

Analysis of Impact of Non-financial Information Disclosure on Capitalization of Russian Oil and Gas Sector Companies

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Abstract

Today, the problems and ways of improving the companies' corporate reporting and confirming their importance are among the most discussed topics in the academic world, both in Russia and globally. The existence of a wide range of research papers, as well as tools for evaluating non-financial information of companies, indicates the significant role of non-financial factors for the global society. However, it is still questioned whether these factors affect the market value of companies. According to the RSPP, the disclosure of non-financial information in the companies' annual reports allows users to identify leaders, helps to strengthen the reputation and investment attractiveness of these companies, and serves to promote the culture of responsible business conduct. In this work, the influence of non-financial factors on the market capitalization of companies in the oil and gas sector was studied using the model of correlation of factors with the calculation of the Pearson and Spearman coefficients. The data about the market capitalization of the three largest Russian companies in this sector, Gazprom, Gazprom Neft, and LUKOIL, were taken from publicly available sources. To find a correlation between the calculated indices and the market capitalization indicator, it was assumed that the company's market capitalization of the current year would be influenced by the indices of non-financial factors calculated according to the data of the previous year. It has been proved that there exists a certain connection between non-financial factors (index of ecological effectiveness; index of economic development; index of social influence) and the company's market value. However, the results of the analysis showed that political factors determine the capitalization of oil and gas companies in Russia to a greater extent at the present stage.

Keywords: sustainability reporting, esg disclosure, corporate social responsibility, gri standards, oil and gas industry

1. Introduction

A significant number of academic researches about non-financial information in corporate reporting, as well as methods for evaluating non-financial reporting on ESG factors (including those conducted outside of academic interests by authoritative global and national communities) indicate a keen public interest not only to the topic of sustainable development of the world but also to the impact of non-financial factors on financial risks and the significance of organizations' activities within the sustainable development on the value of these organizations (market capitalization).

The research is currently underway on the impact of fairly traditional financial indicators on the market capitalization of companies (Al-Afeef, 2020) and economic security (Astrakhantseva, Aletkin & Fakhretdinova, 2015, Snetkova, Markaryan & Elsukova, 2019). However, more attention is given to the analysis of non-financial indicators and value of a company (Efimova, 2018). In their research, Zhang et al. (2020) concluded that the disclosure of environmental and social information can have a positive impact on the company's capitalization. Some modern researchers emphasize the special importance of environmental, social, and managerial factors in assessing the risks of a company's sustainable development (Hübel & Scholz, 2020, Leins, 2020, Ziolo, Filipiak, Bak & Cheba, 2019). At the same time, the scholars note that the high quality of non-financial information disclosure affects the transparency of companies' activities and contributes to the expansion of their financial and investment opportunities (Hamrouni, Boussaada & Ben Farhat Toumi, 2019, Hoang, 2018, Rezaee & Tuo, 2017, Kulikova, Nesterov, Vakhotina & Yakhin 2015, Nagumanova, Sabirova & Titova 2019). Tamimi & Sebastianelli's research results (2017) also reveal that large-cap companies have significantly higher ESG disclosure scores than mid-cap companies, and that governance factors impact ESG disclosure. Bogdanov et al. (2016) present the methodology for determining the impact of

environmental factors on economic ones by calculating the correlation between the environmental effectiveness indices (Iecol) and economic development (Iecon) on the example of the company Surgutneftegaz. The research was based on the company's reporting data of five years (2010–2014). It was concluded that there is a weak relationship between the factors.

2. Method

In this article, we have adapted the method for calculating the Iecon and Iecol indices presented by Bogdanov et al. (2016). However, the correlation will be determined between:

- Index of environmental effectiveness and market capitalization;
- Index of economic development and market capitalization;
- Index of social influence and market capitalization.

Information from official websites or authoritative information systems (RBC, Interfax) was used as the source for the analysis to find the market capitalization indicator, and information from sustainable development reports, environmental reports, and annual reports (2013–2018, 6 years dynamics) was used for calculating indexes.

Besides, we assume that to find the correlation of indices with market capitalization, it is necessary to take into account that the market capitalization of the current year will be affected by non-financial factors indices calculated based on the data of the previous to the current year (Tamimi & Sebastianelli, 2017). Our assumption is based on the fact that the publication of non-financial information for the reporting year will be the object of analysis of stakeholders in the current year, accordingly, the results of their economic decision will affect the value of companies in the current year (for example, the 2018 non-financial report will affect the value of the company in 2019).

Bogdanov et al. (2016) noted that environmental effectiveness and economic development depend on five and four factors (components), respectively. Each component has a specific indicator that measures it, since only quantitative values apply to the model. The authors point out that the analysis is performed between indices. These indicators were chosen because the environmental impact is formed based on factors expressed in different units of measurement (thousand tons, km, ha, thousand rubles, etc.). It makes it impossible to perform the analysis, since in this model, the components are summed in a single index. In this regard, to integrate the components into a single unit of measurement, the data for analysis were presented in the form of natural logarithms.

Since the model deals with the correlation of environmental and economic factors, there is no influence of social factors in Iecon (Mortahan & Talebnia, 2016). We have modified this index by adding a social investment indicator (SI). Besides, based on the quantitative indicators recommended for calculation by GRI standards, we have compiled a social index that includes four components. The indices are described in Table 1.

The choice of components for each index is justified by the following:

- a) Prevention of pipeline accidents: since some oil and gas companies transport their products through pipelines located in vast territories with unique nature, as well as in the vicinity of settlements (northern first nations, etc.), pipeline safety plays a significant role in preserving the environment;
- b) Land reclamation: reducing the negative impact of oil and gas companies on the environment is largely achieved by reclaiming oil-contaminated land;
- c) Air protection: the increased public attention to air pollution and the associated tightening of legislation and penalties raises the importance of this component for analysis;
- d) Protection of water resources: the inclusion of this component in the index is related to the global trend of reducing fresh water resources and signifies the importance of the problem. Water reuse is a method of reducing the negative impact on the environment;
- e) Protection of bioresources and conservation of biodiversity: oil and gas companies use natural resources in the course of their activities, as well as operate within the framework of extractive activities on the territory of animal habitats. In this regard, to compensate for their influence, companies should conduct programs for conservation and multiplication of bioresources and biodiversity;
- f) Finances: this component is needed because it is an indicator of the successful functioning of the company;
- g) Strategy: the company's investment activity represents the vision of its position in the long term;
- h) Education: high-quality human resources contribute to improving the company's efficiency and revenue; they are responsible socially and environmentally. It influences the reducing of the negative impact of the company on the

environment and society;

i) Technology: the contribution to R&D can increase production efficiency, as well as reduce the impact on the environment and society by easing working conditions, reducing waste in production, etc.

The proposed components of the social index have the following grounds:

a) Acceptable working conditions: proper work improves the well-being of society;

b) Labor Protection: the high level of industrial safety contributes to the company's reputation and attracting reliable contractors. It affects people's well-being;

c) Gender equality: it reflects the global trend towards equal professional opportunities;

d) Support for the regions of presence: oil and gas companies in Russia are, for the most part, city-forming enterprises that employ a significant proportion of the local population, which increases the need for infrastructure development and the improvement of living conditions in the regions.

Table 1. Components of the environmental effectiveness, economic development and social index

№	Type of the index	Component of the index	Indicator for evaluating	Unit	Notation in the formula
1	2	3	4	5	6
1	Index of environmental effectiveness	Prevention of pipeline accidents	Length of pipelines protected by anti-corrosion coating	km	PA
		Land reclamation	Area of reclaimed oil-contaminated land	ha	LR
		Air protection	Emissions to air	thousand tons	PAE
		Protection of water resources	Water reuse	thousand cubic meters	PWR
		Protection of bioresources and conservation of biodiversity	Effectiveness of programs and measures to reduce the negative impact on bioresources and biodiversity	Quantity of programs	PBR
2	Index of economic development	Finances	Annual revenue	Thousand rubles	F
		Strategy	Environmental investments for the year	Thousand rubles	I
			Social investments for the year		SI
		Education	Personnel training	hours	Ed
		Technology	Effective implementation of new technologies	Thousand rubles	Tech
3	Index of social influence	Acceptable working conditions	Employee turnover rate	%	TR
		Labor protection	Effectiveness of injury prevention measures	Accident rate	AR
		Gender equality	Percentage of female managers	%	FM
		Support for regions	Effectiveness of programs to support the local population	Quantity of programs	SR

Source: Author

Thus, the formula of the Iecol index is (Formula 1) (Bogdanov, Ilicheva, Balcescu & Zakirov, 2016):

$$\text{Iecol} = 0,1 \times \ln(\text{PA}) - 0,1 \times \ln(\text{LR}) - 0,5 \times \ln(\text{PAE}) - 0,3 \times \ln(\text{PWR}) + 0,3 \times \ln(\text{PBR}) \quad (1)$$

The Iecon, taking into account the added factor, looks like this (Formula 2):

$$\text{Iecon} = 0.3 \times \ln(\text{F}) + 0.3 \times \ln(\text{I}) + 0.2 \times \ln(\text{Ed}) + 0.2 \times \ln(\text{Tech}) - 0.3 \times \ln(\text{I}) + 0.1 \times \ln(\text{SI}) \quad (2)$$

The proposed social index will have Formula 3:

$$\text{ISOC} = 0.3 \times \ln(\text{TR}) - 0.3 \times \ln(\text{AR}) + 0.2 \times \ln(\text{FM}) + 0.1 \times \ln(\text{SR}) \quad (3)$$

It is important to note that, according to the proposed methodology for determining the Iecol and Iecon indices, each component of the index has its degree of significance, which is reflected in different weights of variables. Thus, air, water, and bioresources pollution globally have a more significant effect than land reclamation and pipeline protection. In this regard, their weights are larger.

3. Results

Calculations of indices for non-financial reports of the companies are presented below according to Gazprom data, Table 2. Calculations for Gazprom Neft and LUKOIL were made similarly. It should be clarified that if the values of any components were missing in the company's reports, their value was taken as zero.

Table 2. Calculation of indices for Gazprom 2013–2018 non-financial reports

No	Item	Unit	Indicators by year						Notation in the formula	
			2013	2014	2015	2016	2017	2018		
Calculation of the indices of environmental effectiveness for Gazprom 2013–2018 non-financial reports										
1	Length of pipelines protected by anti-corrosion coating	km	0,00	0,00	0,00	0,00	0,00	0,00	0,00	PA
2	Area of reclaimed oil-contaminated land	ha	839,18	464,60	187,37	94,08	89,10	96,13		LR
3	Emissions to air	thousand tons	3 076,40	2 797,63	2 830,57	2 868,46	2 795,97	2 894,02		PAE
4	Water reuse	thousand cubic meters	10,00	12,00	16,00	11,00	15,00	14,00		PWR
5	Effectiveness of programs and measures to reduce the negative impact on bioresources and biodiversity	Quantity of programs	0	0	0	0	0	0		PBR
6	Iecol	X	-4,00	-3,84	-3,67	-3,72	-3,60	-3,65		X
Calculation of the index of economic development based on Gazprom 2013–2018 non-financial reports										
1	Annual revenue	Thousand rubles	3 933 335,00	3 990 280,00	6 073 318,00	6 111 051,00	6 546 143,00	8 224 177,00		F
2	Environmental investments for the year	Thousand rubles	14 320,00	15 580,00	15 754,00	22 542,00	35 585,00	29 189,00		I
	Social investments for the year									SI
3	Personnel training	hours	79,45	58,55	61,40	62,70	60,15	61,00		Ed
4	Effective implementation of new technologies	Thousand rubles	4 738,00	5125	9 583,00	9 235,00	12 300,00	12 300,00		Tech
5	Social expenses for the year	Thousand	35 498,00	46 429,00	32 485,00	35 516,00	37 461,00	49 589,00		SE

		rubles							
6	Iecon	X	11,04	11,05	11,28	11,40	11,61	11,65	X
Calculation of the social index based on Gazprom 2013–2018 non-financial reports									
1	Employee turnover rate	%	2,50	3,10	3,90	4,00	4,70	5,60	TR
2	Effectiveness of injury prevention measures	Accident rate	161	147	158	134	113	89	AR
3	Percentage of female managers	%	23,00	24,00	23,00	24,00	24,00	25,00	FM
4	Effectiveness of programs to support the local population	Quantity of programs	34	22	25	20	23	35	SR
5	ISOC	X	0,24	0,29	0,34	0,37	0,47	0,62	X

Source: Author

The next stage of analysis is to determine the tightness of the relationship between indices and market capitalization. Two types of correlation were used for calculations: The Pearson product-moment correlation coefficient and the Spearman rank correlation coefficient.

The Pearson correlation coefficient (r) is a method for finding the value of a linear relationship between variables (Formula 4).

$$r = \frac{COV(x,y)}{\sigma_x \times \sigma_y} \quad (4)$$

Where x is explanatory variable; y is explained variable; σ_x and σ_y are sample variances.

The Spearman coefficient is a coefficient between two ordinal rank variables evaluating the closeness of the relationship between them. If there are no repeated data values, the ideal Spearman correlation (ρ)+1 or -1 occurs when each variable is an ideal monotone function of the other (Formula 5)

$$\rho = 1 - \frac{6 \sum D^2}{n(n^2-1)} \quad (5)$$

Where D is the rank difference, and n is the number of observations in the sample.

Using the standard Microsoft Office Excel program, we calculated these coefficients for the three companies under study. Excel formula for calculating the Pearson correlation coefficient: =correlation, where the first data set will be the values of x -indices for 2013–2018, and the second array will be the values of y -market capitalization of 2014–2019. The same formula is used to calculate the Spearman coefficient, but the first data set will be the ranks of the variable x (Excel formula =RANK.CP), and the second – the ranks of the variable y .

The calculation data are shown in Table 3.

Table 3. Dynamics of market capitalization (MC) of Gazprom, Gazprom Neft, and LUKOIL in 2014–2019, in million rubles

Company	MC 2014	MC 2015	MC 2016	MC 2017	MC 2018	MC 2019
Gazprom	3 172,18	3 221,66	3 658,66	3 089,33	3 633,81	6 001,11
Gazprom Neft	678,01	678,01	1 014,64	1 157,35	1 643,81	2 228,41
Lukoil	1 892,50	1 995,42	2 933,59	2 836,20	3 747,75	5 051,25

Source: Author

The calculation results are shown in Table 4.

Table 4. Results of calculating the Pearson correlation coefficient and Spearman coefficient

Company	Item	Correlation with the Iecol	Correlation with the Iecon	Correlation with the Isoc
1	2	3	4	5
Gazprom	Pearson correlation coefficient	0,45	0,66	0,87
	Spearman's Coefficient	0,58	0,54	0,54
Gazprom Neft	Pearson correlation coefficient	0,79	0,57	0,05
	Spearman's Coefficient	0,49	0,84	0,29
Lukoil	Pearson correlation coefficient	0,82	0,47	0,79
	Spearman's Coefficient	0,49	0,20	0,83

Source: Author

According to Table 4, there is a significant difference between the Pearson and Spearman coefficients in some calculations. Thus, the tightness of the relationship between the social index and the market capitalization of Gazprom differs by 0.33. It indicates a non-linear influence of the social index on the company's market capitalization. However, it is essential to note that Gazprom plays a significant role in society due to the significant support of urban infrastructure, the construction of public facilities, a large number of programs for the development of children, and assistance to the indigenous Arctic ethnic groups.

The analysis also showed that there is a non-linear relationship between the indices and the market capitalization of Gazprom Neft. These results appear because this subsidiary of the Gazprom group is more affected by political sanctions due to a lower degree of diversification of activities (compared to the parent company). Besides, the analysis was affected by the lack of disclosure of certain indicators, which, therefore, were accepted for analysis with a zero value in Table 2. Insufficient disclosure of non-financial information leads to less consideration of non-financial reporting by investors when making their economic decisions.

LUKOIL group also shows a weak correlation between economic factors and market capitalization. This abnormal result appears because the group is experiencing a decrease in investment in environmental protection connected with the completion of the main stage of the Program for the Rational Use of Associated Petroleum Gas. Since this indicator is a component of the index, it had a significant impact on the index and the closeness of the relationship. The significant-close relationship between the company's value and environmental and social factors confirms the important role of the company for the Economy and the country as a whole.

4. Discussion

Thus, a weak relationship between market capitalization and non-financial disclosure in the reporting of companies in the Russian oil and gas sector in the modern period was determined. If we consider factors that differ significantly in the Pearson and Spearman coefficients, the market value of Gazprom is more influenced by economic factors, while LUKOIL is more influenced by social factors, no significant factor with a linear relationship was determined for Gazprom Neft. It is notable that the market capitalization of oil and gas companies is currently significantly affected by international events (construction of the TurkStream and related sanctions, political tensions due to certain state territories status), which make the political and economic situation unstable. In this regard, the most accurate results of the close relationship of value with non-financial factors for the modern period can be obtained by adjusting the analysis model for political factors. Since political factors are not expressed in the quantitative estimation, they were not taken into account for the construction of the economic and mathematical model.

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