

## **THE IMPACT OF THE ECONOMIC CRISIS ON THE LABOR MARKET FROM ROMANIA**

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### **ABSTRACT**

*The issue of the labor market is one of the actuality. The employment deficit occupies a special place. The purpose of this paper is to analyze the employment shortage in the post-crisis period. We have also attempted to make forecasts of labor market indicators for the period 2018-2020. Data are used from Eurostat and the National Institute of Statistics from Romania. The forecasts were made using the E-views soft.*

**KEYWORDS:** *shortage, employment, prognosis, crisis.*

**JEL CLASSIFICATION:** *J21, J23, C53, A11*

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### **1. INTRODUCTION**

In an era of rapid technological change, information exchange and the emergence of intensive knowledge industries, it is difficult to identify the future demands of the labor market. Increased unemployment in the Member States of the European Union and in developing countries in Eastern Europe combined with technological change can lead to a continuous change in labor market requirements, taking into account the fact that the educational offer needs to be matched to the labor market demanded. EU Member States surveyed several employment forecasting methods to identify future workforce needs that take into account occupational, educational and training factors that influence job demand and supply.

Several Eastern European countries are interested in developing such models in order to provide the labor market with the required training. Taking into account the requirements of the Single Labor Market and increasing international mobility, states need to develop models that can be comparable to predictive methods for training and qualifications with those existing in EU Member States. This objective implies regular medium-term forecasts that will be extended over time by decision-makers that can be applied across the national economy, taking into account factors such as: future investment in the economy, revenue forecasts and labor productivity and, of course, technological exchanges. Developing such predictions will require the use of quantitative and qualitative methods that will systematically organize and integrate data and analysis on education and training, as well as occupational needs.

The Netherlands and France are two European countries with vast experience in the field of occupational and educational forecasting, Ireland being the country that has joined them most recently. France has the longest tradition in occupational and educational needs prediction, followed by the Netherlands and Ireland, which have recently developed expertise in this field (Eijs, 1994). In the Netherlands, the government has a legal responsibility to provide adequate education for all individuals or groups at all levels of education. People who are responsible for decision-making are

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therefore obliged to try and anticipate demand for education at different levels and to provide the necessary resources and educational facilities to match demand with labor supply. These forecasts were made in the Netherlands by the Central Planning Bureau, which was established since the inception of the first oil crisis, which made estimates for four levels of education and for four branches of activity. The primary objective of the ROA approach was to provide information on current and future developments in both the educational and occupational labor market that is representative and integrated with the relevant information in the economy that distinguished between different occupations and different types of education and vocational training.

The Dutch information system is centered on providing data for future labor market forecasts, for example: Dekker, de Grip and Heijke (1994) used the forecasting models used by ROA. There were elements of risk for people who were looking for a certain level of education, occupation and a sector in which to work; the labor market information system ROA has provided the Netherlands with a range of cyclical employment risk indicators in different sectors and occupations for people with a particular education and qualification and providing information on the number and type of occupations with different educational and vocational qualifications (Lindskog, 2004).

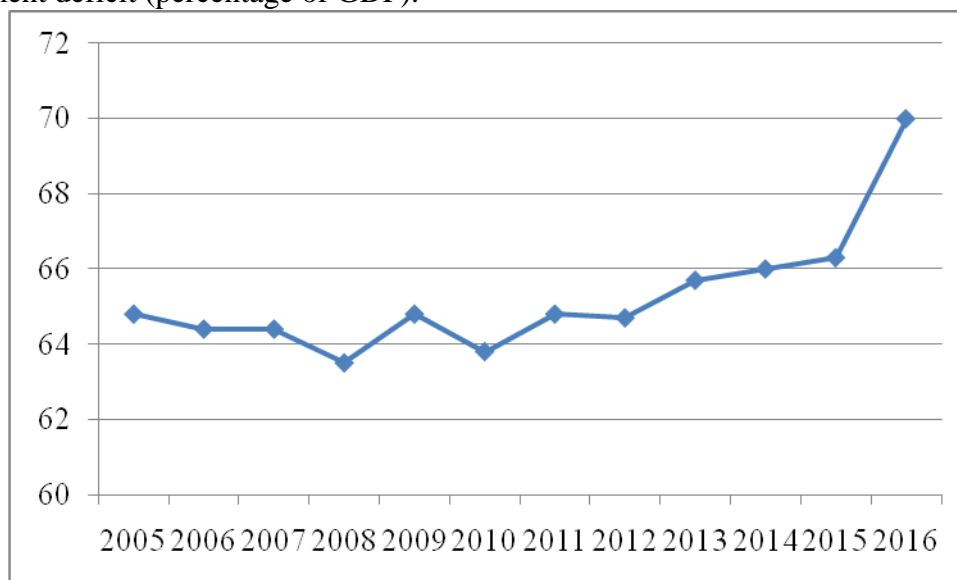
Occupational forecasts for Ireland have only been published since 1993. The main objectives of the Irish forecast were to provide information on changing occupations and to identify possible changes in future labor market demands. An important classification of sectors and occupations has been used and predictions have helped to determine the medium-term strategies of the labor market and to facilitate the planning of education and training needs by the National Employment and Training Authority (Foras Aiseasura Saothar- FAS).

The employment projections are conducted by the Center for Political Studies (COPS), a research center at Monash University that deals with the quantitative analysis of issues relevant to Australia's economic policy. The COPS system has been in use since 1994 to provide services to governmental agencies responsible for vocational and educational training in Australia. The COPS forecasts are carried out in the economic framework that integrates a macro model (to determine aggregate employment), an applied general equilibrium model (to determine occupancy in industry) and an extension of the labor market (occupational occupation determination). Monash's role was to provide a framework for incorporating relevant data into the pretense process. Monash includes a large set of data, such as national accounts, entry-exit tables, population census, foreign trade statistics, income and expenditure surveys (Bombach). With regard to future work demand, the predictions of the relevant exogenous variables in the model are integrated into a pattern of balance, eg the Australian Agriculture and Economic Bureau. A Monash forecast for labor demand runs through five stages (Meagher G.A.).

In Canada, the Human Resource Development Department (HRDC) has developed the Canadian Occupation Projection System. COPS provides information for growth, industry and, in particular, occupations. Occupational projections have a long tradition in Canada dating back to 1969, being carried out by the Canada Forecast Department. Initially, the Labor Market Development Reports were purely informational. In 1980, the information system of the labor market in this country, which had an extensive quantitative framework, began to expand. COPS is the basis for the development of an integrated system of demand and supply projections by activity and occupation sectors. The development of occupational projections at national and provincial level has been facilitated over the past 15 years by the provincial federal partnership including ten provinces and the Department of Human Resources Development in Canada. COPS is an integrated forecast supply model for labor supply and demand 139 occupations and 5 levels of education. Since the mid-1990s, he has provided additional information on the dropout rate in education, immigrants and those who have dropped out of school and want to continue their studies (Paul S., 2003).

## 2. THE METHODOLOGY

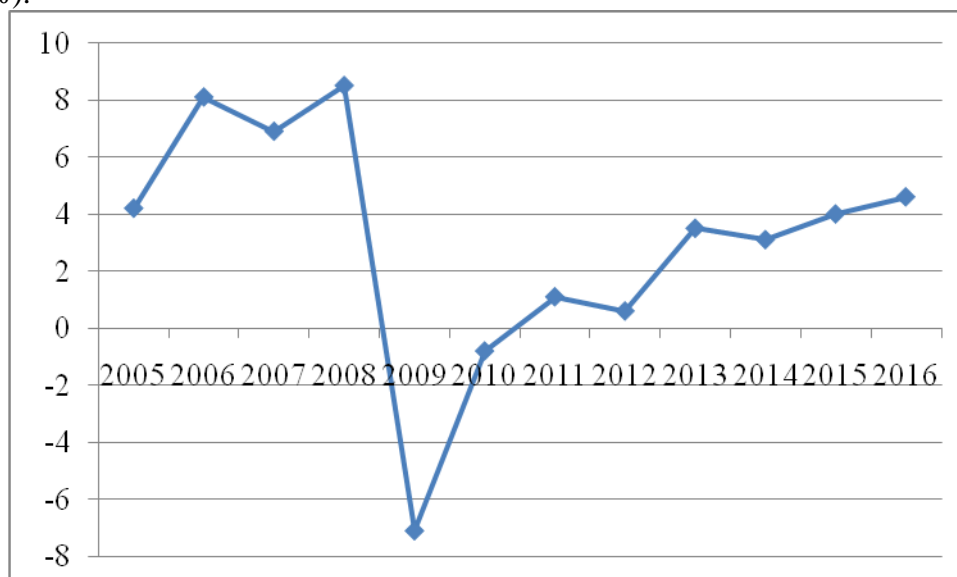
The objective of the paper is to determine the relationship between the employment, the investments and the economic growth. We used a multiple regression model for make prognosis. The main factors for analysis of the employment are: unemployment, real GDP economic growth, the government deficit (percentage of GDP).



**Figure 1. The evolution of the employment rate in Romania between 2005 and 2016**

*Source: Eurostat*

From figure 1, we can conclude that between the period 2005 and 2016, the average employment rate increased with 0.47%. The maximum value was in 2016 (70%), and the minimum value was in 2008 (63.5%).



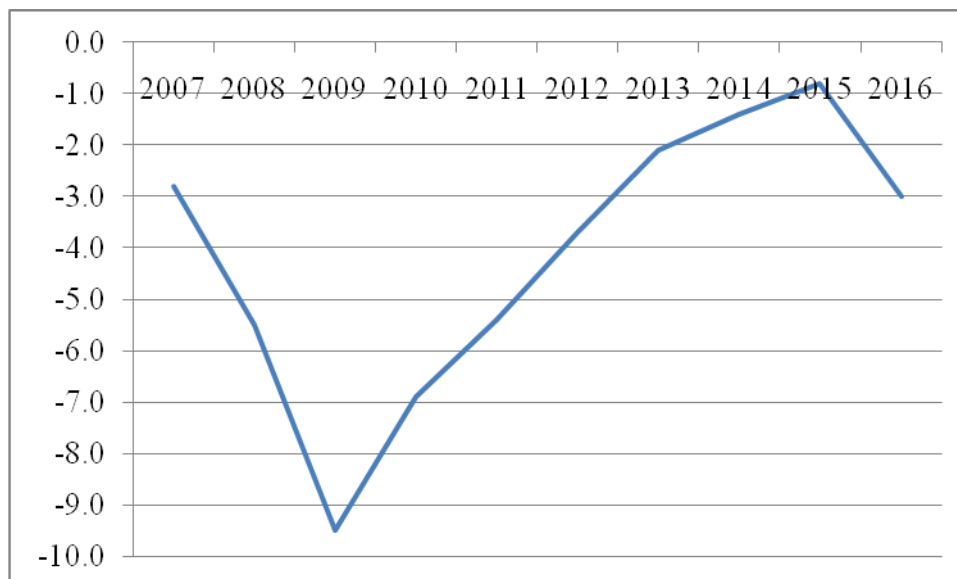
**Figure 2. The evolution of the real GDP economic growth in Romania between 2005 and 2016**

*Source: Eurostat*

From figure 2, we can conclude that the real GDP economic growth between 2008 and 2010 decreases and after 2010 increases.

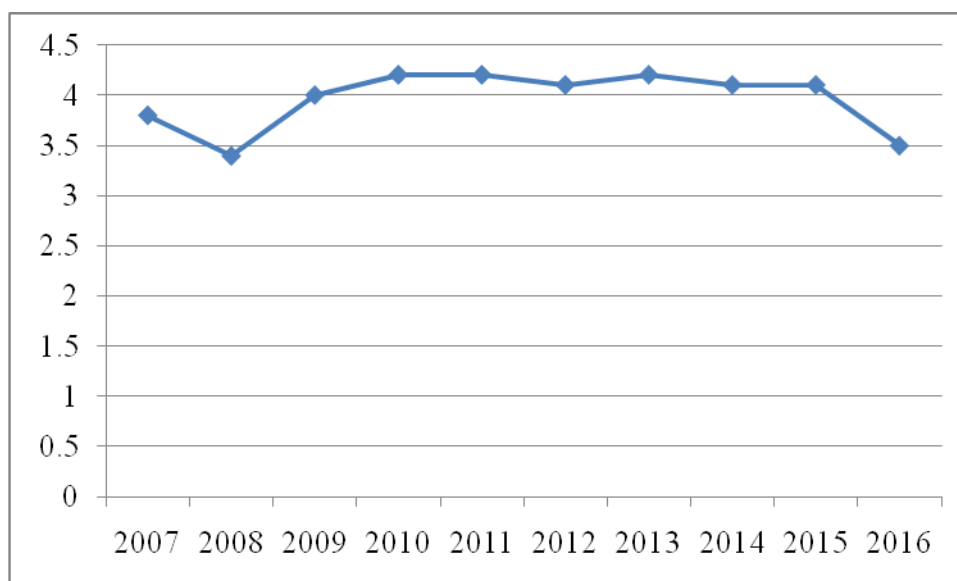
The real GDP economic growth in Romania increases average with 0.03% . The maximum value was in 2006 (8.1%) and the minimum value was in 2009 (-7.1%).

The real GDP economic growth and the percentage of deficit in GDP we will consider exogenous variables.



**Figure 3. The evolution of percentage of public deficit in GDP in Romania between 2007 and 2016**

*Source: Eurostat*



**Figure 4. The evolution of percentage of unemployment rate in Romania between 2007 and 2016**

*Source: Eurostat*

From the figure 3, we can see that between 2007 and 2015 the percentage of public deficit in Romania decreases and from 2016 it begins to increase. The maximum value was registered in the years 2010, 2011 and 2013 (4.2%) and the minimum value was registered in 2008 (3.4%).

The mean value for employment rate between 2005 and 2016 was 65.26%, the mean for the real GDP growth rate between 2005 and 2016 was 3.05%.

**Table 1. The descriptive statistics indicators for employment rate**

Mean	65.26667
Standard Error	0.491955
Median	64.8
Mode	64.8
Standard Deviation	1.704184
Sample Variance	2.904242
Kurtosis	5.665734
Skewness	2.141744
Range	6.5
Minimum	63.5
Maximum	70
Sum	783.2
Count	12

Source: Eurostat

**Table 2. The descriptive statistics indicators for the real GDP growth rate**

<i>Real GDP growth rate (%)</i>	
Mean	3.058333
Standard Error	1.238612
Median	3.75
Standard Deviation	4.290679
Sample Variance	18.40992
Kurtosis	1.857446
Skewness	-1.0717
Range	15.6
Minimum	-7.1
Maximum	8.5
Sum	36.7
Count	12

Source: Eurostat

The mean for the unemployment rate between 2007 and 2016 was 3.96%. The median is 4.1%. We can conclude that in the half of the years the unemployment rate was under 4.1% and in the another half the unemployment rate was over 4.1%.

**Table 3. The descriptive statistics indicators for the unemployment rate**

<i>Unemployment rate(%)</i>	
Mean	3.96
Standard Error	0.093333
Median	4.1
Mode	4.2
Standard Deviation	0.295146
Sample Variance	0.087111
Kurtosis	0.115423
Skewness	-1.22777
Range	0.8
Minimum	3.4
Maximum	4.2
Sum	39.6
Count	10

Source: Eurostat

**Table 4. The descriptive statistics indicators for the percentage of public deficit in GDP**

<i>Deficit</i>	
Mean	-4.11
Standard Error	0.855628
Median	-3.35
Standard Deviation	2.705735
Sample Variance	7.321
Kurtosis	0.164099
Skewness	-0.8075
Range	8.7
Minimum	-9.5
Maximum	-0.8
Sum	-41.1
Count	10

Source: Eurostat

### 3. THE MAIN RESULTS

We applied a linear multiple regression model which has as endogenous variable (the unemployment rate) and as exogenous variables (the real GDP growth rate and the percentage of public deficit in GDP).

**Table 5. The regression model**

	coefficient	Standard deviation	t Statistic	Prob.
Intercept	4.43	0.20	21.92	0.00
Real GDP economic growth	-0.067	0.022	-3	0.01
The percentage of public deficit in GDP	0.094	0.031	3.28	0.04

Source: Own calculations

From the Output Table generated by Eviews, we observe coefficient estimates, their standard errors, the value of the statistics t, and the corresponding p value. For testing the parameters, the assumptions tested are:

-Null hypothesis,  $H_0: \alpha = 0$  or  $\beta_t = 0$ ,  $t = 1,2,3$ ;

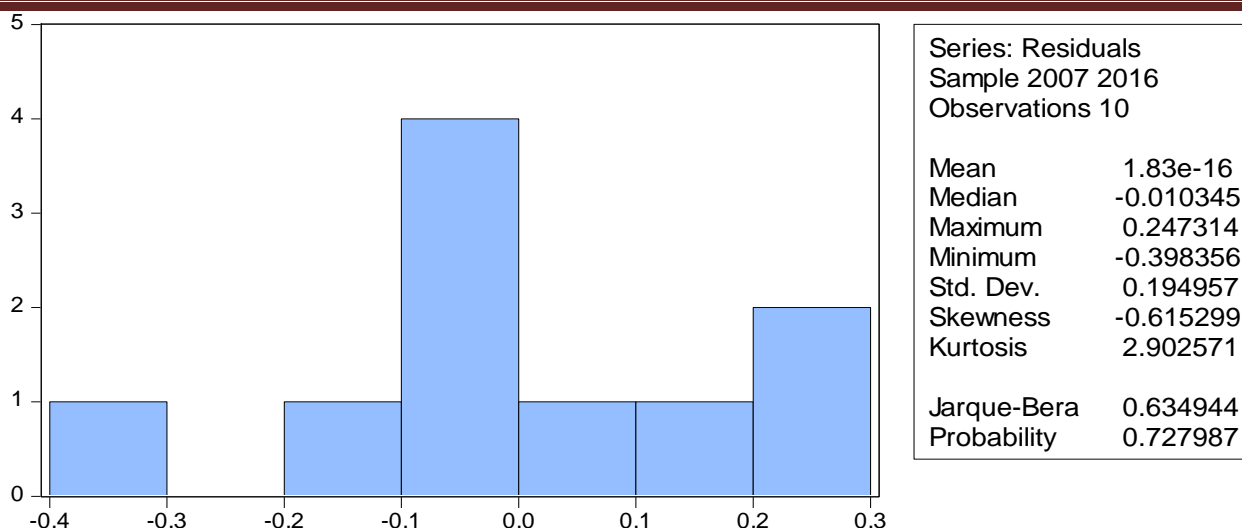
-Alternative hypothesis,  $H_1: \alpha \neq 0$  or  $\beta_t \neq 0$ ,  $t = 1,2,3$ .

If the real GDP economic growth will increase with 1%, then the unemployment rate will decrease with 0.067%, in the condition in which the percentage of public deficit in GDP is constant. If the percentage of public deficit in GDP will increase with 1%, then unemployment rate will decrease with 0.067%, in conditions in which the real GDP economic growth is constant.



**Figure 5. The real values for unemployment rate, the residuals and the adjusted values for unemployment rate**

Source: Own calculations



**Figure 6. The Jarque Bera test**  
 Source: Own calculations

**Table 6 White tes**

Heteroskedasticity Test: White

F-statistic	0.460543	Prob. F(5,4)	0.7913
Obs*R-squared	3.653528	Prob. Chi-Square(5)	0.6003
Scaled explained SS	1.703019	Prob. Chi-Square(5)	0.8885

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 11/20/17 Time: 09:55

Sample: 2007 2016

Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.179656	0.161549	-1.112085	0.3284
REAL_GDP_RATE	0.050716	0.043348	1.169977	0.3070
REAL_GDP_RATE^2	-0.002722	0.002641	-1.030715	0.3609
REAL_GDP_RATE*DEFICIT	0.006308	0.005134	1.228804	0.2865
DEFICIT	-0.060310	0.060577	-0.995601	0.3758
DEFICIT^2	-0.003230	0.007234	-0.446511	0.6783
R-squared	0.365353	Mean dependent var		0.034207
Adjusted R-squared	-0.427956	S.D. dependent var		0.049736
S.E. of regression	0.059433	Akaike info criterion		-2.524230
Sum squared resid	0.014129	Schwarz criterion		-2.342679
Log likelihood	18.62115	Hannan-Quinn criter.		-2.723391
F-statistic	0.460543	Durbin-Watson stat		1.184141
Prob(F-statistic)	0.791304			

Source: Own calculations

The model is significant statistically. The model explains in 56.36% the variation of unemployment rate. From figure 6, we can observe that skewness = -0.61 and kurtosis = 2.9, so the both values are different from the normal distribution, the probability of test is also very high  $p=0.72$ . Due to this, we can reject the null hypothesis. The distribution is not normal.

#### 4. CONCLUSIONS

Increased unemployment in the Member States of the European Union and in developing countries in Eastern Europe combined with technological change can lead to a continuous change in labor market requirements, taking into account the fact that the educational offer needs to be matched to the labor market demanded.

EU Member States have looked at several employment forecasting methods to identify future workforce needs that take into account occupational, educational and training factors that influence job demand and supply.

Several Eastern European countries are interested in developing such models in order to provide the labor market with the required training. Taking into account the requirements of the Single Labor Market and increasing international mobility, states need to develop models that can be comparable to predictive methods for training and qualifications with those existing in EU Member States.

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