ANALYSIS OF UNEMPLOYMENT AMONG YOUNG INDIVIDUALS FROM ROMANIA BY ECONOMETRIC METHODS

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Abstract

Even if the issue of young individual's inclusion on the labour market was always and important issue on political agendas, in the last two decades this issue this issue gained particular prominence. During the last years, unemployment among youths with ages under 25 years of age has increased significantly and being of 23.5% in the year 2013 at EU-28 level and of 23.6 in Romania. Modern societies provide to young individuals unprecedented opportunities, yet they are faced with major challenges related to the educational and vocational training systems and to the access on the labour market.

The reduction, during the times of crisis, in the number of permanent jobs affected disproportionately the young individuals, this group being over-represented in the category of temporary contracts. Even though, under normal conditions, temporary contracts represent the first step towards more stable employment forms, this fact can create segmented labour force markets, the young individuals being blocked at the level of their inferior segments, and hence benefitting from less training on the job, and being placed in the lower range of remuneration levels; thus, they have much worse perspectives with respect to employment and long-term career. In this context, achieving the objective of 75% employment of labour force for the population aged between 20 to 64 years of age as provided for in the Strategy "Europe 2020" requires new approaches regarding the measures and ways of transition of the youths to the labour market. The low participation of youths on the labour market determined that the considerations about the issue of youths' integration on the labour market were regarded as a challenge and priority action in the National Strategy regarding Social Protection and Social Inclusion 2008-2010 and in the National Development Plan 2007-2013.

The paper presents a brief analysis of youths' unemployment development in Romania, and an estimate about the evolution of this phenomenon by econometric techniques.

Key-words: youths' unemployment rate; econometric model; statistical tests

JEL Classification: **C52; E24; E27; J64**

Introduction

In the current context of economic instability, youths are faced with the emergence of a feeling of uncertainty with respect to their own chances of having a good debut on the labour market. The world crisis, the social reality that all societies are faced with brought again up to the forefront the idea of young individuals' fragility on the labour market.

The unemployment rate among young individuals was of 23.5% at EU-28 level in the year 2013. Informal employment among youths remains omnipresent and the transition to decent jobs is slow and very difficult to achieve.

Youths' unemployment, as well as the situations in which the youths are forced to give up seeking a job, or to work in inadequate conditions have a strong impact on the economy of a society, on the families of these youths, and on their personal and career development, and on the society at large, as well. The lack of a decent job, in particular if it occurs at a short-time after graduating some educational form, can compromise the future of an individual, his/her career perspectives, and very often it can lead to social exclusion.

Unemployment among youths is very high. In this context, achieving the objective of 75% labour force employment for the population aged between 20 and 64 years of age, as provided for by the Strategy "Europe 2020" requires improving the measures/ways of transition of the youths to the labour force market.

The current economic crisis generated several challenges that the youths must face. Also, for the future, the transition from school to work will be difficult for the new generation that will enter the labour market, because they shall be faced with the competition with an increased number of individuals who are already seeking for a job, for a permanently decreasing number of jobs, at least on the short-term.

Less skilled youths were already facing obstacles on their way to labour market integration also before the outbreak of the world crisis. The crisis has impact on the highly-educated youths who, after graduating a higher-education institution, prepare to enter the labour force market. During the periods of economic "boom" they are faced with fewer issues on the job. But, during the periods of economic recession they are facing both the issue of long-term unemployment, and the one of low wages, along with taking on jobs in fields for which they are over-skilled. When there are signs of a period of economic turnaround, another issue emerges and with which the youths are faced: employers will be tempted to employ young graduates to the detriment of those who graduated some years earlier, thus the latter are again hit by unemployment or long-term inactivity. Due to this perspective, the generations of youths who are fresh graduates at the time

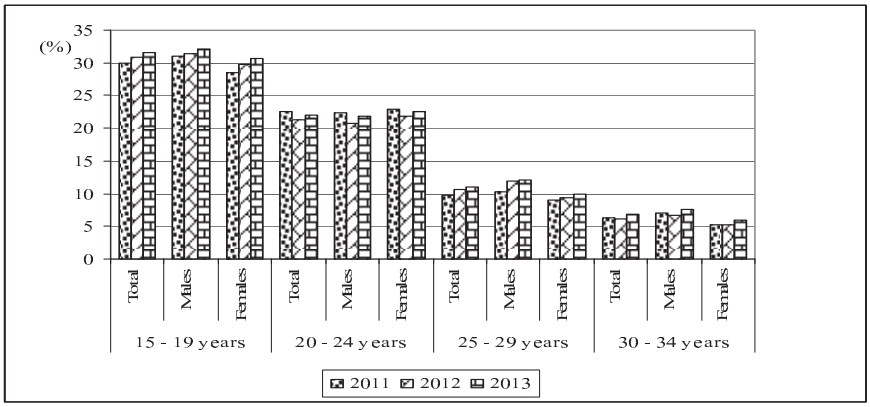
when a crisis period begins are designated in some specialised studies as *the lost generation*.

1. Youths' unemployment in Romania

Unemployment is a contemporary complex and over-reaching phenomenon that includes in its sphere economic, social, political, psychological and moral aspects. It is a negative state of affairs for the economy which consists in failure to put to good use a part of the employed labour force.

In accordance with the data provided by the National Institute of Statistics from Romania, the unemployment rate in Romania for individuals aged between 15 to 19 years of age, and 20 to 24 years of age in the year 2013 was of 31.5%, respectively 22.1% (Figure 1).

Figure 1 *ILO unemployment rate on age groups and genders*



Data source: TEMPO-Online – time series, National Institute of Statistics from Romania

The evolution of the main macroeconomic indicators reflecting the situation of youths on the Romanian labour market during transition does not highlight any positive developments for the persons comprised in the age group 15 to 24 years of age. Nevertheless, the few jobs available in the country were completely put to good use, a fact that cannot be said about several member countries of the European Union.

One of the issues with which Romania is faced is the continuing ageing of the population which puts pressure on the social security system, on the pension funds, but also on the educational system.

The highest values of unemployment among youths is registered for those with upper-secondary and vocational education.

The data provided by the National Employment Agency (ANOFM) indicate that the unemployment structure on age groups by the end of 2013

was the following: 90.151 unemployed with ages under 25 years of age, 38.086 unemployed with ages between 25 and 29 years of age, 110.955 unemployed between 30 and 39 years of age; 137.337 unemployed between 40 and 49 years of age; 61.352 unemployed between 50 and 55 years of age; 74.452 unemployed with ages over 55 years of age.

The analysis of the statistics regarding the evolution of unemployed indicates that the structure of the number of unemployed registered on age groups maintained the same evolution in the period 2008-2013, with periodical peaks, the crisis period having no influence on this structure.
The year 2013 is characterised by the diminishment in the number of available jobs as effect of the constriction in various economic activities and of the limited jobs' supply of the employers on labour market due to economic recession.

With respect to the unemployment structure according to the educational level, 64.49% out of the unemployed are graduates of primary, secondary and vocational education, 23.39% are graduates of upper-secondary, and post-upper-secondary education, and With respect to long-term unemployment, by the end of December 2013, with ANOFM were registered 18.169 youths under the age of 25 years who were unemployed for more than 6 months (representing 20.15% from total unemployed with ages under 25 years of age).

Within the conjecture of socio-economic changes from Romania, youths' unemployment prevention and stimulating the employment of graduates represents one of the main concerns of the agencies for labour force employment, and at the same time is one of the challenges.

The conclusion of labour force contracts on undetermined periods of time for 67.17% from total young employed graduates (13.624 graduates employed without subventions for the job) constitutes a substantial factor for diminishing the expenditures with passive measures from which they should have benefitted otherwise, and also for reducing the risk of their return, in a relatively short period of time, on the labour market.

In the year 2013, the risk of return on the labour market of young employed graduates was diminished due to the fact that employers can benefit from subventions only if they maintain the graduates in activity for a period of minimum 3 years. In the year 2013 were granted employment bonuses for graduates for a number of 3.760 individuals.

One of the reasons that contribute to the increase of the unemployment rate among young individuals in Romania is the mismatch between education and the requirements of the labour force market. Otherwise said, the educational system in Romania on one hand fails to train the workforce according to the required skills demanded by the market, and

on the other hand there is an over-abundance of students for specialties that have no labour force demand on the labour market.

There are still remains of the economic crisis which affect the development in the numbers of unemployed, especially among youths with ages between 15 and 25 years of age who, though in a rather small number, are faced with serious issues in finding a job, due to the employers' requirement for a minimum of experience. As result of this fact, a number of youths take on jobs that are either under their skills-level, or in another field than the one of expertise, where they have easier access; still most youths remain unemployed.

2. Econometric analysis of the unemployment evolution among young individuals in Romania

The evolution of the unemployment rate is influenced by very many factors: identifying the role of each factor on the development of unemployment can be realised with the assistance of the multifactorial econometric model.

The variables considered in the multifactorial modelling are: the unemployment rate among youths, the gross domestic product, the average monthly gross nominal earnings. The data regarding these variables were taken over from the TEMPO-online databank of the National Institute of Statistics from Romania.

As independent (exogenous) variables were considered the gross domestic product and the gross average earnings and the multiple regression models were developed by which was analysed the influence of these two variables on the unemployment rate, representing the dependent variable of the model:

The form of the regression model is:

$$rs_t = a + b \cdot pib_t + c \cdot cms_t + u_t \qquad (1)$$

where:

rs is the unemployment rate;

pib is the gross domestic product;

cms is the gross average monthly earnings.

For the estimation of the model was used the specialised E-views soft, by using the method of the least squares and the validity of the model was tested, the solidity degree, as well as the statistical significance of the model's parameters. Finally, the model was corrected for fulfilling all the hypotheses of the multiple linear regression models.

During the first stage were *analysed the data series with the aid of statistical methods* for being able to describe the intensity and the sense of the correlation between the dependent variable and each of the two

explanatory variables. The intensity of the correlation is given by the Pearson linear correlation coefficient, and the sense of the correlation is suggested by the sign of the coefficient corresponding to the respective variable.

In the case of the correlation between GDP and the unemployment rate, the Pearson correlation coefficient is equal to 0.7, which shows that there is a moderate direct correlation as intensity. With respect to the correlation between the unemployment rate and the net average earnings it can be stated that the same thing occurs based on a correlation coefficient of 0.71. Thus, both variables can be included in the model, because both have influence on the unemployment rate.

The multifactorial linear regression model, by using the method of the ordinary least squares (OLS), is:

$$rs = 19.01 - 2.654e^{0.6} \cdot pib + 6.21e^{0.5} \cdot cms \qquad (2)$$

Based on the equation the coefficients of the regression model can be analysed. Thus, a reverse relationship results between the evolution of the unemployment rate and the GDP evolution and a direct correlation between this and the average earnings. From the economic perspective, this correlation is the one observed, in general, at the level of an economy, the increase of the gross domestic product indicated an increase in the economic state of affairs, which would lead to a diminishment in the level of unemployment during the respective period of recession, decreasing together with the recession. Yet, the coefficients of the two variables result as being insignificantly different from null, an aspect confirmed also by the p-values which exceed the significance degree of 5%.

The determination coefficient shows that to a share of 52% the evolution of the unemployment rate is influenced simultaneously by the two variables included in the model, the rest of 49% being due to some other factors.

Applying the *t-student test* the significance of the linear regression model's parameters can be checked based on the following hypotheses:

$$\begin{cases} H_0 : a = b = c = 0 \\ H_1 : a \neq b \neq c \neq 0 \end{cases}$$

The validity of the model was checked based on the Fisher test which considers the following hypotheses:

$$\begin{cases} H_0 : statistically non-valid \bmod el \text{ (MSR = MSE)} \\ H_1 : statistically valid \bmod el \text{ (MSR > MSE)} \end{cases}$$

Having an F-statistic equal to 7.47 higher than the value of F-critic of 4.49, we can state that the model is valid from the statistical perspective,

the value p (F-statistic) of 0.006 which is lower than the significance threshold of 5% strengthening this fact.

Testing the errors' normality was realised with the aid of the Jarke Bera test. Based on the obtained results the conclusion was drawn that the errors have a distribution close to the normal one, this indicating a probability close to 1 and an average that tends to 0. This fact indicates that the unemployment rate is determined to the largest extent by the two variables, the influence degree of other possible factors being very low, and that the data are correctly taken over and processed. Thus, the estimated values of the unemployment rate do not differ significantly from the real ones.

For verifying the *homoscedasticity of errors* was used the test White and Glesjeri.

The White test is based on residual squares regression in relationship with all exogeneous variables, with their squares and their cross-products. According to this test, for the analysed model was obtained a very low F-static as value (0.49) which shows that the errors are homoscedastic as there are no significant differences between them, a result strengthened also by the probability which exceeds the threshold of 5%, respectively 7.7% which shows a high risk of errors in rejecting the null-hypothesis.

The same results were obtained also by applying the *Glesjer test* that has as hypotheses:

$$\begin{cases} H_0 : b = c = 0 \text{ (erorrs are heteroskedastic)} \\ H_1 : b \neq c \neq 0 \text{ (erorrs are not heteroskedastic)} \end{cases}$$

The analysis of the results for this test shows that there is homoscedasticity of errors.

Durbin – Watson test starts from the null-hypothesis (H_0) according to which we have non-self-correlation of errors and the alternative hypothesis (H_1). Applying this test led to a value DW=2.29 which is comprised between the critical value d_L =1.13 and 2.62 (resulted by subtracting from 4 the critical value d_U = 1.38), fact which determines us to accept the null-hypothesis which confirms the non-self-correlation of errors.

With respect to the *non-co-linearity of the explanatory variables* the determination coefficient between GDP and the average wage earnings was analysed and thus the fact was highlighted that it is visibly higher than the determination coefficient between these two and the unemployment rate (0.98 > 0.51) which shows that the two variables are co-linear.

Conclusions

The unemployment rate among youths with ages between 15 and 25 years of age is very high in Romania.

The analysis of the unemployment rate by econometric methods indicates that even though these are not the only factors of influence, the unemployment rate in Romania is influenced by the net average wage earnings, in the same sense as with the increase of the latter, and in reverse to the increase in the gross domestic product. The developed model is valid from the statistical viewpoint. Nevertheless, considering that GDP and average wage earnings are dependent between themselves more than the unemployment rate on the two, the model should be simplified or other exogenous variables should be considered.

The use of econometric methods allows for identifying the factors with strong influences on the unemployment rate among youths and for realising some short- and medium-term forecasts about this phenomenon, information of particular usefulness in adopting policies and measures for increasing the absorption degree of youths on the labour market.

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