Methodological Approaches for Prediction of the Level of Provision of Regional Economy by Labor Resources

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Abstract. In the article considered the main peculiarities of reproduction and formation of labor potential in the regional economy. Attention is paid for methods of prediction and analyzing of situation. Labor resources and labor market changes despite the crisis in the economy, moreover modern labor potential is one of the main factors of economical development. Attention is paid to the features of formation of labour market of the Russian Federation and differences between the regions. The mechanism of assessment for the level of development of labor potential in the regional economy is proposed. The model of integral indicator for comparing situation in the different regions are approved. It's based on the sixteen indicators, which are divided into four blocks. The key factors of negative impact, causing the need to create a detailed concept of management to increase the degree of efficiency of the formation of labor potential in the regional economy.

1. Introduction

The current state of the economy is largely characterized by crisis trends, which is confirmed by almost zero growth rates. In this regard, the effective use of the labor potential of the regions is one of the most important factors of the economic development of the country and of improving of the welfare of the population. One of the key terms for a qualitative analysis of the use of labor potential is the ability to obtain and process a sufficient amount of reliable data.

The used methodological approaches are largely outdated and do not correspond to modern economic realities. Many indicators have a purely applied sectoral nature, or are designed for research the situation at the national level and are not adapted for the conditions of the regional economy. There is no comprehensive approach to the assessment of reproductive processes of labor potential, which makes the existing concepts ineffective in modern practice of regional management.

2. Statement of problem

The development of common approaches to the monitoring and evaluation of the labor potential of the region can allow the most complete study of the current state, as well as to develop new forecasts of the provision of the regional economy with labor resources.

The use of rating systems has a number of advantages over traditional methods of comparison and analysis:

1) method uses strictly formalized indicators that do not provide for the possibility of their different interpretations;

2) minimization of potential risks of subjective assessment by abandoning the elements of expert approach based on human judgments;

3) increasing the degree of information openness of the system;

4) high level of visibility and ease of perception of research materials;

5) the possibility of a clear distribution of ranks in the rating, which allows to increase the level of managerial motivation based on the competition factor;

6) convenience of rapid comparison of results, including for different periods of time.

Quite a large number of organizations, including the UN, IMF and the World Bank, are engaged in rating in various fields. The greatest relevance are methods used by credit rating agencies, including foreign: Moody's, Fitch Ratings, Standard & Poor's. In the Russian Federation the most popular ratings are provided by ratings agencies, such as Expert RA, RIA Rating, Rus-Rating, an analytical credit rating Agency. Deserve a big attention the approaches to rating used by the HSE and the Ministries of the Russian Federation. However, in modern international and national practice of rating there is no method of complete evaluation of the system of reproduction of labor potential of regions on the basis of ratings.

3. Results and discussion

The system of rating estimation of efficiency of management of labor potential of regions is based on calculation of integral rating point. Only numerically formalized indicators are used in the construction of the rating and calculation of its intermediate elements, which contributes to an objective comparison and minimization of opportunities for distortion of statistical information. The use of an integrated approach to the research of the efficiency of reproduction processes and the formation of labor potential of the regions allows to make the results of the analysis the most objective and understandable for perception. In the basis of the rating is a comparative analysis of the regions using a diverse range of indicators that characterize different areas of socio-economic condition of the regions in the formation and use of their labor potential. The calculation of the indicator allows to rank the studied regions depending on the state of labor potential in each of them, as well as to identify problem areas at the stage of rating formation and analysis.

In the process of the research, a list of indicators characterizing the effectiveness of the sphere of reproduction of labor potential in the regional economy is used. These indicators cover a large array of data, that's why for a more convenient comparison and calculation of the integral rating score, it is advisable to divide them into 4 groups:

- indicators of employment and unemployment;
- indicators of demographic and migration situation;
- indicators of living standards;
- indicators of quality characteristics.

The choice of evaluation indicators is due for the need for a comprehensive analysis of the sphere of reproduction and use of labor potential in the regional economy. Indicators of demographic and migration situation characterize various aspects of population reproduction, allowing to take into account the migration factor, as well as the demographic situation in the region. Labor potential is characterized by a number of qualitative parameters that determine its effectiveness, which makes it necessary to use indicators that demonstrate the level of education and average age of labor resources, as well as demand. Indicators of employment and unemployment allow to assess the level of efficiency of the use of labor resources and to identify negative factors of incomplete realization of the labor potential of the region. Important parameters of efficiency are indicators of living standards, which, on the one hand, characterize the quality and living conditions of the population, and on the other, are an indicator of the demand and efficiency of labor resources.

The group of indicators of employment and unemployment includes indicators that characterize the employment trends of the population, as well as negative factors associated with unemployment. This group includes four indicators:

- unemployment rate;

- level of employment;
- labor force participation rate;
- the share of people of working age in the structure of the employed population.

The group of indicators of demographic and migration situation includes four indicators that are relevant for the analysis of the processes of formation of labor potential of the region from the position of quantitative provision of population. This group includes both indicators characterizing the demographic aspects of the formation of labor resources in the long term period, and migration factors as instruments of influence on the population of the region in the short term period. There are:
- migration balance;
- natural increase;
- divorce-marriage ratio;
- life expectancy.

The group of indicators of qualitative characteristics of labor resources of the region allows to make a deeper analysis of labor potential by studying the level of education and age structure. This group of indicators includes the following four indicators [1-20]:
- share of people with higher and secondary vocational education in the structure of the workforce;
- average age of the population in the workforce;
- proportion of the employed population aged 25 to 65 years who have undergone advanced training or vocational training in the total number of employed in this age group;
- the proportion of unemployed persons seeking employment for 12 months or more.

The group of indicators of the standard of living of the population of the region allows to estimate the income as one of key characteristics of realization of labor potential. This group of indicators includes:
- average income;
- normalized distribution of 20% of the population with the highest incomes;
- subsistence level;
- the proportion of the total population with a cash income below the subsistence level.

The result of the rating calculation is the possibility of ranking the regions of the Russian Federation, in particular Federal districts, depending on the value of the integral rating score. The calculation of the integral rating score is carried out in three stages:
1) calculation of integral rating points for each individual indicator;
2) calculation of rating points by groups of indicators;
3) calculation of final rating points by region.

Calculation of integral rating points of the region for individual indicators is carried out by the formula:

$$R = \frac{(X_{max} - X_i)}{(X_{max} - X_{min})} * 100 \qquad (1)$$

where: R is the value of the integral rating score;

Xmax – the maximum value of the studied series of values;

Xmin – the minimum value of the studied series of values;

Xi – the value of the indicator for the region under consideration.

for the case when the improvement occurs with a decrease in the analyzed indicator;

$$R = (1 - \frac{(X_{max} - X_i)}{(X_{max} - X_{min})}) * 100 \qquad (2)$$

for the case when the improvement occurs with the growth of the analyzed indicator.

This method of calculation allows the ranking of the studied regions by indicators in order of increasing the rating score. Thus due to the use in calculations of the array of values for all regions the value of the integral ranking score reflects not only the region, but also the value of the index on this site regarding the minimum and maximum values. The region with the worst score will have an integral rating score of 1, and the region with the best score will receive an integral rating score of 100. It is important to note that for a situation in which the improvement occurs with a decrease in the analyzed indicator, for the region with the maximum value of the sample, the value of the integral

rating score will be 0. If one region will have all the maximum values for the group of indicators, it may be the situation that the value of the rating score for the group of indicators will be equal to 0, which will not allow to make reliable calculations with the extraction of the geometric mean. That is why when calculating the integral rating score for regions in which it is equal to 0, the assumption is used and the minimum possible integral rating score will be considered equal to 1.

At the second stage of calculations, the rating score of the region is determined by a group of indicators on the basis of integral rating points for individual indicators. The calculation is carried out by the formula:

$$I_{\varepsilon n} = \sum_{i=1}^{N} R_i / N \qquad (3)$$

where: GP rating score in the region on the group performance;

R_i - the value of the integral rating score for the group;

N – the number of indicators in the group.

The study used groups that include four indicators, so in this particular version of the formula will look like:

$$I_{\varepsilon n} = \frac{R_1 + R_2 + R_3 + R_4}{4} \qquad (4)$$

The rating score of a region for a group of indicators is calculated as the arithmetic mean of the integral rating points of the indicators that are included in this group.

At the third stage of calculations the final rating score of regions is calculated on the basis of rating points of regions by groups of indicators. The calculation is carried out by the formula:

$$I_p = \sqrt[N]{\prod_{i=1}^{N} I_{\varepsilon n}} \qquad (5)$$

where: IP-final rating score of the region;

IGP-the value of the rating score of the region by groups of indicators;

N – number of groups of indicators.

The final rating score of the region is calculated as the geometric average of the rating points of the regions by groups of indicators. Four groups of indicators were used in the course of the study, which allows us to present the final formula for the calculation in the following form:

$$I_p = \sqrt[4]{I_{\varepsilon n1} * I_{\varepsilon n2} * I_{\varepsilon n3} * I_{\varepsilon n4}} \qquad (6)$$

Based on the calculation algorithm, the final value of the rating score for the region can be in the range from 1 to 100.

4. Conclusion

In modern conditions, the requirements for labor potential are constantly evolving, which is determined by the need to increase labor productivity through the development of scientific and technological base. This makes it necessary to form, on the one hand, a categorical apparatus that meets the conditions of time, and, on the other, a methodology for assessing the effectiveness of the reproduction system and the use of labor potential in the region. The creation of quality monitoring mechanisms is a necessary element in the development and implementation of approaches to the formation of an effective system of management of the labor potential of the regional economy.

References

[1]   Minakova I V 2015 To the question of increase of efficiency of management of socio-economic development of the russian regions *Economy and society* **3-2(16)** pp 346-350

[2]   Korzhova G I & Suslikova O A & Kovarda V V & Tsukanova N E Manpower of kursk region as the base of the sustainable development of municipal district asymmetry (evidence from kursk region) SGEM International Multidisciplinary Scientific Conferences on SOCIAL SCIENCES and ARTS Proceedings pp 487-492

[3]   Aistrup J A, Zollinger B and Walker M S 2003 Defining the available labor pool the Kansas labor force survey *Economic Development Quarterly* **17(3)** 220-239

[4]   Alon S and Haberfeld Y 2007 Labor force attachment and the evolving wage gap between

white, black, and hispanic young women *Work & Occupations* **34(4)** 369-398

[5]   Jimenez-Martin S and Peracchi F 2002 Sample attrition and labor force dynamics: evidence from the spanish labor force survey *Spanish Economic Review* **4(2)** 79-102

[6]   Davenport T O 1999 Human Capital Jossey Bass (San Francisco, CA)

[7]   Reich R 1991 The Work of Nations: Preparing ourselves for 21st century capitalism *Simon & Schuster* (London)

[8]   Schultz T 1993 Investments in the schooling and health of women and men: quantities and return *Journal of Human Resources* **28(4)** 694-734

[9]   Rimashevskaya N M, Bochkareva V K, Volkova G N, Migranova L A 2012 Quality of labor potential in regions of Russia *Population* **3** pp 111-138

[10] Rimashevskaya N M, Bochkareva V K, Migranova L A, Molchanova E V, toksanbaeva M S 2013 Human potential of Russian regions *the Population* **6(61)** pp 084-141

[11] Pavlov B S 2010 Family policy in the region: symbiosis of economic and moral *Journal of economic theory* **3** pp 58-69

[12] Zaitseva I V, Popova M V 2012 Demographic development of Stavropol Krai as a basis of formation of labor resources *Polythematic network electronic scientific journal of Kuban state agrarian University* **81** pp 862-877

[13] Kulagina G D 2001 Macroeconomic statistics (M.: MESI) 140 p

[14] Migranova L A, Toksanbaeva M S 2014 Quality of labor potential of the Russian regions *the Population* **2(64)** pp 102-120

[15] Bontis N 1998 Intellectual capital: an exploratory study that develops measures and models *Management Decision* **36(2)** pp 63–76

[16] Brewster C 1999 Strategic Human Resource Management: the value of different paradigms, in Strategic Human Resource Management ed R S Schuler and S E Jackson (Blackwell, Oxford)

[17] Cappelli P, Crocker-Hefter 1996 A Distinctive human resources are firms' core competencies (Organizational Dynamics, Winter) pp 7–22

[18] 2003 CFO Research Services Human Capital Management: The CFO's perspective *CFO Publishing* (Boston, MA)

[19] Dowling P J, Weech D E, Schuler R S 1999 International Human Resource Management: Managing people in a multinational context *South Western College Publishing* (Cincinnati, OH)

[20] Panaetov V P, Solovev D B 2019 Interaction of Tops of Domains in Metal Nano of the Film *Materials Science Forum* **945** pp 771-775. [Online]. Available: https://doi.org/10.4028/www.scientific.net/MSF.945.771