EMPIRICAL ANALYSIS OF ECONOMIC GROWTH AND UNEMPLOYMENT RATE FOR WESTERN BALKAN COUNTRIES

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Abstract: The purpose of this paper is to analyze the relationship between economic growth and unemployment rate, applying the Okun's Law for the case of Western Balkan Countries. The annual data are used which cover the time period from the year 2000-2017. It is used the difference version of Okun's Law, while the estimation procedure consists on panel regression models, such that fixed and random effects. The Hausman test is also performed to categorise between fixed or random effects for sample countries. The obtained results reveal that there is a negative correlation between economic growth and unemployment rate but statistically insignificant. The t-statistics is below the critical value, for both fixed and random effects. This implies that the null hypothesis of no relationship cannot be rejected. These results cannot confirm the hypothesis set in this research that there is a significant and negative relationship of unemployment and economic growth. Thus, the results imply that Okun's Law is not applicable for Western Balkan countries and the same cannot be used for forecasting purposes as well as conducting economic policies based on that. Accordingly, the implementation of economic policies related to structural change and reform in the labor market should be priority by policymakers.
Keywords: Economic growth, unemployment rate, Okun's Law, panel regression

1. INTRODUCTION

Reducing unemployment and achieving a high rate of economic growth are among the most essential priorities of both developed and developing country's economies. In terms of performance of a country's economy, economic growth and employment are two extremely important macroeconomic variables and are indispensable elements of the economic policies of all countries, regardless of their level of development.

Labour markets in Western Balkan countries (Albania, Bosnia and Herzegovina, Kosovo, North Macedonia, Montenegro, and Serbia) share a common adjournment that is low employment rate. Unemployment is considered as central economic and social issue that society face. Much has been written about labour market problems and unemployment for the Western Balkan (WB) countries, whereas there is little evidence about the relationship between unemployment rate and economic growth for this region. Therefore, the purpose of this paper is to analyze the relationship between economic growth and unemployment rate, applying the Okun's Law thru an empirical perspective. The hypothesis that is set in this research paper states: "There is a significant and negative relationship between unemployment and economic growth for Western Balkan countries". In fact, it is an extensively reputed postulate in economics that the growth rate of the GDP of an economy increases employment and reduces unemployment and vice-versa. This relationship has been found to be hold for several countries and regions, mainly in developed countries (see Lee, 2000; Farsio and Quade, 2003; Christopoulos, 2004).

According to World Bank systematic reports (2017, 2018) for the Western Balkan countries it is emphasized that the region achieved strong economic growth in the period 2000-2008, higher than the EU average. During this period, job creation helped to decrease somewhat the high rates of unemployment and driving down poverty in most countries in the region. However, the global financial and economic crisis severely hit the WB countries. Subsequently, most WB countries experienced a deep recession or a notable GDP slowdown except Albania and Kosovo, followed by a period of prolonged stagnation or repeated recessions and a very gradual economic recovery (Uvalic and Cvijanovic, 2018).

2. EMPIRICAL LITERATURE

Arthur Okun (1962) examined for the first time the empirical relationship between the rate of growth of GDP and the variation in the rate of unemployment. The "gap version" of Okun's Law suggests that for every 1% increase in the unemployment rate, a country's GDP will be roughly an additional 2% lower than its potential GDP. This simple observation became a fixture in most undergraduate macroeconomic textbooks (Ball et al. 2013).

After the study of Okun (1962), there is a large body of empirical literature that analyse the relationship between unemployment rate and economic growth for different countries. For instance, Lee (2000) conducted a study for 16

OECD countries and supported Okun's law as he finds a strong relationship between economic growth and unemployment. At the other side, Freeman (2001) analyzed the Okun's law for ten industrial countries (US, UK, Japan, Canada, Germany, Italy, France, Netherlands, Sweden, Australia) including new developments with trend decomposition and found that Okun's coefficient which was originally three points, is less than two point's growth in GDP for every one percent change in unemployment rate for the sample countries.

Pierdzioch et al. (2009) examined the relationship between economic growth and unemployment for G7 countries covering the period 1989-2007. Their results confirmed the consistency between Okun's law and professional economist's forecasts of changes in unemployment rate and the real output growth rate. They also found a negative relationship between unemployment and output. Wang and Abrams (2007) found similar results of a negative relationship between economic growth and unemployment for 20 OECD countries for the period between 1970 and 1999.

Neely (2010) noted that industrialized countries with less regulated labour markets tend to have smaller Okun's coefficients. This is because unemployment is more sensitive to changes in output since it is easier to lay off workers. He adds, "The Okun's coefficient can change over time because the relationship of unemployment to output growth depends on laws, technology, preferences, social customs, and demographics".

Owyang and Sekhposyan (2012) investigated the degree of time variation in the unemployment and output fluctuations over the business cycle for U.S. case. They found a great degree of instability in the historical performance of Okun's law. The breakdowns in Okun's law seemed to be highly correlated with the business cycle. The detected break dates of the largest changes the coefficients appeared to be around recessions.

Ball, Leigh, and Loungani (2013) examined how well Okun's Law fits short-run unemployment movements in the United States since 1948 as well as in twenty advanced economies since 1980. They found that Okun's coefficient is highly significant for most of countries. They also disclosed that the coefficient varies substantially across countries. This variation is partly explained by individual features of national labour markets, but it is not related to differences in employment protection legislation.

Ceylan and Şahin (2010) investigated the Okun's coefficient for the economy of Turkey using annual data from 1950 to 2007. In order to test the asymmetric relation, co-integration analysis including TAR and M-TAR models were used. They reveal that the Okun's law is applicable on the economy of Turkey in the long-term and the relationship is asymmetric.

Regarding the Western Balkan countries which are in the focus of the present study, there exist only few studies that examine the relationship between unemployment rate and economic growth.

Balliu J. (2016) analyses the impact of macroeconomic indicators on unemployment rate in Western Balkan (Albania, Bosnia and Herzegovina, North Macedonia, Montenegro, and Serbia). He reveals that the labor market conditions and developments in the Western Balkan economies share a number of similarities. These economies have a unique challenge which is high unemployment rate that affects negatively the economic growth.

Sadiku al. (2014) empirically show the relationship between economic growth and unemployment rate in North Macedonia applying the Okun's Law. For analysing the Okun's coefficient are used four types of models such that, the difference model, the dynamic model, ECM, and VAR estimation approach. They find that there is a negative relationship between changes in economic growth and changes in unemployment.

Thus, this research study attempts to fulfil the gap in the literature on this subject for the Western Balkan countries using a longer time series and including the latest data.

3. METHODOLOGY AND DATA

This section of the paper aims to explain the methodology and data for testing the hypothesis that is set in this research paper: "There is a significant and negative relationship between unemployment and economic growth for Western Balkan countries". The estimation strategy consists on pooled OLS as well as panel regression analysis, i.e., fixed effects, random effects. Panel data regression models have both a cross-sectional and a time series dimension, where all cross-section entities (in this case Western Balkan countries) are observed during the time period (2000-2017). The Hausman test is also performed for choosing between fixed and random effects and the appropriate model for the sample countries.

3.1 Data and Descriptive statistics

The yearly data are used in the empirical analysis, covering the period 2000-2017. The main sources of data are the World Development Indicators (World Bank) and IMF. The used variables in the analysis are described in the table below as well as descriptive statistics with central tendency summary measures are performed and displayed in Table 1.

Table 1. Description of variables and data sources

Variable	Abbreviation	Description	Source
Real GDP growth	RGDPG	Real GDP growth (Annual %)	WDI World Bank
Unemployment Rate	UNEMP	The number of unemployed as percentage of the labor force	WDI World Bank, IMF

The following table gives the summary statistics for the data used in the empirical analysis. In total there are 90 observations. The mean, the standard deviation and the minimum and maximum values of the data are summarized for a better understanding of the data pattern.

Table 2. Descriptive Statistics of the data

Variable	Observation	Mean	Standard Deviation	Min	Max
RGDPG	90	3.475318	2.905869	-5.795093	9.702753
UNEMP	90	22.98334	7.012148	12.6	37.25

Source: Authors' calculation

3.2 The specification of econometric model

As it was emphasized, the negative relationship between unemployment rate and GDP growth is first documented by Arthur Okun's in 1962. The empirical hypothesis is set as following: "Growth decelerate causes unemployment rate to increase". This relationship is more statistical rather than structural economic framework. The Okun's coefficient is widely used as a benchmark to measure the connection between these two variables. Okun's law has different versions which are: difference version, gap version, dynamic version and production function approach. Every method has its own pros and cons which is based on assumptions formulated by the researcher (Javed, 2005).

In this study is used the difference version based on Okun's Law. It was chosen because of the data availability. Also, this version of Okun's law avoid requiring strong—and sometimes controversial— assumptions regarding the definition and computation of potential output and full employment that "gap version" of Okun's law requires.

The Difference Version Approach:

$$U_t - U_{t-1} = \beta_0 + \beta_1(Y_t - Y_{t-1}) + \varepsilon_t$$

Where: U_t = Unemployment rate in period t

Y_t = GDP growth in time period t

ε_t = Error term

This equation shows how the growth rate and unemployment rate change simultaneously. β_1 is the Okun's coefficient and the expected sign is negative. This means that an increase in growth rate would lead to a decrease in the unemployment level and a reduction in output is associated with rise in unemployment.

4. EMPIRICAL RESULTS

In this section are displayed the empirical results of pooled OLS, panel regression models based on fixed and random effects. According to the obtained results it is obvious that there is a negative relationship between changes of economic growth and changes of unemployment rate but statistically insignificant in all three models. The t-statistics is below the critical value of 2 in Pooled OLS and both fixed and random effects. This implies that the null hypothesis of no relationship cannot be rejected. Also, the coefficient of determination that process the goodness of fit of data is extremely low. As a consequence, the results imply that Okun's Law is not applicable for Western Balkan countries and the same cannot be used for forecasting purposes as well as conducting economic policies based on that. Probably, beside the economic factors, the social and political factors have influenced to the evolution of these two basic macroeconomic indicators being uncorrelated to each other. One of the characteristics of the labour market in Western Balkan was its instability over the past three decades. The labour market suffered from political instability and bad economic policies that led to disturbances in the labour market and have contributed to very high rates of unemployment alongside of economic growth.

Table 3. Regression results

Variable	Pooled OLS	Fixed Effects	Random Effects
D_GDPG	-0.0109213	-0.0075164	-0.0108163
	(-0.17)	(-0.11)	(-0.17)
Constant	-0.3903274	-0.3897896	-0.3903274
	(-1.83)	(-1.81)	(-1.83)
R-sq	0.0003	0.0003	0.0003
Number of obs	85	85	85
Number of groups	5	5	5
Hausman test	-	Prob>chi2 = 0.7565	

Note: t statistics are given in parenthesis
Source: Author's calculation

As a relationship between changes in the unemployment rate and economic growth, Okun's law predicts that growth slowdowns typically coincide with rising unemployment. This research shows, however, that this is not always the case. Knotek (2007) has documented several reasons for this. First among these is that Okun's law is not a tight relationship. There have been many exceptions to Okun's law or instances where growth slowdowns have not coincided with rising unemployment. This is true when looking over both long and short time periods. This is a reminder that Okun's law—contrary to connotations of the word "law"—is only a rule of thumb, not a structural feature of the economy.

5. CONCLUSION

The purpose of this research paper was to study the relationship between unemployment rate and economic growth for Western Balkan countries (Albania, Bosnia and Herzegovina, Montenegro, North Macedonia and Serbia). The difference version of Okun's Law was used for estimating the relationship. The Okun's coefficient was estimated through panel regression analysis, i.e fixed and random effects. The results reveal that there is no correlation between these variables for the case of Western Balkan countries. This implies that Okun's Law is not applicable for this set of countries. Therefore, the Western Balkan countries are not yet in a situation whereby the current levels of economic growth guarantee a return to job growth. The transition to modern market economies is not yet complete, and many structural issues remain to be addressed (World Bank, 2017). Accordingly, the implementation of economic policies oriented to structural change and reform in the labor market should be priority by policymakers.

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