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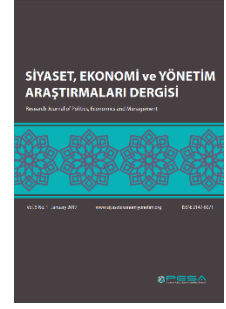
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The Relationship Between Unemployment Rate and Economic Growth: The Case of Turkey

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ABSTRACT

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This paper investigates the relationship between unemployment rate and economic growth rate over the period 2002-2014 for Turkey. In this context, Johansen cointegration test and vector error correction model is applied to determine this relationship. Empirical findings show that the variables are not cointegrated so; there is no causal link between the two variables. This result does not support the Okun Law. However, in the short run growth shock have a negative impact on unemployment rate. On the other hand, shocks in unemployment have positive impact on the growth. The findings of this study have important policy implications.

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INTRODUCTION

Unemployment and economic growth are two of the most important issues of macroeconomics. Unemployment is the difference between the full employment and actual employment and it has different types like voluntary, involuntary, frictional, seasonal, cyclical, disguised, structural and natural unemployment (Mucuk, 2015: 28). Although the classical economic model assumes that there is a full-employment in economies, this assumption does not reflect the truth and all countries are faced with unemployment problem even if they have different causes (Mankiw, 2010: 176). For this reason almost all countries try to keep under control the unemployment with various economic policy implementations (Ceylan and Şahin, 2010: 157).

Economic growth is generally defined as the increase in GDP as a result of the increase in a country's production of goods and services in a specific period (Mucuk, 2015:19). Economic growth is the only way of raising the people's life standards. For that reason, fast economic growth is generally one of the most significant main macroeconomic goals of the countries (Ünsal, 2011: 14). To explain the economic growth, starting with the classical school of economy, economic models were developed by economists. In these models, unemployment takes a part directly or indirectly (Göktaş Yılmaz, 2005: 65). These models can be classified as Classical Growth Model, External Growth Models which includes Harrod Domar Growth Model and Solow Growth Model and Internal Growth Models like Arrow-Romer, Lucas or R&D Growth Models (Muratoğlu, 2011: 3).

Although the problems about economic growth and unemployment usually arise together, they are mostly analyzed separately. Economic growth models generally assume that there is a full-employment while the modern theories of natural and structural employment assume that there is no economic growth. However, there is a relatively new literature analyzing economic growth and unemployment together (Brecher et. al, 2002: 875).

The relationship between the unemployment and economic growth is first analyzed by Arthur M. Okun's study in 1962. According to this approach which later named as Okun Law, high economic growth rate causes a decrease in unemployment rate or vice versa. Empirical studies generally grounds on the assumption that there is a symmetrical relationship that accept that during the cyclical fluctuations, real output has the same absolute effect on unemployment in both extension and contraction period. However, recent studies show that increasing effect of growth on unemployment in contraction period is not absolutely same as decreasing effect of growth on unemployment in extension period (Ceylan and Şahin, 2010:158).

Over the last two decades, despite the double increasing in world economic growth, expected decrease in unemployment is not realized. This situation shows that the relationship between growth and unemployment is getting irrelevant. For decreasing unemployment, economic growth is not enough by itself and 'jobless recoveries' term which means an economic growth not creating employment (Barışık et. al, 2010: 89).

Thanks to the stabilization policies and structural reforms, economic growth is provided after the crises in 2001. In this period positive developments are observed in inflation, export, public debt, interest rate also. Although these positive developments in economy, unemployment stays as an important problem (Takım, 2010: 3). This situation bring into question that if the jobless recovery is valid also in Turkish Economy.

1. Literature Survey

There are a great number of studies on the relationship between economic growth and unemployment. An important part of these studies confirm Okun's Law while others reject it. Table 1 shows the literature survey of various papers for Turkish economy.

Table 1: Overview of Previous Studies for Turkey

Author(s)	Methodology	Period	Country	Results
Kanca (2012)	Stationarity Test, Engle- Granger Test	1970-2010	Turkey	The economic growth is a factor affecting unemployment in Turkish economy but high and low rate in unemployment have no effect on the arising of economic growth.
Şentürk and Akbaş (2014)	Toda-Yamamoto and Bootsrap Causality Tests	2005:1-2012-7	Turkey	There is a bidirectional causality between economic growth and unemployment.
Ceylan and Şahin (2010)	Cointegration Test, TAR Model, M-TAR Model	1950-2007	Turkey	Okun's law is valid in the long run and this relationship is asymmetric for the Turkish economy
Yılmaz (2005)	Granger Causality Test	1978-2004	Turkey	There is no bi-directional relationship between economic growth and unemployment. Direction of causality is from unemployment to economic growth.
Barışık et al. (2010)	Markov Regime Switching Model	1988-2008	Turkey	Economic growth doesn't cause employment.
Altuntepe and Güner (2013)	Least Squares Method	1988-2011	Turkey	Economic growth in the services has a positive effect on employment. On the other hand, the increase in the total employment affects economic growth.
Dilber et al. (2015)	Panel Unit Root Test, Panel Cointegration Test	2001-2011	Turkey and EU Countries	There is a long-term cointegration relationship between economic growth and unemployment.
Altunöz (2015)	Engle-Granger and Johansen Cointegration Tests	2000:Q1-2014:Q1	Turkey	Okun's Law is not valid for Turkish economy.
Eser (2014)	Johansen Juselius Test, Error-Correction Model	1970-2010	Turkey	There is a negative relationship between economic growth and unemployment. Moreover causality runs from unemployment to economic growth.
SaraçveAtabey (2008)	Ordinary Least Squares Method, VAR Model	1951-2006	Turkey	There is a relationship between economic growth and unemployment. But this relationship is not strong.

Table 2 shows the literature survey of various papers for different countries.

Table 2: Overview Of Previous Studies For Other Countries

Author(s)	Methodology	Period	Country	Results
Akeju and Olenipekun (2014)	Johansen Cointegration Test, Error Correction Model	1980-2010	Nigeria	There is both the short and the long run relationship between unemployment rate and output growth.
Makun and Azu (2015)	Johansen Cointegration Test	1982-2012	Fiji	The evidence of long-run association among unemployment and growth, with cointegration running from investment and unemployment to increase in economic output.
Zagler (2003)	Vector Error Correction Model	France 1970:Q1-2000:Q2 Germany: 1968:Q1-1997:Q4 Italy: 1970:Q1-2000:Q2 The UK 1968:Q1-2000:Q1	France, Germany, Italy, The UK	Unemployment and output are cointegrated.
Kreishan (2011)	Cointegration Test, A Simple Regression	1970-2008	Jordan	Okun's law cannot be confirmed for Jordan.
Shahid (2014)	ARDL Model	1980-2010	Pakistan	There is a negative relationship between unemployment and economic growth.

2. Data and Methodology

In this study it is used quarterly data that covers the period of 2002-2014. The variables used are Growth Rate (GRTH) and Unemployment Rate (UNEMP). These variables are obtained from the Central Bank of the Republic of Turkey and Turkish Statistical Institute (TUIK). The data and resources are shown at Table 3.

Table 3: The Data Set

Variable	Explanation	Resources
GRTH	Growth Rate	CBRT
UNEMP	Unemployment Rate	TUIK

For analyzing and evaluating the correlation between the variables, following econometric methods were used:

- i. Unit Root Test
- ii. Johansen Cointegration Test
- iii. Impulse-Response Function
- iv. Variance Decomposition Test

3. Empirical Findings

Applying the VAR model to analyze the long run cointegrated relationship among the different variables firstly, it is necessary to test stationarity and the order of integration of the variables in the model. If some or all of the variables in the model are non-stationary, conventional hypothesis-testing and confidence intervals will be unreliable. All the data series are tested for stationarity to avoid statistically spurious relationships. For this purpose the Augmented Dickey-Fuller unit root test is used and test results are presented in Table 4.

Table 4: Results of ADF Unit Root Test

Variables	Level	First Difference	Test Critical Values		
			1% level	5% level	10% level
GRTH	-1.808361 (0.0674)	-6.117718 (0.0000)	-2.611094	-1.947381	-1.612725
UNEMP	-0.257550 (0.5879)	-3.091958 (0.0027)	-2.616203	-1.948140	-1.612320

The unit root test results show that variables are non-stationary at level form but do not contain unit root after first differencing.

Secondly, it is necessary to determine optimal lag length of VAR model using information criteria. Table 5 shows the optimal lag length selection for the VAR procedure under the sequential modified LR test statistic, final prediction error (FPE), Akaike (AIC), Schwarz (SC) and Hannan-Quinn (HQ) information criteria.

Table 5. VAR Model Lag Length Determination Criterion Results

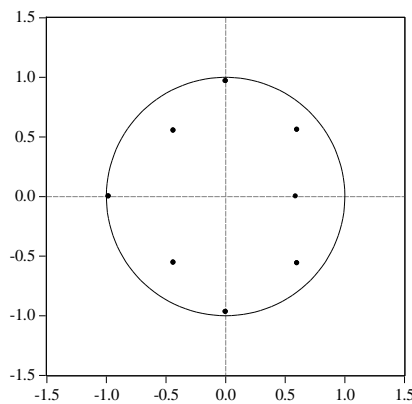
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-195.5561	NA	33.54608	9.188657	9.270574	9.218866
1	-190.4563	9.488067	31.88712	9.137502	9.383251	9.228127
2	-185.9339	7.993115	31.17333	9.113204	9.522785	9.264245
3	-174.6090	18.96260	22.25580	8.772511	9.345925	8.983969
4	-138.1731	57.61951*	4.956349*	7.263866*	8.001113*	7.535740*
5	-136.3198	2.758477	5.535582	7.363710	8.264790	7.696001
6	-133.1534	4.418240	5.845864	7.402482	8.467394	7.795189
7	-133.1145	0.050680	7.185699	7.586719	8.815463	8.039842

* Shows the laglength selected by the criterion.

The optimal lag length is 4 according to all information criteria.

The stability of the VAR model is tested using AR root graph that shows the inverse roots of the AR polynomial.

Graph 1: Inverse Roots of AR Characteristic Polynomial



The points in the graph are the inverse roots of the VAR model. It can be seen in the graph all the points are in the circle, which means the VAR (1) containing growth rate and unemployment rate is stationary.

In the next step Johansen trace and maximum eigen value cointegration tests are used to determine whether there is a long term relationship between growth rate and unemployment rate. The results of the trace and maximum eigen value tests are reported in Table 6 which shows the number of cointegrating vectors.

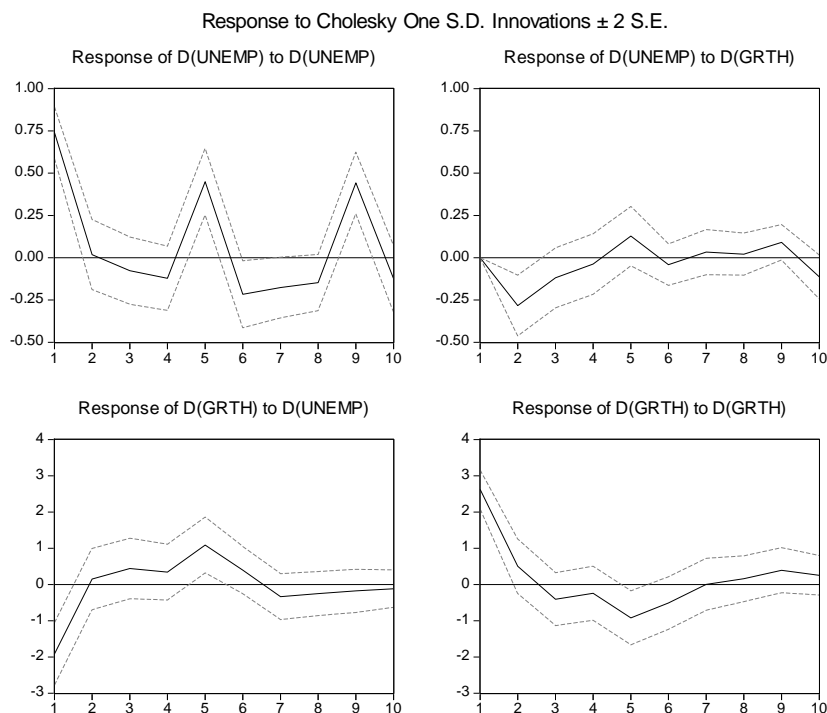
Table 6: Results of Johansen Cointegration Test

Number of Assumed Cointegration Equalities	Trace Test			Maximum Eigenvalue Test	
	Eigenvalue	Trace Statistic	0.05 Critical Value	Max-Eigen Statistic	0.05 Critical Value
0	0.003680	0.208724	15.49471	0.176960	14.26460
Maximum 1	0.000662	0.031764	3.841466	0.031764	3.841466

The cointegration tests showed that there is no cointegration among the variables. Hence, there is no long term relationship between growth and unemployment in Turkey.

To examine the short term relationship between unemployment and growth, impulse response functions and variance decomposition are used. The impulse response function for the variables was depicted in Graph 2.

Graph 2: Impulse-Response Functions



Impulse response functions indicate that growth shocks have a negative impact on unemployment rate but the effect goes down by degrees.

On the other hand, shocks in unemployment have positive impact on the growth at first, but the effect gets smaller.

Finally variance decomposition analysis is used to measure the proportion of forecast error variance in a variable that is explained by innovations in itself and the other variables. The variance decomposition of the VAR is presented in Table 7.

Table 7: Variance Decomposition

Variance Decomposition of UNEMP: Period	UNEMP	GRTH	Variance Decomposition of GRTH: Period	UNEMP	GRTH
1	100.0000	0.000000	1	34.78639	65.21361
2	87.26541	12.73459	2	34.11365	65.88635
3	85.47331	14.52669	3	34.75267	65.24733
4	85.61585	14.38415	4	35.23419	64.76581
5	87.33304	12.66696	5	38.72612	61.27388
6	87.81207	12.18793	6	38.68531	61.31469
7	88.10504	11.89496	7	39.18490	60.81510
8	88.32775	11.67225	8	39.39034	60.60966
9	89.62956	10.37044	9	39.09800	60.90200
10	88.81682	11.18318	10	38.98435	61.01565

According to variance decomposition, around 11 percent variation in unemployment rate is explained by growth rate in the 10th term. On the other hand, almost 39 percent variation in growth rate is explained by unemployment.

CONCLUSION

Unemployment rate is one of the main economic problems for Turkey. In spite of high economic growth in 2000's, unemployment rate is still over 10 percent. This situation brings to question why economic growth does not reduce unemployment. In this study it is tested the relationship between economic growth and unemployment empirically. The data covers 2002:Q1-2014:Q4 and Johansen cointegration test is applied to examine these relationship. The obtained findings show that the variables are not cointegrated. This result means that economic growth doesn't adequately create employment.

REFERENCES

- Akeju, Kemi F. and Dayo B. Olanipekun (2014), "Unemployment and Economic Growth in Nigeria", *Journal of Economics and Sustainable Development*, Vol. 5, No. 4, 138-144.
- Altunöz, Utku (2015), "Reel Büyüme ve İşsizlik Bağlamında Türkiye İçin Okun Yasası Analizi", *Kamu-İş*, Vol.14, No. 1, 29-44.
- Altuntepe, Nihat and Tuğba Güner (2013), "Türkiye’de İstihdam-Büyüme İlişkisinin Analizi (1988-2011)", *Uluslararası Alanya İşletme Fakültesi Dergisi*, Vol. 5, No. 1, 73-84.
- Barışık, Salih, Emrah İsmail Çevik, Nüket Kırıcı Çevik (2010), "Türkiye’de Okun Yasası, Asimetri İlişkisi ve İstihdam Yaratmayan Büyüme: Markov-Switching Yaklaşımı", *Maliye Dergisi*, No. 159, 88-102.
- Ceylan, Servet and Burcu Yılmaz Şahin (2010), "İşsizlik ve Ekonomik Büyüme İlişkisinde Asimetri", *Doğuş Üniversitesi Dergisi*, Vol. 11, No. 2, 157-165.
- Dilber, İlkey, Pınar Eryiğit, Emine Türkan Ayvaz Güven (2015), "Türkiye ve AB Ülkelerinde Ekonomik Büyüme ile İşsizlik Arasındaki İlişki: Panel Eşbütünleşme", *Uluslararası Alanya İşletme Fakültesi Dergisi*, Vol. 7, No. 1, 69-79.
- Eser, Burçin Yılmaz (2014), "Ekonomik Büyüme ve İşsizlik İlişkisi: Türkiye Örneği", *TİSK Akademi*, No. II, 26-47.
- Kanca, Osman Cenk (2012), "Türkiye’de İşsizlik ve İktisadi Büyüme Arasındaki Nedenselliğin Ampirik Bir Analizi", *Ç.Ü. Sosyal Bilimler Enstitüsü Dergisi*, Vol. 21, No. 2, 1-18.
- Kreishan, Fuad M. (2011), "Economic Growth and Unemployment: An Empirical Analysis", *Journal of Social Sciences*, Vol. 7, No. 2, 228-231.
- Makun, Keshmeer and Nnanna P. Azu (2015), "Economic Growth and Unemployment in Fiji: A Cointegration Analysis", *International Journal of Development and Economic Sustainability*, Vol. 3, No. 4, 49-60.
- Saraç, Taha Bahadır and Ayşegül Atabey (2008), "The Relationship Between Economic Growth and Unemployment in Turkey: 1951-2006", *Selçuk Üniversitesi Sosyal Bilimler Meslek Yüksek Okulu Dergisi*, Vol. 10, No. 1-2, 99-116.
- Shahid, Muhammad (2014), " Effect of Inflation and Unemployment on Economic Growth in Pakistan", *Journal of Economics and Sustainable Development*, Vol. 5, No. 15, 103-107.
- Şentürk, Mehmet and Yusuf Ekrem Akbaş (2014), "İşsizlik-Enflasyon ve Ekonomik Büyüme Arasındaki Karşılıklı İlişkinin Değerlendirilmesi: Türkiye Örneği", *Journal of Yasar University*, Vol. 9, No. 34, 5820-5832.
- Yılmaz, Özlem Gökteş (2005), "Türkiye Ekonomisinde Büyüme İle İşsizlik Oranları Arasındaki Nedensellik İlişkisi", *İstanbul Üniversitesi İktisat Fakültesi Ekonometri ve İstatistik Dergisi*, No. 2, 11-29.
- Zagler, Martin (2003), "A Vector Error Correction Model of Economic Growth and Unemployment in Major European Countries and an Analysis of Okun's Law", *Applied Econometrics and International Development*, Vol. 3-3, 93-118.