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Vladimir Shabashev, Viktor Erastov,
Sergey Shorokhov, Marina Verkhozina

FORWARD DYNAMICS OF THE ECONOMICALLY ACTIVE
IN THE KEMEROVO REGION AND ALTAI KRAI

The article describes and analyzes the population dynamics and demographic structure of the economically active population of the Kemerovo Oblast and Altai Krai. These regions are the representatives of the two diametrically opposite clusters - groups of regions "with high shares of manufacturing and extractive industries" and "with relatively low shares of manufacturing and extractive industries." The impact of migration on the size and age structure of the economically active female and male population is analyzed. The comparison of the processes of natural and mechanical movement of the economically active population in these regions is made.

Key words: the economically active population, cohort-component analysis, the balance of migration exchange, age and sex structure, the dynamics of the economically active population.

Владимир Шабашев, Виктор Ерастов, Сергей Шорохов, Марина Верхозина. ПРОГНОЗНАЯ ДИНАМИКА ЭКОНОМИЧЕСКИ АКТИВНОГО НАСЕЛЕНИЯ КЕМЕРОВСКОЙ ОБЛАСТИ И АЛТАЙСКОГО КРАЯ. В статье рассмотрена и проанализирована динамика численности и половозрастной структуры экономически активного населения Кемеровской области и Алтайского края. Данные регионы являются представителями двух полярно противоположных кластеров – группы регионов «с высокими долями обрабатывающих и добывающих производств» и «с относительно невысокими долями обрабатывающих и добывающих производств». Проанализировано влияние миграционных процессов на численность и возрастную структуру экономически активного женского и мужского населения. Произведено сравнение процессов естественного и механического движения экономически активного населения в данных регионах.

Ключевые слова: экономически активное население, когортно-компонентный анализ, сальдо миграционного обмена, возрастно-половая структура, динамика экономически активного населения.

Володимир Шабашев, Віктор Єрастов, Сергій Шерехов, Марина Верхозіна. ПРОГНОЗНА ДИНАМІКА ЕКОНОМІЧНО АКТИВНОГО НАСЕЛЕННЯ КЕМЕРОВСЬКОЇ ОБЛАСТІ І АЛТАЙСЬКОГО КРАЮ. У статті розглянуто і проаналізовано динаміку чисельності і статевовікової структури економічно активного населення Кемеровської області і Алтайського краю. Дані регіони є представниками двох полярно протилежних кластерів – групи регіонів «з високими частками обробних і добувних виробництв» і «з відносно невисокими частками обробних і добувних виробництв». Проаналізовано вплив міграційних процесів на чисельність і вікову структуру економічно активного жіночого і чоловічого населення. Здійснено порівняння процесів природного і механічного руху економічно активного населення в даних регіонах.

Ключові слова: економічно активне населення, когортно-компонентний аналіз, сальдо міграційного обміну, віково-статева структура, динаміка економічно активного населення.

Currently existing various scenarios of development of Russian economy show a growing shortage of manpower. Current demographic processes lead to a reduction of labor supply in the labor market, which determines the need to develop measures that minimize the damage. Firstly, the possibility of increasing productivity due to increased training of employees and the intensification of production on the basis of innovation should be explored. Secondly, the reduction of working time fund due to the reduction of employment can be compensated by an increase in the level of economically active population, in other words, an increase of the retirement age. Third, one should explore the possibility of engaging the workforce due to international migration. Of a number of these measures experts recognize practically feasible the measure of promoting positive international balance of labor resources. [1, pp. 15-19].

In order to know how this measure is able to solve the problem of reducing the economically active population forecasts are required. Given the fact that individual subjects of the Russian Federation in varying degrees are experiencing difficulties due to the reduction of the economically active population, the forecasts should be made for each region. Currently, there are forecasts of Rosstat made for the Russian regions in three enlarged age groups : under the working age, of working age and in the retirement age. However, sex and age pyramid of working ages is not strictly a pyramid, so it is necessary to make forecasts divided into one-or five-year age groups. There also exist the calculations of the balance of international migration exchange. All forecasts are made on the basis of three variants: the average, high and low. [3]

In 2010 the employees of the Institute of International Studies of the Family (IISF) produced a calculation of the total economically active population of Russia up to 2030 year. Calculations showed that the economically active population (at the level of activity being the average of the 2006 - 2008) in the period from 2010 to 2015 will reduce by 0.26%; in the period from 2015 to 2020 - by 2.76%. Overall, in the period 2010 - 2020 the reduction of 3.81% will take place and for the entire forecast period from 2010 to 2030 - 7.35% (Table 1).

Table 1

IISF forecast of the economically active population in Russia [1]

Year	2010	2015	2020	2025	2030
Economically active population (million. pers.)	76,2	76,0	73,9	72,1	70,6

The aging of age structure will also occur, and many studies show that it has a negative impact on the pace of economic growth [6, 7]. The mentioned facts can not be ignored. Since each region has its own demographic and socio-economic specificity, appropriate calculations for each region should be provided. An obstacle for such calculations in a separate survey is time consuming calculations and the lack of accessibility of the data on the age and sex structure of the population of the regions.

We made a forecast of male and female economically active population for the two regions - Kemerovo Region and Altai Krai. They are the representatives of two of the four clusters which we have formed - "with high shares of mining and manufacturing industries" and

"with relatively low shares of mining and manufacturing industries" respectively [4, pp. 56-61]. The forecast was made using a method of shifting ages realized in a matrix form (cohort-component analysis). The information on the age and sex structure of the economically active population in these regions was taken as a basis for this survey. When making a forecast we assumed that economic activity of men and women in these regions would remain at the highest in recent years level, which was reached in 2010. The results are shown in tables 2 and 3.

Figures 1 and 2 clearly show that in the Kemerovo Region a reduction of the economically active population (especially men) accompanied by its aging is taking place.

Table 2

The economically active population of the Kemerovo Region in the various age and sex groups in 2010 – 2020

Age group	2010		2015		2020	
	Male	Female	Male	Female	Male	Female
15÷19	51273	42234	41726	33114	47566	37792
20÷24	78302	64316	51167	42176	41640	33068
25÷29	79491	69120	77803	64126	50841	42051
30÷34	69091	58970	78439	68843	76774	63869
35÷39	62319	54191	67510	58582	76645	68391
40÷44	50743	45634	60229	53674	65246	58023
45÷49	65360	60615	48830	45088	57959	53033
50÷54	73774	71444	62235	59670	46495	44387
55÷59	58717	61000	68965	69941	58178	58416
60÷64	38471	43929	53270	59142	62567	67812
65÷69	19363	27506	33585	41916	46506	56433
70÷72	15754	25444	6369	10283	11049	15670
Total:	662658	624403	643759	596272	630417	583275

Table 3

The economically active population of the Altai Krai in the various age and sex groups in 2010 – 2020

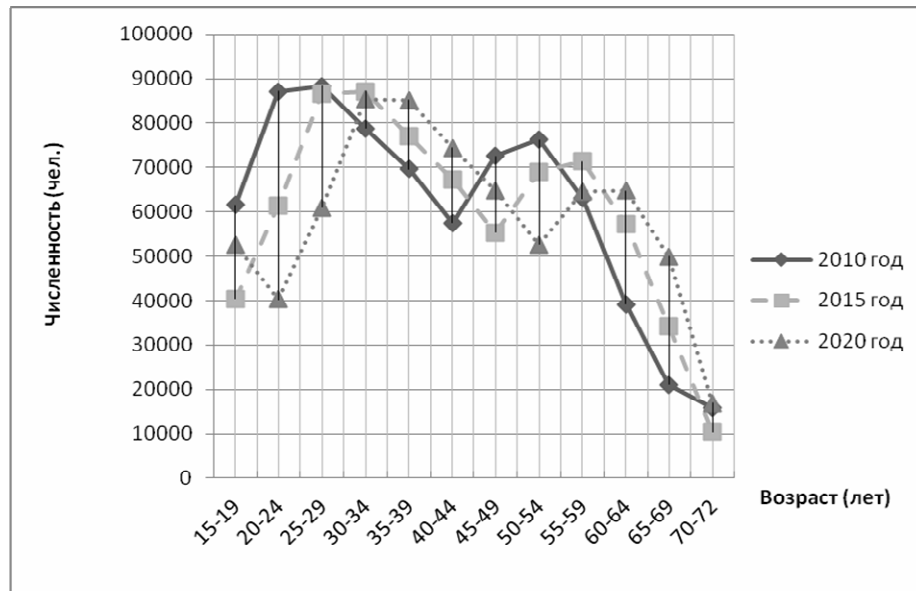| Age group	2010		2015		2020	
	Male	Female	Male	Female	Male	Female
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70÷72	15754	25444	6369	10283	11049	15670
Total:	662658	624403	643759	596272	630417	583275

Figure 1. The dynamics of the age structure of the male economically active population of the Kemerovo Region
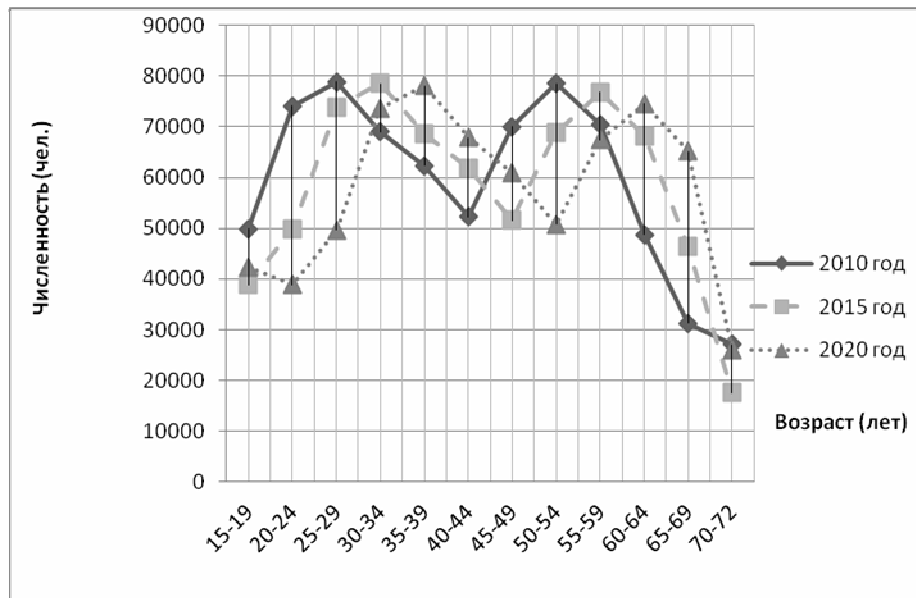

Figure 2. The dynamics of the age structure of the female economically active population of the Kemerovo Region

According to estimations produced, the total economically active population of the Kemerovo Region in 2015 will decrease by 1.8% (25,075 people) compared to 2010, and in 2020 by another 0.8% (10,739 people) relative to 2015. Reduction in the period between 2010 - 2020 will be about 2.5% (35,814 people) and the main reason for this will be the decline of economically active male population. The number of economically active men in the period 2010 - 2015 will reduce by 1.9% (13,570 people), and then in 2015 - 2020 - by another 0.7% (5,013 people). For the whole period 2010 - 2020 the projected decline in the economically active male population of the Kemerovo region will amount 2.6%. In addition, the age structure of the male and female population will significantly become older. The only real source of labor replenishment in the foreseeable future is the influx of migrants. Table 4 shows the migration bal-

ance of the Kemerovo region in 2005 - 2012.

In this period employable immigrants accounted for 74% - 76% of the total number of entrants, that is, in the very best case, about 321,400 people. If it is assumed that the level of economic activity of immigrants in this period corresponded to the highest level of economic activity of the region's population (66.7% in 2012), it can be stated that during the 8-year period migration provided a growth of potential labor force to 214.4 thousand people. If the outflow of people from the region is considered, then under the same terms of age, disability and economic activity, the net increase in the economically active population, which occurred due to migration exchange, was for these 8 years of not more than 13,700 people.

According to estimates, the average annual migration reduces the decline in the number of economi-

cally active population to the relative value of 0.2% [5, p. 154]. Therefore, in order to stabilize this number it is necessary to increase the number of migration balance up to 28 thousand persons per year. Achieving the target in the short term looks problematic task, especially considering the fact that in 2011 and 2012 it was negative. In addition, the sharp increase in the number of immi-

grants can lead to social tensions growth. However, if over a longer time period required migration exchange rate is reached, the problem of the inadequacy of the educational and qualification structure of people entering the regional labor market will remain an unsolved problem.

Table 4

Migration flows in the Kemerovo Region in 2005 - 2012 years (people) [2]

	2005	2006	2007	2008	2009	2010	2011	2012	Total
Inflow	52505	49622	55033	52362	44230	42167	60445	66620	422984
Outflow	46725	45050	45215	44586	38196	41630	63249	71182	395833
Migration balance	5780	4572	9818	7776	6034	537	-2804	-4562	27151

Another negative factor is the marked increase in the proportion of the economically active population over the age of 55 years. Industrial and raw materials specialization of the region, setting a very high share of manual labor, is critical for the health of the worker. The presence of elderly workers in the total amount of employed is a serious threat to the economic growth.

As to Altai Krai, figures 3 and 4 clearly show the downward trend in the number of economically active male and female population. Downsizing accompanies to the aging of the age and sex structure.

According to the calculations, the economically active population of the region by 2015 will fall by 3.7% (47,030 people) comparing to 2010, and by 2.2% (26,339 people) by 2020 (comparing to 2015). During the period between 2010 - 2020, there will be a reduction for more than 5.7% (73,369 people) and the aging of the population will also take place. In comparison with the Kemerovo Region, there are some features in the dynamics of age-sex structure of the economically active population of the Altai. Reduction in the number of economically active population of the region occurs mainly due

to reduction of the women's group. If the reduction in the male group in 2010 - 2015 is 2.9% (18,899 people), in the women's group it is 4.5% (28,131 people). In the next 5 years the comparable figures will equal to 2.1% (13,342 people) and 2.2% (12,997 people). The overall decline in the number of economically active women in the Altai Krai in the next 10 years will be 6.6% (41,128 people). That reduction will occur mainly in women's group, but this does not reduce the severity of the problem for two main reasons: the overall reduction in the number of economically active population is large; declining of number and aging of the women's group reduces the potential for natural reproduction that lays the foundation for further depopulation.

Thus, in 2010 - 2020 years in the Altai Krai there will be a reduction in the number of economically active men and women of 73369 people because of the processes of natural population movement. Migration, in contrast with the Kemerovo Region, will only aggravate the demographic situation if current trends continue (Table 5).
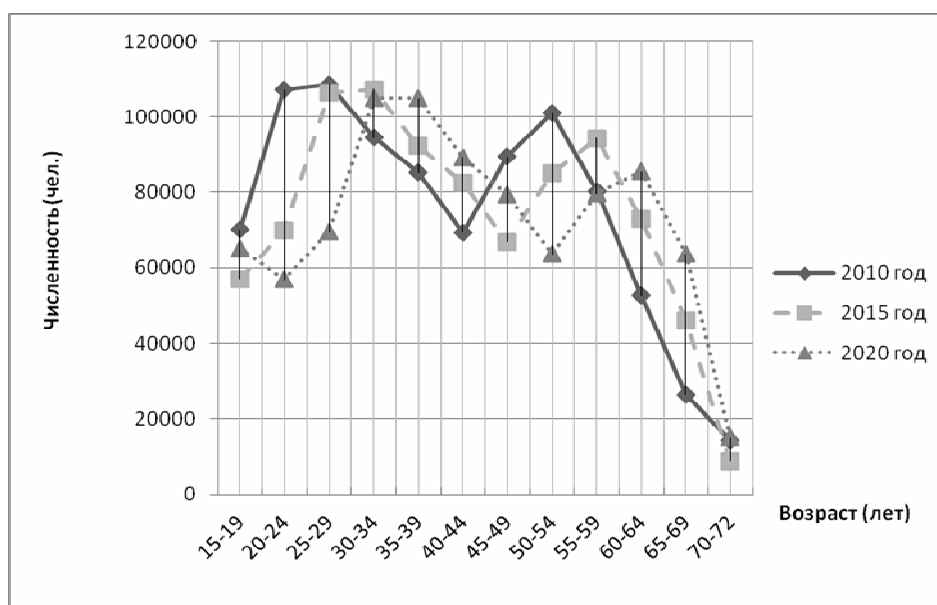

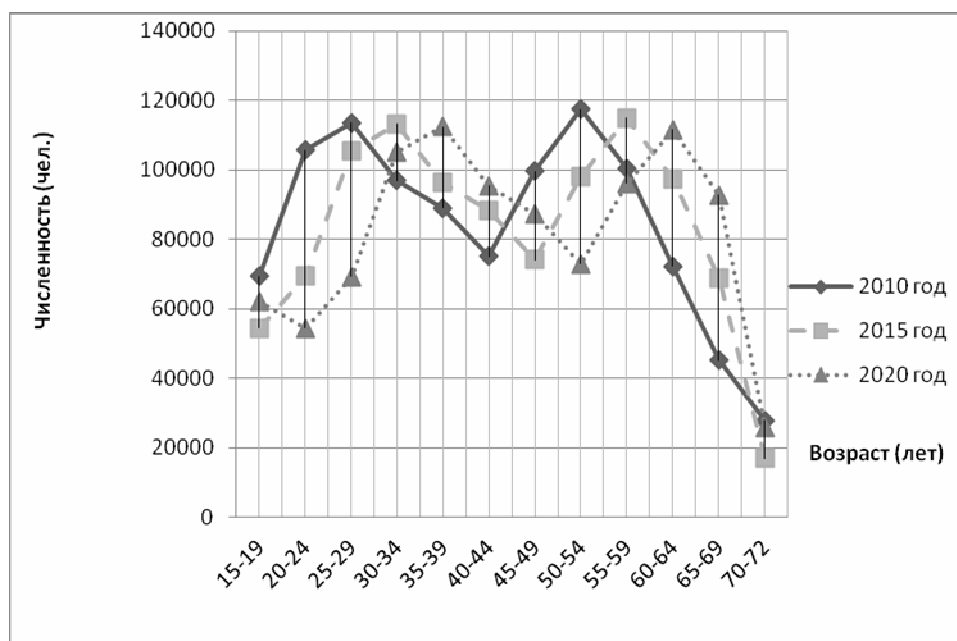***Figure 3. Dynamics of the age structure of the male economically active population of the Altai Krai***

Figure 4. The dynamics of the age structure of the female economically active population of the Altai Krai

Table 5

Migration flows of Altai Krai in 2005 – 2012

Flow / Year	2005	2006	2007	2008	2009	2010	2011	2012	Total
Inflow	50503	48570	48103	43906	43028	44655	74544	86841	440150
Outflow	56905	55738	53894	48852	44222	48942	80269	93067	481889
Migration balance	-6402	-7168	-5791	-4946	-1194	-4287	-5725	-6226	-41739

Reduction of the population of the Altai Krai due to migration outflow in the period of 2005 - 2012 was equal to 35,513 people. Using the same premise about the proportion of immigrants of working age being 74% - 76% of the total migration flow and the assumption about the highest level of economic activity (for the Altai Krai - 66.5% in 2010) it can be concluded that due to migration economically active population in the region has shrunk by about 21,095 people during the 8-year period. If a similar trend maintains, the negative migration balance by 2020, comparing to 2010, will lead to the reduction of economically active population by 8.5% (about 110 thousands of people). Such a reduction of a labor resource can not be painless for the economic system of the region. In addition to quantitative damage, a large number of those who leave the region cause a qualitative damage. Leaving labor force is more consistent with the requirements of the regional economic system in terms of the qualification and professional composition than coming. Therefore, a relative measure of

the magnitude of reduction of 8.5% does not fully reflect the reduction in the labor share in the Altai Krai. To compensate the reduction of the labor resource in the region the measures of promoting the influx of migrants should be complemented by the measures of consolidating workforce and measures aimed to harmonize professional and qualification structure of immigration with the requirements of the regional labor market.

The calculations and the analysis made lead to the conclusion - migration processes currently do not compensate the growing shortage of labor resources, both in the regions "with high shares of mining and manufacturing industries" and in the regions "with relatively low shares of mining and manufacturing industries." Nevertheless, the differences in the natural and mechanical movement of the economically active population in these regions still exist and it must be taken into account when developing of the budget, socio-economic and demographic policy.

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Summary

Vladimir Shabashev, Viktor Erastov, Sergey Shorokhov, Marina Verkhozina. FORWARD DYNAMICS OF THE ECONOMICALLY ACTIVE IN THE KEMEROVO REGION AND ALTAI KRAI.

Russian social and economic space is very heterogeneous and regional processes leave their imprint on the set of processes – economic, social, demographic, etc. The regions discussed in this article are the representatives of the two diametrically opposite clusters. If the Kemerovo Region belongs to a group of regions with the development of the mining and manufacturing sectors of the economy, the Altai Krai belongs to the group of regions where these sectors are not well developed.

In the regions which belong to the first group, in contrast to a second one, the living standard, natural and mechanical rates of reproduction are higher. The latter determines the various opportunities for the regions of these groups of providing their economic systems with labor resources.

Among the measures that counteract the threats for economic regional systems, namely, reducing the number of economically active population, the practically feasible measure in a short term period is increasing the balance of migration labor exchange.

This article presents the results of the projection of the economically active population of the Kemerovo Region and Altai Krai for the years 2015 and 2020. The results of the calculations show that the situation in these regions is very different. In Altai Krai there is a rapid decline in the labor force, accompanied by the aging of the age structure. The mass emigration of the population of working age makes the situation even worse.

The current migration flows do not compensate the growing shortage of labor resources neither in areas with high shares of mining and manufacturing industries nor in regions with relatively low shares of mining and manufacturing industries. Still, there are some differences in the natural and mechanical movement of the economically active population in these areas and they should be taken into account by authorities when developing budgetary, socio-economic and demographic policy. The quantitative indicators which were calculated give regional authorities in these regions the clear picture of the scale of the demographic policy measures.

Keywords: the economically active population, cohort-component analysis, the balance of migration exchange, age and sex structure, the dynamics of the economically active population.