

Formation of strategy of effective management of fixed production assets of oil company

Marina M. Gajfullina

Department of Economics and Management in the Oil and Gas Industry
Ufa State Petroleum Technological University
Ufs, Russian Federation
marina_makova@list.tu

Dilara R. Musina

Department of Economics and Management in the Oil and Gas Industry
Ufa State Petroleum Technological University
Ufs, Russian Federation
musinad@ya.ru

Gylnara Z. Nizamova

Department of Economics and Management in the Oil and Gas Industry
Ufa State Petroleum Technological University
Ufs, Russian Federation
Gulya182004@list.ru

Olga A. Alexandrova

Department of Economics and Management in the Oil and Gas Industry
Ufa State Petroleum Technological University
Ufs, Russian Federation
oalexandrova@mail.ru

Abstract— The article considers the approach to formation of a strategy for effective management of the fixed production assets of the oil company. The stages of forming a strategy for effective management of the fixed production assets of the oil company are given. Recommendations on the choice of the strategy of technological renewal and effective use of fixed production assets of the oil company are formed on the basis of the ratio of an integrated indicator of the efficiency of the use of the company's fixed production assets and the integral level of environmental factors affecting the process of reproduction of the company's fixed production assets. Formation of the integrated indicator of the efficiency of use of the company's fixed assets is made through the standardization of single indicators of the efficiency fixed production assets. Assessment of the impact of environmental factors on the process of reproduction of the company's fixed production assets is carried out by means of an expert method. A scale for assessing the level of impact of environmental factors on the company's activity is presented. By the example of the oil company PJSOC Bashneft, an experimental approbation of the offered approach is carried out. The efficiency of use of the fixed production assets of the company is assessed; external factors influencing the process of reproduction of the fixed production assets of the company are estimated, problems of effective use of the fixed assets of the oil company are revealed.

Keywords— *the fixed production assets, strategy, management efficiency, oil company*

I. INTRODUCTION

One of the priority directions of development of economy of any state is technological renewal and an increase of efficiency of use of the fixed production assets. The enterprise place in industrial production, its financial position and competitiveness depend on the solution of these problems. For Russia, the solution of this task becomes increasingly important because with accession to WTO, the Russian

enterprises and the organizations will have to work in more severe competitive conditions.

Meanwhile, the fixed production assets of most enterprises and organizations in the oil sphere of the Russian Federation have become outdated and are becoming updated at low rates. So, in an upstream segment, depreciation of main assets is 53.7%, in a downstream segment - 47.1% (at the end of 2015). The share of completely worn-out main assets in an upstream segment makes 20.6%; in a downstream segment - 16.8% (at the end of 2015). Thus, problems of renewal and effective use of fixed production assets of the oil companies are very urgent.

Besides, questions of calculation of the efficiency of use of fixed production assets of the company are extremely urgent. The need to improve methods for assessing the efficiency of the use of the fixed production assets of the oil company determines the relevance of this research.

II. RESEARCH METHODOLOGY

The notion of the fixed assets was observed in tractates of Karl Marx, David Ricardo, Adam Smith, Jean-Baptiste Say as one of the classic production factors. There is no treatise of Economics, Enterprise Economics, Microeconomics and other economics studies that would lack the main production funds topic.

E. Dovere, S. Cavalieri, S. Ierace [1], K. Wong, M. Joshi [2], D. Lowenstein, C. Slater [3], V. Kufenko, N. Geiger [4] did researches on efficiency and methods of efficiency determination.

G.Z. Nizamova [5], W. Hulsink, V. Scholten [6], V. Gazman [7], M. Ben, Chelbi, M. Radhoui [8-9], S.R. Lopes, A.V. Cristiano, H.M. Alencar [10] analyzed issues of effective use of the fixed assets in their works.

Considering analysis of advanced topics in the oil sector, one can draw attention to tractates of D.A. Wood [11], S. Lavrov, A. Aleksanyan [12].

Diversity of points of view on efficiency determination of the use of the fixed production assets shows that there is no unified approach on its estimation methodology.

There are differences in assessment of the fixed production assets efficiency within a framework of the fixed assets usage. Return on production assets is one of the most frequently mentioned indicators. However, there is no consistent approach to its calculation. This can be verified by following statements:

- depending on the company practice, economists can use total acquisition cost, depreciation acquisition cost (net of amortization), total replacement cost or depreciation replacement cost as a value of the fixed assets;

- there is not agreement on what kind of production should be used in return on production calculation (manufactured goods or products sold);

- return on production is not a definitive measure of efficiency of the fixed production assets usage.

The generalization of researches in this sphere has revealed differences in approaches and directions of the analysis of the fixed production assets, in determination of key criteria for evaluation of efficiency of their use. The known methods of an assessment of economic efficiency of use of the fixed production assets consider branch features of operation of the fixed assets in the oil sphere insufficiently. So, the widespread indicator of an assessment of efficiency of use of the fixed production assets is the traditional indicator of capital productivity while there are well-known contradictions in its practical application.

The majority of widespread methods do not take into account the influence of external economic factors on results of efficiency of use of the fixed production assets. The specific risks accompanying the factors of increasing the efficiency of use of the fixed production assets in the oil sector have not found reflection in works on an economic assessment.

Efficiency of the use of the fixed production assets of the oil company as a complex social and technological system can be achieved only by providing capital assets, technological and social compatibility with the stated level of development and economic efficiency of their usage. From these perspectives, the proposed methodical approach to economic assessment of need of reproduction of the fixed production assets of oil company is based on usage of three groups of indicator:

- 1) *Indicators of the technical condition of the fixed production assets.*

- 2) *Economic indicators of the efficiency of the use of the fixed production assets.*

- 3) *Social indicators of the efficiency of the use of the fixed production assets.*

Tractates of M.M. Gajfullina [13], D.I. Pushkar, E.V. Dragunova [14], A. Wan, N. Wan, J. Rezaei, and S.

Sadaghiani [15] were taken into consideration when choosing the indicators that have been proposed above.

As a result of analysis of the proposed above author's researches and considering the oil sector industry specialization, the authors have built the system of indicators of efficiency of use of the fixed production assets of oil company.

The authors have offered a methodology of assessment of need and feasibility of technological renewal of the fixed production assets of the oil company and the choice of renewal strategy, based on the ratio of the integrated indicator of efficiency of use of the fixed production assets and the level of impact of factors of the external environment on the process of reproduction of the fixed production assets of the oil company.

The sequence of calculation of the integrated indicator of efficiency of use of the fixed production assets of the oil company includes the following stages:

- 1) *Calculation of indicators of efficiency of use of fixed production assets by groups of indicators.*

- a) *Indicators of the technical condition of the fixed production assets.*

- b) *Economic indicators of the efficiency of use of the fixed production assets.*

- c) *Social indicators of the efficiency of use of the fixed production assets.*

- 2) *Calculation of the weight coefficients of the significance of the indicators of efficiency of use of the fixed production assets.*

- 3) *Standardization of indicators of efficiency of use of the fixed production assets.*

- 4) *Calculation of the integral indicator of the efficiency of use of the fixed production assets.*

- 5) *Determination of the degree of efficiency of use of the fixed production assets.*

The indicators included in the calculation of the integrated indicator of the efficiency of use of the company's fixed production assets are given in TABLE I. The proposed methodical approach to the economic evaluation of the need to reproduce the fixed production assets of the oil company is based on the use of three groups of indicators.

Calculation of priority weights of the indicators takes place at the second stage.

The authors suggest estimating ratios of priority weights of the indicators of efficiency of the use of the fixed production assets, using one of the expert methods – a hierarchy analysis method [16].

Standardization of the indicators of efficiency of the use of the fixed production assets takes place at the third stage.

TABLE I. COMPONENTS OF THE INTEGRATED INDICATOR OF EFFECTIVENESS OF USE OF THE FIXED PRODUCTION ASSETS OF THE COMPANY

Name of indicator	Calculation formula	
	Numerator	Denominator
Indicators of the technical condition of the fixed production assets		
Coefficient of renewal	The cost of the fixed production assets entered during a year	The cost of the fixed production assets at the end of a year
Coefficient of renewal scale	The cost of the fixed production assets during a year	The cost of the fixed production assets at the end of a year
Replacement coefficient	The cost of the fixed production assets entered during a year	The cost of the fixed production assets which remained a year later
Coefficient of park expansion	The cost of the fixed production assets entered during a year minus the cost of the fixed production assets, which remained a year later	The cost of the fixed production assets entered during a year
Depreciation coefficient	The amount of depreciation of the fixed production assets	Initial value of the fixed production assets
Economic indicators of the efficiency of the use of the fixed production assets		
Capital productivity	Proceeds from production sales	Average annual value of the fixed production assets
Return on production assets	Net profit	Average annual value of the fixed production assets
Efficiency of the use of capital	Profit from production sales	Average annual value of the fixed production assets
Return on equity	Net profit	Average annual value of the equity
Investment ratio	Average annual cost of equity capital	Average annual value of the non current funds
Social indicators of the efficiency of the use of the fixed production assets		
Capital labour ratio	Average annual cost of the fixed production assets	Average payroll count
Level of mechanical operations	Average annual cost of the active elements of the fixed production assets	Average payroll count
Coefficient of a ratio of the increase in labor productivity and the increase in the labor-power ratio of labor	Rate of increase in labor productivity for the year	Rate of increase of capital labour ratio for the year

Source: composed by authors based on [5], [13-15].

As indicators of efficiency of the use of the fixed production assets have different measurement units, it is efficient to normalize them to a united system of measurements by using a standardization algorithm.

The integral index of efficiency of the use of the fixed production assets is calculated at the fourth stage.

Analysis of theoretical and methodical materials on the issue of efficiency of using the fixed production assets of

company showed that the use of only one indicator of efficiency is insufficient. It is necessary to consider different spheres of company activities. Considering this, let us propose the integral index of efficiency of using the fixed production assets of an oil enterprise.

Formation of the integrated criterion is offered by a formula of arithmetic-mean weighed:

$$K \sum_{i=1}^n Y_i * Z_i$$

where Z_i – weight coefficient of significance of i - criterion of the effective use of the fixed production assets ;

Y_i – i criterion of the effective use of the fixed production assets ;

n – number of indicators of the effective use of the fixed production assets.

Weight coefficients of significance of the indicators is suggested to find by one of the expert methods- pair-wise comparison.

Based on the integral index of the effective use of the fixed production assets, the degree of the effective use the fixed production assets is defined:

$K \geq 1.15$ - high;

$1.00 \leq K < 1.15$ - average;

$K < 1.00$ - low.

The policy of reproduction of the fixed production assets of the oil company depends not only on the level of the effective use of the fixed production assets, but also on external factors.

Works of Raiko D.V. , L.M. Tseytlin, [16], P. Korchagin, N. Nikitina [17] were taken into consideration when choosing factors that have impact on the process of reproduction of the company's fixed production assets.

As a result of proposed above author's researches and considering the oil sector industry specialization, the authors have built the system of factors that impact the process of reproduction of the company's fixed production assets of oil company.

Factors affecting the process of reproduction of the fixed production assets can be grouped into three groups:

1) A group of economic factors affects the financial capacity of the process of reproduction of the fixed production assets.

a) General characteristics of the economic situation (recovery, stabilization, recession).

b) Rate of national currency.

- c) *Refinance rate.*
 - d) *Availability of borrowed funds for financing the reproduction of the the fixed production assets.*
 - e) *Level and dynamics of the inflation level.*
 - f) *Level and dynamics of the unemployment rate.*
 - g) *Level of solvency of demand for petroleum products.*
- 2) *A group of scientific and technological factors influence through knowledge that can be realized in the reproduction of main capital; affect the nature of the functioning of the fixed production assets and prospective projects for its renewal.*
- a) *Trends of researches and developments in the oil sector.*
 - b) *Emergence of new technologies and construction materials.*
 - c) *Scientific research and design organizations of the oil sector.*
 - d) *Availability of know-how and new technologies in the oil sector.*
- 3) *A group of institutional factors influences by means of the norms of the legal framework, the forms of behavior of market participants.*
- a) *Price regulation of the oil sector.*
 - b) *State influence on the oil industry.*
 - c) *The interest of the territorial and administration authorities in the development of the reproductive process of the fixed production assets.*
 - d) *Stability of legislation.*
 - e) *Availability in sufficient quantity and quality of human resources.*
 - f) *The level of bureaucratic transaction costs and corruption in the oil sector.*

The degree of influence of each factor on the process of reproduction of the fixed production assets of the oil company is proposed to be evaluated by an expert method using a five-point scale (Fi): Fi = 5 - high impact, serious danger; Fi = 1 - absence of impact, threats. The hierarchy analysis method is used as an expert method [18].

Level of impact of environmental factors on the process of reproduction of the fixed production assets (F):

$$F = \frac{\sum_{i=1}^n fi}{5 * n} \quad (2)$$

where fi – level of impact of i factor according to the five-point scale;

n – number of evaluated factors;

5 – maximum assessment of the impact of the factor.

Scale for assessing the level of the impact of the factors is given in Table II.

TABLE II. SCALE OF ASSESSMENT OF THE LEVEL OF IMPACT OF FACTORS ON THE PROCESS OF REPRODUCTION OF THE COMPANY'S FIXED PRODUCTION ASSETS

Number of points (F)	Characteristics of the impact of factors
$0.80 \leq \Phi \leq 1.0$	High impact
$0.50 \leq \Phi \leq 0.79$	Average impact
$\Phi \leq 0.49$	Low impact

Source: Authoring

After calculating the integral index of the effective use of the fixed production assets (K) and the level of environmental factors affecting the reproduction process of the fixed production assets of the oil company (F), let us determine the need for reproduction of the fixed production assets of the oil company and the strategy for renewal of the fixed production assets (Table III).

TABLE III. MATRIX OF THE CHOICE OF STRATEGY OF RENEWAL OF THE FIXED PRODUCTION ASSETS

		F		
		Low impact	Average impact	High impact
		$F \leq 0.49$	$0.50 \leq F \leq 0.79$	$0.80 \leq F \leq 1.0$
K	High efficiency $K \geq 1.15$	Partial renewal	Partial renewal	Current renewal
	Average efficiency $1.00 \leq K < 1.15$	Partial renewal	Current renewal	Accelerated renewal
	Low efficiency $K < 1.00$	Current renewal	Accelerated renewal	Accelerated renewal

Source: composed by authors based on [5], [14]

The description of recommended strategies for renewal of the fixed production assets is given in Table IV.

TABLE IV. STRATEGY OF RENEWAL OF THE FIXED PRODUCTION ASSETS

Strategy	Description of strategy
Strategy of accelerated renewal	The organization needs to accelerate processes of renewal of fixed production assets, to increase the technological potential.
Strategy of current renewal	The organization needs renewal of the fixed production assets for preservation of competitiveness and market position in the future.
Strategy of partial renewal	The organization should support the fixed production assets at the appropriate level of engineering, technical, operational characteristics, in due time to carry out planned repairing and reconstruction, to increase control on the carried-out projects.

Source: composed by authors based on [5], [14]

III. APPROBATION OF THE METHODOLOGY

Approbation of the developed methodical approach is carried out by an example of the oil company PJOSC

Bashneft. PJOSC Bashneft - the largest oil company of Russia. It takes the 6th place in Russia by oil production volumes (19.9 million tons in 2015 – 4% of the total Russian production), by oil refining volume – the 4th place (19.1 million tons in 2015 – 7% of the total Russian refinery).

Dynamics of indicators of efficiency of using the fixed production assets of PJOSC Bashneft is given in TABLE V.

TABLE V. DYNAMICS OF INDICATORS OF EFFICIENCY OF USING FIXED PRODUCTION ASSETS OF PJOSC BASHNEFT

Groups of indicators	Name of indicator	2014 y.	2015 y.	2016 y.
Indicators of the technical condition of the fixed production assets	Coefficient of renewal, unit shares	0.37	0.19	0.18
	Coefficient of renewal scale, unit shares	0.38	0.21	0.21
	Replacement coefficient, unit shares	2.69	7.32	16.19
	Coefficient of park expansion, unit shares	0.63	0.86	0.94
	Depreciation coefficient, unit shares	0.53	0.50	0.54
Economic indicators of the efficiency of the use of the fixed production assets	Capital productivity, Ruble / Ruble	5.11	4.30	3.54
	Return on production assets, %	57.26	41.33	32.19
	Efficiency of the use of capital, %	74.38	60.65	44.03
	Return on equity, unit shares	42.79	34.71	44.94
	Investment ratio, unit shares	0.65	0.53	0.32
Social indicators of the efficiency of the use of the fixed production assets	Capital labour ratio, Rubles / person	3420.2	3372.1	3732.9
	Level of mechanical operations, Rubles / person	2052.1	2023.3	2239.8
	Coefficient of a ratio of the increase in labor productivity and the increase in the labor-power ratio of labor, unit shares	1.02	0.84	0.82

Source: author's estimations based on <http://www.bashneft.ru>.

Calculation results of standardize indicators of efficiency of using the fixed production assets of PJOSC Bashneft with consideration of priority weights are given in TABLE VI.

TABLE VI. TANDARDIZE INDICATORS OF EFFICIENCY OF USING FIXED PRODUCTION ASSETS OF PJOSC BASHNEFT WITH PRIORITY WEIGHTS, UNIT FRACTION

Name	Weight coefficients of the significance of the indicator	Standardized value with consideration of priority weight		
		2014 y.	2015 y.	2016 y.
Coefficient of renewal	0.084	0.15	0.04	0.08
Coefficient of renewal scale	0.102	0.16	0.06	0.10
Replacement coefficient	0.070	0.05	0.19	0.15
Coefficient of park expansion	0.105	0.09	0.14	0.11

Depreciation coefficient	0.090	0.09	0.08	0.10
Capital productivity	0.050	0.05	0.04	0.04
Return on production assets	0.068	0.06	0.05	0.05
Efficiency of the use of capital	0.064	0.06	0.05	0.05
Return on equity	0.068	0.07	0.06	0.09
Investment ratio	0.050	0.04	0.04	0.03
Capital labour ratio	0.063	0.06	0.06	0.07
Level of mechanical operations	0.075	0.07	0.07	0.08
Coefficient of a ratio of the increase in labor productivity and the increase in the labor-power ratio of labor	0.113	0.11	0.09	0.09

Source: author's estimations based on <http://www.bashneft.ru>.

The calculation of the integrated index of the effective use of the fixed production assets of PJOSC Bashneft is given in Table VII.

TABLE VII. CALCULATION OF INTEGRATED INDEX OF EFFECTIVE USE OF FIXED PRODUCTION ASSETS OF PJOSC BASHNEFT

Name	2014 y.	2015 y.	2016 y.
Integrated index (K)	1.07	0.99	1.05
Effective use of the fixed production assets	average	low	average

Source: author's estimations based on <http://www.bashneft.ru>.

Based on the results of the calculations, it is established that PJOSC Bashneft has an average effective use of the fixed production assets. In 2016, there was a deterioration in 7 out of the 13 considered indicators of the effective use of the fixed production assets: a significant decrease of the investment coefficient (by 40%), the capital utilization efficiency (by 27%), the return on production assets (by 22%), coefficient of the renewal of the fixed production assets. The rate of growth in labor productivity falls behind at 18% from the growth rate of the capital labour ratio by 18%.

Estimation of the impact of the external factors on the process of reproduction of the PJOSC Bashneft's fixed production assets was conducted using the expert method. The 5-point scale was used to measure impact where $\Phi_i = 5$ – high influence, major hazard; $\Phi_i=1$ – absence of influence and threat. The role of experts was taken by researches of the problems of efficiency of using the fixed production assets and specialists of economic and investment departments and of the PJOSC Bashneft (the total number of experts – 10 people).

Average expert estimations of the impact of the factors on the process of reproduction of the PJOSC Bashneft's fixed production assets are given in Table VIII.

TABLE VIII. EXPERT ESTIMATIONS OF THE IMPACT OF THE FACTORS ON THE PROCESS OF REPRODUCTION OF THE PJSOC BASHNEFT'S FIXED PRODUCTION ASSETS, POINT

Groups of factors	Name of factor	Rate of impact
A group of economic factors	General characteristics of the economic situation (recovery, stabilization, recession)	3.5
	Rate of national currency	3.6
	Refinance rate	2.8
	Availability of borrowed funds for financing the reproduction of the fixed production assets	4.1
	Level and dynamics of inflation level	2.9
	Level and dynamics of unemployment rate	3.3
	Level of solvency of demand for petroleum products	3.7
A group of scientific and technological factors	Trends of researches and developments in the oil sector	3
	Emergence of new technologies and construction materials	2.1
	Scientific research and design organizations of the oil sector	2.5
	Availability of know-how and new technologies in the oil sector	3.3
A group of institutional factors	Price regulation of the oil sector	3.6
	State influence on the oil industry	2.2
	The interest of the territorial and administration authorities in the development of the reproductive process of the fixed production assets	2.7
	Stability of legislation	3.3
	Availability in sufficient quantity and quality of human resources	3.4
	The level of bureaucratic transaction costs and corruption in the oil sector	3.2
Level of impact of environmental factors on the process of reproduction of the fixed production assets (F)		0.63
Characteristics of the impact of factors		Average impact

Thus, following the results of 2016 in the PJOSC Bashneft company, the average efficiency of using the fixed production assets which does not allow one to realize fully the production potential of the company is observed. At the same time, the level of impact of factors of the external environment on the process of reproduction of the fixed production assets is characterized as average ($F=0.63$). The strategy of the current renewal of the fixed production assets for preservation of competitiveness and market position in future is recommended to the PJOSC Bashneft.

Having investigated theoretical bases of economic effective use of the fixed production assets of the enterprise, it is possible to draw a conclusion that still there was no uniform concept of efficiency and methodology of its definition. Within the process of using the fixed production assets, there are differences in definition of efficiency of their use. Capital productivity is the most often used indicator of using the fixed production assets.

The offered methodology in this work allows one to estimate effective use of the fixed production assets of the company in a complex, taking into account technical condition of fixed production assets, their economic and social efficiency of use, and also to choose the optimum strategy for renewal of the fixed production assets.

References

- [1] E. Dovere, S. Cavalieri, and S. Ierace, "RFID systems for moveable asset management: an assessment model", *International journal of production research*, vol 55, Issue 5, pp. 1336-1349. 2017.
- [2] K. Wong and M. Joshi, "The Impact of Lease Capitalisation on Financial Statements and Key Ratios: Evidence from Australia", *Australasian accounting business and finance journal*, vol 9, issue 3, 2015.
- [3] D. Lowenstein and C. Slater, "Reducing the Cost of Test through Strategic Asset Management", *IEEE Autotestcon Proceedings*, Anaheim, September 2016.
- [4] V. Kufenko and N. Geiger, "Business cycles in the economy and in economics: an econometric analysis", *Scientometrics*, vol 107, pp. 43-69, April 2016.
- [5] G.Z. Nizamova and A.V. Zhelezova, "Formation of the enterprise investment policy strategy", *economics and management: scientific-practical journal*, Publisher: Bashkir Academy of Public Service and Management under the Head of the Republic of Bashkortostan (Ufa), vol. 2, pp.82-86, February 2014.
- [6] W. Hulsink, and V. Scholten, "Dedicated funding for leasing and sharing research and test facilities and its impact on innovation, follow-on financing and growth of biotech start-ups: the Mibiton case", *Venture capital*, vol 19, Issue: 1-2, pp. 95-118, 2017.
- [7] V. Gazman, "Overcoming stereotypes in leasing", *Voprosy ekonomiki*, vol 2, pp. 136-151, 2017.
- [8] M. Ben, A. Chelbi, and M. Radhoui, "Optimal imperfect maintenance strategy for leased equipment", *International journal of production economics*, vol 178, pp. 57-64, August 2016.
- [9] M. Ben, A. Chelbi, and M. Radhoui, "Optimal imperfect preventive maintenance policy for equipment leased during successive periods", *International journal of production economics*, vol 54, Issue: 17, pp. 5095-5110, 2016.
- [10] S.R. Lopes, A.V. Cristiano, and H.M. Alencar, "Delay-time inspection model with dimensioning maintenance teams: A study of a company leasing construction equipment", *Computers & industrial engineering*, vol 88, pp. 341-349, October 2015.
- [11] D.A. Wood, "Characterization of gas and oil portfolios of exploration and production assets using a methodology that integrates value, risk and time", *Journal of natural gas science and engineering*, vol. 30, pp. 305-321, March 2016.
- [12] S. Lavrov and A. Aleksanyan, "Case study: The Transnationalization of Russian Oil and Gas Companies", *Vestnik mezhdunarodnykh organizatsii-international organisations research journal*, vol 12, Issue: 1, 2017, pp. 209-230.
- [13] S.E. Martynova., Y.G. Dmitriev., M.M. Gajfullina, and Totskaya Y.A. "Service" municipal administration as part of the development of youth entrepreneurship in Russia", *Social Indicators Research*, pp. 1-14, 2016.
- [14] D.I. Pushkar and E.V. Dragunova, "Financial Analysis as a Tool for Company Strategy Developing", vol 3, 13th International Conference on Actual Problems of Electronic Instrument Engineering (APEIE), Novosibirsk, Russia, pp. 279-283, 2016, October.
- [15] A. Wan, N. Wan, J. Rezaei, and S. Sadaghiani "Evaluation of the external forces affecting the sustainability of oil and gas supply chain using Best Worst Method", *Journal of cleaner production*, vol 153, pp. 242-252, June 2017.
- [16] H. Sun, J. Quingyuan, and P. Ping. "Application of the analytic hierarchy process in the selection of nuclear power plant decommissioning strategy", *Proceedings of the 24th international conference on nuclear engineering*, vol 5, June 2016.
- [17] D.V. Raiko and L.M. Tseytlin, "Factors which influence on the development of the enterprise", *Marketing and management of innovations*, vol 3, pp. 149-159, 2015.
- [18] P. Korchagin and N. Nikitina, "Factors that influence the effectiveness of Russian telecommunication companies", *Economics & sociology*, vol 8, pp. 119-130, 2015.