

THE INFLUENCE OF THE EU INTEGRATION PROCESS ON THE UNEMPLOYMENT DYNAMICS FROM ROMANIA

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This paper points out the tendencies of the unemployment dynamics from Romania in the context of the integration in the European Union. After a presentation of the tools and methods of calculating unemployment, we carried out a diagnosis of the evolution of this important macroeconomic indicator in the post-accession period. The analysis is performed for the ILO unemployed as a consequence of the need of compliance with the EU regulations. Predictions have been carried out for the post-accession period followed by an analysis of the real evolution of the dynamics of the indicators in relation with the predicted values. High performing programs have been used in order to process and analyse the series of statistical data.

Keywords: ILO unemployed, ILO unemployment rate, active persons, employment

JEL Classification: E24, E27, J21

1. Introduction

The problem of employment and unemployment is an important side of the macroeconomic balance and an indispensable element of the macroeconomic and social policies.

Unemployment is defined in the economic literature, as being a negative state of the economy, carried out in a structural and functional imbalance of the labour market, where the labour force supply is higher than the labour force demand of the economic operators.

The emergence and the accentuation of unemployment have a multitude of *objective causes*, the most important being: the rhythm of economic growth; the technical progress, the economic crisis; the structural modifications of the economic branches and sectors; immigration and economic situation.

Unemployment generated by objective causes is manifested in different *ways*, according to its causes. The *cyclical unemployment* became highly important nowadays and is generated by the evolution of the economic cycle. In the crisis stage, unemployment grows as a consequence of the contraction, of the reduction in production, of the economic activities and of the growth of the number of bankruptcies especially for the small and middle enterprises.

One can assess that unemployment is a phenomenon which influences to different extents all the countries in the world and which has various *economic and social negative consequences*. The long-term chronic unemployment from Romania, which has led to the crisis in employment, needs an active employment policy, which should meet micro-and macroeconomic objectives.

Taking into account the utmost importance of this macroeconomic indicator, presented above, we think that it would be convenient to present the evolving tendency of the unemployment dynamics in the forerunning accession period to the EU but also to carry out predictions and analyses of the real evolution of unemployment related to the predictions from the post-accession period.

2. Methodological aspects regarding the calculation of unemployment

The *active persons* consists of all persons who supply available labour force for the production of goods and services in the reference period including the employed population and the unemployed. The number of active persons is calculated according to the formula:

$$\text{ActivePersons (AE)} = \text{Employment (E)} + \text{ILO unemployed (ILOU)} \quad (1)$$

The employed population consists of all persons of 15 year old and over who have carried out an economic or social activity producing goods and services for at least an hour in the reference period (a week before the interview), in order to obtain income under the form of salary, payment in kind or other benefits. It was adopted the “at least one hour” standard criterion recommended by the International Labour Office (ILO) in defining the employed population in order to provide better ways of comparison for the data at an international level.

The *ILO unemployed* are persons of 15 year old and over who meet the following conditions during the reference period:

- they do not have a working place and do not carry out any activity which results in income;
- they are job-seekers, using in the past 4 month different methods in order to find a job;
- they are available to start working in the next 15 days if they immediately found a job.

The *ILO unemployment rate* represents the proportion of the ILO unemployed in the active population.

Estimating the evolving tendencies. Extrapolation involves the determination of the estimative levels for the future periods using as a computation basis the parameters of the statistical-mathematical function where after its use in the analysis of the review of the studied phenomenon the formula $\sum (y - Y)^2$ had the lowest level.

In order to increase the degree of precision of the respective estimations, one can use the “predictive horizon”, which is determined according to one of the relations:

$$\pm \Delta_y = \pm \xi \quad \text{or} \quad \pm \Delta_y = \pm \frac{Y_i \cdot v}{100} \quad (2)$$

The trust interval settled with the help of this indicator:

$$(Y_i - \Delta_y) \leq Y_i \leq (Y_i + \Delta_y) \quad (3)$$

Y_i - levels of the functions used both for the analysis of the retrospective tendency and for the determination of the estimative levels for the future periods;

ξ - average error of estimation and v - variation coefficient determined with the help of the relations;

$$\xi = \sqrt{\frac{\sum (y_i - Y_i)^2}{n}}; \quad v = \frac{\xi}{\bar{Y}} \cdot 100 \quad (4)$$

The first relation of the predictive horizon is used for the linear tendencies and the second for the nonlinear tendencies. The limits of the first interval, that are: $Y_i - \xi$ and $Y_i + \xi$ are on parallel straight lines and the limits of the second interval: $Y_i - (Y_i \cdot v) / 100$ and $Y_i + (Y_i \cdot v) / 100$, are on curve lines, which are drawing off, if Y_i grows as it goes with the prediction in the future.

3. Analysis of the unemployment dynamics in the EU pre-accession period

In the last decade the evolution of the labour resources from Romania was under the impact of some demographic and social phenomena, as: the acceleration of the reduction in the birth rate and the high level of mortality, the growth of immigration, the reduction of the quality of medical services and of sanitary assistance. Information regarding the active population, the employed population, unemployed, and unemployment rate are presented in table 1.

The data for 2002 are not comparable with the ones from the previous years due to their estimations on the basis of the results of the census of the population and of the houses from March 2002, and also due to the review of the definition and of the area, according to the last regulations of the European Commission.

-thousands of persons-

	2000	2001	2002	2003	2004	2005	2006
Active persons	11283	11151	10079	9915	9957	9851	10042
Employment	10508	10440	9234	9223	9158	9147	9314
ILO unemployment	775	711	845	692	799	704	728
ILO unemployment rate- %	6,9	6,4	8,4	7,0	8,0	7,2	7,3

Source: Labour force in Romania. Employment and unemployment 2008, NIS

Table 1. The main unemployment indicators

The active population has met a decrease, except for 2006, when a low growth was registered with 191 thousand as opposed to 2005. The employed population registered a decreasing trend from 10508 thousand persons in 2000 to 9314 thousand persons in 2006.(Table 1), so that after 12 years of transition, it decreased with a quarter as opposed to the initial situation.

In the analysed period, the evolution of the number of ILO unemployed had an oscillating tendency manifesting a low decrease. For example in 2012, the number of unemployed reached the number of 845 thousands, the highest in the entire period, being 12,7% higher than in the previous year. The unemployment rate had the highest value (8,4%), 1,8% percentage points higher than in the previous year.

An interesting evolution can be found in 2004 when its was registered a substantial growth of the number of unemployed (107 thousands) as opposed to 2003, that is 15,5% higher although the number of active population has remain almost constant. This is the highest growth from one year to another in the analysed period, fact also proved by the evolution of the unemployment rate with 1 percentage point.

Due to the fact that Romania acceded top the European Union on 1 January 2007 and to the need of comparing it with the other Member States, has led to the use of the methodology of the International Labour Office (ILO) in calculating and analysing the evolution of the unemployment.

The statistical data series regarding the number of ILO unemployed does not allow for the identification of a certain trend. Therefore the implementation of the linear, parabolic, third-order polynomial models etc. have shown determination coefficients of low values, not higher than 0,3. The use of exponential levelling was used which for an adjustment coefficient of 0,4 has shown a form of the evolution of unemployed which allowed for the identification of a parabolic trend. This model assesses very well the evolving tendency on a total number of unemployed, the regression coefficient having a pretty low value (3,09) as compared to the level of the dynamic series (figure 1).

Fitted Trend Equation:

$$Y_t = 785,31 + 3,090 * t - 1,43316 * t^2$$

R-Sq = 68,49% R-Sq(adj) = 52,69%

The ILO unemployment rate has a series of statistical data which does show in a simple analysis the identification of a tendency. The successive implementation of the linear and parabolic models has shown pretty low values for the determination coefficient (0,2840 and 0,3571). Applying the exponential levelling technique which an adjusting coefficient of 0,2 has led to a form where the tendency could be estimated with the third order polynomial model (figure 2).

Fitted Trend Equation:

$$Y_t = -0,0159 \cdot t^3 + 0,1437 \cdot t^2 - 0,4242 \cdot t + 8,0316$$

R-Sq = 81,41%

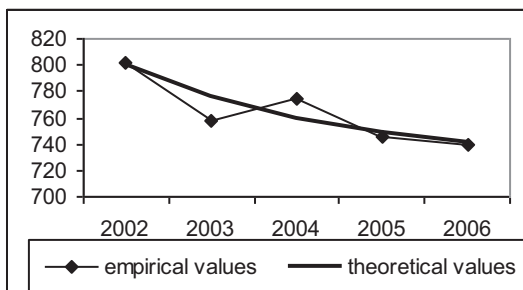


Fig. 1 Analysis of the ILO unemployment trend

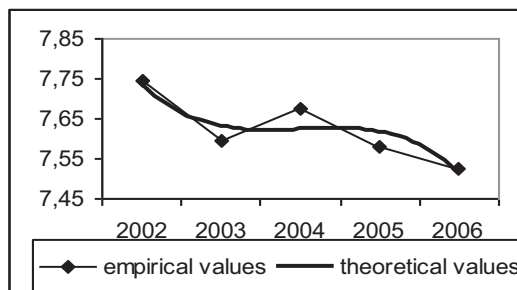


Fig. 2 Analysis of the ILO unemployment rate trend

The determination coefficient(R-Sq) has a pretty high value(0,8141), which means that 81,41% of the total variation is explained with the help of the model, the unexplained difference being the residual trend.

4. Considerations regarding the unemployment rate prediction

Taking into account the results from the previous paragraph one can predict the main indicators of unemployment, for the next four years after Romania's accession to the European Union.

With the information regarding the theoretical values and the statistical series of data related to this indicators and by using the function Trend Analysis of the program MINITAB 14.1 the following predicted values are obtained (table 2) for the period 2007-2010.

Period	ILO unemployment	ILO unemployment rate
7	730	7,2
8	718	7,0
9	705	6,8
10	695	6,7

Table 2. Predictions for the unemployment indicators

For the growth of the precision degree of the predictions, one can use the "predictive horizon" which helps to determine the levels of the predictive horizons (the most optimistic value and the most pessimistic value). The main elements used in the determination of these horizons are the average error of the estimation (ξ) and the variation coefficient (v), calculated with formula 4.

The levels of the predictive horizons and the trust intervals for the next four years are presented in table 3 and figures 3 and 4 for the number of unemployed and the ILO unemployment rate. The obtained values are presented in table 4.

Year	ILO unemployment				ILO unemployment rate			
	$\pm \Delta = Y_i \cdot v / 100$	$Y_i - \Delta_y \leq Y_i \leq Y_i + \Delta_y$			$\pm \Delta = Y_i \cdot v / 100$	$Y_i - \Delta_y \leq Y_i \leq Y_i + \Delta_y$		
2002	38,67	791,33	830	868,67	0,29	8,11	8,4	8,69
2003	36,61	749,15	786	822,37	0,26	7,14	7,4	7,66
2004	36,42	745,28	782	818,12	0,28	7,72	8,0	8,28
2005	35,64	729,36	765	800,64	0,25	6,95	7,2	7,45
2006	34,71	710,29	745	779,71	0,25	7,05	7,3	7,55
2007	34,01	695,99*	730	764,01	0,25	6,97*	7,2	7,48
2008	33,45	684,55*	718	751,45	0,24	6,77*	7,0	7,25
2009	32,85	672,15*	705	737,85	0,24	6,56*	6,8	7,04
2010	32,38	662,62*	695	727,38	0,23	6,47*	6,7	6,93

*) Predicted values for the extrapolation

Table 3. Levels of the predicted horizons and the trust intervals

The limits of the interval for the number of ILO unemployed and the ILO unemployment rate are on curve lines as a consequence of the fact that for the assessment of the evolving trend of the active population a non-linear model was used. These lines are drawn off step by step as the predictions goes into the future.

The analysis of the results shows that this indicator will have a descending trend in the next period but the accuracy of the predictions will go down as we come to the end of the period.

We notice the fact that in 2007 and 2008 the real values show a descending trend for the number of unemployed and the unemployment rate, exceeding the limits of the trust interval, and the limits of the most pessimistic variant. This situation was registered due to a positive economic growth - Romania's GDP having values of over 6% each year - leading to the interdependency between the GDP rhythm and the unemployment rate which shows that if there is an economic growth the unemployment rate will go down.

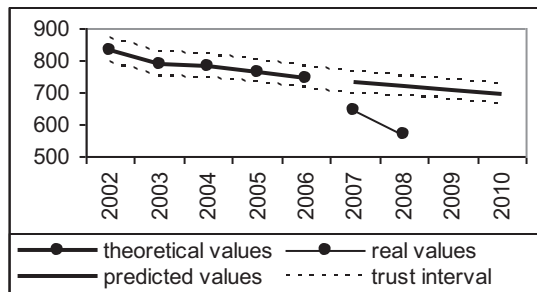


Fig. 3 Predictions and accomplishments for the ILO unemployed

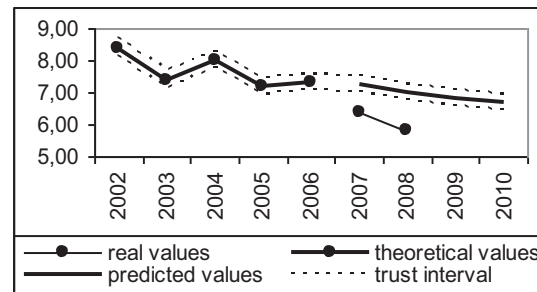


Fig. 4 Predictions and accomplishments for the ILO unemployment rate

A more detailed analysis shows that in Romania the effects of the global economic and financial crisis are also felt, starting with the last quarter of the year 2008. So in the 4th quarter, there was registered an ILO unemployment rate of 5,8%, 4 percentage points higher than in the previous quarter, but on the whole the unemployment rate in 2008 was lower than in 2007. Still, the values registered at the end of last year are higher in reality, but are not reflected in these percentages because a large part of the unemployed do not show off at the National Employment Agency in order to be registered as job seekers.

Year	Active persons	Employment	ILO unemployment	ILO unemployment rate - %
2007	9994	9353	641	6,4
2008	9805	9237	568	5,8

Table 4. Real values for the unemployment indicators

5. Conclusions

In the forerunning accession period to EU (2000-2006), the unemployment rate from Romania registered a slightly descending trend although there were a series of oscillations almost inexplicable due to the fact that the rhythm of economic growth was positive during the analysed period. Therefore in 2002 and 2004 the unemployment rate has grown although the active population decreased.

The economic predictions for 2007-2010 were based on the hypothesis that the business environment will remain stable and the economic growth will maintain the ascending trend. In consequence, the aim trend for the unemployment rate will continue to decrease, which has also happened in the first two years after the accession to EU (table 4). The descending trend was more persistent than predicted, the registered values exceeding the limits of the trust interval of the predictive horizon.

The emergence of the economic and financial crisis on an international level has led to major changes - in a negative way - in what the unemployment is concerned in Romania. The first signs have appeared from the 4th quarter of 2008 when the unemployment rate went up with 0,4 percentage points as opposed to the previous quarter.

The integration of Romania on the EU labour market will increase the mobility of the labour force, drawing and loosing worker. The reduction of the unemployment rate will be one of the main preoccupations of the Romanian Government especially in the current economic circumstances.

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