Modeling of Regional Unemployment in Russia: Comparison of Resource-Rich and Resource-Deficient Regions

Demidova O., NRU HSE, demidova@hse.ru

Mokhova V., RusAgro, mohova.victoriya@yandex.ru

The unemployment rate is one of the main indicators of the socio-economic situation in the country. Despite the fact that the unemployment rate varies considerably from region to region, in various macroeconomic forecasts, policy programs, analytical materials, as a rule, only country level unemployment rate is analyzed. However, in so large and economically heterogeneous country as Russia, the country's unemployment rate can not reflect the fullness of the picture available for observation in the regional context. Thus, with the overall unemployment rate in Russia at 5.2% in 2014, the difference between the minimum (1.4% in St. Petersburg) and the maximum (about 30% in Ingushetia) regional unemployment levels reached almost twenty times (Oschepkov, 2015). Of course, with such variation of the data, it is quite difficult to characterize the real situation on the labor market of our country, analyzing the levels aggregated for all countries, so a more effective strategy is to analyze regional data.

Many studies on the modeling of unemployment in the regions of Russia indicate the existence of a relationship between regional labor markets. Accounting for this relationship is important, first of all, because the presence of spatial effects plays an important role in the formation of regional policies in the sphere of labor and employment. In addition, the inclusion of spatial lags in econometric models that estimate the level of unemployment, allows you to avoid the coefficients bias for other regressors of the model, caused by the omission of an essential variable.

The main purpose of this work is to study the spatial interactions of regional labor markets in terms of unemployment and the estimation of the impact of various factors on the unemployment rate in the Russian regions in 2005-2013 using spatial econometric models.

The main feature of this study is the use of several weighting matrices, including an endogenous weighting matrix based on the structure of the gross regional product and designed for each year of the period under study.

In this research all regions are divided into two groups. This idea has already been found in papers (Kolomak, 2010) and (Demidova, 2014), however in these studies the criterion for subdivision of regions into groups was their geographical location: eastern or western. In the current study, the regions are divided into two other groups: resource-rich and resource-deficient.

Two main hypotheses were tested:

1) On the asymmetric impact of resource-rich and resource-deficient regions on each other

2) About differences in factors explaining the dynamics of unemployment in : resource-rich and resource-deficient regions.

To test these hypotheses, we used a model:

$$\begin{pmatrix} Y^r_{i^*t} \\ Y^p_{i^{**}t} \end{pmatrix} = \gamma \begin{pmatrix} Y^r_{i^*,t-1} \\ Y^p_{i^{**},t-1} \end{pmatrix} + \begin{pmatrix} \rho^{r\cdot r}_k W^{r\cdot r}_k & \rho^{r\cdot p}_k W^{r\cdot p}_k \\ \rho^{p\cdot r}_k W^{p\cdot r}_k & \rho^{p\cdot p}_k W^{p\cdot p}_k \end{pmatrix} * \begin{pmatrix} Y^r_{i^*t} \\ Y^p_{i^{**}t} \end{pmatrix} +$$

$$+ \begin{pmatrix} X^r_t \beta^r \\ X^p_t \beta^p \end{pmatrix} + \sum_{t=2005}^{2013} \theta_t d_t + \begin{pmatrix} \alpha_{i^*} \\ \alpha_{i^{**}} \end{pmatrix} + \begin{pmatrix} \varepsilon_{i^*} \\ \varepsilon_{i^{**}} \end{pmatrix}$$

where $Y^r_{i^*t}$ - level of unemployment in year t in resource-rich region i^*, $Y^p_{i^{**}t}$ - - level of unemployment in year t in resource- deficient region i^{**}, $W^{rr}_k, W^{rp}_k, W^{pr}_k, W^{pp}_k$ – weights matrices, k denote the type of the matrix (boundary or inverted distance or endogenous), $\rho^{rr}_k, \rho^{rp}_k, \rho^{pr}_k, \rho^{pp}_k$ - coefficients of weights matrices, X^r_t, X^p_t - matrices of explanatory variables, d – time effects, α - individual effects, ε - errors.

This model was estimated by the panel data for 80 Russian regions for the period 2005-2013.

The methodology for estimation the model is similar to that used in (Demidova, 2014).

Based on the results of the estimation of models by the Arellano-Bond method, both hypotheses have been empirically confirmed.

In more detail, the following was established:

1) In the group of resource-rich regions there is competition for labor resources. This result could be explained by the fact that in the fuel and energy industry, which are the main industries for these regions, as a rule, profile specialists are employed. Due to the specifics of their profession, such workers, when they lose their jobs in one place, are forced to move to other cities / regions following vacancies in a similar professional field.

2) Neither in the geographically neighboring regions nor in similar resource-deficient regions, competition for labor resources was not identified.

3) The influence of resource-rich regions on the resource-deficient regions is positive. In other words, if unemployment decreases in resource-rich regions, it does not have a competing impact on resource-deficient regions.

4) Only the interpretation of spatial lags in the case of the influence of resource-deficient regions on resource-rich regions was ambiguous. In geographically neighboring resource-rich and resource-deficient regions there were no competition for labor resources and unemployment percentage change is co-directive. An opposite picture is observed for resource-rich and resource-deficient regions with a similar economic structure. Resource-deficient regions compete for labor resources with resource-rich regions with a similar economic structure. With the decline in unemployment in resource-deficient regions, it should increase in resource-rich regions.

If the migration of labor is considered as a mechanism for linking regional labor markets, this situation can be interpreted as follows. Ready-to-migrate workers from resource-rich regions will prefer to move to other resource-rich regions, or to those resource-deficient regions whose economies are most similar to the donor region.

Estimates for other factors included in the model were more or less stable and often differed for resource-rich and resource-deficient regions, which confirms the meaningfulness of such a division.