THE ECONOMIC GROWTH AND THE UNEMPLOYMENT RATE

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Abstract: *The unemployment rate is one of the most important macroeconomic indicators. The change of the unemployment rate is highly correlated with the phase of the economic cycle. The economic growth has positive impact on employment issues, while the negative growth will result in increasing unemployment. In terms of the future economic outlook, it is important to analyze the evolution of the unemployment rate. This study focuses on examining the relationship between the economic cycle and the long-term unemployment rate. The method of regression analysis and the descriptive statistics of Eurostat data source were used.*

Key words*:* unemployment rate, economic growth, labor market.

JEL Classification Codes: O43, E24, I23.

1. INTRODUCTION

The unemployment rate is a macroeconomic indicator that reflects the inability of an economy to fully utilize the labor resources. The phenomenon itself is based on concentrating the social-economic activity, improving the high efficient means of production, more people able to fill in the available jobs in the economy than their actual number, or the imbalance between the labor supply and the available jobs within a region or a country. Unemployment has two negative economic effects: the economic effort of paying the unemployment aids, on the one hand, and the existence of a percentage of the labor resources that cannot be used to increase the production of goods and services, on the other hand (Anghel, Anghelache, Manole, 2017). Thus unemployment has direct implications on the evolution of the Gross Product and implicitly on the economic growth.

The specialized literature had paid special attention to the economic growth, since the general well-being of a society depends on its level. The economic growth is desired in any country because it enables the population to consume more goods and services and at the same time it contributes to the provision of a greater amount of goods and social services, such as health, education, thus leading to a real improvement of the living standards.

Knowing the relation between these two macroeconomic variables (the unemployment rate and the economic growth rate), as well as their forecasts, is important for any state. Any economic program includes measures aimed at achieving the main objectives of the macroeconomic policy, among which the employment and the economic growth are perhaps the most important, along with the price stability and the balance of external payments (Anghelache, 2006).

In the second half of the 20th century, the economist Arthur Okun analyzed the relation between the unemployment rate in the economy and the Gross National Product. Since the employed persons participate in the production of material goods and services, and the unemployed persons do not produce economic goods, it can be assumed that the unemployment

rise implies a reduction in the real volume of GNP. This negative relation between the unemployment rate and the volume of GNP is called Okun's law.

Okun proposed initially a single model to describe the dependence of the GDP evolution on the unemployment rate and the dependence of the unemployment rate on the GDP evolution (Okun, 1962). This approach was proven to be flawed, demonstrating the need to use two distinct models to describe the relation between the two variables (Okun, 1970). The parameters of the models that describe this interdependence can vary in time and space depending on the structure of the analyzed economy. Okun states that there is a reciprocal correlation between the unemployment rate and the economic growth, which shows an inversely proportional relation between the change in the growth rate of the Gross Domestic Product and the unemployment rate. Basically, Okun showed that the reduction of the unemployment rate by 1% would be due to the increase of the Gross Domestic Product by 3%.

There are other studies that highlight the relation between the growth rate of real GDP and the unemployment rate. Walterskirchen (1999) investigated the correlation between the evolution of the GDP, the employment and unemployment rates in the European Union. Analyzing the time series in EU member countries, he shows that there is a strong negative linear correlation between the evolution of the real GDP and that of the unemployment rate. Mura et all (2000), analyzing the same correlation for the member countries of the Visegrad Group, finds that there is a weak link between the GDP growth rate and the unemployment rate in the analyzed period (2008 – 2019). Hjazeen et all (2021), analyzing the correlation between the economic growth and the unemployment rate in Jordan between 1991 and 2019, reaches the opposite conclusion, namely that there is a strong, negative relation between them and mentions that a positive evolution of the Gross Domestic Product can represent an important solution for reducing unemployment. Nagel (2015) also analyzed the relation between the economic growth and the unemployment rate and identified a negative correlation between the two indicators. Admed (2013), analyzing the same correlation for the SAARC countries (Bangladesh, Bhutan, Pakistan, India, Sri Lanka) for the period 1990-2010, found that the relation between the change in the rate of economic growth and the unemployment rate is different depending on the country. Magnani (2013), who used Solow's model, concluded that an increase in the aggregate demand leads to a reduction in unemployment.

2. RESEARCH METHODOLOGY

To study the correlation between the economic growth of a country, expressed by the annual growth rate of the Gross Domestic Product, and the unemployment rate, we analyzed the data series from 2001 to 2020. Therefore, we considered that the growth rate of the Domestic Product Gross represents the independent variable and the unemployment rate the dependent one. We took into account the unemployment rate for the 20-64 age group, which is the most relevant for the purpose of the research. The two series of data were interpreted both from the point of view of the chronological evolution and from the point of view of the correlation between the two mentioned indicators for the all central and south-eastern European Union member countries, part of the former communist bloc until 1989, except for Greece. We used a regression model to investigate the empirical relation between the two variables and used the Data Analysis section of Excel to interpret the results. The method allows the estimation of the coefficients of a linear model by the method of least squares and the calculation of the statistics required for the associated statistical tests. To estimate the parameters of the model, we used 20 observations on the variables in the model. The statistical data we used are those provided by EUROSTAT.

3. RESULTS

One of the objectives of this paper is the analysis of the annual GDP growth rate and the unemployment rate. The data related to the two indicators refer to a time interval of 20 years, enough for this analysis to be relevant. The period 2001 – 2020 can be divided into several sub-periods:

- the period 2000 – 2008 was characterized by economic growth for those countries which, except for Greece, were part of the communist bloc; the unemployment rate was high in many of those countries in the first part of that period;
- 2009 – 2011 (in some countries this period extends until 2012 or even 2013): is the period of the great economic and financial crisis that shook the world economy;
- 2012 – 2019: recovery after the crisis;
- 2020: the onset of another crisis, the sanitary one, with negative effects also in economic terms.

The first analyzed indicator is the growth rate of the Gross Domestic Product. The calculation of this indicator allows comparisons of the evolution of economic development both in time and between economies of different sizes.

Table 1. Percentage change in GDP compared to the previous years (%)

	Bulgaria	Czech Republic	Greece	Croatia	Hungary	Poland	Romania	Slovenia	Slovakia
2001	3.8	3.0	4.1	3.0	4.1	1.3	5.2	3.2	3.3
2002	5.9	1.6	3.9	5.7	4.7	2.0	5.7	3.5	4.5
2003	5.2	3.6	5.8	5.5	4.1	3.5	2.3	3.0	5.5
2004	6.5	4.8	5.1	4.1	5.0	5.0	10.4	4.4	5.3
2005	7.1	6.6	0.6	4.3	4.3	3.5	4.7	3.8	6.6
2006	6.8	6.8	5.7	4.9	3.9	6.1	8.0	5.7	8.5
2007	6.6	5.6	3.3	4.9	0.3	7.1	7.2	7.0	10.8
2008	6.1	2.7	-0.3	1.9	1.0	4.2	9.3	3.5	5.6
2009	-3.3	-4.7	-4.3	-7.3	-6.6	2.8	-5.5	-7.5	-5.5
2010	1.5	2.4	-5.5	-1.3	1.1	3.7	-3.9	1.3	6.3
2011	2.1	1.8	-10.1	-0.1	1.9	4.8	1.9	0.9	2.6
2012	0.8	-0.8	-7.1	-2.3	-1.3	1.3	2.0	-2.6	1.4
2013	-0.6	0.0	-2.5	-0.4	1.8	1.1	3.8	-1.0	0.7
2014	1.0	2.3	0.5	-0.3	4.2	3.4	3.6	2.8	2.7
2015	3.4	5.4	-0.2	2.5	3.7	4.2	3.0	2.2	5.2
2016	3.0	2.5	-0.5	3.5	2.2	3.1	4.7	3.2	1.9
2017	2.8	5.2	1.1	3.4	4.3	4.8	7.3	4.8	3.0
2018	2.7	3.2	1.7	2.9	5.4	5.4	4.5	4.4	3.8
2019	4.0	3.0	1.8	3.5	4.6	4.7	4.2	3.3	2.6
2020	-4.4	-5.5	-9.0	-8.1	-4.5	-2.2	-3.7	-4.2	-4.4

Source: Eurostat

As the table above shows, in the first part of the analyzed interval, until the onset of the economic-financial crisis from 2007 to 2011, the countries of center and south-east European Union recorded sustained economic growth. These countries, part of the former communist bloc until 1989, completed the period of transition to the market economy, restructuring the economy,

intensified economic relations with the other states of the European Union, benefited from non-reimbursable funds and overcame the period of severe recession specific to the 90s of the last century. The growth rate of the Gross Domestic Product during this period was different from one country to another, Romania and Bulgaria registering the highest values of this indicator, and Poland, Greece and Hungary the lowest.

The economic crisis caused a severe recession in the world economy, and the analyzed countries were also affected. The only country that recorded an increase in the Gross Domestic Product was Poland. Otherwise, all the other analyzed countries were affected, Greece, Romania and Croatia the most.

The recovery after the crisis was different: Greece only started to have economic growth in 2017, in Croatia and Slovenia the crisis lasted until 2014, respectively 2013, other countries (Romania, Slovakia, the Czech Republic, Bulgaria) returned faster to a positive, upward evolution of their economies. Given all the difficulties these countries experienced due to the crisis, we witnessed the stabilization of the Gross Domestic Product and favorable prospects until 2019.

Unfortunately, the health crisis generated by the coronavirus pandemic at the beginning of 2020 interrupted these favorable prospects for the economies of central and south-eastern European countries, the prospect of a severe economic crisis being currently amplified by the increase in energy and food prices and inflation, amid the conflict in Ukraine.

The second indicator, the unemployment rate, corresponded to the stage of development and the concrete situation in each country until the economic-financial crisis (which began in central and south-eastern Europe in 2009).

Table 2. The unemployment rate (%)

	Bulgaria	Czech Republic	Greece	Croatia	Hungary	Poland	Romania	Slovenia	Slovakia
2001	19.7	7.7	10.5	15.3	5.5	17.9	6.7	6.0	17.9
2002	17.7	7.0	10.1	14.1	5.6	19.6	8.4	6.1	17.6
2003	13.4	7.5	9.6	13.6	5.7	19.4	6.9	6.5	16.7
2004	11.7	8.0	10.4	13.1	5.9	18.9	7.7	6.2	17.6
2005	9.8	7.6	9.8	12.3	7.0	17.7	7.0	6.5	15.7
2006	8.6	6.9	8.9	11.0	7.3	13.8	7.0	5.9	12.8
2007	6.6	5.2	8.3	9.4	7.3	9.6	6.3	4.8	10.7
2008	5.4	4.3	7.7	8.1	7.7	7.0	5.6	4.3	9.2
2009	6.6	6.5	9.5	8.8	9.9	8.1	6.7	5.8	11.7
2010	10.0	7.1	12.7	11.1	11.1	9.5	7.0	7.3	14.0
2011	11.0	6.5	17.8	13.2	11.0	9.5	7.2	8.2	13.2
2012	12.0	6.8	24.3	15.5	10.9	10.0	6.7	8.9	13.6
2013	12.7	6.8	27.3	16.6	10.0	10.2	7.1	10.2	13.9
2014	11.3	6.0	26.4	16.5	7.6	8.9	6.7	9.8	12.9
2015	9.1	5.0	24.9	15.5	6.7	7.4	6.7	9.0	11.3
2016	7.6	3.9	23.5	12.5	5.0	6.1	5.7	8.1	9.5
2017	6.1	2.8	21.4	10.8	4.0	4.8	4.8	6.6	7.9
2018	5.1	2.2	19.3	8.2	3.6	3.8	4.0	5.1	6.4
2019	4.2	2.0	17.3	6.4	3.3	3.2	3.7	4.4	5.6
2020	5.1	2.5	16.4	7.0	4.2	3.1	4.8	4.9	6.6

Source: Eurostat

Bulgaria, facing major structural imbalances at the end of the last decade of the last century, had high unemployment rates between 2001 and 2004, but quickly absorbed due to the economic policies taken by the government in Sofia. Croatia, Poland and Slovakia also experienced high unemployment rates during the same period. These countries, especially Poland, chose rapid restructuring, but accompanied by high unemployment. In the same period, Romania, Slovenia, the Czech Republic or Hungary registered a low level of unemployment, especially due to the increase in the volume of foreign investments and the attraction of European funds (except for Romania, where the low unemployment rate was due to the external migration of labor).

The economic crisis at the end of the first decade led to an increase in the unemployment rate. The most affected country was Greece, where the unemployment rate reached a high of 27.3% in 2013. High unemployment rates were also recorded in Croatia, Slovakia, Bulgaria and Hungary. Romania and the Czech Republic were the countries least affected by unemployment, with the unemployment rate hovering around 7%.

After the crisis, the unemployment rate fell in all countries, with the health crisis at the beginning of 2020 not significantly affecting this development, due to the governments' measures to support economic agents and preserve jobs.

In order to study the correlation between the two previously mentioned indicators, we created an econometric regression model, using the unemployment rate as the dependent variable and the growth rate of the Gross Domestic Product as the independent variable.

Table 3. The linear regression between the unemployment rate and the real GDP

	Regression Statistics		Coefficients	Significance F
Bulgaria	Multiple R	0.184183	8.964825	0.824649
	R Square	0.033923	0.236123	
Czech Republic	Multiple R	0.135302	5.410632	0.569525
	R Square	0.018307	0.082573	
Greece	Multiple R	0.369389	15.64805	0.108962
	R Square	0.136448	-0.53203	
Croatia	Multiple R	0.179372	11.72818	0.449234
	R Square	0.032174	0.146413	
Hungary	Multiple R	0.42669	7.701333	0.060628
	R Square	0.182065	-0.33318	
Poland	Multiple R	0.002614	10.4006	0.991272
	R Square	6.83E-06	0.00699	
Romania	Multiple R	0.036525	6.295673	0.878495
	R Square	0.001334	0.010529	
Slovenia	Multiple R	0.213014	6.954973	0.367216
	R Square	0.045375	-0.1079	
Slovakia	Multiple R	0.265693	11.29156	0.257548
	R Square	0.070593	0.269443	

Source: own results

The data above show that the change in the growth rate of the Gross Domestic Product has no influence on the unemployment rate in Poland and Romania (regression values close to zero). The correlation between the two indicators is low in countries such as Bulgaria, the Czech Republic, Croatia, Slovenia, Slovakia (regression values between 0.3 and 0.8). A somewhat stronger correlation is found in Hungary and Greece (regression values of 0.182065 and 0.136448, respectively). The fact that the value of Significance F is very high (it should be less than 0.05) shows that there is a very weak correlation between the two indicators.

4. CONCLUSIONS

The first part of this paper analyzes the evolution of the growth rate of the Gross Domestic Product and the unemployment rate between 2001 and 2020. We identified 3 sub-periods, two periods of positive, upward evolution of the economies of the analyzed countries, separated from the period the economic-financial crisis at the end of the first decade of the current century. The analysis showed a different evolution of the two indicators in the analyzed countries.

We used a regression model to study the connection between the two indicators. The results obtained show a weak relationship between the two indicators in all the analyzed countries, with obvious differences for each country. These results correlate with the results of other researchers (Paweta, 2018). The reason is that the economic-financial crisis that significantly affected the economies of the analyzed countries (except for Poland) substantially changed the relation between the two indicators, since there is a time gap between the change in the economic growth rate and the change in the unemployment rate. On the other hand, the change in the growth rate of the Gross Domestic Product is not the only indicator that influences the unemployment rate, new research is needed to expand this issue.

The Covid crisis (year 2020) does not significantly affect the results obtained by applying the regression model. If the growth rate of the Gross Domestic Product fell sharply in 2020, the unemployment rate remained constant (given the government intervention to save jobs). This development is yet another argument that there is a time lag between the change in the economic growth rate and the unemployment rate.

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