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Analysis of oil and gas companies' corporate social responsibility practices in Russia

Elena V. Rytova [1], Svetlana S. Gutman [2], Viktoriia V. Brazovskaia [3], Nikita A. Blagoi [4]

[1-4] Peter the Great St. Petersburg Polytechnic University; St. Petersburg, Russia

[1] rytova_ev@spbstu.ru, https://orcid.org/0000-0002-6774-7577

[2] SGutman@spbstu.ru, https://orcid.org/0000-0002-1098-3915

[3] brazovskaya_vv@spbstu.ru, https://orcid.org/0000-0002-9252-7410

[4] nikita_1915@bk.ru, https://orcid.org/0000-0003-4039-9274

Abstract

Purpose: to develop an approach to identifying and assessing the best corporate social responsibility (CSR) practices aimed at improving the social and environmental performance of enterprises and having a positive impact on the financial results and risks of companies.

Methods: the authors conducted a regression analysis to identify key CSR indicators affecting a company's financial results, and Data Envelopment Analysis (DEA) to analyze the comparative effectiveness of CSR practices and identify the most successful practices in terms of the balance between key CSR indicators and financial results.

Results: an algorithm for identifying the best CSR practices was proposed. In particular, according to the GRI standard, ESG factors of the oil and gas sector were selected provided that they had been included in reports from 2012 to 2023; profit was chosen as an endogenous indicator; the presence of a relationship between the profit indicator and the selected ESG factors was assessed using correlation and regression analysis; based on the modelling results, the factors that are most closely functionally related to the result were selected and used as input variables for the DEA; the DEA method was used to select companies with the most effective CSR practices; a comparative analysis was conducted to identify the best practices of CSR and recommendations were suggested for oil and gas companies CSR practices development.

Conclusions and Relevance: as a result of the research, an approach was developed to identify successful CSR practices taking into account their relationship with the financial results of companies using the example of the oil and gas sector. The developed algorithm can also be used for companies in other industries, provided that these companies implement CSR and provide non-financial reporting. The assessment of CSR practices efficiency is supplemented by an in-depth analysis of specific CSR activities of benchmark companies.

Keywords: corporate social responsibility, econometrics, sustainable development, energy economics, ESG, DEA, regression

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Научная статья

Анализ практик корпоративной социальной ответственности нефтегазовых компаний в России

Рытова Елена Владимировна [1], Гутман Светлана Семеновна [2], Бразовская Виктория Владимировна [3], Благой Никита Арсенович [4]

[1-4] Санкт-Петербургский политехнический университет Петра Великого; Санкт-Петербург, Россия

[1] rytova_ev@spbstu.ru, https://orcid.org/0000-0002-6774-7577

[2] SGutman@spbstu.ru, https://orcid.org/0000-0002-1098-3915

[3] brazovskaya_vv@spbstu.ru, https://orcid.org/0000-0002-9252-7410

[4] nikita_1915@bk.ru, https://orcid.org/0000-0003-4039-9274

Аннотация

Целью представленной статьи является разработка подхода к выявлению и оценке лучших практик корпоративной социальной ответственности (КСО), направленных на улучшение социально-экологической эффективности предприятий и оказывающих положительное влияние на финансовые результаты и риски компаний.

Методы. Авторами применены регрессионный анализ для выявления ключевых показателей КСО, влияющих на финансовые результаты компании, и Data Envelopment Analysis (DEA) для анализа сравнительной эффективности практик КСО и выявления наиболее успешных практик с точки зрения баланса между ключевыми показателями КСО и финансовыми результатами.

Результаты работы. Предложен алгоритм выявления лучших практик КСО. В частности, согласно стандарту GRI были отобраны ESG-факторы нефтегазового сектора при условии их включения в отчеты с 2012 по 2023 гг.; в качестве эндогенного показателя выбрана прибыль. С помощью корреляционно-регрессионного анализа оценено наличие связи между показателем прибыли и выбранными ESG-факторами. По результатам моделирования отобраны факторы, наиболее тесно функционально связанные с результатом, которые использованы в качестве входных переменных для анализа методом DEA, примененном для отбора компаний с наиболее эффективными практиками КСО. Проведен сравнительный анализ для выявления лучших практик корпоративной социальной ответственности. Предложены рекомендации по развитию практик КСО нефтегазовых компаний.

Выводы. В результате проведенного исследования был разработан подход к выявлению успешных практик КСО с учетом их взаимосвязи с финансовыми результатами компаний на примере нефтегазового сектора. Сформированный алгоритм может быть использован и для компаний других отраслей при условии реализации в этих компаниях механизмов КСО и предоставления нефинансовой отчетности. Оценка эффективности КСО практик дополнена углубленным анализом конкретных мероприятий компаний-бенчмарков.

Ключевые слова: корпоративная социальная ответственность, эконометрика, устойчивое развитие, экономика энергетики, ESG, DEA, регрессия

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Introduction

The corporate social responsibility (CSR) of companies ensures their competitiveness and reduces risk in the long term. Responsible CSR practices form a complex mechanism that relies on a number of algorithms and strategies and achieving Sustainable Development Goals (SDGs) without a loss of profitability implies very rational implementation of CSR practices, with the effectiveness of each of them being properly evaluated.

The oil and gas sector is strategically important for any country, and the well-being of the country's population depends largely on the social responsibility of companies operating in this industry. Oil and gas companies are so large that any of their actions can seriously affect the economic, political, and social situation in the country. Companies' corporate social policy is very important, since it influences the well-being of the society, including its social and ecological environment.

The specifics of CSR strategies applied by such companies vary. For a large company to be able to constantly grow, special strategic development programmes are needed, and the success of the CSR strategies directly depends on the versatility and effectiveness of the tools applied.

The following objectives were set to fulfil the purpose of the study:

1. Analyse the impact of the CSR practices on companies' financial results and risks.
2. Analyse the CSR practices applied by leaders in the Russian oil and gas sector.
3. Identify the CSR indicators most influential for a company's performance.
4. Benchmark the practices applied by Russian leaders in the sector for achieving SDGs.
5. Introduce recommendations for improving the CSR policy of a company.

The object of the study was companies operating in the oil and gas sector.

The subject of the study was the CSR practices in the oil and gas industry and the relationship between these practices and the financial results of oil and gas companies.

The theoretical basis of the research is the studies by Russian and foreign scientists. The empirical basis of the research is the data obtained from financial statements and sustainable development reports of Russian oil and gas companies, such as Gazprom, Transneft, Rosneft, and Tatneft.

Literature Review

Corporate social responsibility (also called corporate responsibility, responsible business, and corporate social opportunities) is a concept according to which organizations consider the interests of society and shoulder responsibility for the impact that their activities have on customers, suppliers, employees, shareholders, local communities, and other stakeholders, as well as the environment. Comparison of corporate social responsibility by type can take two forms:

External:

1. Social investments and charity.
2. Respect the environment.
3. Company's responsibility towards consumers.
4. Communicate with government bodies and the public.

Internal:

1. Safety at work.
2. Stable and adequate wages.
3. Guarantee social security and medical insurance of workers.
4. Provide employees with additional learning opportunities, learning programmes, and advanced training.

The next comparison is by level. First level is about due payment of taxes and wages and, in case of need, expansion of staff. Second level is about ensuring decent working and living conditions for the employees (provide accommodation, improve qualifications, etc.). Third level is about social activity undertaken by the organization.

The last comparison of corporate social responsibility will be made by areas (elements).

Environmental area solves serious problems, such as:

1. Preservation of water and land resources, atmospheric pollution.
2. Depletion of natural resources.
3. Fast climate change.

Economic area:

1. Investments in product sustainability.
2. Efficient use of labour resources.
3. Build a sustainable supply chain.
4. Conduct research for business development.
5. Efficient use of materials and resources in making the final product.
6. Ethical behaviour towards consumers and competitors.

Social area:

1. Respect human rights (of staff and population).
2. Comply with labour protection and safety regulations.
3. Professional development of human resources.
4. Develop the territories of presence.

This paper aims to consider whether CSR is a real tool for improving socio-economic efficiency and whether it can positively affect the financial performance of companies that actively apply CSR principles.

The first signs of a connection between CSR and financial indicators were verified by using an empirical model adapted from a study by Capon, Farley, and Hoenig [1], which included data from S&P 500 companies for the period 2005–2014. The results show that there is a positive sign of interplay between CSR and the balance sheet financial indicators.

In recent years the number of assets managed by socially responsible investment funds has grown, which increases the importance of CSR practices introduced in companies [2]. In particular, more than 3,000 billion assets are managed according to the SRI (Stanford Research Institute) standards. Second, in most situations, companies do not have full control over a particular social or environmental problem. Therefore, there is need to consider the impact that a company's participation in social responsibility initiatives has on its financial performance as a whole. The information disclosed can be used as an indicator of participation in CSR initiatives [3–6].

Orlicki, Schmidt and Raines [7] concluded that CSR influences financial performance. De Lucia, Pazienza and Bartlett proved the impact of CSR on the change in a company's market capitalization, profit, net income, and change in total capital, return on equity (ROE), and return on assets (ROA) [8]. In particular, ESG disclosure indicators have a positive effect on ROA and ROE and may contain information useful for stakeholders – that is, investors and the management team. First, investors can use the ESG assessment as a signal about the company's social responsibility, which positively influences the company's financial performance. Second, thanks to participation in CSR initiatives, managers can both solve social problems and pursue shareholders' goals. The impact on financial indicators can be explained by the fact that companies that integrate CSR in their activities have a competitive advantage over those that do not. CSR activities can improve the morale and productivity of employees. Companies may reduce risks by implementing CSR initiatives. Publicly traded companies that disclose information about CSR and make it more transparent reduce their business risks [9]. This also confirms the theory of stakeholders that disclosure of information about CSR:

- improves corporate governance,
- improves the corporate image in the eyes of stakeholders, and
- improves reputation, attracts customers, and contributes to business development [10].

According to a study conducted by EY 2018 Global Climate Change and Sustainability Services among institutional investors, investors find ESG information crucial for decision-making. All over the world, investors expect more extensive and useful reports with substantial non-financial information about performance, which they increasingly use to assess the creation of long-term value [11]. Less trust of stakeholders in the company leads to economic losses caused by untimely control and management of reputational risks [12]. These losses can be significant and are seen in higher churn rate, increased costs of primary raw materials and equipment, greater cost of borrowed funds, or in other forms depending on the specifics of the company's activity [13].

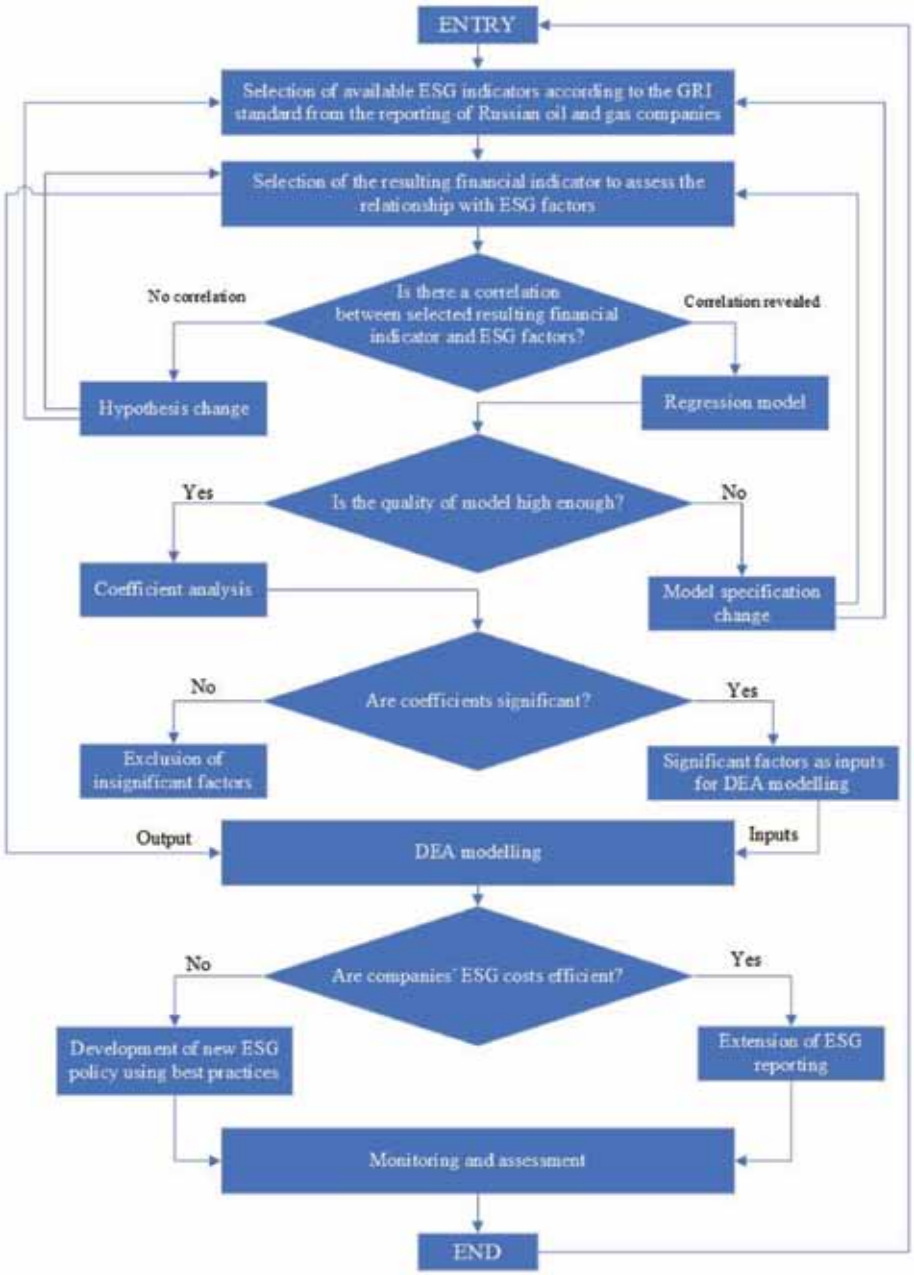
There is also a contrary opinion. When profit and social security are in direct conflict, a call for CSR will almost always be ineffective since managers are not willing to act in the public interest and contrary to the interests of shareholders [14]. In the short term, large companies find it easier to pay a fine out of net profit than to take expensive measures for increasing social responsibility. At the same time, the expenses incurred by an organization due to the compensation of environmental damage do not reduce the taxable profit. Therefore, it has still to be proved that, in the long term, complying with the principles of social responsibility is a more profitable option than paying fines for causing environmental damage. A study by McKinsey highlights that 'the overwhelming weight of accumulated research finds that companies that pay attention to environmental, social, and governance concerns do not experience a drag on value creation – in fact, quite the opposite. A strong ESG proposition correlates with higher equity returns from both a tilt and momentum perspective. Better performance in ESG also corresponds with a reduction in downside risk, as evidenced, among other ways, by lower loan and credit default swap spreads and higher credit ratings' [15].

Materials and Methods

To select the best CSR practices and assess their interplay with the financial results of a company, the following algorithm was proposed. The algorithm is shown in Figure 1.

1. According to GRI standard, the ESG factors of the oil and gas sector were selected provided they had been included in reports for several years.
2. An endogenous indicator is selected: profit as the resulting indicator of a company's overall activity.
3. The presence of a relationship between the resulting indicator and the selected ESG factors was evaluated using correlation and regression analysis.
4. According to the modelling, the factors that are most closely functionally related to the outcome were selected and used as input variables for the Data Envelopment Analysis (DEA).
5. The DEA method was used to select companies with the most effective practices and the least effective ones. Thereby, companies whose practices should be followed to improve the efficiency of other companies are determined.
6. A comparative analysis was carried out to identify the specific practices for borrowing.

According to the specifics of the study, a company's profit was chosen as the resulting indicator. So,



Developed by the authors

Fig. 1. Algorithm of companies' CSR practices efficiency analysis

Разработано авторами

Рис. 1. Алгоритм анализа эффективности практик КСО

in DEA models, a firm's revenue is considered as outputs because revenue or income generation is a major objective criterion for a firm [16]. The authors note that all activities aimed at developing CSR in the company in the long run will primarily affect profit as the initial main result of business activity [17–19]. Return on assets is a more effective relative indicator when several companies with the same profit are compared [20], while profit is an absolute indicator and can be included in econometric models to determine the influence of factors [21]. In addition, this indicator is chosen due to the availability of data.

Stata was used for modelling and DEA.

Results

The following Russian oil and gas companies were chosen as the objects of research:

1) PJSC Gazprom,

2) PJSC Transneft,

3) PJSC Tatneft,

4) PJSC Rosneft.

Based on the ESG identifiers, described according to the GRI standard and published by the companies, it can be assumed that the following factors influence the profit of an oil and gas company on the part of CSR:

- Gross emissions of pollutants, million tons (EN19) – Grossemissions,
- Direct energy emissions of greenhouse gases, billion tons CO2-equiv. (EN20) – Directenergyemission,
- Environmental costs, billion rub. (EN14) – EnvCost,
- Social investments, billion rub. (EC8) – Socialinvest.

Before an econometric model is built, a preliminary analysis of the data has to be carried out. Panel data on the four largest oil and gas companies of the Russian Federation for nine years were considered, from 2012 to 2023.

Let us evaluate the presence of relationships between the indicators. To do this, we have built a correlation matrix as shown in Table 1.

Table 1

Matrix of correlations

Таблица 1

Корреляционная матрица

Variables	(1)	(2)	(3)	(4)	(5)
(1) Profit	1.000				
(2) Grossemissions	0.613	1.000			
(3) Directenergyem~n	0.571	0.837	1.000		
(4) EnvCosts	0.483	0.818	0.607	1.000	
(5) Socialinvest	0.351	0.560	0.483	0.640	1.000

Developed by the authors according to the data posted on the websites of Gazprom, Transneft, Tatneft, Rosneft.

Разработано авторами на основе данных, представленных на официальных сайтах компаний «Газпром», «Транснефть», «Татнефть», «Роснефть».

The correlation of all factors can be recognized as weak. However, the presence of concealed connections cannot be ruled out.

Let us conduct a regression analysis and build a basic regression model with the factors selected (OLS1). According to this regression model, the following conclusions can be drawn: the model as a whole is significant; the coefficient of determination is 38.69; the standard error of the model is 421.36; the model has no one significant factor. The verification of the model shows the absence of multicollinearity and presence of heteroscedasticity of the remainders. Non-linearity can be assumed for a number of factors.

To resolve the problems, it was decided to change the functional form of the model. As a result, the logarithm of the resulting indicator and the factors of the model were taken in order to turn to the profit elasticity coefficients for the selected CSR indicators.

A new regression model (OLS2) was built. According to this regression model, the following conclusions can be drawn: the model as a whole is significant; the coefficient of determination has increased to 56.78; the standard error of the model has decreased to 0.68; the model has two insignificant factors (environmental costs [EnvCosts]) and Direct energy emissions of greenhouse gases (Directenergyemission). Multicollinearity is not tested, and heteroskedasticity has been corrected using robust standard errors of coefficients.

In the next step, an insignificant factor was removed (Direct energy emissions of greenhouse gases [Directenergyemission]). This led to a change in the model parameters and to the insignificance of the environmental costs (EnvCosts) factor. After this factor was removed, the model acquired its final form (OLS3). According to this regression model, the following conclusions can be drawn: the model as a whole is significant; the coefficient of determination is 54.66; the standard error of the model is 0.68; all factors in the model are significant. There is no multicollinearity. Heteroskedasticity is not tested: according to the Breusch–Pagan test (chi 2 = 4.08; P > chi 2 = 0.043) and the Cameron and Trivedi test (chi 2 = 10.64; P > chi 2 = 0.06). Testing for normality shows a normal distribution of remainders according to the Shapiro–Wilk test (z = 1.37; p = 0.085).

To check for the presence of unobservable effects related to the company's specifics, additional models were built: a model with fixed effects and a model with random effects. The analysis revealed no significant regressors in the model with fixed effects. In the model with random effects, both regressors are significant and the quality of the model is satisfactory. Based

on the Breusch and Pagan Lagrangian multiplier test for random effects (chi bar 2 = 0; Prob > chi bar 2 = 1.00), a choice was made between the OLS3 model and the model with random effects. Table 2 shows the null hypothesis in the LM test that is there is no significant difference between the companies, so we have to accept this hypothesis and choose the linear regression without considering the effects (OLS3).

Table 2

Comparison of models

Таблица 2

Сравнение моделей

Variable	OLS1	OLS2	OLS3	FE	RE
Grossemiss~s	206.391				
Directener~n	1076.732				
EnvCosts	-0.385				
Socialinvest	0.381				
lnGrossemi~s		.4494**	.308***	-.013	.308***
lnDirecten~n		-0.060			
lnEnvCosts		-0.147			
lnSocialin~t		.314**	.251**	.222*	.251**
_cons	105.710	5.295***	5.219***	5.048***	5.219***
R2	.387	.568	.547	.145	
RMSE	421.364	.681	.680	.606	.680
AIC	691.251	97.790	95.950	82.232	
BIC	700.394	106.823	101.370	87.652	
legend: * p < 0.05; ** p < 0.01; *** p < 0.001					

Developed by the authors

Разработано авторами

As a result, the final equation takes the following form:

$$lnProfit = 5.219 + 0.308lnGrossemissions + \\ + 0.251lnSocialinvest + \varepsilon. \quad (1)$$

According to the model, the following conclusions can be drawn:

1) An increase in the indicator of gross emissions of pollutants positively affects the changing profit indicator. This is consistent with the fact that the increase impact on the environment is usually connected with the increasing of production and as a result – increasing in profit.
2) The social investment indicator has a positive relationship with the profit indicator. This is consistent with the fact that the impact of the social costs, which are an important components of CSR policy, will have a positive effect on the company's well-being.

It should also be noted that the factors in this regression model alone cannot fully describe the dynamics of profit, which is obvious and confirms the relatively low coefficient of determination of the model.

To evaluate the effectiveness of the CSR practices aimed at improving the environmental component across the industry, it is advisable to use a DEA model. In this type of analysis, a model is built based on benchmarking – that is, determining the industry leaders in the sphere of application, in this case, environmental practices that have an impact on the company's profit. The DEA model is designed to compare the CSR practices of companies and evaluate the effectiveness of a decision-making unit (DMU).

To assess the effectiveness of the CSR practices adopted by oil and gas companies the following input parameters were selected, according to the results of the regression model:

1) Gross emissions of pollutants (GEP),
2) Social investments.

The profit of the oil and gas company was taken as an output parameter.

The model was built for 2017, 2019, 2021 and 2023. But it is important to note that recent years have been unstable for all Russian sectors.

Thus, the model has two input and one output parameters.

The initial data for the companies used for calculating the indicators of the model are presented below in Table 3, Table 4, Table 5 and Table 6.

Table 3

DEA initial data, 2017

Таблица 3

Исходные данные DEA за 2017 г.

Company	Input 1 GEP	Input 2 SocialInvest	Output 1 Profit
Gazprom	2.796	27.297	767
Rosneft	1.929	37.435	222
Tatneft	0.086	57.4	100
Transneft	0.0782	5.4	191.8

Developed by the authors according to the materials posted on the websites of Gazprom, Transneft, Tatneft, Rosneft.

Разработано авторами на основе данных, представленных на официальных сайтах компаний «Газпром», «Транснефть», «Татнефть», «Роснефть».

Table 4

DEA initial data, 2019

Таблица 4

Исходные данные DEA за 2019 г.

Company	Input 1 GEP	Input 2 SocialInvest	Output 1 Profit
Gazprom	2.86	27.72	1269
Rosneft	1.773	35.4	708
Tatneft	0.103	22.85	103.3
Transneft	0.073	10.2	179

Developed by the authors according to the materials posted on the websites of Gazprom, Transneft, Tatneft, Rosneft.

Разработано авторами на основе данных, представленных на официальных сайтах компаний «Газпром», «Транснефть», «Татнефть», «Роснефть».

Table 5

DEA initial data, 2021

Таблица 5

Исходные данные DEA за 2021 г.

Company	Input 1 GEP	Input 2 SocialInvest	Output 1 Profit
Gazprom	2.506	39.5	2159
Rosneft	1.336	56	1057
Tatneft	0.104	22,268	198.4
Transneft	0.061	5.457	152

Developed by the authors according to the materials posted on the websites of Gazprom, Transneft, Tatneft, Rosneft.

Разработано авторами на основе данных, представленных на официальных сайтах компаний «Газпром», «Транснефть», «Татнефть», «Роснефть».

In our case, it is necessary to understand which variant of the CSR indicators allows us to conclude the optimal value of profit and, accordingly, build an output-oriented model (CCR model). The CSR indicators are shown in Table 7, Table 8, Table 9 and Table 10.

As a result of the analysis, it can be concluded that the strategy of Transneft in terms of its CSR policy in 2017–2023 was the most effective. On the other hand, Tatneft, which has recently been at the top of ESG reporting ratings and rankings, demonstrates a lower relative efficiency of its CSR policy than other companies. Thus, it is necessary to conduct an in-depth analysis of CSR practices in relation to more successful companies. As the results of applying the algorithm, top 3 efficient CSR companies can be chosen: Transneft, Gazprom and Rosneft. The results of the analysis can be supplemented with a comparative analysis of the top 3 practices of oil and gas companies.

As a starting point for comparative analysis, we take the Sustainable Development Goals (SDGs). The 2030 Agenda for Sustainable Development, adopted by all United Nations member states in 2015, is a comprehensive plan that ensures peace and prosperity for people and the planet today and tomorrow. It is based on 17 Sustainable Development Goals as shown in Figure 2.

Below is a detailed comparison of the companies' practices relative to each other. Rosneft [1] and Gazprom [2] were selected for comparison with Transneft [3]. These companies' practices are shown in Tables 11–12.

The analysis shows that despite the best results of the DEA, Transneft has additional opportunities for improvement compared to other companies in the sector. Today, Transneft is noticeably lagging behind according to the ESG Transparency Ranking of Russian

1 About the company. Rosneft. URL: https://www.rosneft.ru/about/ (accessed 15.06.2024) (In Russ.)

2 Time to be together. The Gazprom Group's Social Impact Report 2023. URL: https://www.gazprom.com/f/posts/15/716993/gazprom-sustainability-report-2023-en.pdf (accessed 15.06.2024)

3 Avant-garde in detail. Sustainability Report 2020. Transneft. URL: https://rspp.ru/upload/uf/747/ПАО%20«Транснефть»%20ОУР%202020.pdf (accessed 15.06.2024) (In Russ.)

Table 6

DEA initial data, 2023

Таблица 6

Исходные данные DEA за 2023 г.

Company	Input 1 GEP	Input 2 SocialInvest	Output 1 Profit
Gazprom	2.213	54.88	-629
Rosneft	1.339	34.86	1267
Tatneft	0.102	31.745	286.3
Transneft	0.099	24.187	296.5

Developed by the authors according to the materials posted on the websites of Gazprom, Transneft, Tatneft, Rosneft.

Разработано авторами на основе данных, представленных на официальных сайтах компаний «Газпром», «Транснеф ть», «Татнефть», «Роснефть».

Companies and Banks (RA "Expert") and ESG ranking of Russian companies. Tatneft has advanced further in terms of information disclosure, but the analysis of the relationship between CSR indicators and the company's profit shows there is less efficiency. Gazprom has already covered all the Sustainable Development Goals, it includes them in its reporting. Additionally, it should be noted that both Rosneft and Gazprom, unlike Transneft, carry out actions to combat climate change, which is quite important in terms of the environmental aspect.

Table 7

CSR indicators, 2017

Таблица 7

Показатели КСО за 2017 г.

DMU	Rank	Theta	Ref: Gazprom	Ref: Rosneft	Ref: Tatneft	Ref: Transneft
Gazprom	2	0.791	.	.	.	3.999
Rosneft	4	0.167	.	.	.	1.157
Tatneft	3	0.474	.	.	.	0.521
Transneft	1	1	.	.	.	1

Developed by the authors.

Разработано авторами.

Table 8

CSR indicators, 2019

Таблица 8

Показатели КСО за 2019 г.

DMU	Rank	Theta	Ref: Gazprom	Ref: Rosneft	Ref: Tatneft	Ref: Transneft
Gazprom	1	1	1	.	.	0
Rosneft	3	0.663	0.378	.	.	1.274
Tatneft	4	0.409	.	.	.	0.577
Transneft	1	1	.	.	.	1

Developed by the authors.

Разработано авторами.

Table 9

CSR indicators, 2021

Таблица 9

Показатели КСО за 2021 г.

DMU	Rank	Theta	Ref: Gazprom	Ref: Rosneft	Ref: Tatneft	Ref: Transneft
Gazprom	1	1	1	.	.	0
Rosneft	4	0.549	0.190	.	.	4.260
Tatneft	3	0.764	.	.	.	1.305
Transneft	1	1	.	.	.	1

Developed by the authors.

Разработано авторами.

Table 10

CSR indicators, 2023

Таблица 10

Показатели КСО за 2023 г.

DMU	Rank	Theta	Ref: Gazprom	Ref: Rosneft	Ref: Tatneft	Ref: Transneft
Gazprom	4	.	.	.	.	.
Rosneft	1	1		1	.	.
Tatneft	3	0.936	.	.	.	0.966
Transneft	1	1	.	.	.	1

Developed by the authors.

Разработано авторами.

Source: Sustainable Development Goals. United Nations. URL: https://sdgs.un.org/goals (accessed: 01.05.2024)

Fig. 2. Sustainable Development Goals

Источник: Sustainable Development Goals // United Nations. URL: https://sdgs.un.org/goals (дата обращения: 01.05.2024)

Рис. 2. Цели устойчивого развития

Table 11

Companies' practices by SDGs

Таблица 11

Практика компаний по ЦУР

SDG No.	Transneft	Rosneft	Gazprom
1	2	3	4
1	+	-	+
2	-	-	+
3	+	-	+
4	+	+	+
5	-	+	+
6	+	+	+
7	+	+	+
8	+	+	+
9	+	+	+
10	-	-	+

End of table 11

Окончание таблицы 11

1	2	3	4
11	-	-	+
12	+	+	+
13	-	+	+
14	-	+	+
15	+		+
16	-	-	+
17	+	+	+
Total	10	11	17

Developed by the authors according to the materials posted on the websites of Gazprom, Transneft, Rosneft.

Разработано авторами на основе данных, представленных на официальных сайтах компаний «Газпром», «Транснефть», «Роснефть».

Table 12

Companies' activities in the sphere of SDGs

Таблица 12

Деятельность компаний в области ЦУР

Name of the goal	Transneft	Rosneft	Gazprom
1	2	3	4
End poverty in all its forms everywhere	Provide further jobs. Support for indigenous peoples	-	Create jobs with a decent level of remuneration and social compensation. Pay all necessary taxes in due time. Carry gas to various regions of the Russian Federation, ensuring equal access to this service. Comply with the principles of transparency, minimization, and subsequent complete absence of discrimination
End hunger, achieve food security and improved nutrition and promote sustainable agriculture	-	-	Supply gas supply to various settlements, including remote ones. Sensitive attitude to local communities and population in cases of required investment
Ensure healthy lives and promote well-being for all at all ages	Develop a healthy diet and lifestyle. Promote sports among the staff or in the regions of the company's operational activity	-	Provide the staff and their relatives with access to measures aimed at improving overall tone and reduce the risk of diseases. Provide medical care and insurance to employees and their family members. Implement system-type solutions to increase security at the enterprise. Reduce the overall possible impact on the environment and, as a result, reduce the negative impact on human health
Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	Educational events for the company's staff	Cooperate with higher educational institutions that have faculties matching the company profile. Support schools, students, and teachers. The company's internal staff education programmes	Assist the young strata of society and adults in receiving education. Cooperate with educational institutions in running advanced training courses and vocational training. Prepare a talent pool
Achieve gender equality and empower all women and girls	-	Support the relatives of the company's employees	Ensure a respectful attitude towards women and their rights, including equal pay with men and equal access of women to managerial positions

Continuation of table 12
Продолжение таблицы 12

1	2	3	4
Ensure availability and sustainable management of water and sanitation for all	Use water resources efficiently. Maximally reduce the possible impact on the bodies of water in the areas where the company operates. Constantly monitor the impact on the water environment and its inhabitants	A chain of environmental safety measures. Volunteer activities, including abroad. Environmental project competitions. Charity events for garbage collection near rivers	Reduce the amount of untreated water. Provide high-quality water supply for the premises of the enterprise. Provide water supply conforming to environmental principles. Restore and preserve ecosystems. Preserve rivers included in the Ramsar List
Ensure access to affordable, reliable, sustainable and modern energy for all	Increase the company's own electricity generation. Increase possible energy efficiency	Increase the amounts of renewable energy. Improve energy efficiency at the company's facilities	Provide gas services to the population. Promote the use of gas as a least carbon alternative, e.g. methane or propane. Improve energy efficiency and the amounts of renewable energy
Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	Pay taxes in due time. Provide the highest possible decent salary for the company's staff to ensure a decent standard of living for all employees	Pay wages and social expenses in due time. Special programme on labour protection and improvement of the quality of working conditions	Open new vacancies, including in supply chains. Make contracts not only with big businesses. Provide market wages to the company's employees. Protect the interests and freedoms of the company's employees and minimize risks to the health of the staff
Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	Introduce innovations, if possible, in the infrastructural scientific and production areas	A chain of events with a scientific focus. Improve the company's information technology level of the company	Development of energy and social infrastructure in the places where the organization operates. Integration of innovative products and new technologies into the organization's operations
Reduce inequality within and among countries	-	-	Conducting gas to various regions of the Russian Federation to ensure equal access to this service. Implementation of the principles of transparency, minimization and subsequent complete absence of discrimination
Make cities and human settlements inclusive, safe, resilient and sustainable	-	-	Ensure the preservation of people's and different cultures' heritage. Create opportunities for cultural exchange Create opportunities for funding museums and other cultural organizations
Ensure sustainable consumption and production patterns	Form environmentally focused management. Increase the level of precaution at all company facilities	Take measures to ensure the environmental safety of waste	Install new equipment or focus on innovations that allow almost complete elimination of waste produced during the core activities of the company
Take urgent action to combat climate change and its impacts	-	Take measures to ensure the environmental safety of clean air. Optimally use associated gas	Reduce the level of greenhouse gases by ensuring maximum availability of gas in various parts of the country and switching vehicles to gas. Take actions aimed at making preparations for climate change
Conserve and sustainably use the oceans, seas and marine resources for sustainable development	-	Continuous environmental monitoring. Emergency minimization programme; conserve biological diversity; land restoration, including in the Arctic zones	Optimally exploit coastal areas. Reduce the impact, including industrial impact, on the marine ecosystem. Obtain insurance in case of serious environmental risks
Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification,	Prevent negative impacts on soil and other components of the environment.		Maintain the ecological balance. Finance environmental measures and prevent possible accidents. Maximize programmes for conservation of rare species' habitats.

End of table 12

Окончание таблицы 12

1	2	3	4
and halt and reverse land degradation and halt biodiversity loss	Take protective measures aimed at restoring the environment		Continuous environmental monitoring. Obtain insurance in case of serious environmental risks
Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	-	-	Open business practice. Exclude corruption within the company. Work on improving corporate culture and ethics
Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development	Participate in the discussions taking place in the world community concerning sustainable development	Member of the UN and the World Bank	Work together with various international and Russian organizations and the civil society

Developed by the authors according to the materials posted on the websites of Gazprom, Transneft, Rosneft.

Разработано авторами на основе данных, представленных на официальных сайтах компаний «Газпром», «Транснефть», «Роснефть».

Limitations and discussion

This article is an example of using an algorithm for analyzing the CSR practices of a company given both environmental and financial aspects. Of course, this example has a number of objective limitations, and further research is required to confirm whether this approach can be applied to other industries and other countries [22, 23].

A number of limitations can be highlighted for this research:

1. Since CSR practices have been introduced in Russia only recently, it is difficult to find a sufficiently large sample of companies that collect the necessary information and disclose their non-financial reporting. Despite the fact that the oil and gas sector is a pioneer in these practices, not all companies even in this industry provide reporting equally and instead only use a limited number of indicators [24]. As a result, the sample used for modelling is not large enough. With the growth of CSR practices in Russia and the inclusion of more companies, the sample can be expanded both in terms of the number of companies and the number of indicators included in the analysis, which will potentially change the results of the analysis.
2. Since CSR practices have not yet been introduced everywhere in Russia, at the moment it is difficult to perform an analysis of other sectors or an analysis that includes companies operating in various industries, which prevents us from making more general conclusions.
3. Profit was used as an output variable in the analysis. At the same time, there are many studies that suggest other financial indicators that can be used for similar modelling [25]. This research can be supplemented with an analysis using other indicators of a company's financial results and/or performance.
4. The analysis deliberately does not include other indicators of a company's performance, which explicitly affects the formation of profit, although the coefficient of determination is low. The target was to identify the relationships with CSR indicators, and the inclusion of 'stronger' factors in the model would most likely lead to the insignificance of the coefficients for the variables we are interested in.
5. Output-oriented models with variable returns on scale were built in the DEA as well [26]. The results for other calculation options confirmed the conclusions and were omitted.
6. As for further research, it is interesting to analyze separate models for social and environmental indicators.

Conclusions and Relevance

The main scientific result of this study is the algorithm proposed to identify the best CSR practices, presented in the form of a diagram and sequential steps. At the first step, the regression analysis of the impact of the

practices on profit was carried out, so the factors related to the profit indicator were identified. At the second step, DEA model was built, which shows comparative efficiency of companies using CSR practices. As the result of algorithm work, top 3 CSR efficient Russian oil and gas companies was chosen.

The main practice result of this study is the in-depth comparative analysis of the best CSR practices of the top 3 Russian oil and gas companies in the context of Sustainable Development Goals.

Summing up the results of this study, four main recommendations can be put forward for improving the CSR policy of oil and gas companies.

1. Obtain insurance for environmental risks.

Insurance is required because the main types of production activities entail the risks of environmental pollution. The impact on the environment is possible as a result of accidents in the course of production and economic activities, resulting in the pollution of land and water, or the disappearance of the habitat of rare species of plants and animals. Insurance will also help a company avoid possible serious financial consequences in the event of an emergency.

2. Increase the transparency of information about environmental practices.

The first point worth highlighting is that in some situations the company simply does not reflect how a particular goal has been achieved. Either just the results are presented, or a very general description of the process is given. A comparison of the details of the described introductory level can be seen below. Thus, it is necessary to provide more detailed information about the activities that were carried out or to document information on the planned practices in the company's report. This way, it will be possible to track their implementation. Including this information in the company's policy also raises the company's rating in terms of information disclosure.

3. Generate electricity from renewable energy sources.

One of the recommendations is to continue moving towards renewable energy sources, especially relevant given the current fluctuations in energy prices in the world. An obviously necessary improvement is to increase their amounts and reflect them not only in absolute values but also in relative ones for better information disclosure. One of the positive examples is Lukoil, where the amounts of renewable energy are immediately documented in the reporting.

4. Develop a comprehensive program to reduce greenhouse gas emissions.

A coherent policy to reduce greenhouse gas emissions is needed, and it should not just be about development of recommendations. Such a policy will stipulate the company's goals and determine the steps that have to be taken to achieve them. Pursuing a comprehensive policy and stipulating it in the company's documents will also increase the company's overall sustainable development rating relative to its competitors in the sector. Moreover, reduction of greenhouse gas emissions is often attributed to Sustainable Development Goal 13, which will allow the company to mark this goal as being chased.

These recommendations will allow the company both to improve its image in the eyes of consumers, who are becoming increasingly sensitive to the environmental agenda of companies, and to improve its position in ratings, making itself more attractive to investors. One of the risks that should be mentioned is the significant political uncertainty associated with the special operation in Ukraine, which may affect the financing of environmental practices and shift the focus to minimizing the sanction risks. Nevertheless, if a longer-term perspective is considered, environmentally friendly production is an important component because most of the production facilities are located inside Russia and pollution of the country's environment can lead to irreversible consequences.

References / Список источников

1. Capon N., Farley J.U., Hoenig S. Determinants of financial performance: a meta-analysis. *Management Science.* 1990; 36(10):1143–1159. http://dx.doi.org/10.1287/mnsc.36.10.1143 (In Eng.)

2. Giannarakis G., Konteos G., Zafeiriou E., Partalidou X. The impact of corporate social responsibility on financial performance. *Investment Management and Financial Innovations.* 2016; 13(3):171–182. https://doi.org/10.21511/imfi.13(3-1).2016.03 (In Eng.)

3. Abbott W.F., Monsen R.J. On the measurement of corporate social responsibility: self-reported disclosures as a method of measuring corporate social involvement. *The Academy of Management Journal.* 1979; 22(3):501–515. https://doi.org/10.5465/255740 (In Eng.)

4. Li Sh., Fetscherin M., Alon I., Lattemann C., Yeh K. Corporate social responsibility in emerging markets. *Management International Review.* 2010; 50:635–654. https://doi.org/10.1007/s11575-010-0049-9 (In Eng.)

5. Yu Y., Choi Y. Corporate social responsibility and firm performance through the mediating effect of organizational trust in Chinese firms. *Chinese Management Studies*. 2014; 8(4):577–592. https://doi.org/10.1108/cms-10-2013-0196 (In Eng.)

6. Fernandez-Feijoo B., Romero S., Ruiz S. Commitment to corporate social responsibility measured through global reporting initiative reporting: factors affecting the behavior of companies. *Journal of Cleaner Production.* 2014; 81:244–254. https://doi.org/10.1016/j.jclepro.2014.06.034 (In Eng.)

7. Orlitzky M., Schmidt F.L., Rynes S.L. Corporate social and financial performance: a meta-analysis. *Organization Studies*. 2003; 24(3):403–441. https://doi.org/10.1177/0170840603024003910 (In Eng.)

8. De Lucia C., Pazienza P., Bartlett M. Does good ESG lead to better financial performances by firms? Machine learning and logistic regression models of public enterprises in Europe. *Sustainability*. 2020; 12(13):5317. https://doi.org/10.3390/su12135317 (In Eng.)

9. Thuy C.T.M., Khuong N.V., Liem N.T. Corporate social responsibility disclosure and its effect on firm risk: an empirical research on Vietnamese firms. *Sustainability*. 2021; 13(22):12933. https://doi.org/10.3390/su132212933 (In Eng.)

10. Freeman R.E. Part I – The stakeholder approach. In: *Strategic management: a stakeholder approach*. Cambridge: Cambridge University Press, 2010. P. 1-2. https://doi.org/10.1017/cbo9781139192675.003 (In Eng.)

11. Sinkov L.S., Stepuk E.I. Role of non-financial reporting in express stability assessment of mining enterprises. *The Eurasian Scientific Journal.* 2015; (3(28)):65. EDN: https://elibrary.ru/umfwyl. http://dx.doi.org/10.15862/14EVN315 (In Russ.)

12. Bebbington J., Larrinaga C., Moneva J.M. Corporate social reporting and reputation risk management. *Accounting, Auditing and Accountability Journal.* 2008; 21(3):337–361. https://doi.org/10.1108/09513570810863932 (In Eng.)

13. Lin W.L. The role of corporate social responsibility and corporate social irresponsibility in shaping corporate reputation: an analysis of competitive action and innovation strategies. *Corporate Social Responsibility and Environmental Management*. 2024; 31(2):1451–1468. https://doi.org/10.1002/csr.2640 (In Eng.)

14. Pinelli M., Debellis F., De Massis A. Long-term orientation, family-intensive governance arrangements, and firm performance: an institutional economics perspective. *Small Business Economics*. 2024; 63:731–754. https://doi.org/10.1007/s11187-024-00877-4 (In Eng.)

15. Diwan H., Amarayil Sreeraman B. From financial reporting to ESG reporting: a bibliometric analysis of the evolution in corporate sustainability disclosures. *Environment, development and sustainability*. 2024; 26:13769–13805. https://doi.org/10.1007/s10668-023-03249-2 (In Eng.)

16. Mohseny-Tonekabony N., Sadjadi S.J., Mohammadi E., Tamiz M., Jones D.F. Robust, extended goal programming with uncertainty sets: an application to a multi-objective portfolio selection problem leveraging DEA. *Annals of operations research.* 2024; 346:1497–1552. https://doi.org/10.1007/s10479-023-05811-7 (In Eng.)

17. Fosu E., Yi K., Asiedu D. The effect of CSR on corporate social performance: Mediating role of corporate image, green innovation and moderating role of corporate identity. *Corporate social responsibility and environmental management.* 2024; 31(1):69–88. https://doi.org/10.1002/csr.2553 (In Eng.)

18. Tsatsaronis M., Syriopoulos T., Gavalas D., Boura G., Trakadas P., Gkorila M. The impact of corporate social responsibility on corporate financial performance: an empirical study on shipping. *Maritime Policy and Management.* 2024; 51(2):226–239. https://doi.org/10.1080/03088839.2022.2116658 (In Eng.)

19. Rahi A.F., Johansson J., Blomkvist M., Hartwig F. Corporate sustainability and financial performance: a hybrid literature review. *Corporate Social Responsibility and Environmental Management*. 2024; 31(2):801–815. https://doi.org/10.1002/csr.2600 (In Eng.)

20. Al-Ali A.H.H., Al-Shabeeb S.K.I. Relationship between profitability indicators and maximization market value added and intrinsic for the industrial companies. *Global Business and Finance Review (GBFR)*. 2024; 29(2):71–84. https://doi.org/10.17549/gbfr.2024.29.2.71 (In Eng.)

21. Zhang Zh., Zhang G., Su B. The spatial impacts of air pollution and socio-economic status on public health: empirical evidence from China. *Socio-Economic Planning Sciences*. 2022; 83:101167. https://doi.org/10.1016/j.seps.2021.101167 (In Eng.)

22. Rodionov D., Gataullin M., Smirnova I., Konnikov E., Kryzhko D., Shmatko A. Risk modeling in the oil and gas industry. *International Journal of Technology*. 2023; 14(8):1663–1674. https://doi.org/10.14716/ijtech.v14i8.6852 (In Eng.)

23. Rodionov D., Smirnova I., Kryzhko D., Konnikova O., Konnikov E. The influence of the social environment on the development of the labor market in the field of information and communication technologies (ICT). In: *Digital Transformation: What is the Impact on Workers Today?* Springer Nature Switzerland, 2023. P. 167–180. https://doi.org/10.1007/978-3-031-47694-5_13 (In Eng.)

24. Eremina I., Rodionov D. The special aspects of devising a methodology for predicting economic indicators in the context of situational response to digital transformation. *International Journal of Technology*. 2023; 14(8):1653–1662. https://doi.org/10.14716/ijtech.v14i8.6839 (In Eng.)

25. Camanho A.S., Silva M.C., Piran F.S., Lacerda D.P. A literature review of economic efficiency assessments using Data Envelopment Analysis. *European Journal of Operational Research*. 2024; 315(1):1–18. https://doi.org/10.1016/j.ejor.2023.07.027 (In Eng.)

26. Manuylenko V., Rodionov D., Shebzukhova M., Galasova M., Roshchupkina V. Development of system toolkit for financial control in corporations: theoretical, methodological and practical aspects. *Pakistan Journal of Life and Social Sciences.* 2024; 22(2):2890–2911. https://doi.org/10.57239/PJLSS-2024-22.2.00212 (In Eng.)

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About the authors:

Elena V. Rytova, Candidate of Economic Sciences; Associate Professor at the Graduate School of Industrial Economics, Institute of Industrial Management, Economics and Trade; SPIN: 6399-0228, Researcher ID: U-4318-2019, Scopus ID: 56958439500

Svetlana S. Gutman, Candidate of Economic Sciences, Associate Professor, Associate Professor at the Graduate School of Industrial Economics, Institute of Industrial Management, Economics and Trade; SPIN: 1028-3558, Researcher ID: H-7920-2016, Scopus ID: 56957907300

Viktoriia V. Brazovskaia, Candidate of Economic Sciences, assistant at the Graduate School of Industrial Economics, Institute of Industrial Management, Economics and Trade; SPIN: 3404-5530, Researcher ID: GRE-8086-2022, Scopus ID: 57222508001

Nikita A. Blagoi, Postgraduate student at the Graduate School of Industrial Economics, Institute of Industrial Management, Economics and Trade; SPIN: 7510-2301, Researcher ID: JXY-8057-2024, Scopus ID: 57215671010

Contribution of the Authors:

Gutman S. S. – scientific guidance, provision of resources.

Rytova E. V. – conducting experiments, developing methodology.

Brazovskaia V. V. – conducting a critical analysis of materials, drawing conclusions.

Blagoi N. A. – preparing the initial version of the text.

All authors have read and approved the final version of the manuscript.

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Об авторах:

Рытова Елена Владимировна, кандидат экономических наук, доцент Высшей инженерно-экономической школы, Институт промышленного менеджмента, экономики и торговли; SPIN-код: 6399-0228, Researcher ID: U-4318-2019, Scopus ID: 56958439500

Гутман Светлана Семеновна, кандидат экономических наук, доцент, доцент Высшей инженерно-экономической школы, Институт промышленного менеджмента, экономики и торговли; SPIN-код: 1028-3558, Researcher ID: H-7920-2016, Scopus ID: 56957907300

Бразовская Виктория Владимировна, кандидат экономических наук, ассистент Высшей инженерно-экономической школы, Институт промышленного менеджмента, экономики и торговли; SPIN-код: 3404-5530, Researcher ID: GRE-8086-2022, Scopus ID: 57222508001

Благой Никита Арсенович, аспирант Высшей инженерно-экономической школы, Институт промышленного менеджмента, экономики и торговли; SPIN-код: 7510-2301, Researcher ID: JXY-8057-2024, Scopus ID: 57215671010

Вклад авторов:

Гутман С. С. – научное руководство, обеспечение ресурсами.

Рытова Е. В. – проведение экспериментов, развитие методологии.

Бразовская В. В. – проведение критического анализа материалов, формирование выводов.

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