

# Methodological Approaches to the Cost-Benefit Analysis of Basic Branches of the Region's Economy

G.S. Kovrov

Scientific-Research Institute of Regional Economy of the North, Federal State Autonomous Educational Institution of Higher Education "M. K. Ammosov North-Eastern Federal University"  
Yakutsk, Russia,  
kgs02@yandex.ru

P.V. Gulyaev

Scientific-Research Institute of Regional Economy of the North, Federal State Autonomous Educational Institution of Higher Education "M. K. Ammosov North-Eastern Federal University"  
Yakutsk, Russia,  
petr\_gulyaev@mail.ru

N.N. Konstantinov

Scientific-Research Institute of Regional Economy of the North, Federal State Autonomous Educational Institution of Higher Education "M. K. Ammosov North-Eastern Federal University"  
Yakutsk, Russia,  
dr.economist@yandex.ru

**Abstract**—The authors consider issues of cost-effectiveness analysis of the region's economy in the article. The purpose of this research is to develop methodological approaches to cost-effectiveness analysis of basic industry of the region's economy. The authors propose a methodology for an inter-grated cost-benefit analysis of basic industry of the region's economy based on the analysis of foreign & domestic research. The system of key figures characterizing the research's object is defined.

As an approbation of the proposed evaluation methodology, the Republic of Sakha (Yakutia) has calculated the integral indices of the efficiency of the municipal economy's economic sectors and the efficiency of main enterprises-leaders and a composite integrated index of efficiency. The current state and dynamics of development for the period from 2005 to 2016 are analyzed. A comparative assessment of the efficiency of economic sectors in the context of municipal district, economic area and in the whole Republic was carried out. Also, to evaluate the efficiency of the economy sectors, the following performance indicators have been calculated: labor productivity and return on assets in the dynamics for the period from 2005 to 2015.

The results of the research show that the methodology proposed by the authors can adequately solve the problem of assessing the efficiency of the industries of the economy of municipal districts.

**Keywords**— regional economy, branch, type of economic activity, specialization, efficiency, methods of evaluation, rating.

## I. INTRODUCTION

In today's free market economy, efficiency of production is one of the main factor in the competitiveness of the economy. In this regard, the study of methodological and methodical approaches to assess the effectiveness of economic entities, including the development of methodical approaches to assessing the effectiveness of the basic branches of the

economy of the region at the level of municipal districts is a very crucial task. Today in foreign and domestic literature there are many scientific works on methodological and methodical approaches to assessing the effectiveness of the economy at various levels.

## II. METHODOLOGY

In-process [1] the evolution of forming and development of category is studied "efficiency". The review of foreign and home literature on questions of theoretical bases of efficiency works are concerned to [2, 3, 5]. The questions of study of methodological and methodical approaches of estimation of efficiency are reflected in works [4 - 6].

The study of the labour productivity engaged leading foreign and domestic scientists [7-15]. The authors offered adaptive methodology of integral estimation that allows to estimate efficiency of economic activity of basic sectors of economy from the perspective of municipalities. The general integral level of potential of research object settles accounts on the standard formula of determination of arithmetic average:

$$I_i = \sum_{i=1}^m K_{in} / n_i \quad (1)$$

where;

i – is a number of indicat;

m – is an amount of indicators;

n – is an amount of indexes of i-indicator;

– it is the internal index rationed by 1 on the standard formula of linear down-scaling, that stipulates the single scale of measuring of all calculation coefficients :

$$K_{in} = \frac{x_{in} - x_{in}^{\min}}{x_{in}^{\max} - x_{in}^{\min}} \quad (2)$$

where

- is a value of current value of indexes of i-indicator;
- it is a minimum value of indexes of i-indicator;
- it is a maximal value of indexes of i-indicator.

For calculations the values of statistical indexes of official editions and electronic sources of Federal state statistics service are used, Territorial body of Federal state statistics service for RS (Y), and also official figures of major industries of expertise [16 - 20].

In accordance with an offer methodology it is necessary to define key indicators, characterizing an object researches on the basis of that on the first stage the rating estimation of current status is produced from the perspective of municipal districts of Republic. For this purpose it is suggested to calculate of next coefficients : specific weight of industry on the volumes of the shipped goods of own production, executed works and services by own forces on the types of economic activity (Shipping Volume on Economic Activity) coefficient of per capita output, labour capacity, capital productivity and efficiency of production for the calculation of that the generally accepted approaches are applied, but as basic data the combined indexes characterizing the municipal districts of economic zones are used. Further calculated an average integrated efficiency index of basic sector of economy on municipal districts on the basis of which a comparative analysis of municipal districts is carried out as a whole in the republic and also from the perspective of economic area.

In the second stage, for a more detailed assessment of the efficiency, calculations are performed from the perspective of the main types economic activity by the following indicators: the share of the Volume of shipped goods in economic activity in the municipal areas to the Volume of shipped goods economic activity in the republic, coefficient of localization and capital productivity ratio which we calculate the average integrated efficiency index in economic activity. According to the results of two sets of calculations, we derive the combined integral index of efficiency in the context of municipal districts (Md), which method of comparative analysis evaluated the effectiveness of the industries in the municipal areas and in economic zones of the Republic of Sakha (Yakutia).

In the third stage it is proposed to carry out an evaluation of primary industries on the results of the evaluation of the effectiveness of key business leaders that characterize this industry. This will perform the calculations the following integral indexes: cost of sales, labor productivity on 1 worker, capital productivity ratio and profitability. You can also compare the results of an average integrated efficiency index throughout municipal districts and an average integrated efficiency index on the main enterprises.

### III. RESULTS

The main indicators characterizing the object of research are determined. On the basis of these indicators, at the first stage, quantitative integral calculations of the effectiveness of the basic sectors of the economy in the context of municipal districts and the main types of economic activity were carried out as an approbation of the methodology on the example of the Republic of Sakha (Yakutia). In the structure of the gross regional product (GRP) in 2015, the main economic activity (TEA) in the country is the foreign economic activity "Mining" (48.2%). The integrated assessment of the efficiency of the main enterprises of the industry of the Republic of Sakha (Yakutia) in the foreign economic activity "Mining" for 2015 shows that the leaders in the republic are: PJSC "Alrosa-Nyurba", JSC "Search gold" and OJSC "Surgutneftegas". Such ordering rating adequately characterizes current status of specialization industries.

To obtain a more complete assessment of the efficiency of the economic sectors, a comparative evaluation of the results of the integrated assessment of MPs and main enterprises in terms of economic zones was made (see Figure 1).

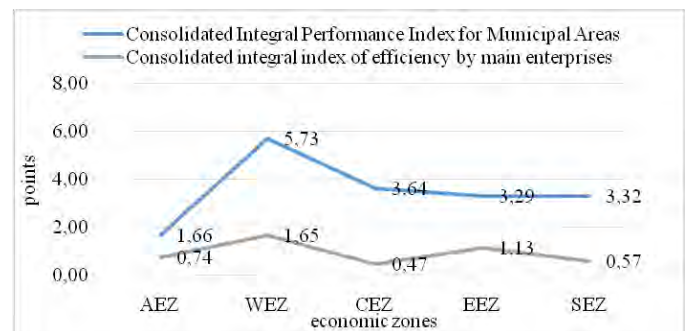


Fig. 1. Comparative diagram of an average integral indexes of efficiency of industries of economy and basic enterprises in the context of economic zones for 2015.

Comparison is executed on five zones: arctic economic zone (AEZ), western economic zone (WEZ), central economic zone (CEZ), east economic zone (EEZ) and south economic zone (SEZ). The analysis of comparison of results of estimation shows that on rating of average integral indexes of efficiency of industries of economy and on rating of basic enterprises on the first place a western economic zone (WEZ) stands among zones. There is quality cross-correlation connection of results of estimation that grounds to talk that enterprises-leaders can describe the state of this industry of specialization.

The calculation of summary integrated index of efficiency of industries of economy of MD is conducted for period from 2005 to 2015 (fig. 2).

Analysis of results of rating of efficiency of industries of economy of municipal districts for period 2005-2015, shows that leaders are CD Yakutsk, Vilyuysk and Mirniy MD at a mean value on a republic 1,99 points.

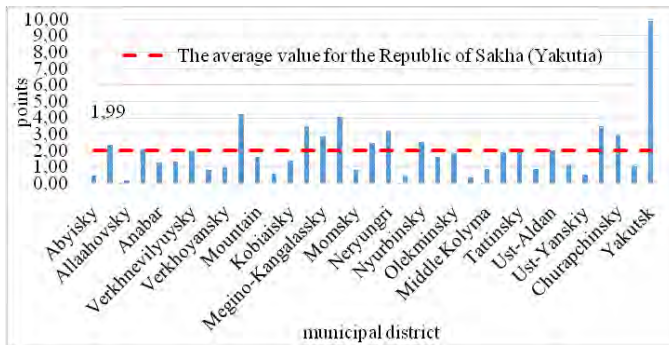


Fig. 2. Summary integral index of efficiency of industries of economy of municipal districts of Republic Sakha (Yakutia) for period 2005-2015.

The dynamics of change of gross regional product (GRP) of Republic Sakha (Yakutia), basic index of efficiency of development of economy of region (fig. 3) is also presented.

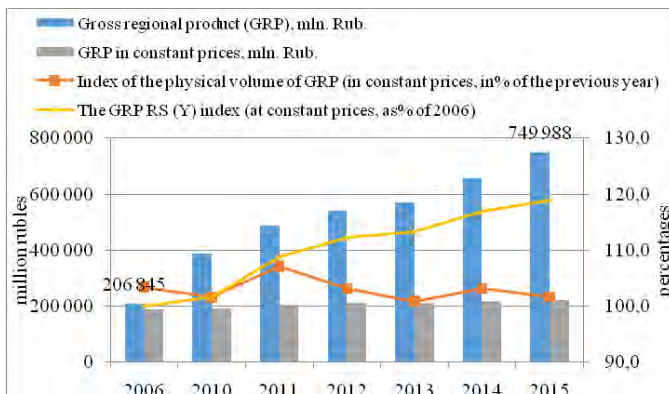


Fig. 3. Dynamics of changes in the Gross Regional Product of the Republic Sakha (Yakutia)

The analysis of change shows on years, that the rate of height of GRP has a positive dynamics both in current and in permanent prices. Another from basic indexes, characterizing efficiency of economy of region there are the labour productivity and labour intensiveness (fig. 4).

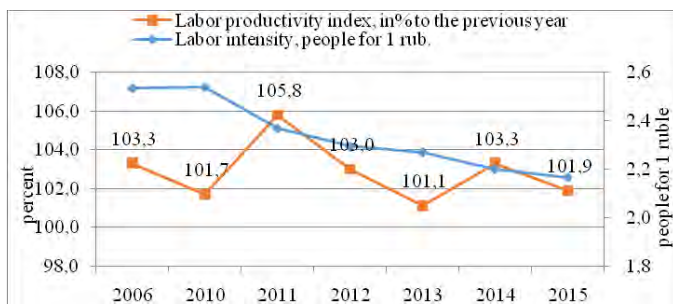


Fig. 4. Dynamic of changes of the labour capacity and labour intensity on the economy of Republic of Sakha (Yakutia).

The analysis of diagram shows that the labour productivity on the whole on the economy of Republic of Sakha (Yakutia)

has a positive dynamics. In 2015 the labour productivity made a 462 thousand rub on 1 busy in an economy, and in 2006 is a 394 thousand rub on 1 busy in an economy, that shows an increase in 1,17 times for this period. At the same time index of the labour productivity in % to the previous year the unstable has saltatory character. The values of labour intensity show unstable saltatory character.

The calculation of the labour of productivity on volumes of shipped goods is also executed on TEA "Mining" (fig. 5.)



Fig. 5. Dynamic of changes of the labour productivity on VSG "Mining", one thousand roubles on one busy man.

The analysis of data shows that as compared with 2005 in 2016 the labour productivity on TEA "Mining" that in the structure of The GRO occupies a basic stake increased in 4,8 time.

#### IV. CONCLUSION

Thus, during research authors are get next basic results:

- methodology of estimation of efficiency of industries of economy of municipal districts is produced;
- basic indexes, on the basis of that indicators are expected, characterizing efficiency of industries of economy of municipal districts are certain;
- an analysis and estimation of current status and dynamics of development of industries of economy of municipal districts are executed for period from 2005 to 2015 by comparison to other municipal formations of Republic of Sakha (Yakutia);
- comparison of rating of average integral indexes of efficiency of industries of economy and rating of efficiency of basic enterprises shows quality cross-correlation connection, that grounds to talk that enterprises-leaders can describe the state of this industry of specialization.

Research results show that the methodology offered by authors decides the task of estimation of efficiency of industries of economy adequately.

#### CONCLUSION

The Article is prepared within the framework of implementation of project on the state task of Department of Education and Science of Russian Federation "Development of theory and methodology of spatial organization of the socio-economic systems of north region" (№ 26.8327.2017/8.9). FSBI "Russian Foundation for basic

research" (project № 16-02-00426-OGN "Assessment of the impact of the results of economic activity of the mining Corporation on the budget process in the resource region (for example, the Republic of Sakha (Yakutia))").

## **References**

- [1] Limareva, Y.A., Limarev, P.V.: Evolution of the category "efficiency" in economics science. Economics and jurisprudence: electron. scientific journal.. 4 (5). 7-12 (2014).
- [2] Valitov, S.M., Demyanova, O.V.: Efficiency of the macroeconomic system: theory and practice. Economics. Moscow. (2011).
- [3] Sukharev, O.S.: The theory of the effectiveness of the economy. Publishing house "COURSE". Moscow. (2014).
- [4] Polterovich, V.M.: Problems and methods of regional diagnostics. Economics and management. 1. pp. 49-54. (2014).
- [5] Slobodnyak, I.A., Preina, O.A.: Methodological bases of an estimation of efficiency of activity of establishment. BSEEP Publishing House. Irkutsk. (2014).
- [6] Spitsyn, V.V.: Methodological approach to assessing the effectiveness of development of complex socio-economic systems. Economics: yesterday, today, tomorrow. Vol. 7. 4A. pp. 25-32. (2017).
- [7] Voskoboynikov, I.B., Gimpelson, V.E.: Growth of labor productivity, structural shifts and informal employment in the Russian economy. Issues of Economics. Vol.. 11. pp. 30-61. (2015).
- [8] Zaytsev, A.A.: Per capita GDP and labor productivity in Russia: was there a catch-up development? Bulletin of the IE RAS.. Vol.. 4. pp. 33-50. (2014).
- [9] Zaytsev, A.A.: Regional Diagnostics and Sectoral Analysis of Labor Productivity. Federalism.. Vol. 1. 69. pp. 1-26. (2013).
- [10] Ilyin, A.V., Gulin, A.K., Uskova, T.V.: Strategic reserves of labor productivity growth in the regional economy. Economic and social changes, factors, trends, forecast. 1. pp. 24-38. (2010).
- [11] McKinsey: Effective Russia. Productivity as the foundation of growth. McKinsey Consulting Company. Moscow. (2009).
- [12] Mikheeva, N.N.: Comparative analysis of labor productivity in the Russian regions. Region Economics and Sociology. Vol. 2. 86. pp. 86-112. (2015).
- [13] Muratova, L.I., Kupova, M.K., Khachirov, I.E.: Rating rating of municipalities in the regional economy. Management of economic systems: electronic scientific journal. 2 (62). p. 26. (2014).
- [14] Tsallagova, L.M., Khachirov, I.E.: Rating rating of municipal formations of the region. Management of economic systems: electronic scientific journal. 7 (55). p. 6. (2013).
- [15] Yumaev, E.A.: Rating rating of social and economic development of municipal formations of the region. Young Scientist. 9. pp. 763-765. (2015).
- [16] Database of municipalities. <http://www.gks.ru/dbscripts/munst/munst98/DBInet.cgi>, last accessed 2018/03/20.
- [17] State program of the Republic of Sakha (Yakutia) "Development of industry in the Republic of Sakha (Yakutia) for 2017 - 2021 years." Approved by the Decree of the Head of the Republic of Sakha (Yakutia) of April 21, 2017 No. 1854.
- [18] Program of socio-economic development of the Republic of Sakha (Yakutia) for the period up to 2025 and main directions until 2030. Approved by the Decree of the Government of the Republic of Sakha (Yakutia) of 05.05.2011, No. 190.
- [19] Rosstat, Regions of Russia. The main characteristics of the subjects of the Russian Federation. 2017. <http://www.gks.ru/> last accessed 2018/03/20.
- [20] Statistical collection of the Republic of Sakha (Yakutia). Federal state statistics service, Territorial body of the Federal state statistics service for the Republic of Sakha (Yakutia). Yakutsk. (2016).