

**FORECAST OF THE EMPLOYED POPULATION SIZE DYNAMICS  
ON THE BASIS OF MODEL AGREEMENT OF THE DEMAND  
FOR LABOUR FORCE AND ITS SUPPLIES**

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**Keywords:** forecast, model, script, alternative forecast, labour force, employed population, forecasting-analytical calculations, population forecast.

The results of the forecasts of the employed population size dynamics in Samara region are presented here on the basis of the agreement model of the demand for the labour force and its supplies. For the forecasting, analytical calculations of the dynamics of the sector of employment and the labour-market, mono- and multisectoral agreement models can be used.

The definition “potential employees” ( $U(t)$ ) is used in these models. It means the part of population in the working age which is not employed in the economy of the country (or the region) now. So that  $U(t) = N(t) - L(t)$ , where  $N(t)$  - population size in the working age,  $L(t)$  - population size of the employed in the economy of the country (or the region). “Potential employees” include the following groups: idle disabled persons of groups I and II, retired aided people, students older than 16, army soldiers, the unemployed and some other groups.

The influence of the vacant working places dynamics on forming the occupational pattern in different branches of economy is determined by the processes of “opening” and “closing” the working places.

Supposing that the connection between the “potential employees” and the vacant working places is  $V(t)$ , it increases ‘potential employees’ - and the vacant working places -  $dV(t)$  for the time  $dt$  will be prorated respectively  $U(t)$  and  $V(t)$ . So we get:

(1)

where  $\varepsilon_0, \varepsilon_1$  - accession rates, which show the dependence of the increases  $dU/dt$  and  $dV/dt$  to the values  $u$  and respectively.

In real life the connection between the “potential employees” and the vacant working places influences the number of all of them. This influence is and  $\beta_2 = \mu_2 UVdt$ . For the time  $dt$

the numbers of the “potential employees” and the vacant working places change respectively to

$$\begin{cases} dU = \varepsilon_0 U dt + \mu_1 UV dt \\ dV = \varepsilon_1 V dt + \mu_2 UV dt \end{cases} \quad (2)$$

The increase of the number of the “potential employees” is equal to the difference in the increase of the population in the working age, and the increase of the vacancies is equal to the difference of the increase in the working places.

From the (2) we get:

$$\begin{cases} dU / dt = \varepsilon_0 U + \mu_1 UV \\ dV / dt = \varepsilon_1 V + \mu_2 UV \end{cases} \quad (3)$$

Forecast of the population size dynamics.

According to the first variant of Samara region population during the 2010-2025 the size decreases to the 4,5%, or to the 140 000 people.

The second and third variants correspond to the high and low Rosstat variants of the forecast. The second variant sounds rather optimistic. The third variant supposes the great decrease in the population size during 2020-2025.

In the fourth variant the population size also reduces immensely. The fifth variant supposes to implement a range of measures in the population policy. Variants six and seven reflect the results of the migration and local movement of the population.

*Perspective evaluation of the employed population size dynamics in Samara region.*

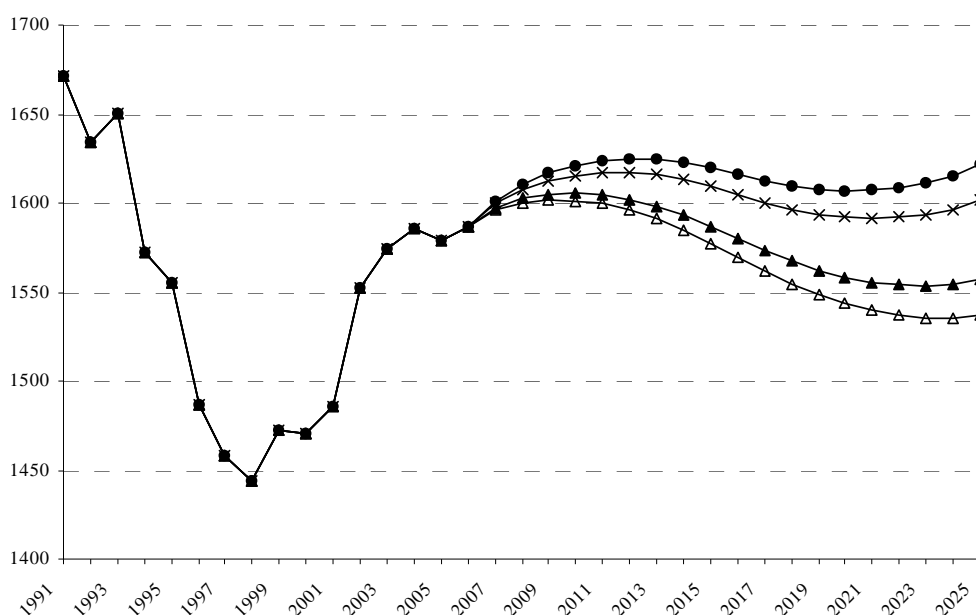
The results of the analysis demonstrate that the most optimistic forecasts take place at the innovational script of the economic development.

The highest estimations of the employed population size in Samara region are characteristic for the case, when the level of economic activity grows according to the tendencies of the period from 1999 to 2006.

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**Evaluation of the prospective dynamics of the population size in Samara region up to 2018**

Variants of the forecast	2010	2011	2012	2013	2014	2015	2016	2017	2018
Rosstat middle variant	-0,17	-0,20	-0,21	-0,22	-0,24	-0,27	-0,27	-0,29	-0,29
Rosstat high variant	-0,06	-0,07	0,00	0,05	0,07	0,06	0,06	0,05	0,05
Rosstat low variant	-0,37	-0,42	-0,42	-0,45	-0,49	-0,52	-0,55	-0,62	-0,62
Variant in the absence of population policy measures	-0,21	-0,24	-0,28	-0,32	-0,36	-0,42	-0,46	-0,51	-0,55
Variant according to the implementation of population policy measures	-0,12	-0,10	-0,08	-0,07	-0,06	-0,06	-0,07	-0,07	-0,08
Variant according to the model of the movement of population in 1991-2006	-0,10	-0,08	-0,06	-0,05	-0,03	-0,02	0,00	0,02	0,04
Variant according to the model of population movement in 1999-2006	-0,12	-0,11	-0,09	-0,08	-0,06	-0,05	-0,03	-0,01	0,00



**Fig. Employed population size dynamics according to the 3<sup>rd</sup> variant**

Top down: economic activity during the period 1999-2006 (variant 1);  
 regional structure during the period 1999-2006 (variant 3);  
 regional structure during the period 1991-2006 (variant 4);  
 economic activity during the period 1991-2006 (variant 2)

According to the analysis, we get the following results: two variants of the socio-economic development are enough. All the variants demonstrate quite similar results and changes. All the variants can be divided into two groups: the first group, demonstrating the optimistic dynamics of the employment, and the second, demonstrating rather pessimistic dynamics. Variants 2 and 3 approximate the value of the demand for labour force in the Samara region.

According to the results of the research, during the last 2-3 years the negative influence of the population tendencies on the labour-mar-

ket intensified greatly, and the problem of the lack of labour force worsened.

The results of the population size dynamics let us forecast the structure of the employment in Samara region on the levels of education, territories and different kinds of economic activities. This forecast can also be used in the regional policy, while working with the employment in modern economic situation.

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