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Economic Efficiency Rating of Russian Industrial Enterprises

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ABSTRACT

The objective of this study addresses a specific rating technique to assess the efficiency of enterprise performance. The article touches upon the rating methods commonly applied to obtain a complex rating value on the basis of a comprehensive enterprise activity assessment, such as rank-sum method, rank-score method, scale interval method and rating number method. Here we present a specific approach to rating with a focus on the efficiency of enterprise performance in particular. We also give reasons for the advantages the approach we suggest obviously provides, such as time saving, gain in information content as well as applicability of the rating results as a reliable tool to a company's productive capacity management. The article presents the results of the efficiency ratings assigned to a number of Russian industrial enterprises which are based on the assessment of their performance efficiency premised on the key efficiency values. As the result of the rating, enterprises engaged in extraction of commercial minerals have been assigned the top positions. The analysis of the indices used for calculating profitability values has led to a conclusion that profit growth and expenditure reduction will favor the raise of their efficiency and, therefore, upgrade their positions in the rating.

Keywords: Rating Assessment, Efficiency, Rank-sum Method, Rank-score Method, Profitability Indices, Rating Results
JEL Classification: L16

1. INRODUCTION

Rating is currently becoming widely applied as a relevant technique to provide analysis and assessment of the whole scope of business aspects. Ratings are assigned to every particular entity within a set number of the entities according to the full range of the key values under consideration. Since the problem of insufficient productive capacity growth is the very challenge enterprises have to face increasingly nowadays, rating methodology should obviously involve the methods and techniques which would allow to focus on assessing the efficiency of enterprise performance.

It is necessary to note that most of the currently applied rating techniques are intended for comprehensive assessment of enterprise performance. The literature most widely presents releases of financial strength ratings for companies of different profiles, commercial banks and other lines of businesses. However, business world representatives have recently been taking an increasing interest in well-organized, structured, most unbiased and credible information obtained on the basis of reliable methods to provide objective business coverage. Thus, applying a specific rating technique to assess the efficiency of an enterprise in particular is obviously relevant. The above-mentioned reasons clearly show that analytic studies of enterprise operations and production requires comprehensive consideration of rating methodology as well as the possible ways of its practical application.

So far, there is no consistent approach to assessing the aspect of enterprise efficiency, since the science of economics has not arrived at consensus on the concept of efficiency. That is the reason why the literature suggests such a big variety of methods to evaluate the efficiency of enterprise operations and production (Avrashkov and Grafova, 2006).

In our opinion, the need for the development of specific rating methods and techniques to assess the efficiency of enterprise performance is determined by the current demands of business, as well as by the following trends in the contemporary economic science:

1. Extensive use of the "efficiency" index (which is actually meant as the output, or sales volume) by expert RA (Russia's

No. 1 rating agency working on a global scale) as a key value for its Expert-400 rating (Vinogradova, 2015);
2. Focus on two groups of efficiency indices from the set of four key values commonly used for comprehensive entity assessment (distinguished by Prof. A. Sheremet, Doctor of Economic Sciences (Sheremet, 2011));
3. Admission of efficiency values as critically important criteria for enterprise health diagnostics (Prof. G. Grafova, Doctor of Economic Sciences (Grafova, 2006)) which rests on Prof. E. Altman's 5-factor Z-score formula as well as the golden rule of business.

2. METHODOLOGY

2.1. Currently Applied Rating Methods

In order to obtain high precision credibility rating results it is necessary to develop most exact and reliable methods which would cover adequately the scope of company aspects. At present there are different rating methods which are reported in economic literature and are widely used in analytical practice, namely: Rank-sum method, rank-score method, scale interval method and rating number method (Ovcharenko, 2015).

2.1.1. Rank-sum method

The method involves summing up the ranks of all the particular enterprise key figures. The integrated assessment value is calculated according to the following formula:

$$Kj = \sum_{i=1}^{n} Aij \quad (1)$$

Where K_j is the integrated value of each (j^{th}) enterprise assessment on the key values considered; j is the order number of the enterprise; Ai is the index value (i = 1….n); n is the number of indices considered.

The results obtained allow to judge which of the enterprises shows the highest efficiency according to the range of the key values. Enterprises are assigned ratings by ranking the integrated assessment value in an ascending (or descending) order. The higher the integrated assessment value is, the higher the enterprise is rated. In case of equal indicator values, companies are assigned with the same positions. Companies with the minimum sum of positions will have the best results under this method (Batkovskiy et al., 2015).

2.1.2. Rank-score method

The method involves summing up the scores assigned to each of the enterprise key values. The higher the key value is, the lower the score assigned. The integrated assessment value is calculated according to the following formula:

$$Kj = \sum_{i=1}^{n} Bij \quad (2)$$

where K_j is the integrated value of each (j^{th}) enterprise assessment on the indices considered; j is the order number of the enterprise; B_i is the index score (i = 1 … n); n is the number of key values considered. The lower the figure obtained is, the higher the enterprise is rated. (Dibal, 2009).

The assessment value acquired according to this method is representative of the enterprise economic and financial capacity level (low, insufficient, average, normal and high) (Sheremet et al., 2007).

2.1.3. Scale interval method

The method for comparative assessment of enterprise performance involves a 3-Step algorithm. Let us consider each of the steps.

Step 1: Enter the key data matrix (A_{ij}), where the key values (i = 1,2,3,… n) are placed into the matrix rows, whereas order numbers of entities (j = 1,2,3,… m) are placed into the matrix columns.

Step 2: Define the benchmark (the reference optimum value) for each particular i^{th} value and enter it into the column for the reference company (m + 1).

Step 3: Calculate standardized key indices as the ratios to the benchmark (reference) values according to the formula:

$$X_j = \frac{\text{Aij}}{A_{ij}\,(\text{reference})}, \quad (3)$$

Where A_{ij} is the best (optimum) value for all the i input values aggregated.

Step 4: The rating assessment value (K_j) for each entity is calculated according to the formula:

$$K_j = \sqrt{(1-X_{1j})^2 + \ldots + (1-X_{nj})^2} \quad (4)$$

Where $x_{1j}, x_{2j}, \ldots x_{nj}$ are the standardized indices of j^{th} entity.

Step 5: The entities are assigned ratings in the ascending order of the rating value. The one with the minimum K_j value is rated highest (Plaskova, 2010).

2.1.4. Rating number method

The method supposes working out the so-called rating number according to the formula.

$$R=2X_1+0.1X_2+0.08X_3+0.45X_4+X_5, \quad (5)$$

Where X_1 is the own circulating capital coverage index, X_2 is the current liquidity index, X_3 is the asset turnover index, X_4 is the sales margin return on sales (ROS), X_5 is the return on equity. This approach is most commonly used to develop standard methods and techniques of assessing enterprises.

The higher the value of a rating number is, the higher the enterprise is rated (Vachrushina, 2009).

2.1.5. Analysis of the currently applied rating methods

The currently applied rating methods are based both on overall evaluation of a number of indices and key values and on rigorous mathematical approaches. The analysis of those described above shows that generally they involve consideration of a wide range of indices which are, to a varying extent, descriptive of financial solvency, business credibility and sustainability, credit standing, investment attractiveness of entities. That sheds light on the core of the concept of comprehensive assessment, which reports virtually of the whole scope of quantitative and qualitative parameters and provides a comprehensive holistic picture of a company state.

2.2. The Alternative Method for Rating Evaluation of Enterprise Performance Efficiency Suggested by the Authors

2.2.1. Rationale for the need for the development of a specific rating method to evaluate enterprise efficiency

However, business representatives are often interested not in comprehensive information covering the whole range of enterprise aspects, but they seek to receive data focused on a certain set of indices which would report on particular aspects of a company and would be specifically indicative of the efficiency of enterprise performance.

As it was mentioned above, no consistent approach to business efficiency evaluation has actually been elaborated. Consequently, no explicit well-developed method based on rating techniques which would provide evaluation of enterprise efficiency is currently available.

2.2.2. The advantages of availability of a specific rating method to provide evaluation of enterprise performance efficiency

Here we deem it necessary to highlight the main advantages of the specific rating method we present in this work in order to prove the actual need for its development and its eventual application:

1. Gain in time for the calculations. Availability of a specific technique to provide systematic rating of enterprise efficiency allows to shorten the time of analytical procedure considerably compared to comprehensive rating analysis, since it requires much less measuring and calculation;
2. Gain in rating informative content and value. Since this rating scale is specifically focused on the aspects which are indicative of enterprise efficiency, unlike integrated assessments, it provides more complete, precise and detailed evaluation results for an analyst;
3. The suggested rating presentation is definitely considered to be instrumental in fostering enterprise productive capacity growth as well. Thus, it will contribute greatly to identifying hotspots and trouble areas which result in the lack of efficiency. Consequently, this rating system will provide clues to working out certain strategic options for enhancing productive and financial capacity of an enterprise (Ovcharenko, 2015).

Thus, availability of a rating system to evaluate enterprise efficiency can be greatly beneficial to the companies which are actually interested in expert assessment of their own as well as their competitors' standing. Since the rating we suggest is only focused on the factors indicative of enterprise efficiency, it seems advantageous from the point of view of time saving and information value compared to ratings considering a full scope of business aspects. It also facilitates making strategic decisions related to productive capacity management. The facts mentioned above give evidence of the need to develop a specific rating methodology for assessing enterprise efficiency.

3. RESULTS

Here we present the economic efficiency rating scaling Russian industrial enterprises. It must be noted that industry, as the main sector in the sphere of material production, plays the key role within the structure of the national economy. That is the rationale for our choice of the assessment object.

For that purpose we suggest to use the rank-sum method, although modified to some extent. It deems most appropriate in this case since it does not require analyzing a comprehensive set of various criteria. In our opinion it is relevant to focus on profitability indices only, specifically, ROS and return on total assets (ROA) - as the input data, since those indices are representative of both the company's assets and sales margin disposal efficiency. The results of calculations help to assess the efficiency of companies for each of the groups of selected indicators, and to identify what factors had the greatest impact on the summary for assessment of the effectiveness (Tsaruk, 2014).

Thus, ROS shows the share of gross profit on sales in the total revenue, which displays company's potential profitability; whereas ROA is the ratio of company's earnings before taxes (EBT) against the total assets invested in it, which is indicative of the management efficiency in disposing company assets. Consequently, assuming these indices as assessment inputs makes it possible to assess enterprise efficiency most comprehensively.

We have assigned efficiency ratings to a number of Russian industrial enterprises over the period of 2010 to 2013 applying the official statistics. The assessment addresses the companies engaged in the following industry branches:

- Extraction of commercial minerals
- Manufacturing industry
- Generation and supply of electric power, gas and water
- Construction industry.

The input data for efficiency rating assignment for Russian industrial enterprises are presented in Table 1.

The rating results are reported in Table 2.

Thus, efficiency rating for the Russian industrial enterprises addressed displayed the following allocation of the rating positions:

Table 1: The input data for efficiency rating assignment for Russian industrial enterprises

Branch of industry				
Index/year (%)	**2010**	**2011**	**2012**	**2013**
Extraction of commercial minerals				
Return on sales	31,9	31,4	28	22,1
Return on total assets	11,6	14,2	11,9	11,3
Manufacturing industry				
Return on sales	14,8	13,2	10,7	8,8
Return on total assets	8,2	8,4	8,1	4,5
Generation and supply of electric power, gas and water				
Return on sales	7,1	6,4	3,9	4,4
Return on total assets	4,6	1,1	0,9	0,7
Construction industry				
Return on sales	4,5	4,3	5	8,3
Return on total assets	2	2,1	2,9	5,6

Table 2: Rating positions of the enterprises assessed (by the industry branches)

Year	Rating position			
	Extraction of commercial minerals	Manufacturing industries	Generation and supply of electric power, gas and water	Construction industries
2010	1	2	3	4
2011	1	2	3	3
2012	1	2	4	3
2013	1	2	3	2

- The companies engaged in extraction of commercial minerals are assigned the top position;
- The manufacturing enterprises are rated second;
- The enterprises engaged in generation and supply of electric power, gas and water are mostly rated third (over the period);
- Construction companies have gradually shifts from the fourth position in 2010 up to the second position (2011-2012) and then, in 2013, they share the second position with manufacturing industries.

Thus, we come to a conclusion that the leading position in the efficiency rating among the industrial enterprises (with regard to the industry branches) is occupied by the companies engaged in extraction of commercial minerals, which is due to the country's immense mineral wealth – Russia is the global leader in mineral resources abundance.

The next step of the studies is to assign efficiency ratings to major mining companies within the leading branch in order to determine the absolute national "efficiency leader." We have addressed the following Russian enterprises:

- Public Joint Stock Company (PJSC) Gazprom;
- PJSC Rosneft';
- PJSC Surgutneftegaz.

The input data for assigning efficiency ratings to the leading mining companies are presented in Table 3.

The rating results are displayed in Table 4.

The efficiency rating for the Russia's leading companies engaged in extraction of commercial minerals displayed the following allocation of the rating positions:

- PJSC Gazprom is assigned the top position;
- PJSC Rosneft' is mostly rated second (over the period);
- PJSC Surgutneftegaz is rated second (and, therefore, the least efficient) in 2010, but then, in 2011 and 2013 the company shares the top position with PJSC Gazprom and in 2012 it shares the second position with PJSC Rosneft'.

Thus, according to the efficiency rating PJSC Gazprom appears the absolute leader among the Russia's leading enterprises engaged in extraction of commercial minerals, which can be primarily accounted for by the best indicating figures the company displays.

4. DISCUSSION

We have also found that over the period covered the efficiency of Russian industry in general gradually abates. This is, obviously, a negative trend.

Table 3: The input data for assigning ratings to the leading Russian enterprises engaged in extraction of commercial minerals

Indices/enterprises (%)	PJSC Gazprom	PJSC Rosneft'	PJSC Surgutneftegaz
2010			
Return on total assets,	13,79	20,51	13,28
Return on sales,	30,96	30,93	22,10
2011			
Return on total assets	15,41	11,99	18,13
Return on sales	35,73	16,03	21,04
2012			
Return on total assets	12,53	11,33	10,80
Return on sales	27,06	12,43	17,64
2013			
Return on total assets	11,06	8,38	14,44
Return on sales	30,23	11,82	16,52

PJSC: Public joint stock company

Table 4: Rating positions of the enterprises assessed

Year	Rating position		
	PJSC Gazprom	PJSC Rosneft'	PJSC Surgutneftegaz
2010	1	1	2
2011	1	2	1
2012	1	2	2
2013	1	2	1

PJSC: Public joint stock company

The pattern displaying the average values of ROA and ROS indices for industrial enterprises over the years 2010 to 2013 shows a simultaneous lowering of those for all the national industries (Figure 1).

Besides, we have detected that the efficiency of the national leading companies in extraction of commercial minerals also tends to lower at the end of the period covered. Since the branch is admitted to be most developed in Russia and, consequently, can promote (or, on the contrary, inhibit) the development of other industrial branches, the fact speaks for the overall decrement in the efficiency of national industries.

The pattern displaying the average values of ROA and ROS for the leading national industrial enterprises engaged in extraction of commercial minerals over the years 2010 to 2013 shows a simultaneous efficiency decrement (in most periods) for the companies (Figures 2 and 3).

We have tried to ascertain the cause for the rating downgrade. For that purpose we considered the figures which make it possible to calculate ROA and ROS. The collation of the values of company assets and EBT as well as revenue and sales profit for the leading

Russian enterprises in extraction of commercial minerals covering the period of 2010 to 2013 is represented in Figures 4 and 5.

Figure 1: Dynamics of return on total assets and return on sales for Russian industrial enterprises taken in average values over the period of 2010-2013, %

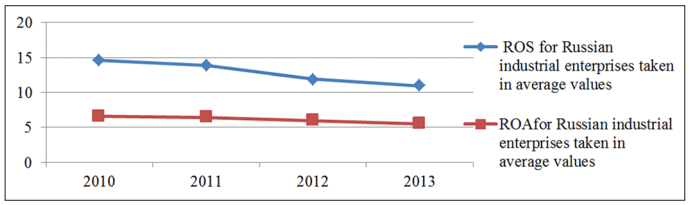


Figure 2: Dynamics of return on total assets values for the leading national enterprises engaged in extraction of commercial minerals, 2010-2013, %

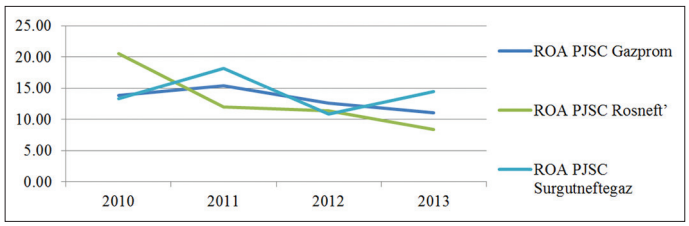


Figure 3: Dynamics of return on sales values for the leading national enterprises engaged in extraction of commercial minerals, 2010-2013, %

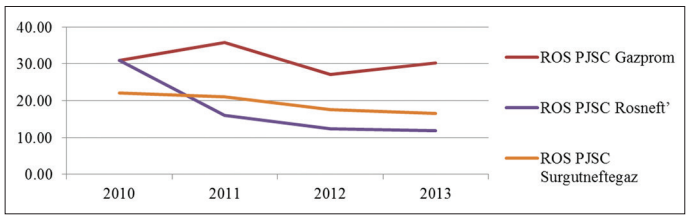


Figure 4: The values of the assets and the EBT for the leading Russian companies engaged in extraction of commercial minerals in 2010-2013, mln rubles

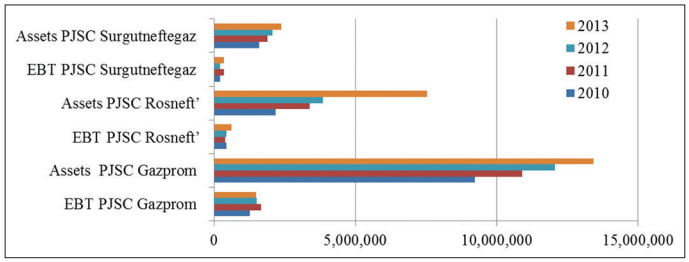
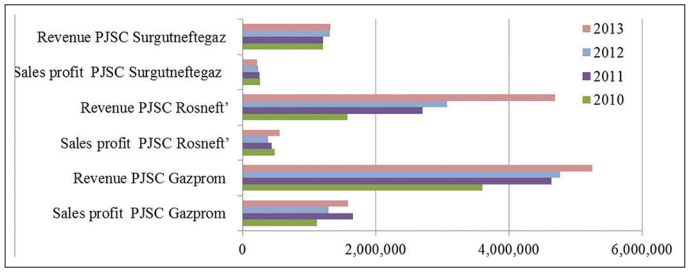


Figure 5: The values of the revenue and the sales profit for the leading Russian companies engaged in extraction of commercial minerals in 2010-2013, mln rubles



Horizontal analysis of the assets and the sales profit values of the leading companies engaged in extraction of commercial minerals has allowed to conclude that:

- Almost every company displayed lower EBT growth rate compared to that of the assets (the only exception is PJSC Rosneft' in 2013);
- They also mostly displayed lower sales profit growth rate compared to that of the revenue (the only exception is PJSC Rosneft' in 2013).

As it was mentioned before, ROA shows the share of EBT within total company assets, whereas ROS indicates the share of sales profit in sales revenues.

We deem that the reduction in the efficiency of performance of the leading Russian enterprises engaged in extraction of commercial minerals over the period of 2010-2013 was caused by the following actualities in the efficiency index we have used for assigning the ratings:

1. Constant and considerable growth of the denominator (assets and revenue);
2. Slight diminution of the numerator (EBT and sales profit).

The rating results give evidence to the fact that upgrading the efficiency rate is the top priority task for the leading Russian enterprises engaged in extraction of commercial minerals. To achieve the goal it is necessary to take such basic steps as increasing the profit and reducing the company expenditures. That will eventually result in the upgrade of the efficiency rating for Russian companies.

5. CONCLUSION

The present study addresses rating as a technique of assessing the efficiency of enterprise performance. It was ascertained that the existing modern methods of rating cover the full range of enterprise performance aspects. However, the rating which is specifically focused on the efficiency of enterprise performance has a number of advantages, such as time saving, gain in information content as well as applicability of the rating results to productive capacity management of a company. It is necessary to highlight the importance of further development of a special rating methodology for that purpose.

In the conduct of the present study we have assigned ratings to a number of Russian industrial enterprises focusing on the efficiency of their performance. We have also presented an efficiency rating for the leading companies engaged in extraction of commercial minerals covering the period of 2010-2013. The assessment has led to a conclusion that the absolute efficiency rating leader is PJSC Gazprom, which displays the best efficiency key values among all the industrial enterprises under consideration. However we have diagnosed an overall decline in the efficiency of the leading Russian companies engaged in extraction of commercial minerals (and, consequently, the trend touches upon all the national industrial enterprises). Increasing the profit and reducing the company expenditures will foster the improvement of their actual efficiency and, therefore, upgrade their efficiency rating.

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