

Marshallian vs Jacobs effects comparison: which one is stronger?

Evidence for Russia unemployment dynamics

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Better knowledge of between Russian regions differences allows the state to pursue a more structured national and regional policy in order to avoid negative social and economic consequences from the concentration of regions with high unemployment (Elhorst, 2003). One of the most important reasons of inequality is the current concentration of economic activity in regions which have a number of competitive advantages. Possible consequences of high concentration in the region and its impact on unemployment are interesting because of the existence of two differently directed effects. The Jacobs’ theory (Jacobs, 1969) proves that due to the higher diversification level urban territories better absorb unemployment shocks, it’s easier to find a job in another sector of the economy in case of job loss, which leads to a lower unemployment rate. Marshall's theory, by contrast, suggests that regions with a high level of specialization have better economic indicators and have a lower unemployment rate due to agglomeration economies (Marshall, 1993). These effects can overlap, especially in heterogeneous regions, and the main objective of the study was to empirically confirm these effects, to find out which effect dominates and whether this predominance is constant for different time intervals.

Viladecans-Marsal (2004) noticed the nonlinear dependence between degree of concentration and the level of region’s unemployment. Simon and Nardinelli (1992) also paid attention to the non-linear influence of diversification: the negative impact on the dynamics of unemployment is mitigated when a certain level of specialization of the region is reached or it completely changes the sign under the existence of the Marshallian externalities. Both Marshallian and Jacobs effects can exist at the same time and influence unemployment level in the opposite directions. These effects may overlap. Basile et al. (Basile et al., 2012) found evidence of nonmonotonic dependence for Italy. At low specialization values, Jacobs effects dominate due to intersectoral mobility, but in regions with a higher level of specialization, the importance of the Marshallian externalities increases. Thus, in highly concentrated regions, the overall effect of spatial specialization on the unemployment growth is not statistically significant. Russia, as well as Italy, is a very heterogeneous country, so it makes sense to check

the validity of the following conclusions for Russia as well. So the first hypothesis was formulated.

Hypothesis 1: The dependence of the unemployment rate on the degree of concentration or diversification is non-monotonic due to the possible overlapping effects of urbanization and localization.

It is assumed that during periods of economic growth regions with a high degree of diversification have more favorable indicators of the labour market (unemployment level) due to the existence of Jacobs effects, as they spread among different industries in one region and labour mobility contributes to a reduction in unemployment. On the contrary, in the crisis periods localization effects prevail due to the declining demand for products. Having studied the transition period in the Russian and Chinese economies (1990's), Galbraith came to the conclusion that the industries with the maximum level of concentration remained in a winning position and were less affected by the crisis, especially, had lower unemployment rate (Galbraith et al., 2004). Simon and Nardinelli (Simon, 1988, Simon and Nardinelli, 1992), Elhorst (Elhorst, 2003), Ferragina and Pastore (Ferragina, Pastore, 2008) also confirmed the effects of urbanization. They concluded that with growth of diversification level in the region, employment opportunities increase due to shifts between sectors and lower levels of unemployment are observed. However, the authors showed that there were such crisis periods, when in more diversified regions the unemployment rate was higher. Based on these studies, the study of the unemployment rate's dependence on concentration or diversification level in the Russian regions at various time intervals was of particular interest. Thus, the second hypothesis was formulated.

Hypothesis 2: The direction of influence of the degree of concentration or diversification on the unemployment level depends on the chosen time interval.

To test Hypotheses 1 and 2 we took the methodology and technique of estimation from the article of Basile et al. (2012), namely, an additive semi-parametric model was used:

$$y_i = X_i^* \alpha^* + f_1(X_{1i}) + f_2(X_{2i}) + \dots + f_w(y_i^0) + \varepsilon_i ,$$

where i is the number of a region, Y_i is rates is an approximation of the average percentage increase in unemployment over the period $[(t-n) - t]$ in region i and is calculated by the following

formula: $y_i = \frac{(\ln U_t - \ln U_{(t-n)})}{n}$, X^* - matrix of strictly parametric components, α^* - the corresponding parameter vector, f_j - estimated smooth functions, y_i^0 - spatial lag of y , ε_i - vector of errors. We used the following explanatory variables: GRP per capita, calculated in the base prices of 2000, share of urban population, share of population with higher education, coefficient of migration increase per 10000 people, share of people below working age (below 16 years), share of people above working age (55 years for women and 60 years for men),

population density (number of persons per square kilometer), Lilien index, of concentration and diversification, initial unemployment level and growth of indices weighted unemployment in neighboring regions (spatial lag of the dependent variable). The concentration and specification indices were calculated in two ways: 1) on the basis of firms revenues obtained using a database Ruslana, 2) on the basis of regional gross value added (GVA) by types of economic activity, listed on the Rosstat website (www.gks.ru). The following time periods were considered: 2007-2016 (general period), 2007-2008 (the period before economic crisis), 2008-2010 (crisis period), 2010-2013 (recovery period) and 2013-2016 (slowdown in economic growth).

According to the results obtained, our main hypotheses were empirically confirmed. The dependence of the dynamics of unemployment on the degree of concentration or diversification in the general case is indeed non-monotonic due to the overlap of the effects of urbanization and localization. It was shown that in Russia, depending on the period, various effects dominated: in 2008-2010 and 2013-2016, Marshallian effects predominated, while in 2010-2013, Jacobs effects dominated. So, in the crisis period the state should support enterprises whose specialization does not coincide with the main specialization of the region through tax benefits and special subsidies, and in the period of growth - to develop the most promising sectors in each region.