Argentina, China, Indonesia, and South Africa, the increase in democratization level has negative effects on the economic growth. Moreover, given the causality analysis results as a whole, it was determined that there is bidirectional causality relationship between democracy and economic growth in general. But, according to the results of causality test performed separately for each country, it was observed that democracy is the reason for economic growth in Chile, India, and China, whereas economic growth is the reason for democracy in China and Indonesia.

In emerging countries such as Turkey, the sustainable economic growth depends on the presence of strong economic institutions. But, it is not possible to establish the strong economic institutions without other transparent, objective, independent, and accountable institutions that are under active control and are loyal to the state of law. That's because the structures completing the stability can be achieved only via the achievements of democracy. It can be seen that democracy is nothing but an election system in emerging countries. In countries such as Turkey, where democracy couldn't be completely established, certain measures need to be taken in order for democracy to have positive effect on economic growth. First of all, the existing democratic structure should be protected and the method to improve the quality of democracy should be employed. For instance, certain groups should be prevented from using the resources in parallel with their own interests by making use of democracy. Moreover, in addition to the fundamental rights and liberties as the prerequisite of democracy, some of these measures are to protect the proprietary rights, to prevent the corruption that the political authority involved by passing beyond its legal limits, and to prefer consensus policies over social conflicts.

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