

A regional model for labour demand in Romania

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Abstract. *In this paper we analyze the labour market from the point of view of the labour force demand. We develop a model that describes the connection between the employment rate of labour resources and other socio-economic indicators involved in the functioning mechanisms of the labour market. The model is empirically estimated using time series data taken from the labour force section from the Romanian National Institute of Statistics.*

The results of this analysis indicate and confirm the positive impact of the household income on employment and also the negative influence of labour productivity on the labour force demand.

Keywords: labour force demand; econometric model; regional labour market; employment rate; time series.

JEL Classification: C5, J2, R1.

REL Classification: 12I.

Introduction

In the current context, the Romanian economy is influenced by the effects of a continuous and dynamic process of change generated by both the transition to the market economy and globalisation.

The state of uncertainty which developed since 2009, as a result of the economic crisis, was characterized by significant decreases of investments and consumption, leading to the stagnation or even the decline of the demand of goods and services and therefore blocked the making of new jobs. Moreover, dismissals were registered in many fields, increasing the unemployment rate.

Furthermore, this change also influenced the main features of the labour market, with important implications on both economic and social terms.

The effects of these changes have been differently felt in our country, at a regional level, depending on the development degree, the North East region being one of the most affected ones.

This study aims both to identify the main factors which influence the regional labour force demand in Romania and to provide an analysis concerning the impact of these factors on employment.

The research focuses on the North-East region, which has recently registered significant decreases on the employment rate.

Theoretical aspects regarding the labour demand

Generally, the labour demand is expressed by the amount of the wage labour needed to produce material goods and services. This is structured on professions, qualifications and training levels.

The labour demand is a derived demand from the investments made as a consequence of the demand for products and services. In other words, the labour demand is determined by the production of the consumer goods.

From a statistical point of view, the labour force demand may be quantified by the number of employed people or vacancy, the statistical indicator corresponding to the number of employed population.

In some studies (Schneider, Hofreither, Neck, 1989, Schneider, 2011), the employment labour demand is highly correlated with changes in the real unit labour cost.

Within the model developed by Belot and van Ours (2001), the labour force demand is regarded as the real wage (the difference between the gross wage and

the price level) and by other institutional factors such as the payroll taxes, the employment protection and the active market policies.

Dobrescu (2005) studied the functioning mechanisms of the labour market by analysing the dependencies between the participation in the labour force, the unemployment and the rate of labour income per employed person.

By algebraic transformations, some relations were obtained describing the connection between the employment and the labour income per employed person.

Data and methodology

In order to develop a model for describing the influence of the variance of some socio-economic indicators on the labour force demand from the Romanian North-Eastern region, we took into consideration time series containing regional level data for 1995-2011 period. The data was taken from the Tempo Online Databases of National Institute of Statistics.

In our case the labour force demand was quantified through the dependent variable *Employment rate of labour resources (E)* defined as *the civil employed population / labour resources × 100*. The independent variables taken into account in the analysis are:

$E(-1)$ – first lag of employment rate;

I – monthly averages of total income per household;

P – labour productivity perceived as GDP/employed population;

D – dummy variable.

The analysis of the existing connections between these variables was done by estimating the following regression equation:

$$E = a + b_1E(-1) + b_2P + b_3I + b_4D + \varepsilon$$

where $b_1, \dots, b_k, k=1, \dots, 4$, are the regression coefficient, a regression constant and ε is the residual.

The variables E , I and P were employed in the analysis as growth indexes determined using the following formula $X_i' = X_i / X_i(-1)$, where $i=1, \dots, 3$.

All the series obtained were stationary. The Augmented Dickey Fuller and Phillips Perron were used for testing the existence of unit root.

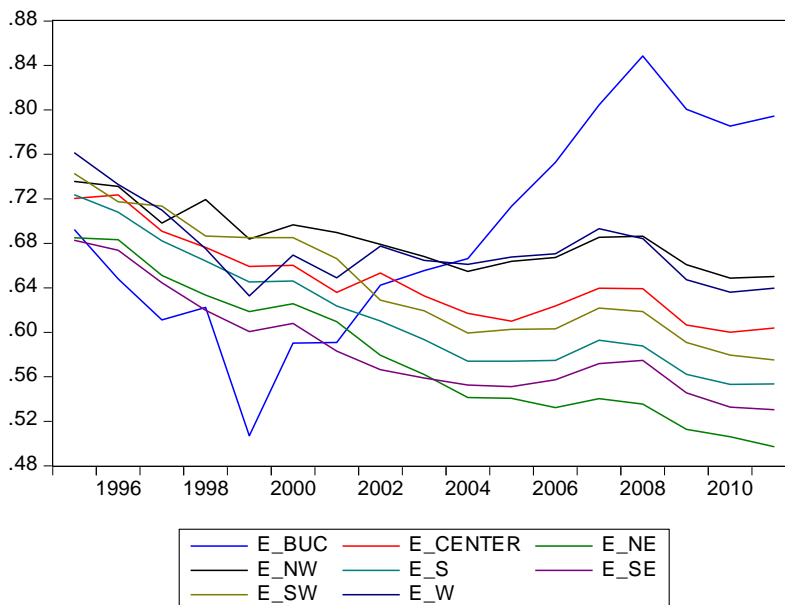
The dummy variable is used for highlighting structural breaks occurred in the evolution of some indicators (Gujarati, 2003).

Regarding the empirical study, before computing the data, the following transformation were done: the GDP was deflated using the GDP Deflator and the household income was deflated using the consumer price index (CPI).

The statistical software used for the analysis was E-Views 7.2.

Empirical results

Figure 1 offers a detailed image regarding the evolution of the employment rates recorded for the eight development regions in Romania, in accordance with NUTS II level.



Source: Authors' computing based on the database of the National Institute for Statistics.

Figure 1. *The evolution of the employment rate in Romania, per regions, from 1995 to 2011*

As one can see, beginning with 2003-2004 the North-Eastern region has started to register the lowest values for the employment rate compared to the other regions of the country. Also between 2008 and 2009 a decrease of the employment rate was registered for all the Romanian regions, as an effect of the world economic crisis.

The next step is to present the comparative evolution of the variables' growth indexes: employment rate of the labour force, GDP and income, recorded for the North-Eastern region from 1995 to 2011.



Source: Authors' computing based on the database of the National Institute for Statistics.

Figure 2. The evolution of the main indicators of the labour force demand in the North-Eastern region

After employing the multiple regression analysis the following results were obtained (Tables 1a and 1b):

Table 1a. Regression results
(dependent variable: E)

Variab.	Coeff.	Std. Error	t-Stat.
C	0.776687*	0.191267	4.060752
E(-1)	0.379290**	0.212618	1.783902
P	-0.292259*	0.088757	-3.292813
I	0.133174*	0.035978	3.701536
D	-0.055413*	0.017232	-3.215639

Source: Own processing in E-Views.

Note: *, ** denote significance at the 1%, and 10%.

Table 1b. *Regression results*

R-squared	0.626259
Adjusted R-squared	0.476762
F-statistic	4.189118
Prob(F-statistic)	0.030126
Akaike info criterion	-5.423135
Schwarz criterion	-5.187119
Hannan-Quinn criter.	-5.425650
Durbin-Watson stat	2.347525

Source: Own processing in E-Views.

All the estimated coefficients of regression equation are statistically significant at the 0.01 level, except the variable E(-1), whose coefficient is statistically significant at the 0.1 level.

After estimating the regression model one can observe a positive influence of the first lag of the employment rate variable from the previous period and the household income variable on the current employment rate. Income is expected to have a positive impact on the employment rate because an increase in household incomes leads to an increase in the production of goods demand and thus in the labor force demand.

Also it is worth noting that labor productivity has, in some degree, a negative impact on the employment rate. This can be explained by the fact that an increase in labor productivity among employed people leads to a stagnation or even a decline in the number of new jobs. Productivity growth is due, in general, to the growth of the technological progress and continuing trainings for employees. The development of new technologies in almost all fields has both positive effects through the increase of labor productivity and negative effects, much of the physical and intellectual activity being taken over by these "automated equipment", leading to a decrease in the number of new jobs.

The explanatory variables considered are not the only variables which can explain the variation of the dependent variable. There are other factors that influence and explain the variation of the employment rates for the North-Eastern region and other regions. In general, these determinants are mainly qualitative and regard the investors' decision to invest in a certain region, the existing economic and employment policies and the business position towards creating new jobs and maintaining the existing ones.

Conclusions

A very important issue that Romania is faced with at the moment is the decrease of the employment rate, especially in the low developed regions. Among them we can find the North-Eastern region, where the biggest part of the population is engaged in agricultural activities.

The present study analyses the labour market from the demand perspective, without getting into details as regards to the labour demand dependent on professional components, age groups of employed population, activity fields.

The study's estimated model shows the influences of a number of socio-economic indicators on the labour demand, quantified by means of the employment rate of labour resources.

The results obtained for North-Eastern region may contribute to developing some strategy for increasing the employment rate in the region or may be used as support for investors' decisions.

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