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# IMPACT OF ECONOMIC GROWTH ON UNEMPLOYMENT IN REPUBLIC OF MACEDONIA

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**Abstract**

*Any macroeconomic policy objective is to reach a sustainable economic growth with a low rate of inflation and unemployment. Unemployment as a social phenomenon is worldwide present a longer and often countries have been forced to make extremely large mobilization to eliminate or overcome this social phenomenon. Especially in transition economy countries such as Republic of Macedonia. Various studies have discussed the link between unemployment and economic growth. Most of these studies show a negative relationship between unemployment and economic growth. The Republic of Macedonia also has a low level of economic growth, therefore the purpose of this paper is to identify the impact of economic growth in the unemployment rate in the Republic of Macedonia. In this paper will be a regression analysis through economic growth model estimated by the method of OLS (Ordinary Least Squares) for the period from the year 1998-2013 in the Republic of Macedonia. Based on Okun's law, one would expect that Okun's coefficient to be negative, so that rapid output growth is associated with a decrease in the unemployment rate and slow economic growth or negative associated with high rate of unemployment. In this paper with a regression analysis through economic growth model estimated by the method of OLS for the period from the year 1998-2013 in the Republic of Macedonia the results show us that unemployment lag has a very significant positive relationship with the current unemployment.*

*Keywords: Macroeconomic issues, economic growth, unemployment, unemployment lag, relation, transition economy*

## INTRODUCTION

Various studies have discussed the link between unemployment and economic growth. Most of these studies show a negative relationship between unemployment and economic growth.
It is a simple economic reality that the number of labor force directly affects the growth of the GDP of a country. Not only labor force increased production of goods and services but leads to increased purchasing power, which also contributes to economic growth.

Also traditional negative relationship between unemployment and economic growth shows us Okun's law which tells us that when the growth rate is above trend pace of 2.25%, the unemployment rate falls. Especially, for every 1% increase in real GDP above trend pace achieved during the year, the unemployment rate falling to 0.5%: $\Delta U = -0.5 (Y 2.25)$

Wolfers (2000) have found that the growth of TFP (Total Factor Productivity) has a negative effect on unemployment. Fitoussi et al. (2000) used data for 19 OECD countries over the period 1960 to 1998 to find that the rate of Hodrick-Prescott mitigate the change in labor productivity has a negative effect on unemployment. Using individual data in the United Kingdom which covers the period 1982-1999,

Bräuninger and Pannenberg (2002) show that the increase in unemployment was accompanied by a decline in productivity growth in Europe and the US during the period 1960-1997. William (2005) estimates the link between employment and growth in real GDP in 10 developed countries. Search results demonstrate that economic growth has a direct effect on employment. When the economy grows, will increase employment and improve living standards. When the economy grows has a significant impact on employment growth and increased employment plays a major role in economic growth.

Soegner Leopold and Alfred Stiassny (2002) tested the Okun's law and claim a negative correlation between the unemployment rate and real output (GDP). Christian E. Weber (1996) investigated the Okun's law and stated that it is traditionally associated measure of the output gap in the unemployment rate which has been one of the facts of the business cycle.

Moosa (2008) estimates that there is no link between unemployment and economic growth. Unemployment represents one of the biggest problems in the Arab countries, particularly in non-oil producing countries. The search was made from 1990 to 2005 in four countries. This research describes unemployment in these countries does not represent a cyclical unemployment caused by the recession in the economy, but by other factors such as the high cost of doing business and what people do not have the capability to existing jobs. This research shows the Okuni josinjifikant law and the rate of economic growth does not interpret the problems of unemployment in these four countries.

Bakare (2012) conducted a study on the policy of stabilization, the crisis of unemployment and economic growth in Nigeria. He used OLS and found that the relationship between inflation, unemployment and economic growth in Nigeria were negative. Rafindadi (2012) conducted a study on the relationship between output and unemployment in Nigeria; OLS and the model he used the Threshold and found a linear negative relationship between production and unemployment.

## METHODOLOGY

During this analysis they are used 15 observations. Inflation, annual percentage change in real GDP, unemployment rate are all taken from the database of the World Bank. The rate of inflation measured by the consumer price index represents the annual change in the percentage of the cost for the average consumer of acquiring a basket of goods and services that can be fixed or changed at specified intervals, such as annually. Data on the annual growth rate in percentage of GDP are expressed at market prices based on local currency. Aggregates are based on dollars Constant US 2000 US GDP is the sum of gross value added by all resident producers in the economy plus any tax product and minus any subsidies not included in the value of products and is calculated without making deductions for depreciation of assets fabricated or for depletion and degradation of natural resources. Unemployment refers to the part of the labor force that is unemployed but able to look for work.

If a regression variables are not stationary, then it can be proved that the asymptotic analysis standard assumptions are not valid. T tests will not follow a normal distribution (t-student), so can not test hypotheses common.

Dickey and Fuller (Dickey and Fuller, 1979, Fuller 1976) are the first researchers tested formally unitary presence of a decrease in the time series. The main objective is to test the null hypothesis (H0) that the series contains a unitary root or alternative hypothesis (H1) that the series is stationary.

Based on the literature and the objectives of this study, the regression model is specified in the order as follows:

$$UNEMP = \int (INF, GROWTH, AGEDEP)$$

$$UNEMP_t = \beta_0 + \beta_1 INF_t + \beta_2 INF_{t-1} + \beta_3 GROWTH_t + \beta_5 UNEMP_{t-1} + \varepsilon_t$$

Ku,

$UNEMP$ = unemployment rate

$INF$= inflation rate

$GROWTH$= Annual change in real GDP as an indicator of economic growth

It should be noted that following the procedure of Puzon (2009), who used "the augmented version of Stiglitz's model" to capture inflation expectations, the delay of the first order of inflation is included in the model as a measure of the expected rate of inflation. Moreover, a delay of the first order unemployment is also included to determine if they can facilitate a better fit of the model as it has presented Puzon (2009). Following are the assumptions for signs of the explanatory variables:

a) Delay of unemployment is positively related to unemployment while unemployment will increase the likelihood of the current unemployment rate, if they are able to find a job.

b) Based on the Okun's law one would expect that the coefficient of Okun's be negative, so that the rapid increase in production associated with a decrease in the unemployment rate and slow economic growth or negative associated with high unemployment rate (Knotek, 2007).

## ANALYSIS AND RESULTS

In the table 1, we present p- values of Augmented Dickey-Fuller Test for each of our time series. Always reject the null hypothesis at the default level of 5%, then we accept the alternative hypothesis (H1) that the series are stationary. So, we can proceed with the evaluation of the model by traditional OLS method.

Table 1. p- values of Augmented Dickey-Fuller Test

| Time series | P-value 'Augmented Dickey-Fuller' Test |
|---|---|
| ***Unemp*** | *0,0215* |
| ***Inf*** | *0,0039* |
| ***Growth*** | *0,0162* |

In the table 2 below, we present the coefficients of economic growth model estimated by the method of OLS (Ordinary Least Squares). The traditional method OLS (Ordinary Least Squares) is known in econometrics to assess the linear regression model. In practice, optimization by OLS performed by minimizing the sum of squared errors of the model. OLS is consistent assessor when regressors are exogenous and don't have multikolinearity. To have parameters estimated to mistakes should be homoskedastic (with constant variance) and uncorrelated with each other. An additional hypothesis is used and normal distribution of errors.

Table 2. Coefficients of economic growth model (OLS estimation)

| Dep.variable: Unempl | Estimate | P-value |
|---|---|---|
| **CONSTANT** | ***2,735*** | *0,00837* |
| **Inf(t)** | ***-0,0431*** | *0* |
| **Inf(t-1)** | ***-0,089*** | *0,00845* |
| **Growth(t)** | ***-0,235*** | *0,0179* |
| **Unempl(t-1)** | ***0,812*** | *0* |
| **F-statistic** | ***344,45*** | *0* |
| **R-Squared** | ***0,6816*** | |
| **Adjusted R-Squared** | ***0,6753*** | |

In the table we assess the coefficient for each variable. The parameters are statistically valid. We are rejecting the hypothesis that the model assessed is invalid because alpha is statistically equal to zero (less than 5%). The adjusted value of R square show to us that the model estimated explains about 68% of the variance of the dependent variable. Accordingly, the model 2 is expressed in the form:

***Model 2***

$$\widehat{UNEMP}_t = \underset{(0.8437)}{1.955} - \underset{(-1.588)}{0.049}INF_t \_ \underset{(-4.829)}{0.091}INF_{t-1} - \underset{(-3.752)}{0.246}GROWTH_t + \underset{(0.9989)}{0.032}AGEDEP_t$$

$$+\underset{(5.632)}{0.73}UNEMP_{t-1}$$

$r^2=0.727$ $F=50.370$ $p=0.000$

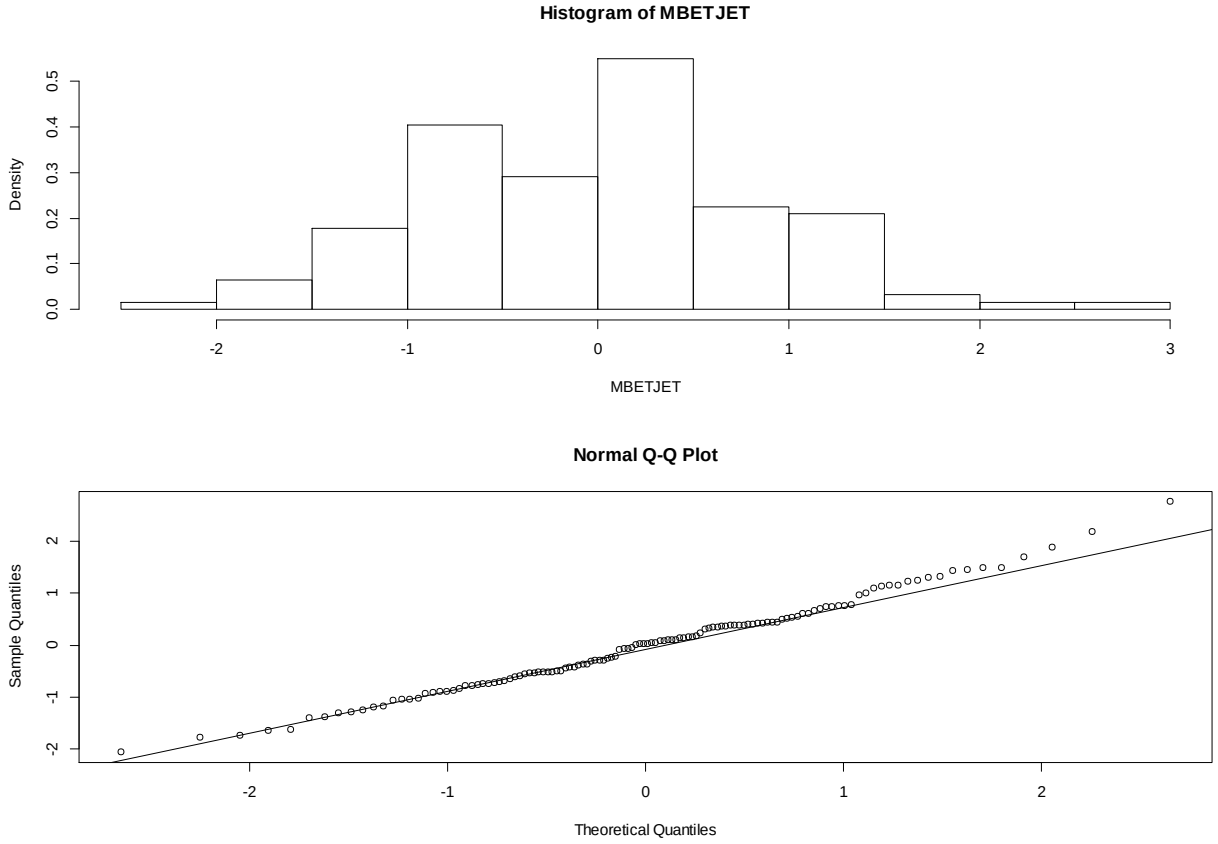
Model 2 shows that unemployment lag has a very significant positive relationship with the current unemployment. Although this can be suggestive of a lag in the results of fiscal policies that address the issue of unemployment and slow expansion of private businesses that could have generated employment. Puzon (2009) posits that the significance of the unemployment lag may indicate that fiscal policies in relation to inflation may not have an immediate effect and that there could be policy lags. This highlights the impetus of urgently addressing the unemployment problem to slow down, if not curb, its increase.

On the other hand, the survey results show that the negative relationship between unemployment and economic growth as our Okun's law applies to the Republic of Macedonia's significantly. For a one percent increase in the rate of economic growth, the unemployment rate decreased by 24. 6%.

Adjusted R-Squared of 66.75% associated with a statistically significancy, F-statistics of 50,370 shows that the model assumes a relatively good fit. R2 of 72.7% indicates that only 27.3% of the variation in the unemployment rate can not be explained by a change in any of the variables in the model.

In the chart below, check whether or not residues follow a normal distribution. Adapting to normal line distribution is generally good, we see some modest problems fitting in the extreme of straight line. Histogram is almost symmetrical about the value zero, then our model is not wrong in average.

Figure 1. Normal Distribution




## CONCLUSION

Any macroeconomic policy objective is to reach a sustainable economic growth with a low rate of inflation and unemployment. Unemployment as a social phenomenon is worldwide present a longer and often countries have been forced to make extremely large mobilization to eliminate or overcome this social phenomenon. Especially in transition economy countries such as Republic of Macedonia. Various studies have discussed the link between unemployment and

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