

ECONOMETRIC EVALUATION OF THE RELATIONSHIP ECONOMIC GROWTH AND UNEMPLOYMENT IN EU & TURKEY

Eryiğit Pinar ¹, Cura Serkan ², Züngün Deniz ³, Ortanca Murat ⁴

¹ Kula Vocational School, Celal Bayar University, Manisa, Turkey

² The Faculty of Economics & Adm. Sci., Celal Bayar University, Manisa, Turkey

³ Ahmetli Vocational School, Celal Bayar University, Manisa, Turkey

⁴ The Faculty of Economics & Adm. Sci., Celal Bayar University, Manisa, Turkey

pinarer45@hotmail.com

curaserkan@hotmail.com

zungund@hotmail.com

murat.ortanca@cbu.edu.tr

Abstract: *Unemployment, in Turkey as well as in the whole, world poses huge economic problems. When considering Turkey's economy with a continued growth but a sustainable growth trend that cannot be provided and cannot be avoided in unemployment. The concepts of unemployment and economic growth in the macro and micro level are the subject of many studies. Economists look for solutions to these problems that are faced by each country; unemployment, unemployment causes, economic growths are all concepts that are discussed. Turkey's population growth rate is high, investment and capital accumulation at the desired level cannot be performed, the quality of labor as a lack of economic and political instability, informal employment, the existence of inter-regional disparities, the lack of sufficient support in agriculture contribute to the many reasons such as unemployment, the foundation raised as an issue is caused to the end. One of the biggest problems faced by Turkey's economy has long been the problems of unemployment. Many policies have been identified and implemented to combat unemployment have been studied. High rates of growth to reduce unemployment are among the most important of these policies. The relationship between unemployment and growth for the first time was examined by Arthur M. Okun (1962). The main objective of this study with the participation of Croatia in 2013 with 28 member countries of the European Union and in Turkey for the period 2001-2011 is to examine and test the relationship between economic growth and unemployment is variable. Analysis Breitung (2000), ADF Fisher and Levin, Lin and Chu (2002) panel unit root tests, Westerlund (2007) panel cointegration tests are used. Breitung (2000), ADF Fisher and Levin, Lin and Chu (2002) tests taken by the series of first differences were stagnant. In addition, error correction model established between unemployment and economic growth Hausman tests were performed, and long-term parameters have been shown to be homogeneous, long-and short-term relationships Average Pooled Estimator Group (PMG) and have been estimated. Unemployment and economic growth variables among long-term relationships Westerlund (2007) panel co-integration test with the tested and analysis of our results of unemployment in the short and long-term parameters are significant and economic growth on the long term effects of positive and short-term effect was negative, was observed. In addition, a 1% increase in unemployment in the long-term economic growth, while an increase of 0.35%, a decrease of 0.26% in the short term cause has been determined.*

Keywords: Economic Growth, Unemployment, Panel Cointegration

JEL classification: O40, J60, C10

1. Introduction

Economic growth, the amount of goods and services produced in a country is increasing over time. The only way for a person living in the country to continuously raise the standard of living is to have economic growth. So all the basic macro-economic objectives

of the country one of the most important, is to realize a rapid economic growth (Ünsal, 2000). Reynolds (1974) according to unemployment; desire and ability to work in the wage level in the market for a job in the job search cannot be found even though it may be expressed. According to Bluestein et al. (2013) unemployment; many people who are caught in the vortex of the economic recession, inability to work caused by the deterioration of the physical and psychological states are expressed in this form. Substituting the use of capital rather than labor increases the unemployment rate is considered as the most important factor. In addition to these factors; informal employment, socio-demographic information on the labor market inefficiencies and lack of labor also increases unemployment are considered as other factors (Schimke, 2014). Belan and Cheron (2014)'s study shows that his; during his years of turbulent economic period, the U.S. and European unemployment rates remained at very high levels. Thus, the economic instability that affects unemployment must also be expressed. Okun (1970) put forth by the law's impact on employment growth is explained. Changes in the rate of change in the unemployment rate and real growth are examined in the relationship between Okun Law. In other words, this law, potential and actual output to the change in the unemployment rate as the relationship between the growth rate is discussed (Güran, 1996). Between economic growth and a source of instability for the purpose of examining the relationship between unemployment in this paper, and for the relationship between economic growth and unemployment has been referred to the literature. Then, using a panel data analysis of short and long-term economic growth and the relationship between unemployment is tested.

2. Related Literature

The impact on employment growth in the economics literature is a controversial issue and validations of empirical research are often expectations. Describes the relationship between growth and unemployment rates, some of this work is presented below.

Moosa (1999), Okun coefficient was evaluated in terms of the U.S. economy. Studies have used quarterly data from 1947:1-1992:2. Okun coefficient, was found near -0.38. Read the estimated coefficient value close to the original value of Okun and also working with dynamic models, which give higher values than many recent studies have found to be reasonable.

Freeman (2000), Okun's law, has been sought at national level and in 8 regions in the United States. For the study, 1958-1998 quarterly and annual data for 1977-1997 were used. Okun coefficient is constant over time and across regions reached about "2" as a value of the findings.

Harris and Silverstone (2001), have examined the relationship between unemployment and real output. As a data source, the seven OECD countries (Australia, Canada, Germany, Japan, New Zealand, United Kingdom and the United States) has been addressed. As a result of this study, there wasn't a long-term relationship between unemployment and the product has been revealed.

According to Muscatell and Tirelli (2001), for OECD countries, the relationship between growth and unemployment in the years 1955-1990, were examined using structural VAR model. After all a negative relationship between unemployment and growth were found.

Gürsel et al. (2002), in Turkey from 1992 to 1997 covering the period of studies, it has concluded that, a 1% increase in growth rate has created a 0,425% increase statically and a 0.285% increase dynamically in employment in the non-agricultural sector. Employment growth will reduce unemployment, the results envisaged in the Okun Law though weak inverse relationship is seen to be confirmed. Yıldırım and Karaman (2003), with growth in order to explain the relationship between the unemployment rates in their study, they have used the period between 1975 to 1995 for Turkey. According to their results; period trend

growth rate which is 4.3% exceeding every 1% growth the unemployment rate 0.13% percent decrease and in some years a high growth rate despite the unemployment rate has increased in some years while the opposite is observed (Demir ve Bakırcı, 2005).

Brauninger and Pannenberg (2002), a country's level of unemployment that affects the rate of long-term growth to examine; Solow-type models have demonstrated improved. As a result, an increase in the scale of unemployment lowers the level of long-term growth as concluded.

Zagler (2003), examined Okun law by using vector error correction model for France, Germany, Italy and the United Kingdom. In conclusion it was determined that, long-term economic growth and unemployment is among the co-integration and direction of the relationship is positive.

Christopoulos (2004), has been wanted to test the validity of the Okun law for 13 regions of Greece by using panel data in the period 1971-1993. As a result of the study, 6 of the 13 regions showed that the unemployment and output move together.

Demir and Bakırcı (2005), With the growth of the relationship between the unemployment rate in Turkey 1988 - 2004 period under the Okun law to include the three different methods (mean, trend and internalization) were tested. The results obtained with these three methods; Okun equations, growth - the relationship between the explanatory power of unemployment at the same time very close together and showed to be very weak. On the other hand with the growth of unemployment relationship between the weak, the population growth, rural to urban migration and housewives in business increasingly more involved, such as employment and unemployment together in order to increase pressures there were connected.

Yılmaz (2005), in Turkey during the period from 1978-2004, with a growth direction while investigating the relationship between unemployment rates; Granger and Hsiao's causality tests were used. In the research; Turkey's economy with a growth rate of unemployment where there is a mutual causality, only unidirectional rate of unemployment growth rate was concluded that a causal relationship exists.

Villaverde and Maza (2009), in Spain, and for its seventeen regions using annual data from 1980 to 2004 Okun coefficient were examined. In this study, panel data analysis was used. Results in most of the regions throughout the country and is an inverse relationship between unemployment and output showed.

Ceyhan and Şahin (2010), investigated asymmetric relations in Okun Law by using analysis of Integrating Conversations involves TAR & M-TAR Models and annual data for the period 1950-2007. According to the results obtained, Okun coefficient was found asymmetric for the economy of Turkey and it has been demonstrated that the effect of reduction in unemployment (increase) during the period of real output expansion (contraction) is not the same.

Tunalı (2010), his work using quarterly data from 2000 to 2008, real GDP, unemployment level, the real effective exchange rate index and the consumer price index variables were used. After all, the real unemployment level of 1% increase in GDP 1.42% like it would create a reduction in economic growth creates jobs in Turkey, but it can't be said that it means reducing unemployment. During this situation arise, some reasons such as the demographic dynamics of the total workforce unpaid family workers and the agricultural sector disguised unemployment high share of the 2001 crisis, then the hours worked increased as a result of increased productivity and hence job creation by economic growth but being inadequate about reducing unemployment have been shown.

Boubtane et al. (2013), between the years 1987-2009 using VAR analysis, the studies conducted in 22 OECD countries, immigration, the relationship between growth and unemployment have been introduced. Immigration from countries GDP per capita rates of unemployment emerges in the positive results that have been affected negatively.

Mosikari (2013) in South Africa, unemployment on GDP investigate the effect aimed at in the study, from 1980 to 2011, covering the years of time series based on the analysis, the Augmented Dickey-Fuller (ADF) test, Johansen Cointegration Test and Granger Causality Test was applied. According to the results obtained, with unemployment rates of GDP growth a causal relationship has not been found.

Elshamy (2013), based on data from the year 1970 to 2010 for Egypt, Okun coefficient was tested. In this study, the long-term cointegration analysis in the short term when using the Error Correction Model was used. According to the obtained results, the long and short-term coefficients are statistically significant.

This study investigated the relations between growth and unemployment of Turkey and EU countries. This study similar to those encountered in the literature; is believed to be capable of further contributing to the literature.

3. Research Methodology

The merger consists of panel data, time series and cross sectional data. Panel data in time data samples are obtained from a horizontal section is repeated; but with the same economic unit is followed throughout the sample period. The general characteristic of these data is that the overall cross section of sample N is relatively large than time period T (Bayraktutan and Demirtaş, 2011). One of the major advantages of panel data analysis to researchers in the modeling of individual behavior change is that it allows much greater flexibility to offer. (Greene, 2003) Another advantage of panel data is adapted for controlling individual heterogeneity (Baltagi, 2011).

3.1. Panel Unit Root Test

Levin, Lin and Chu (1993) and Quah (1994) since the work performed by the unit empirical analysis of the data in the root operation panel play an important role. In fact, the panel integrated in the data (integrated) series is known a great development in the search for and the panel unit root tests have been applied to different areas of the economy (Hurl and Mignon, 2006).

Im, Pesaran and Shin (2003) panel unit root test, the Dickey-Fuller (ADF) test statistics using panel for each unit ADF, calculating the ADF average of the test statistic (Saracoglu and Dogan, 2005). Unit root test panel for the implementation of the horizontal section N and T to be the time series, first order autoregressive process,

$$\Delta y_{it} = \alpha_i + \beta_i y_{i,t-1} + e_{it}, \quad i = 1, \dots, N, t = 1, \dots, T,$$

is defined (Im, Pesaran and Shin, 2003). In the test comes,

$$\begin{aligned} H_0 : \beta_i &= 0, \text{ for all "i"} \\ H_1 : \beta_i &< 0, \quad i = 1, 2, \dots, N_1, \beta_i = 0, \quad i = N_1 + 1, N_1 + 2, \dots, N. \end{aligned}$$

Acceptance of hypothesis H_0 implies the existence of panel unit root and the acceptance of the alternative hypothesis implies the adoption of panel unit root. Im, Pesaran and Shin (2003: 56), "There is no unit root" hypothesis is tested with the t-bar statistic.

In the form of first and second generation panel unit root tests are divided into two. First-generation unit cross-sectional correlations between tests assuming that the second generation unit root tests the correlation between the cross-sectional units are taken into consideration. The most widely used second-generation unit root tests of Moon, Perron and Phillips (2007), Pesaran (2007), Phillips and Sul (2003) and Bai and Ng (2004) is located. Second-generation panel unit root test, primarily for the cross-sectional dependence in the data set are tested. In case if the cross-sectional correlation tests should be used in this case is the second generation.

3.2. Panel Cointegration Test

The concept of cointegration Granger (1980) has been provided in the literature for the first time. The concept of cointegration between economic variables implies the existence of a long-term relationship. Two or more variables to express whether or not integrated the principles of co-integration tests constitute (Dickey, Jansen and Thornton, 1991).

Co-integration test, under the assumption that there is cross-sectional dependence, with seven different tests to determine whether the panel data used in cointegrated. These 7 different tests; 3 of them inter-group (between-dimension) estimator, while 4 of them intra-group (within-dimension) include estimation was using the estimator (Pedroni, 1999).

Panel cointegration tests according to the practice of using time series cointegration advantage are to increase the power of the test. Panel Cointegration tests are Westerlund Panel Cointegration Test, Kao Panel Cointegration Test and Pedroni Panel Cointegration Test (Tatoglu, 2012). In this study, Westerlund (2006) cointegration test is the LM test statistic. This test is a test that takes into account structural breaks and cross sectional dependence. The model for applying Westerlund test will be estimated below:

$$y_{it} = Z'_{it}\gamma_{ij} + x'_{it}\beta_i + e_{it},$$

$$e_{it} = \Gamma_{it} + u_{it},$$

$$\Gamma_{it} = \Gamma_{it-1} + \theta_i u_{it}$$

The above model is time-series variables (subduction). In the model, $t=1, \dots, T$ time period, $i=1, \dots, N$ -panel shows a cross section..

P_a and P_t test statistics have been calculated by informations belongs to all panels. Hypothesis:

$$H_0: \rho_i = 0, \text{ for all "i"}$$

$$H_a: \rho_i < 0, \text{ for all "i"}$$

after establishing stats:

a. P_a -Statistics: $P_a = (\sum_{i=1}^N L_{i11})^{-1} \sum_{i=1}^N L_{i12}$

b. P_t -Statistics: $P_t = \hat{\sigma}^{-1} (\sum_{i=1}^N L_{i11})^{-1/2} \sum_{i=1}^N L_{i12}$

is calculated as such.

Average statistics groups D and Gt obtaining n, which is estimated for each unit ρ_i and ρ_i is started by calculating the weighted average of the ratio of t. Hypothesis:

$$H_0: \gamma_i = 0, \text{ for all "i"}$$

$$H_a: \gamma_i < 0, \text{ for at least one "i"}$$

after establishing stats:

c. G_a -Statistics: $G_a = \sum_{i=1}^N L_{i11}^2 L_{i12}$

d. G_t -Statistics: $G_t = \sum_{i=1}^N \hat{\sigma}^{-1} L_{i11}^{-1/2} L_{i12}$

is calculated as such.

In both test groups, rejecting of hypothesis H_0 means the rejection of cointegration relations for all panels (Tatoglu, 2012).

4. Results

Data used in this study that were investigated the relationship between unemployment and economic growth in the short-run and long-run in Turkey and 28 EU members (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom) was obtained from the World Development Indicators published by World Bank for 2001-2011. Total unemployment (UNEMPLOYMENT in Table-1) data is

taken as a % share within the total workforce and the economic growth data type is taken as the total annual Gross Domestic Product (GDP in Table-1). Analysis of State-12 package and is collected using Eviews 7.0 Beta.

4.1. Panel Unit Root Analysis

Panel cointegration tests of the long-run relationship between unemployment and economic growth as a priority in order to examine the unit root properties of the series should be examined. First-generation panel unit root tests are used in situations. We also express our cross-sectional analysis because there is a relationship between the first-generation unit root tests have been utilized.

Table 1: Panel Unit Root Test Results

Variables	Breitung t Statistics (Trend&Constant)	ADF Fisher χ^2 Statistics (Trend&Constant)	Levin, Lin and Chu t Statistics (Trend&Constant)
LNGDP	1.74768	36.1706	-9.13908
LNUNEMPLOYMENT	-0.68082	64.7831	-7.76590
Δ LNGDP	-7.81703***	216.339***	-28.4935 ***
Δ LNUNEMPLOYMENT	-2.85221***	76.8272 **	-9.54836 ***

Note: Δ shows the difference for the first degree. ***p<.01, **p<.05, *p<.10

In Table 1, Breitung (2000), the ADF Fisher and Levin, Lin and Chu (2002) panel unit root tests taken in first differences regarding the level and unit root results are given as a series. Breitung (2000), ADF Fisher and Levin, Lin and Chu (2002) tests taken by the series of first differences were stagnant. Thus, a prerequisite in series in that the same difference stationary Westerlund (2007) cointegration test condition is provided to apply.

4.2. Panel Cointegration Analysis

UNEMPLOYMENT and GDP variables belonging to the Westerlund (2007) panel cointegration test results are given in Table 2. "There is no cointegration". Our hypothesis is that we have established in the form of the hypothesis is defined as H_0 . G_t , D , P_t and P values of the test statistic, z values and the probability values are given in Table 2. As seen from the table based on the results generated from the analysis of all statistics based on the hypothesis H_0 is rejected. In this case, long-term UNEMPLOYMENT and GDP is a correlation between the variables is concluded.

Table 2: Westerlund Panel Cointegration Test Results

Statistics	Value	Z Value	Probability
G_t	-8.534	-41.423	0.000***
G_a	-14.952	-2.473	0.007***
P_t	-23.924	-14.613	0.000***
P_a	-16.089	-6.433	0.000***

***p<.01, **p<.05, *p<.10

From the analysis we have achieved these results, Zagler (2003)'s, read law in France, Germany, Italy and the United Kingdom for the vector error correction model using the observations the work achieved in the long term economic growth and unemployment, among co-integration is and direction of the relationship positive is that is consistent with the results.

Accordingly, the Panel error correction model in Table 3, we see the results of the PMG. Long-term test of homogeneity Hausman test which is used to choose between forecasters and PMG has been seen that the model should be used. Long term homogeneous parameters were seen to be stable i.e. from unit to unit (see Table 3). According to the results obtained from the model, the error correction parameters were positive and significant. This parameter deviation of the series of short-term due to lack of stable equilibrium in the next period shows celerity. Accordingly, in a period of approximately 78% of the imbalance will be corrected in the next period will be provided closer to long-run equilibrium.

Table 3: Pooled Regression Results Per Group

Independent Variables	Coefficient	Std. Error	Z Value	Possibility
lnGDP	0.3496274	0.0567126	6.16	0.000
lnGDP _{t-1}	-0.260783	0.040849	-6.38	0.000
e _{t-1}	0.7766382	0.015277	50.84	0.000
Constant	6.43	4.44	14.48	0.000
Hausman Test (χ^2 test)	0.000			

***p<.01, **p<.05, *p<.10

In addition, short-and long-term unemployment and economic growth parameters have significant impact on the long-term and short-term positive effects were found to be negative. A 1% increase in unemployment in the long-term economic growth, while an increase of 0.35% over the short-term will result in a decrease of 0.26%. When we look at studies on unemployment; GDP is usually calculated causality, and we can see that the correlation between them. Panel co-integration between our variable short-long-term relationships, there is much work trying to explain. Also the analysis obtained from our results Brauninger and Pannenberg (2002) in a country's level of unemployment long-term growth rate affect to examine whether the Solow-type models by putting their work obtained from the unemployment scale an increase in the long-term growth lowers the level to the conclusion that is in conflict.

5. Conclusion

In this study, using panel data analysis of short and long term economic growth and the relationship between unemployment and 28 EU member states in the 2001-2011 period and data to test for Turkey were used.

Whether long-term homogeneous parameters were examined by Hausman test. Breitung (2000), ADF Fisher and Levin, Lin and Chu (1993) panel unit root tests have been testing the stability of the series. Unemployment and economic growth as a result of the analysis variables in first difference stationary I (1) and in this case they are a long-term relationship between the two variables could be explored has emerged. For this purpose, Westerlund (2007) panel cointegration test with the long-term existence of a relationship between variables is proven. There is a long-term relationship between these two variables and it has been able to achieve a short and long term parameters. Unemployment in the short and long term economic growth in order to see how it affects the PMG forecasters using an error correction model was obtained. Error correction parameter is negative and statistically significant increased. Short and long term unemployment and economic growth parameters have significant impact on the long-term and short-term positive effects were found to be negative. A 1% increase in unemployment in the long-term economic growth, while an increase of 0.35%, a decrease of 0.26% in the short term cause has been determined.

Studies on the growth of European countries / continents at the level of the unemployment variables when examining the interaction of supply that have revealed several differences. For example, high unemployment in France, Italy and Germany are caused by the low level of growth similar situations override must in this case in the UK about the existence of the relations between variables cannot be fully rejected. Briefly, in Europe, unemployment in different countries affected by several variables, it is not explained only by a factor (Zagler, 2004). Our study short-and long-term unemployment and the relationship between economic growths have tried to be explained. In this sense, we believe that by using a different variable or adding new variables, we can provide new contributions to the literature for the future studies about unemployment.

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