Research on Romanian Labour Market Dynamics

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The purpose of this research paper is to analyze the Romanian labour market dynamics during the time period 1997-2014. We used descriptive statistics, focusing on: evolution of the employed persons, self-employment, temporary employment, part-time employment, unemployment rate. Secondly, we used trend line function to make previsions regarding the evolution of the number of employees in Romania till the year 2020 and correlations in order to analyze the connection between the proposed variables. We could underline the duality of employment-unemployment within the dynamics of the Romanian labour market. The paper drew an objective analysis on the various aspects of the Romanian labour market outcomes (employment/unemployment).

Keyword: employment, self-employment, temporary employment, part-time employment, and unemployment

The paper analyzes the evolution of the main indicators that characterize the labour market from Romania, for the period 1997-2014. During the financial crisis of 2008-2009, the country's labour force suffered major changes and currently the country is trying to improve its macro-economic situation.

Several authors studied the labour market dynamics. Albu and Gorun (2010) used 3D representations in order to highlight "the expected movement in labour force", under the convergence programme. The "convergence assessment" is based on "nominal convergence" and "real convergence" (Albu, 2012). Caraiani (2015) focused on the test of nonlinearity in unemployment, based on the concept of surrogate data. Other authors underlined „the contributions of ins and outs of the unemployment to the dynamics of unemployment" (Silva, Vazques-Grenno, 2013). Smith (2011) proved that „inflows and outflows of unemployment contribute in almost equal parts to the country's unemployment volatility". Agnello et al. (2014) used the panel data model to show that „an increase in labour market flexibility contributes to an important fall in youth unemployment", while long-term unemployment „does not seem to respond to the state of the economy".

In this paper, we used descriptive statistics in order to analyze the various aspects of the Romanian labour market outcomes (employment/unemployment), focusing on: the evolution of the employed persons during the period 1997-2014, self-employment, temporary employment, part-time employment, as a percentage of the total employment. Secondly, we used trend line function to make previsions regarding the evolution of the number of employees in Romania till the year 2020 and correlations in order to analyze the connection between the proposed variables.

The paper is organized as follows. The second section presents the methodology used to analyze the macroeconomic data. Then, we discuss the results and their limitations, during the third section. The conclusions and the possible future development of the analysis are discussed in the last section of the article.

Experimental part

Database and methodology

Descriptive statistics was used in order to analyze the main evolutions of the labour market outcomes in terms of employment and unemployment analysis.

In order to have a more complex view of the evolution of the macroeconomic variables chosen for our labour market dynamics analysis, we will first proceed to the analysis of the evolution of the resident population of Romania during the following period of time: 1997-2014. The resident population is defined as the total number of persons that have Romanian citizenship, strangers and persons without citizenship, who have the common residence on the territory of Romania. As we can observe from the figure 1, the Romania's resident population decreased from 22,3 million in 1997 to 19,9 million in 2014 (fig. 1).

However, analyzing the number of employed persons, we can see that their number also decreased from 10.1 million in 1997 to 8.25 million in 2014, (fig. 2). That means

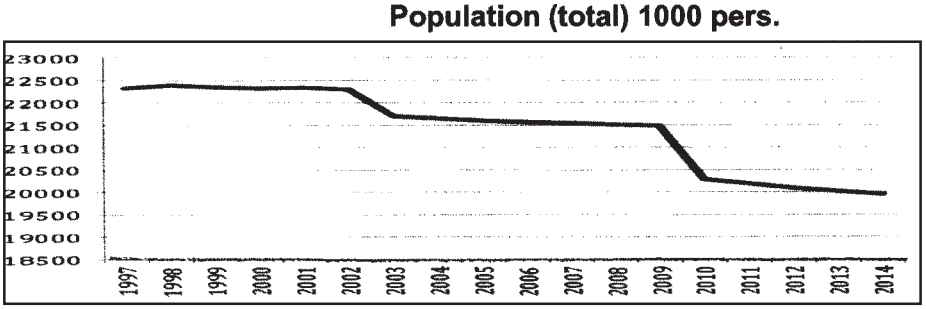

Fig. 1. Processed after LABDEV, 2015; TEMPO, 2015

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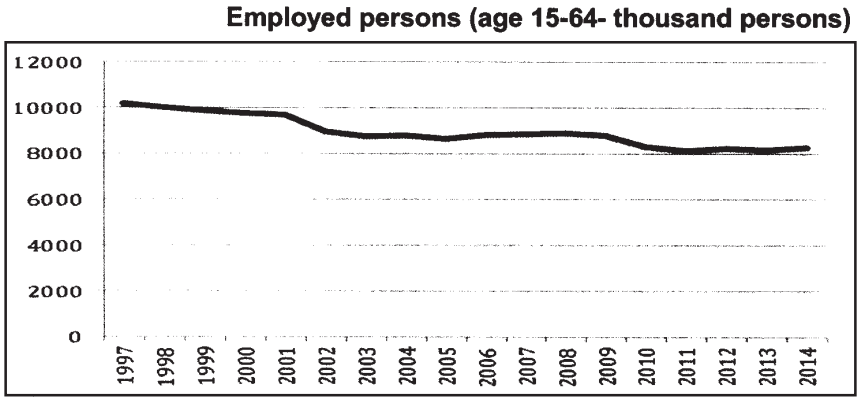

Fig. 2. Processed after LABDEV, 2015; EUROSTAT, 2015

that from the total population of Romania (19.9 million people in 2014), 8.25 million persons are employed, which represent a percentage of 41.5%. We can define the employed persons as all the persons that have a profession that brings them income, which they practice regularly in one of the activities of the national economy, being part of an economic or social activity, having a work contract or being independent (on their own) in order to achieve incomes under the form of salaries, etc.

In order to forecast the number of the employed persons till the year 2020, we used the trend line function, with the following equation:

$$y = a + bx \quad (1)$$

where:

y = forecast
x = year
a = intercept (base level)
b = slope (trend)

According to figure 4, the equation of trend line forecast becomes:

$$Y = -115.62x + 240834.37 \quad (2)$$

with

$$R^2 = 0.86 \quad (3)$$

If we analyze the value of the coefficient of determination R^2, we can observe that 86% of the total variation can be explained with the linear trend, while the difference represents only 14% and cannot be explained with this model (fig.3).

According to the prevision, the number of the employed persons in Romania will not have an ascendant trend. The prevision of the number of employed persons in Romania for the following six years is: 7.8 million (2015), 7.7 million (2016), 7.6 million (2017), 7.5 million (2018), 7.3 million (2019) and 7.2 million (2020), (fig. 4). This ascendant trend is mainly due to the fact that the number of the resident population of Romania is also decreasing.

The main sectors, where the employees from Romania work, are: manufacturing industry, services, building and construction, agriculture. However during the period 1994-2008, building and construction sector registered the highest growth in terms of employees, reaching the percentage of 22.1% in 2007, followed by manufacturing industry with 10.1% in 2002, services with 6.6% in 2004 and agriculture with 6.3% in 2003, (fig.5).

As we can see from the figure 6, the self-employment registered a decrease beginning with the year 2001, when we had 19.2% self-employed reported to the total number of employed persons. In 2009, the percentage was 16.9% self-employed from the total number of employed persons.

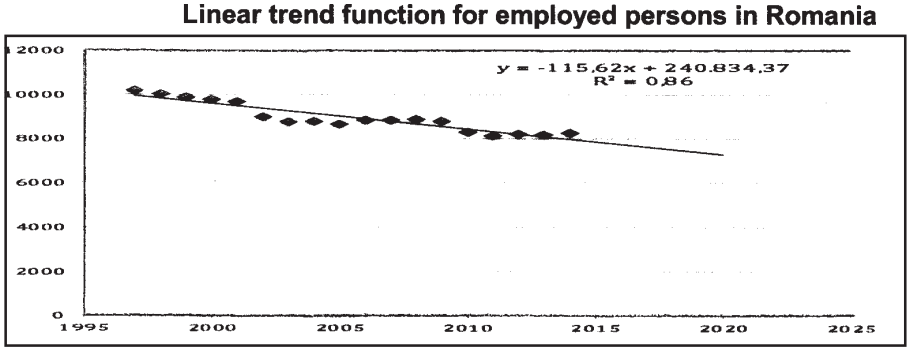

Fig. 3. Data analysis in Excel software

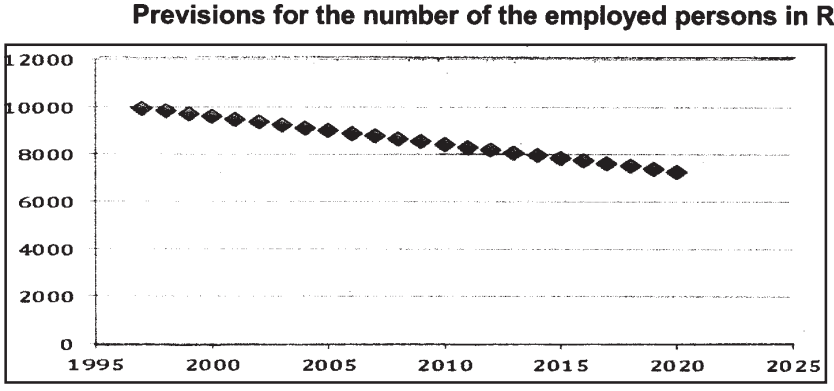

Fig. 4. Data analysis in Excel software

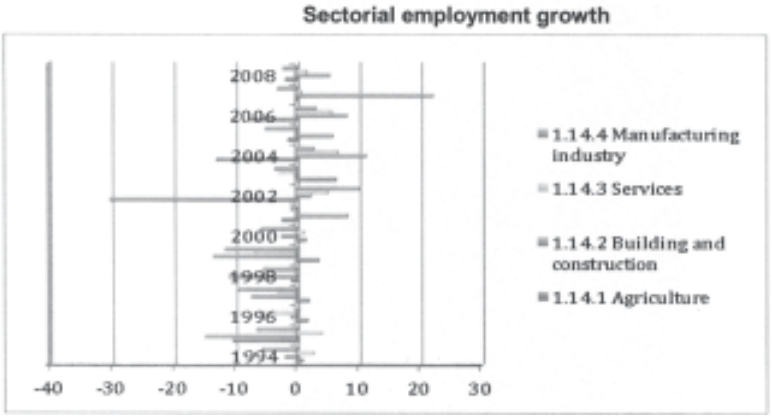

Fig. 5. Processed after LABDEV, 2015

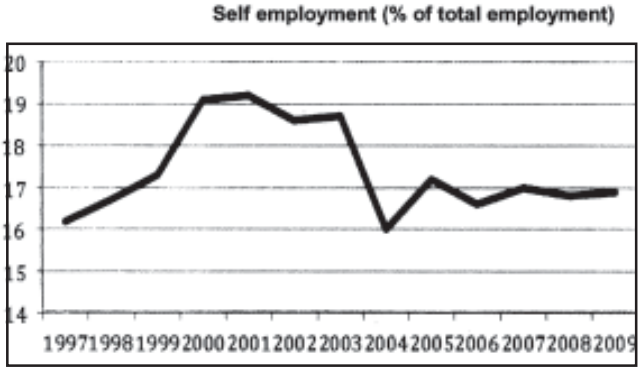

Fig. 6. Processed after LABDEV, 2015

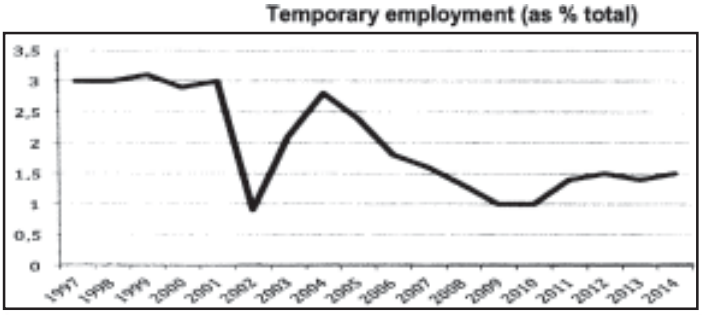

Fig. 7. Processed after LABDEV, 2015; EUROSTAT, 2015

The temporary employees registered a fall down from 3% in 2001 to 0.3% temporary employees in 2002. In 2009, the percentage of temporary employees in the total number of employed persons was 1%, while in 2014 the percentage grew to 1.5%, (fig. 7).

According to European Commission statistics database, the main reasons for temporary employment in Romania are (EUROSTAT, 2015):

- could not find a permanent job (88.8% in 2014);
- d id not want a permanent job (no reliable data available for 2014);
- in education or training (no reliable data available for 2014);
- probationary period (no reliable data available for 2014).

Analyzing the part-time employees in the total number of employees at the level of Romania for the period 1997-2004, we can observe variations between 14.3% in 2001, 9.7% in 2002 and 8.5% in 2009, (fig. 8).

However, the main reasons for part-time employment in Romania, at the level of the year 2014, were (EUROSTAT, 2015):

- could not find a full-time job (56.9% in 2014);
- own illness or disability (3.2% in 2014);
- other family or personal responsibilities (5.8% in 2014);
- looking after children or incapacitated adults (2.4% in 2014);
- in education or training (1.2% in 2014);
- other reasons (1.2% in 2014).

If we analyze the unemployment rate in Romania for the period 1999-2014, we can observe that the highest value was registered in 2002 (8.6%), the year when all the other variables (self-employment, temporary employment, part-time employment) registered important decreases. Another year when this rate was lower was 2008 (5.8%), just before the consequences of economic-financial crisis, which hit also Romania. The next year, the percentage of unemployed persons reached the value of 6.9%. Till the year 2014, the unemployment rate suffered low variations, reaching the value of 6.8% in 2014, (fig. 9).

The main methods used for seeking work, by the unemployed persons from Romania, are (EUROSTAT, 2015):

- contact public employment office (34.9% in 2014);
- contact private employment office (14.2% in 2014);
- apply to employers directly (64.3% in 2014);
- ask friends, relatives, trade unions (86.5% in 2014);
- publish or answer advertisements (59.7% in 2014).

For a further analysis, we used correlation in order to determine if two variables measured on the same number of observations have the same variation or not. Thus, we

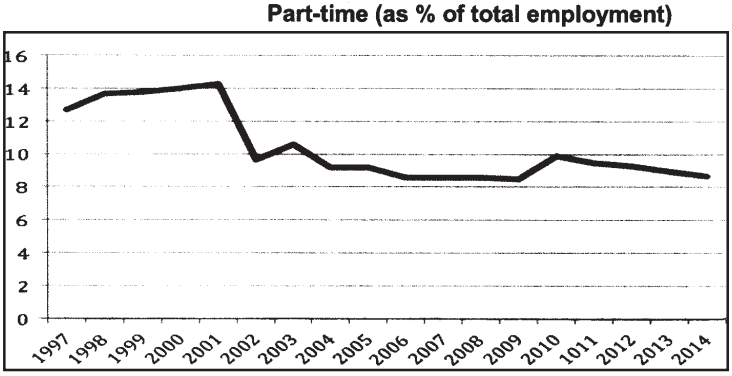

Fig. 8. Processed after LABDEV, 2015; EUROSTAT, 2015

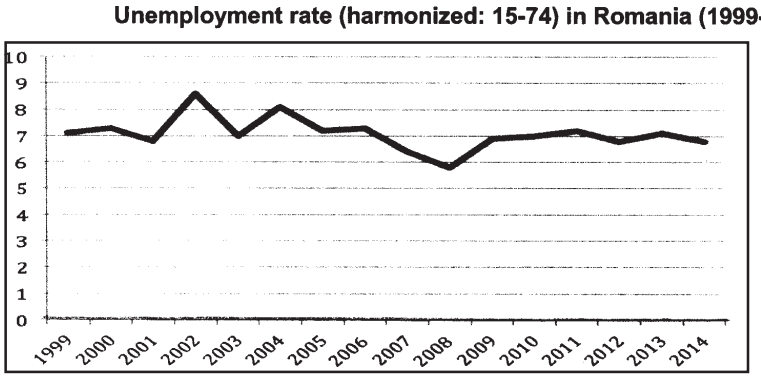

Fig. 9. Processed after LABDEV, 2015; EUROSTAT, 2015

Pearson correlation

		Self employed	Temporary employment	Part-time employment	Unemployment rate
Self employed	Pearson Correlation	1	0.211	0.690*	0.117
	Sig. (2-tailed)		0.534	0.019	0.731
	N	11	11	11	11
Temporary employment	Pearson Correlation	0.211	1	0.744**	0.062
	Sig. (2-tailed)	0.534		0.009	0.857
	N	11	11	11	11
Part-time employment	Pearson Correlation	0.690*	0.744**	1	0.042
	Sig. (2-tailed)	0.019	0.009		0.902
	N	11	11	11	11
Unemployment rate	Pearson Correlation	0.117	0.062	0.042	1
	Sig. (2-tailed)	0.731	0.857	0.902	
	N	11	11	11	11
*. Correlation is significant at the 0.05 level (2-tailed).					
**. Correlation is significant at the 0.01 level (2-tailed).					

Source: Data analysis with SPSS informatics program, version 22.00 for Windows

Table 1
PEARSON CORRELATION

try to find if there is a connection between the main elements of the labour market dynamics: self-employed, temporary employed, part-time employed and unemployment rate, (table 1). However, the results show that there is a strong correlation between part-time employment and self-employment (Pearson coefficient = 0.690, $p < 0.5$) and between part-time employment and temporary employment (Pearson coefficient = 0.744, $p < 0.01$). The correlation is positive, so we can say that the variables follow the same way.

Results and discussions

The results of this analysis show the evolution of the main macroeconomic variables that characterize the Romanian labour market dynamics. First of all, the Romania's resident population decreased from 22.3 million in 1997 to 19.9 million in 2014. Analyzing the number of employed persons, we can see that their number also decreased from 10.1 million in 1997 to 8.25 million in 2014. The prevision of the number of employed persons in Romania for the following six years is also not so optimistic: 7.8 million (2015), 7.7 million (2016), 7.6 million (2017), 7.5 million (2018), 7.3 million (2019) and 7.2 million (2020). However during the period 1994-2008, building and construction sector registered the highest growth in terms of employees, reaching the percentage of 22.1% in 2007, followed by manufacturing industry with 10.1% in 2002, services with 6.6% in 2004 and agriculture with 6.3% in 2003. The self-employment registered a decrease beginning with the year 2001, when we had 19.2% self-employed from the total number of employed persons. The temporary employment also registered a fall down from 3% of the total number of employed persons in 2001 to 0.3% temporary employees in 2002. Analyzing the part-time employees in the total number of employees at the level of Romania for the period 1997-2004, we can observe variations between 14.3% in 2001, 9.7% in 2002 and 8.5% in 2009. If we analyze the unemployment rate in Romania for the period 1999-2014, we can observe that the highest value was registered in 2002 (8.6%), the year when all the other variables (self-employment, temporary employment, part-time employment) registered important decreases. However, the results show that there is a strong correlation between part-time employment and self-employment (Pearson coefficient = 0.690, $p < 0.5$) and between part-time employment and temporary employment (Pearson coefficient = 0.744, $p < 0.01$).

Conclusions

Romanian labour market is very well described by the employment-unemployment dynamics over the time period. For instance we can underline the duality of labour market by the existing types of contract: temporary and permanent (self-employed, part-time etc.). The descriptive statistics and correlation used to analyze the chosen variables underline the duality of the Romanian labour market. The study of labour market dynamics can be useful to other researchers that analyze the employment-unemployment fluctuations in other foreign labour markets.

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