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How Okun's Law Works in Fragile Five Countries? Panel Data Analysis

Araştırma Makalesi /Research Article

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ABSTRACT: *Today, as in many countries, Economic growth and unemployment are important macroeconomic issues in developing countries that should be examined. This study aims to test the validity of the negative effect of unemployment on growth for the Fragile Five countries under the Okun Law. For this purpose, unemployment rate and growth rate data for the period 1991-2019 were used in the study. Panel ARDL analysis method was used in the study, which allows long and short-term results to be obtained and separate findings for each country. According to the findings obtained; For the Fragile Five country group, there was a negative and statistically significant relationship between growth and unemployment rate in the long-term results, while a positive significant relationship was found in the short-term results. Thus, when the general findings of the study were evaluated, it was seen that the assumptions of the Okun Law were valid*

Keywords: Okun's Law, Growth, Unemployment, Panel ARDL

JEL Codes: E24, F43, O40, C33

Okun Yasası Kırılgan Beşli Ülkelerinde Nasıl İşliyor? Panel Veri Analizi

ÖZ: *Günümüzde birçok ülkede olduğu gibi gelişmekte olan ülkelerde de ekonomik büyüme ve işsizlik konusu incelenmesi gereken önemli makroekonomik sorunlardan biridir. Bu çalışma, Okun Yasası kapsamında Kırılgan Beşli ülkeleri için büyüme ve işsizlik oranı arasındaki ilişkinin geçerliliğini test etmeyi amaçlamaktadır. Bu amaçla çalışmada 1991-2019 dönemine ait işsizlik oranı ve büyüme oranı verileri kullanılmıştır. Çalışmada uzun ve kısa dönemli sonuçların elde edilmesine ve her ülke için ayrı bulguların elde edilmesine olanak sağlayan Panel ARDL yöntemi kullanılmıştır. Elde edilen bulgulara göre; Kırılgan Beşli ülke grubu için uzun dönem sonuçlarında büyüme ile işsizlik oranı arasında negatif ve istatistiksel olarak anlamlı bir ilişki bulunurken, kısa dönem sonuçlarında pozitif anlamlı bir ilişki bulunmuştur. Böylece çalışmanın genel bulguları değerlendirildiğinde Okun Yasası'nın varsayımlarının geçerli olduğu görülmüştür*

Anahtar Kelimeler: *Okun Yasası, Büyüme, İşsizlik, Panel ARDL*

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1. Introduction

Unemployment is one of the measurement tools of a country's macroeconomic performance. Arthur M. Okun (1962) conducted a study for the US economy that revealed negative impact of unemployment on economic growth. Although the existence and the negative correlation between economic growth and unemployment tested, this contrast has decimated today, including groups of developing and developed countries. The number of countries that epitomize the contrary has also increased. In the emergence of this situation, it has a significant role that the existence of the opposite the validity of the negative effect of unemployment on growth in countries with labor-intensive production is stronger, and in countries with capital-intensive production, this relationship is decidedly weaker.

This study aims to test the validity of the negative effect of unemployment on growth in the Fragile Five countries. The results are expected to contribute to the policies of the Fragile Five countries in the fight against unemployment. In this context, the Panel ARDL method will be applied in the study to achieve both long-and short-term results in general for the fragile five countries and short-term relations separately for each country. Since this study has not studied whether Okun's Law is valid in the Fragile Five countries, which are similar to the Panel ARDL method in the low growth rate scale, in the literature, it is a point of view in terms of shedding light on the unemployment-reducing policies that can be applied both within the scope of the Fragile Five and on the basis of each country and to close this gap in the literature considered to be of the original value. The study will first consider growth - unemployment relationship and fragile economies. Then, conclusions and policy recommendations will be given in the light of literature review, data set and model, methods and findings.

2. Growth - Unemployment Relationship and Fragile Economies

An important aspect of this study is to reveal the existence of an inverse the validity of the negative effect of unemployment on growth in countries with fragile economies in line with the change in labor force participation, working hours and productivity as in Okun (1962).Thus, it has paved the way for knowledge about how much deviations that will occur in growth will affect the unemployment rate with the equation expressed as function 1 below (Güran, 1999: 50-51).

$$u = u^* - [\beta (y - y^*)/ y^*] \quad (1)$$

In the functionally expressed Okun's Law equation, u stands for the actual unemployment rate, u^* for the natural unemployment rate, y for actual real income, and, y^* for potential real income. In this model analysis applied to the US economy in 1962, the β coefficient was obtained as 0.3. As a result, findings that the actual unemployment rate would be below the natural unemployment rate of 0.3% if the actual product was 1% greater than the potential product were

gathered. Apart from the original function, the case of the negative relationship of unemployment and growth, which includes the assumptions of Okun's Law, can also be measured by the following equation (2).

$$\Delta u = -\beta\,(y - y^*) \tag{2}$$

Equation 2 is presented as a practical method of testing the negative relationship. β parameter can give different results according to the economies of the countries tested. Although this method gives approximate results and does not give exact results about changes annually, significant results are still obtained in measuring the relationship between growth and unemployment (Dornbusch and Fischer, 1998: 19).

Apart from the default Okun's Law, more different methods of sizing variables can be upheld due to reasons such as the inability to observe a direct relationship between potential growth and the unemployment rate, as well as the lack of a generalized criterion for this relationship. In this context, it is believed that the theory of Okun's Law can have an influence, including a combination of the current decency and the past period. The equation in which the effect method in question can be studied (obtained as a result of the addition of both the current period and the past period effects to the model) is called a dynamic model. In the dynamic method, the goal of adding delayed values of the unemployment rate variable to the model is to prevent a common movement that may occur between error terms and the model. This is useful in eliminating the problem of autocorrelation (Demirgil, 2010:140-143).

$$u_t = a_0 + a_1 y_t + a_2 y_{t-1} + a_3 u_{t-1} + \varepsilon_t \tag{3}$$

In the dynamic model (y), real output refers to the growth rate, while (t) and (t-1) of the variables refer to the current period and the delayed periods of the variables.

The fragile five groupings emerged after the US Central Bank (FED) announced that it would enable bond tapering. In the process following the FED statement, the economies that saw the most depreciation in their national currencies were India, Indonesia, Brazil, Turkey and South Africa. The high ratio of the current account deficit to GDP, low growth rates, and high inflation rates have been decisive in including countries in such a grouping from a macro-economic point of view (Artekin and Soydal, 2017:176).

With this change experienced as a result of the FED decision, there was a large capital outflow from the markets in the existing countries and the funds in these markets decreased. Hot money reduction in countries has also raised issues regarding the need for external financing (Hayaloğlu, 2015: 133).

3. Literature Review

In a study conducted by Arthur M. Okun in 1962 for the first time in the US economy and covering data for the period 1947-1960, it was found that there was

a negative relationship between the unemployment rate and real output growth. As a result, the study found that every 1% increase that exceeds the natural unemployment rate reduces real GDP by 3%.

Freeman (2000) examined the U.S. economy on a regional basis in his study. As a result of the research, Okun coefficient was found as around 2. It was stated that statistically speaking, interregional differences were not observed in the study.

Sögner and Stiassny (2002) tested the structural break and continuous change using the Bayesian method and Kalman filtering in their study. The data set of the study covers 15 OECD countries and the period 1960-1999. The countries with the lowest separation in the reverse relationship of growth and unemployment were Japan and Austria, while the Netherlands had the highest one.

Bartosik (2020), who examined Poland, analyzed the negative effect of unemployment on growth with data covering the period 1996-2018, unlike developed EU countries. This is due to the widespread use of temporary contracts in Poland. As a result of the analysis, which was evaluated according to age and gender criteria, it was concluded that the Okun coefficient works on the unemployment rate figures of women and young workers.

Cutanda (2020) conducted an Okun's Law evaluation in the study of Spain using data from the period 1955-2013. As a result of the study, results confirming the Okun's Law with statistically significant and strong coefficient rates were obtained.

Küçükkaya et al. (2019) examined the relationship between labor force participation rate and unemployment rate in transition economies within the scope of the Okun Law. According to the findings, as a result of the dynamic panel analysis applied with data for the period 1990-2017, results supporting the Discouraged Worker Hypothesis were obtained.

Elsayed (2020) investigated the validity of Okun's Law using the unemployment rate, growth rate, and employment rate variables for Egypt from 1982-2018. The study findings showed that the activity between employment and growth is stronger and more linear than the activity between unemployment and the rate of growth.

Another study that gives different results on a country-by-country basis is the study of Doğru (2013). In this study, an analysis was carried out on countries in the Euro zone. As a result of the study, an Okun coefficient that changes for each country was obtained.

Some of the Okun's Law studies for Turkey are as follows; Yilmaz (2005) used the growth and unemployment figures for 1978-2004 in his examination of Turkey. In the study, Granger and Hsiao causality tests were used and a causal relationship from growth to unemployment was found with the help of the available data.

Mıhçı and Atılgan (2010) use panel analysis methodology for the 1991-2006 period and conclude that the sensitivity of changes in unemployment rate and sectors other than manufacturing industry to the Okun coefficient is low.

In the study of Ozturk and Sezen (2018), quarterly data for the period 2005:Q1-2017:Q3 were used for growth and unemployment variables in Turkey. In the study, Angel-Granger cointegration test and Granger causality test was carried out. At the same time, a one-way causality relationship was obtained, in which variables were integrated with the period studied.

In the study Yalcinkaya et al. (2018), the negative effect of unemployment on growth figures related to the Turkish economy were analyzed within the Okun's Law framework along with the difference model, the interval model, and the dynamic model. The interval of the data set used in the study belongs to the period 2000:Q1-2017:Q4 and time-series analysis was performed. The study results confirm the inverse relationship between growth and unemployment.

In the study of Uslu (2020), the existence of Okun's Law on a periodic basis for Turkey was investigated. Firstly, they identified strong coefficient relations in the analysis conducted for the period 1923-1971. The findings for the period 1923-2019 were obtained as low impact coefficients, while the analysis for the 1972-2019 period showed a different aspect of the study, emphasizing that economic growth does not create employment opportunities. In addition, the study, which ensures the validity of Okun's Law, finds that there is no causal relationship in the short run, while there is a causal the negative effect of unemployment on growth in the long run.

Oruç (2019), who conducted the study of Okun's Law within the scope of the Fragile Five countries, analyzed the data for the period 1990-2017. In the study conducted with unit root tests, structural break tests and least squares method, while Okun's Law was confirmed for Turkey, South Africa and Indonesia, no results could be obtained for Brazil and India on its behalf.

Naskah (2019) used the panel ARDL approach as the analysis method in their study, which investigated the existence of Okun's Law for the Indonesian economy. As a result of the study, it was seen that Okun's Law is statistically significant on economic growth and unemployment for the Indonesian economy, therefore, it was stated that there is a negative and strong effect.

Unemployment in developing countries is a fundamental problem. Since Indonesia is also a country struggling with this problem, Purnomo et al. (2020) investigates the validity of the Phillips curve and Okun's Law assumptions in the context of Indonesia. As a result of the study, it was stated that the validity of the Phillips Curve and Okun Law could not be ensured for the Indonesian country because they found the inflation rate, unemployment and growth to be positively related.

Kavese (2020), investigating the validity of Okun's Law assumptions in the South African sample, continued their work using the data set for the period 1996-2016. In this study, the panel ARDL method was used. While significant short-term results were obtained for the country in general, no significant results were found in the long-term. In the results found on the basis of provinces, it is among the findings that there are relationships significant on short-term at different levels of importance.

4. Data Set and Model

This study aims to investigate whether Okun's Law is valid in the countries called the Fragile Five, which are similar in economic characteristics in the economics literature and consist of Brazil, Indonesia, India, South Africa and Turkey, and aim to contribute to policy recommendations. In the study, the growth and unemployment data of the countries in question for the period 1991-2019 were used. The data are taken from the World Bank's https://data.worldbank.org/ database.

Okun's Law (1962) applied the relationship between real output level and unemployment rate for the US economy and obtained results that are still accepted today. The starting point of the study is based on the need for the country to produce higher amounts of goods and services in the face of a constantly increasing workforce. At this point, Arthur Okun's equations, which are very important and explain the current situation, shed light on the economic literature (Schnabel, 2002:1).

Okun (1962) explained the inverse relationship between growth and unemployment rate with the help of the following models:

$$u_t - u_t^* = \alpha + \beta(y_t - y_t^*) + \varepsilon_t \quad (4)$$

The values indicated with * in Model (4) represent the potential value of unemployment and growth variables. The ε in the model represents the error term coefficient and explains the economic fluctuations that do not belong to the model but are included in the model.

α is the constant term, and β indicates the strength of the relationship between growth and unemployment rate. In the model that Okun applied in his study, he obtained the constant term as 3.72 and the output coefficient as 0.36, which is interpreted as a 1% increase in unemployment if the output deviates from the potential value by 3% (Owyang and Sekhposyan, 2012:400).

The second model, created by considering the period differences of unemployment and growth in Okun's study, is shown functionally as follows:

$$\Delta u_t = \alpha + \gamma \Delta y_t + \omega_t \quad (5)$$

In the model (5), unemployment and growth variables were analyzed by taking the differences of one period (Ball et al., 2016: 843). The reason for the development of the second model by taking the differences of the past period is based on the fact that the potential product and natural unemployment rate values of a country are not known (Izyumov and Vahaly, 2002: 317-331).

According to the results obtained with the Okun's Law difference model, the constant term was 0.30 and the coefficient of the growth rate differences was 0.30. These values show that the 1% decrease in the real GDP growth rate will be reflected in the unemployment rate by 0.3% (Owyang and Sekhposyan, 2012:400).

As explained above, Okun's Law can be explained by two different models. In the first equation, the difference between the potential value and the real value of unemployment and GDP variables is taken with the help of the equation, which is also expressed as the open model. In other words, it examines the existing relationship by obtaining an output gap. The second equation is called the difference model and the difference between one period delay values is taken. Analyzing Okun's Law with the help of both models gives us the right results (Arshad, 2007: 11).

Okun (1962), although there are various options for obtaining the potential values of the growth and unemployment variables mentioned in the first model, the de-trendification stage of these existing variables was used by Durech et al. provided by the Hodrick-Prescott Filter that he used (Durech et al. 2014: 57–65).

Due to the difficulty in obtaining the potential values in the study, the output gap (first) model in Okun's (1962) study was preferred by using the Hodrick-Prescott Filter to de-trend the growth and unemployment rate variables. In the research, the effect of growth on the unemployment rate was limited to the period of 1991-2019 due to the incomplete unemployment rate data before 1991 and the lack of growth figures after 2019, and within the scope of the Fragile Five (Brazil, Indonesia, India, South Africa and Turkey) countries, both long-term and long-term effects were observed. Panel ARDL method was used for both short-term analyses. Analysis results were obtained with the help of Eviews and Stata package programs.

5. Method and Findings

There are three different types of data in econometrics. Time Series, cross-section data and panel data which includes features from the other data types are the three types of data. (Damodar, 2004: 25).

Since the analyzes using panel data have horizontal and cross-sectional variable structures, they have the power to explain the unit effects as a whole or separately. At the same time, explanatory variable-oriented analyzes can be performed with each unit. With these aspects, panel data contain features that allow high explanatory power (Hsiao, 1985:3).

The Panel ARDL (Autoregressive Distributed Lag Model) method is basically the name given to the models that enable the examination of the short and long-term causality relationship (Vogelvang, 2005:306). It was developed by Pesaran and Shin (2001) and it is a method that provides superiority in empirical analysis compared to previous cointegration analyses. With its advantage, it determines the optimal lag numbers of both dependent and explanatory parameters for researchers. The number of delays for each parameter is determined by the information criteria, so it is aimed to obtain more consistent results (Pesaran and Shin: 2001:1-2).

In the panel ARDL method, at the stage of determining the appropriate lag numbers, the assumption that each parameter is stationary at the level I(0) or at the first difference is valid, unlike the Johansen and Engle-Granger approaches, provided that it is not quadratic. In line with this opportunity provided by the model, the ARDL method is quite advantageous and has the ability to be applied even at different cointegration levels. In this context, in order to carry out the application in the study, first of all, the stationarity of the parameters should be tested. After the stationarity levels are determined, a two-stage analysis is performed. first suggested by Pesaran, (2001) the existence of a long-term relationship and the Bounds test is to be examined. If meaningful results are obtained for the long-term relationship, short-term relationships can be examined (Nkoro and Uko, 2016: 64-79).

On the basis of cross-sectional dependence, it enables the examination of the question of whether the change that will occur in one of the units that make up the panel data set is effective on other parameters. In order to obtain accurate and unbiased results in econometric analyzes, it is desirable that this effect does not exist between units (Çadırcı, 2020: 51).

The tests examining the cross-section dependency vary in terms of the values of the section size (N) and time dimension (T) values in the panel data set. Pesaran (2004) developed tests on the hypothesis that the cross-section dependence disappears as the time and section size values get larger and approach infinity (Pesaran, 2004:1).

There are three tests investigating the cross-sectional dependence in panel data. The first of these is the Breush-Pagan (1980) LM (Lagrange Multiplier) test. The assumption of the test, on the other hand, is preferred if the time dimension (T) values in the panel data to be used in the application are more than the cross-sectional dimension (N) values. The second test is the Bias-corrected LM test and is used in cases where both the time dimension and the cross-section dimension are large and at the same time show normal distribution. The third test, which is the developed and comprehensive version of this test, is the Pesaran (2004) scaled LM test. Finally, the Pesaran CD test is preferred if the size of the panel data is larger than the time dimension of the data (Koçbulut and Altıntaş, 2016: 152-153).

In all of the test statistics that test the cross-sectional dependence, the default hypotheses are H_0: there is no cross-section dependency, H_1: there is a cross-section dependency.

The panel data set, which is subject to analysis in the study, has time dimension (T=29) and cross-sectional dimension (N=5) values. Since T>N, the Breush-Pagan (1980) LM (Lagrange Multiplier) test statistic, which is one of the cross-section dependency tests, will be considered. Cross-section dependency test results applied to the existing variables Table 1.' also shown.

Table 1: Cross-Section Dependency Tests

	Test	Statistics	P Value
U_GAP	Breusch-Pagan LM	31.52940	0.0005*
	Pesaran scaled LM	3.696085	0.0002
	Bias-corrected scaled LM	3.606800	0.0003
	Pesaran CD	1.858307	0.0631
Y_GAP	Breusch-Pagan LM	4.560063	0.9186***
	Pesaran scaled LM	-2.334431	0.0196
	Bias-corrected scaled LM	-2.423727	0.0154
	Pesaran CD	0.819801	0.4123

Note: *, **, *** denote significance at the 1%, 5% and 10% level, respectively.

According to the Breush-Pagan (1980) LM test results, which are considered in cross-sectional dependence, the probability value for the U_GAP variable is examined. hypothesis was rejected and it was concluded that there is a cross-section dependency. Therefore, in this case, since the application of the first-generation panel unit root test will enable us to obtain erroneous results, the second-generation unit root test should be applied. When the probability value for the Y_GAP variable is interpreted there is no inter-unit effect, that is, there is no cross-sectional dependence, and therefore first-generation unit root test should be applied.

Table 2: Panel Unit Root Tests

Maddala and Wu (1999) Panel Unit Root Test						
	Without trend			With Trend		
Variable	Lag	Chi-Square	Probability	Lag	Chi-Square	Probability
U_GAP	0	20.070	0.029**	0	9.419	0.493
	1	37.826	0.000*	1	22.535	0.013
Pesaran (2007) Panel Unit Root Test (CIPS)						
	Without trend			With Trend		
Variable	Lag	Z Statistic	Probability	Lag	Z Statistic	Probability
Y_GAP	0	-8.587	0.000*	0	-7.880	0.000
	1	-5.872	0.000*	1	-4.939	0.000

Note: *,**,*** denotes significance at the 1%, 5% and 10% level, respectively

The results of Maddala and Wu (1999) unit root test and Pesaran (2004) (CIPS) unit root test in which the parameters were tested for stationarity Table 2 is also shown.

Through the Hausman test, it is decided which estimator will be preferred among ARDL models. According to the Hausman test statistics, the Pooled Mean Group (PMG) estimator and the Mean Group (MG)estimator results are evaluated and the appropriate estimator is determined (Tatoğlu, 2003: 256).

Table 3: Hausman Testing

	(b) mg	(B) pmg	(b-B) Difference	sqrt(diag(V_b-V_B)) Std. error
Y_GAP	-0.0809347	-0.068006	-0.0129287	0.0179662
	chi2(2) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 0.52 Prob>chi2 = 0.4718 * b = consistent under *Ho* and *Ha;* B = inconsistent under H_a active under Ho.			

In the Hausman test, the MG estimator under column (b) is consistent under H_0 and H_a. The second PMG estimator in column (B) is inconsistent under H_a but H_0 is assumed to be active (Karadaş, 2020: 53). According to the Hausman test results, the H_0 hypothesis was rejected for the ARDL model and it was decided that the model to be applied was the Pooled Mean Group (PMG) estimator in order to obtain consistent results.

Table 4: Panel ARDL Long- and Short-Term Results for Vulnerable Five Countries

Dependent Variable: D(U_GAP)
Test Name: ARDL
Observation Period: 1991-2019
Model Chosen: ARDL(1, 1)

Variable	**Coefficient**	**Standard Error**	**t-statistic**	**p- value**
Long-Term Equation				
Y_GAP	-0.068006	0.025510	-2.665801	0.0087
Short-Term Equation				
ECM	-0.307684	0.057343	-5.365713	0.0000
D(Y_GAP)	0.011099	0.002351	4.720234	0.0000
C	-0.295544	0.320562	-0.921957	0.3583

The ARDL (1,1) model was applied for the Panel ARDL Pooled Mean Group (PMG) analysis results analyzed according to the Akaike, Schwarz, and Hannan-Quinn information criteria. According to the results in Table 4, when the results of the Panel ARDL analysis for the Fragile Five in general are interpreted, there is a statistically significant and inverse long-term relationship between the unemployment rate gap (U_GAP) and the output gap (Y_GAP). existence of the relationship. When the parameters are interpreted according to the equation $u_t - u_t^* = \beta(y_t - y_t^*) + \varepsilon_t$, it is seen that a 1% increase in the output gap reduces the unemployment rate by a coefficient of 0.068.

Okun (1962) stated that 1% unit growth over each 2.25% growth in the growth rate will cause a 0.5% unit decrease in the unemployment rate (Okun, 1962: 104). Therefore, the effect of the increase in the growth rate in the long run on the unemployment rate is supported by the findings of the analysis. Findings indicate that policies to reduce unemployment rate in the short term and economic growth will show their effects in the long run.

Considering the short-term results, a statistically significant but positive correlation with a coefficient of 0.011 is observed between the parameters. This result explains that an increase in growth in the short run does not have an immediate effect on reducing the unemployment rate.

When the short-term findings are evaluated, it is possible to evaluate why a positive and significant relationship was obtained as follows. Increases in national income bring along economic growth and enrich the production potential of countries, thus allowing the scale of production to increase, which occurs in the long run (Cinel, 2014: 15).

Therefore, if one considers that there is a demand-side increase in GDP, this can only be met by the increase in working hours in the short term, but it will not be reflected in the product immediately, and it will take time to see the reducing effect on the unemployment rate (Ekşi, 2016: 13). Supply shocks such as oil prices and energy market shocks, fluctuations in exchange rates or gold market trends that may occur in the economy have more permanent effects on GDP and carry the recovery process of the economy to the long term (Ekşi, 2016: 15).

In the model based on the error correction coefficient, the ECM coefficient explains in the studies of Narayan and Smyth (2006) that a fluctuation in the dependent variable will return to equilibrium in the long run. For this, it is expected to be statistically significant and negative (Narayan and Smyth, 2006: 340).

When the ECM coefficient is evaluated in the short-term results covering the Fragile Five countries in general, it is seen that it is statistically significant and negative. This result brings us the following interpretation; It is possible that any shock that will occur in the unemployment rate, which is the dependent variable,

will come back into balance if the relationship between growth and growth deteriorates in the long run. Regarding this issue, the error correction coefficient was obtained as -0.307684 and it was statistically significant. This coefficient explains to us that if the long-term balance disappears with a deviation in the current period, this deviation will improve by 30% in the next period. Therefore, in the event of a shock, the re-approximation of the long-term balance corresponds to a period of 3.3 years.

6. Conclusion

Economics examines the negative effect of unemployment on growth within the scope of Okun's Law. Okun's Law based the phenomenon of unemployment and growth on strong foundations. With the realization of economic growth in a country, it is expected to increase employment, by showing its effect in many areas such as increasing investment and production, and the emergence of new job opportunities.

The unemployment rate and growth rate variables for the period 1991-2019 and the existence of Okun's Law are investigated within the scope of Fragile Five countries. For this purpose, Panel ARDL analysis method was used in the study.

When the study findings are evaluated in the light of the information provided by Okun's Law, negative and statistically significant coefficients between unemployment rate and growth were obtained for the Fragile Five country group in the long run, and results were obtained that confirm the theory of Okun's Law. When the short-term results are examined, a statistically significant but positive effect is observed. Error correction coefficient (ECM) is at the expected significance level and expected sign in all results. This shows us that the Fragile Five countries may come back to balance in the long run, even if they experience deviations from their current balance in the event of a shock. In addition, when the short-term results for each country are evaluated, it should be noted that there is an econometrically significant but positive relationship.

As a result, the findings of the analysis confirm the predictions of Okun's Law. In line with this information, the result of the study shows us that the unemployment rate can be reduced for policy makers with policies to be implemented on a country basis or as a country group. However, it should be noted right away that; When the ECM coefficients are evaluated, although it is negative and significant for all countries, the time to return to the long-term equilibrium for each country in the face of a shock that will occur in the dependent variable varies according to the current economic structures of the countries in question. Policy implementations may differ depending on the difference in the coefficients on a country basis. Especially in countries like Turkey, which are foreign-dependent for growth and have current account deficits in the balance of payments, it is observed that the effect of foreign savings (capital) drawn into the country to close the current account deficit, reducing the exchange rate negatively affects

unemployment rates. In this context, it should not be forgotten that the way to maintain the growth-unemployment relationship on a solid basis is to overcome the structural problems that cause the current account deficit. Possible future studies are to reveal the variables that determine the growth and unemployment rates of the countries in this group and to discuss the policies to affect these variables. In this context, it is expected that this study will shed light on the academy and policy makers doing research on the aforementioned issues.

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