OECONOMIA
COPERNICANA

VOLUME 11 ISSUE 2 JUNE 2020

p-ISSN 2083-1277, e-ISSN 2353-1827
www.oeconomia.pl

ORIGINAL ARTICLE

Citation: Filimonova, I., Komarova, A., & Mishenin, M. (2020). Impact of the global green factor on the capitalization of oil companies in Russia. *Oeconomia Copernicana, 11*(2), 309–324. doi: 10.24136/oc.2020.013

Contact to corresponding author: filimonovaiv@list.ru; Trofimuk Institute of Petroleum Geology and Geophysics of SB RAS, Novosibirsk State University, Koptug ave. 3, Novosibirsk, 630090, Russia

Received: 16.12.2019; Revised: 5.05.2020; Accepted: 18.05.2020; Published online: 25.06.2020

Irina Filimonova
Trofimuk Institute of Petroleum Geology and Geophysics of SB RAS
Novosibirsk State University, Russia
orcid.org/0000-0003-4447-6425

Anna Komarova
Institute of Economics and Industrial Engineering of SB RAS
Novosibirsk State University, Russia
orcid.org/0000-0002-5844-1648

Mikhail Mishenin
Trofimuk Institute of Petroleum Geology and Geophysics of SB RAS
Novosibirsk State University, Russia
orcid.org/0000-0001-7017-1698

Impact of the global green factor on the capitalization of oil companies in Russia

JEL Classification: *L22; G14; Q57*

Keywords: *capitalization; ecology; oil company; green factor*

Abstract

Research background: This paper studies the impact of a new so-called green factor on the capitalization of petroleum companies, which is becoming highly relevant in view of the signing of the Paris agreements in 2015 and the support for clean energy. Although society, international organizations, and government authorities encourage companies to reduce their environmental impact, one of the main reasons for responsible behavior is still economic efficiency. The oil industry, on the one hand, faces one of the most volatile markets and, on the other hand, has one of the largest environmental impacts of any industry. That requires a detailed study of interconnections between market capitalization and the green factor.

Purpose of the article: A comprehensive study of factors affecting the level of capitalization of oil and gas companies in Russia and identification of the most significant among them with a special focus on the green factor.
Methods: Econometric analysis of panel data for Russian petroleum companies. The database includes indicators for six major Russian oil companies from 2011 to 2018. The following groups of factors are analyzed to explain the change in the companies' capitalization: macroeconomic (GDP and inflation in Russia), microeconomic (companies' revenue, net profit, tax payment, return on assets, return on equity, ratio of borrowed capital to equity), industrial (oil export, refining, production and proven reserves of the companies), and the green factor.
Findings & Value added: The selection of factors showed that the size of capitalization has been influenced most significantly by the following: the volume of the company's proven reserves, net profit, tax burden, and the green factor based on the policy of minimizing environmental damage. This result shows that investors consider companies with high environmental performance to be more valuable than companies with similar financial results but lower environmental ratings.

Introduction

The oil industry is a leading industry in the global economy, the largest element of the global energy supply system, and a leader in technological and innovative development. World oil consumption was 4.7 billion tons in 2018. Over the past ten years, annual growth in oil consumption has been at the level of 1.0–1.5% (Eder *et al.*, 2018). At the same time, there has been a decline in the share of oil in the structure of the fuel and energy balance, going from 38.9% in 1990 and 38.6% in 2000 to 33.6% in 2018. One of the main reasons for this is substitution in the transport sector of refined oil products (gasoline and diesel fuel) with natural gas and electricity in connection with the orientation of many countries toward a greener economy. According to BP's forecast to 2035, oil will remain as one of the main energy sources, but oil and gas production will increase mainly due to hard-to-recover and unconventional hydrocarbon resources. The exploration, production, and transportation of hard-to-recover and unconventional hydrocarbon resources requires significant investments (Kryukov & Moe, 2018).

The oil industry of Russia and other petroleum producing countries is a donor to the economy that provides a significant portion of budget revenues, generates cash flow from the export of crude and refined products, and has a significant multiplier effect on related sectors of the economy.

The Russian oil industry is represented by large vertically integrated companies and several independent companies. Crude oil in Russia is produced by 290 enterprises, of which 100 enterprises are part of 11 vertically integrated companies. A total of 187 independent extractive companies are not included in the structure of vertically integrated oil companies, and

three companies perform under the terms of production sharing agreements (Filimonova *et al*., 2018).

However, despite the large number of companies, Russia's oil market is highly concentrated. Rosneft holds the largest market share, with 34.9% of Russia's total oil production. The shares of LUKOIL, Surgutneftegaz, and Gazpromneft are 14.9%, 11%, and 7.1% of total production, respectively. In total, the four largest companies produce almost 70% of oil in Russia. The industry's need to maintain a stable level of production and, as a result, the expansion of the resource base and the implementation of large-scale capital investments leads to special attention being paid to the investment attractiveness of companies in both the domestic and international capital markets (Eder *et al.*, 2019).

In terms of revenue, in 2018 the two largest companies, Rosneft and LUKOIL, each account for approximately 29% of the total revenue of the industry. Gazpromneft has a share of 9.1% of total sales, and Surgutneftegaz has 6.6%. The four largest companies control 73% of the oil market in Russia.

The main indicator of the investment attractiveness of oil production projects is capitalization (the market value of all shares of the company). An increase in capitalization indicates that the company is developing dynamically, its shares are in demand on the market, and investors will receive the expected return in the future. At the global level, capitalization allows companies from all over the world to evaluate the effectiveness of investments in a particular company.

Due to the ongoing postindustrial shifts in the most developed and developing countries, services occupy the leading position in the structure of economies, both in the share of GDP and market capitalization and in their growth rate. However oil and gas companies still show strong positions in international rankings. Moreover, the performance of petroleum companies has a strong spillover effect in terms of the connected industries and other layers of the financial market. In Russia, the petroleum companies have the highest levels of market value.

The aim of this paper is to comprehensively study factors affecting the level of capitalization of oil and gas companies in Russia and identify the most significant among them.

To achieve this aim, the following objectives have been set: classification of factors affecting the amount of capitalization of the companies of oil and gas sector, development of a model of the mutual influence of factors on capitalization using econometric methods, analysis of the results, and development of recommendations to increase the capitalization of oil and gas companies to raise their investment attractiveness.

The paper presents an econometric analysis of panel data, including the buildup of the three models and following tests for significance of the factors and the models, in addition to comparison of the models. The models are based on extensive research of factors concerning the specifics of petroleum industry and the so-called "green" policies of companies.

The paper is structured as follows. The literature review provides a theoretical background on the market capitalization of the oil companies. The methodology section presents the chosen model of the evaluation, with detailed description of factors. The results' section contains the main quantitative findings derived from application of the proposed model. In the next section, the results are discussed within the theoretical and practical framework of the paper, and conclusions are provided in the final section.

Literature review

There is a discussion in the academic literature on the issue of justifying the choice of factors that influence the capitalization of companies. There are many approaches for grouping factors that affect the value of a company's capitalization. For example, factors can be divided into economic, market, specific, and corporate. Some researchers group factors into macroeconomic, microeconomic, sectoral, and regional. There are also papers in which factors are divided into narrower groups: market and technical, political and psychological, in addition to factors related to the capital market. After analyzing a large number of academic papers, it can be concluded that factors are divided conditionally into three large groups: factors related to the processes that occur inside the company, external factors, and factors characterizing the industry in which the object in question is located.

Several researchers have studied the market capitalization of petroleum companies (Howard & Harp, 2009). Their studies have revealed a positive relationship between the market value of companies and the value of hydrocarbon reserves and resources. Conclusions are based on the construction of a regression model using the generalized least squares method (Ewing & Thompson, 2016). Recent evaluations of the influence of asset acquisition in the petroleum industry have shown positive results for both conventional and unconventional resources, with a greater impact from unconventional resources (Sabet *et al.*, 2018).

Misund (2016) tested the data of the international petroleum companies listed on the US stock exchanges from 1992 to 2013 for structural breaks in the value relevance of oil and gas companies depending on the degree of vertical integration of the examples of international petroleum companies.

As a result, the list of companies was divided into three groups based on the structural breaks (Misund, 2016).

Blumenshine and Wunnava (2010) examined the influence of both financial and non-financial factors on the market value for 100 of the companies included in Newsweek's Top 500 Green Rankings 2009 from 2000 to 2008. As one of the non-financial factors, the so-called "green" variable is introduced into the regression equation. The results support the hypothesis that companies with high environmental rankings have higher market cap values than do comparable companies with lower rankings (Blumenshine & Wunnava, 2010).

Much research attention has been paid to general risk assessment in the industry and its connection to valuation (Domnikov *et al.*, 2017), in addition to the influence of the market and financial conditions on the performance of the companies (Horobet *et al.*, 2019).

Several papers have considered the complex issue of responsible behavior of the oil companies and its influence on their performance. Authors have revealed a positive connection between different greening strategies and the age and size of the firms (Shrivastava & Tamvada, 2019). It has been noted that more and more firms are choosing environmentally friendly business strategies, particularly over the long term. (Charlo *et al.*, 2017). Authors have used time series and cross-sectional analysis to reveal the motives of investors in regard to the social policy of oil companies (Dyck *et al.*, 2019). For the example of India, it has been shown that active environmental policy in the polluting industries has had a positive influence on the companies' performance (Kumar & Shetty, 2018).

Our proposed line of research focuses on the complex intersection of petroleum companies' valuation and the influence of companies' environmental policy on their financial performance. The object of the research is the Russian petroleum industry, which is one of the largest in the world but has not been analyzed widely from the above perspective.

Research methodology

Within the algorithm for the buildup of an econometric model on panel data, the first step is to build an ordinary least squares (OLS) model to test the significance of all the studied factors. Furthermore, factors are selected to obtain more significant models. We perform a correlation analysis to identify interdependent factors and exclude them from the model. A model is constructed with the obtained set of factors. If there are no significant factors, we exclude them from the model. The final step is to build panel

data models (with fixed and random effects) with a finite set of selected factors. The resulting model is tested for multicollinearity and autocorrelation. The presence of multicollinearity is checked using the Variance Inflation Factor indices. An analysis of the presence of autocorrelation is carried out using the Wooldridge test. Next, the final version of the model is selected using the tests of Wald, Breusch–Pagan, and Hausman.

We have formed groups of factors to justify the choice of indicators that have a great influence on the level of capitalization of companies. The first group consists of the factors that describe the processes occurring within the company (microeconomic factors). The second group is environmental factors that reflect the influence of state management of the economy (macroeconomic factors) and sectoral changes (sectoral factors) (Tab.1).

To conduct the study, we compiled a database of indicators from the financial statements of the largest oil and gas companies in Russia (Rosneft, Gazpromneft, Surgutneftegas, Lukoil, Tatneft, and Bashneft), according to IFRS, from 2011 to 2018. Data on macroeconomic factors were collected from the website of the Federal State Statistics Service of Russia.

As study of the influence of factors on the capitalization of oil and gas companies is supposed to be carried out in the context of companies and taking into account changes in time, we employ an analysis of panel data. A model with fixed and random effects is built.

Particular attention is paid to the analysis of the influence of the so-called "green factor." This factor is based on the world ranking of the Top 500 GreenRankingsNewsweek from 2011 to 2018, and it is a dummy variable. If a company is included in this rating during the period under review, the dummy variable takes the value of 1, otherwise it is 0. The rating used is a combination of various environmental assessments, which consist of several environmental efficiency factors. The environmental impact assessment takes into account CO2 emissions, water use, solid waste, and emissions that occur as acid rain. The introduction of this variable allows assessment of the impact of companies' strategies to reduce negative environmental impacts on the investment attractiveness (Murguia & Lence, 2014).

The level of a company's market capitalization is considered as the explained variable.

The main hypothesis is that the green factor is a significant variable for market capitalization. In addition, the positive influence on capitalization from reserves and profits and the negative influence from the tax burden are tested.

Statistical calculations are performed using the software package Stata.

The linear panel model is represented by the following equation:

$$y_{it} = x_{it}^{T}\beta + u_{it} \tag{1}$$

where:
i – petroleum company,
t – period of time,
β – regression coefficients,
x_{it}^{T} – the transposed vector of observations of k independent variables.

A fixed effects model has the following form:

$$y_{it} = \alpha_i + \beta_1 \cdot x_{it}^{1} + \beta_2 \cdot x_{it}^{2} + \cdots + \beta_k \cdot x_{it}^{k} + \varepsilon_{it}, i = 1,2, \ldots . N, \quad t = 1,2, \ldots . T \tag{2}$$

A random effects model has the following form:

$$y_{it} = \mu + u_i + \beta_1 \cdot x_{it}^{1} + \beta_2 \cdot x_{it}^{2} + \cdots + \beta_k \cdot x_{it}^{k} + \varepsilon_{it}, \quad i = 1,2, \ldots . N, t = 1,2, \ldots . T \tag{3}$$

After building up the panel data models, it is necessary to choose the most suitable and significant model for the interpretation of the results. Analysis of the choice begins by comparing the OLS model with a model with fixed effects. It is necessary to conduct a Wald test to understand which of the two models better describes the relationship. The Breusch–Pagan test is performed to compare the OLS model with a model with random effects. In conclusion, a Hausman test is conducted to compare models with fixed and random effects. This test verifies the hypothesis that there is no relationship between individual effects and dependent variables. If this hypothesis is rejected, random effects give insolvent and ineffective estimates, which means that a model with fixed effects is more significant.

Results

Our initial analysis of the data showed that the variables were unsteady, so we used the logarithms of the variables. The transition to the logarithms allowed bringing the distribution of the regression residuals closer to normal, i.e., eliminating heteroscedasticity. Heteroscedasticity occurs when the variance of errors is inconsistent with observations. Therefore, we can eli-

minate heteroscedasticity in the data by changing the scale of the variables through, for example, applying the logarithms.

The construction of the initial panel data model from the logarithms of all the above factors showed that many factors were insignificant. In the OLS model, the only factors that were significant were the logarithm of the oil exports and the logarithm of inflation. In the model with fixed effects, only the logarithm of inflation was significant. In the model with random effects the logarithm of the value of oil exports and the logarithm of inflation were both significant (Tab. 2).

To obtain more significant models, we made a detailed selection of factors.

Correlation analysis was performed to reveal which of the considered factors are highly correlated with each other. Factors whose correlation coefficient is greater than 0.7 in absolute value were excluded. According to the results of this test, we observed a strong relationship between:

- GDP with inflation;
- Return on assets (ROA) with return on equity (ROE);
- oil refining and revenue with ROE;
- oil reserves with production and the ratio of borrowed capital to equity;
- oil production and oil refining with the reserves.

For further development of the model, we excluded strongly correlating factors, such as GDP, revenue, ROE, borrowed capital to equity ratio, oil production, and refining.

After exclusion of the correlating factors, a model investigating the dependence of capitalization on such indicators as the inflation, net profit, tax payments, ROA, oil export, oil reserves, and the green factor was built.

To select the best model, a series of tests were conducted. First, we compared the model with fixed effects and the OLS model using the Wald test: F-test that all u_i = 0: F (6, 42) = 2.16, Prob> F = 0.3233. So, the OLS model is better than is the model with fixed effects. Further, to compare the OLS model and the model with random effects, we performed the Breusch–Pagan test. The results of this test showed that the OLS model is better (Prob> chibar2 = 1.0000). The Hausman test showed that, in general, it is possible to use a model with random effects (Prob> chi2 = 0.0617).

Having built and tested all the above panel data models, we concluded that it is better to use the OLS model (Prob> F = 0.0000; R-squared = 0.7821). The obtained determination coefficient indicated that 78.21% of the variation of the dependent variable was taken into account in the model.

In the final obtained models, the following factors became significant: net profit, tax payments, proven oil reserves, and the green factor.

The final regression equation is as follows:

$$lny_{it} = 0{,}3964 \cdot lnx_{it}^{4} - 0{,}3365 \cdot lnx_{it}^{5} + 0{,}5876 \cdot lnx_{it}^{12} + 0{,}2418 \cdot x_{it}^{13} + \varepsilon_{it} \quad (4)$$

This allows for the quantitative and qualitative evaluation of the influence of the particular factors on the market valuation of the Russian oil companies.

Discussion

The study of factors influencing the capitalization of the company is an important tool to increase the investment attractiveness of companies.

The specifics of the market value of petroleum companies has been the central topic of some studies. Osmundsen *et al.* (2006) revealed that the main influencing factors are oil price, oil and gas production, and, to some extent, reserve replacement. This corresponds partially to the current study, as oil prices are represented by revenues and taxes, which are highly dependent on prices, and production and reserves are highly correlated and significant. Another paper provided an empirical study of the valuation of the 82 largest world oil companies for 2009–2013 and showed a positive influence of the firms' liquidity positions and cash flow results and a negative influence of capital intensity (Bhaskaran & Sukumaran, 2016). A more recent study of Nureev and Busygin (2019) on capitalization of the eight largest public oil companies in the world from 2006 to 2017 revealed a strong positive connection with oil production. However, the study showed a positive connection with greenhouse gas emissions, which reflects one specific issue of the green factor but does not reflect the environmental strategy of the company in general.

The amount and growth of hydrocarbon reserves is one of the most important factors positively influencing the capitalization of petroleum companies. The indicator reflects the sufficiency of the main asset for the oil companies both at the current moment and in the future. The presence of a high level of proven hydrocarbon reserves provides information to the investor that the company will continue its activities and will make profits for its shareholders. Studies point out the importance of the factor and discuss different types of reserves, stressing that proven reserves have the highest impact on valuation of a company (Howard & Harp, 2009). From an example of 46 US companies it was confirmed that market capitalization depends on the company's ability to replenish reserves by an amount ex-

ceeding the current level of production of oil (Ewing & Thompson, 2016). Some studies reflect a different scale of influence depending on the size of the company and the type of hydrocarbon (oil or gas) and still find a positive connection (Kaiser, 2013). The results obtained in our study are consistent with these findings.

Net profit is also a significant factor affecting the market value of a company in the oil industry. Net profit is a basic indicator of investment attractiveness, as it reflects the company's ability to pay dividends and, as a result, affects the growth of capitalization, which is confirmed by the results of this study. Net profit is an indicator of how stable the company is in terms of its financial position, how effectively the company manages its assets, and whether the company will expand its activities. This connection corresponds to the results of a study of the market capitalization of companies listed in the Amman Stock Exchange from 1978–2016 (Alawneh, 2018).

Inclusion of tax payments in regression is one of the novel aspects of this paper. It is justified by the high impact of the taxation on the Russian oil industry. At the same time, the taxation framework of Russia has been undergoing drastic and constant changes for the past few decades (Fjaertoft & Lunden, 2015). Tax payments adversely affect companies' capitalization. On the one hand, the growth of tax payments indicates the successful current activity of the company, whereas, on the other hand, the greater the tax burden for the company, the less free cash it can invest in its development (Jaimovich & Rebelo, 2017). The state is trying not only to insure and support large oil companies from losses but also to receive most of the revenues from rising prices. Tax preferences allow companies to release part of their profits and direct them to investments. Thus, a company's investments grow, and the market value of the company grows. Therefore, to increase the capitalization rate of the Russian companies, the tax burden on the oil sector should be reduced.

The green factor, based on the world ranking of the Top 500 Green Rankings Newsweek, and introduced into the model as a dummy variable, has turned out to be a significant factor. This is a positive result in terms of the value of green investments. This result shows that investors consider companies with high environmental performance to be more valuable than companies with similar financial results but lower environmental ratings. This may be related to the fact that the environmental policy pursued by companies is an approximation of other important characteristics that investors are looking at: better company management, a stable financial position, and business transparency. These results are supported by the findings of other authors. A meta-analytical review on the influence of environmental

management on financial performance showed that most studies reveal a positive connection (Albertini, 2013). More recent studies have included a more complex analysis of the topic for US companies, separating environmental performance and environmental disclosure, and have revealed negative relationships for the issues under examination. Authors have provided explanations regarding new waves of green responsibility, which becomes more financially challenging for the companies and decreases the level of financial performance (Lu & Taylor, 2018). However, compared to US and European companies, Russian companies tend to adopt environmental policies with a certain lag, and in that case this study supports the idea of positive influence in the early stages of implementation.

Conclusions

The innovative development of the Russian oil and gas industry is largely dependent on an increase in investment. The global economic crisis created several problems, including the current state of oil companies. To raise funds, companies must have a sufficiently high level of investment attractiveness, with the subsequent possibility of persuading investors.

The market value of a company remains the main indicator affecting the decision of the investor as to whether to invest money in that company. The higher the level of capitalization, the more attractive the investor considers the company to be. The Russian investment climate needs to be improved, as the main risks for investors are still the underdeveloped financial market, relatively low efficiency of the operating activities of the companies, instability of the national currency, and taxation policies.

At the same time, Russian oil companies both now and in the future will remain the most attractive assets for investors. Despite the change in the geography of production, new projects in the Arctic, Eastern Siberia, and the Far East are characterized by a significant resource base. Therefore, according to the results of this study, the value of companies engaged in their development will increase. This will attract enough domestic and foreign investment for the full development of new production regions, and increase the efficiency and sustainability of the oil companies and the industry in general.

The main hypothesis of the research, i.e., that the "green factor" positively influences evaluation of a company, has been confirmed for the largest companies of the Russian petroleum industry. This proves the need for intensification of the companies' environmental policies, not only for society but also for the companies themselves.

One of the limitations of the paper is connected with the object of the research. We considered only Russian companies, which provided for more detailed analysis but limited the application of the results to countries with a similar structure of the oil industry. Moreover, it must be noted that different development level and structure of the economy, institutional framework, and state policy (especially in taxation) can drastically influence the results of the study. Further development of the research could be connected with expanding it to other countries and using the same level of analytical complexity.

Another limitation is connected with the high volatility of industry's indicators connected with oil prices. Moreover, the environmental policies of states and companies develop rapidly, and this can influence not only the initial indicators but also the application of the results.

In addition, the limitations can include the form of assessment of the green factor. In this study, the value of the factor was based on the external source and took a binary form; thus, the companies' level of being green was not evaluated. Moreover, some of the companies might not be represented in the ranking due to the non-availability of information. In further research it might be possible to develop our approach to evaluation of the companies' environmental responsibility, with inclusion of various factors.

References

Alawneh, A. (2018). Dividends, net income after taxes and earnings per share and their impact on the market capitalization of listed companies AMMAN stock exchange during the period 1978-2016. *International Journal of Economics and Finance*, *10*(10). doi: 10.5539/ijef.v10n10p69.

Albertini, E. (2013). Does environmental management improve financial performance? A meta-analytical review. *Organization & Environment*, *26*(4). doi: 10.1177/1086026613510301.

Al-Malkawi, H. A. N., AlShiab, M. S., & Pillai, R. (2018). The impact of company fundamentals on common stock prices: evidence from MENA region. *Business & Management Review*, *9*(4).

Banerjee, R., & Gupta, K. (2017). The effects of environmental sustainability and R&D on corporate risk-taking: International evidence. *Energy Economics*, *65*. doi: 10.1016/j.eneco.2017.04.016.

Bhaskaran K. R., & Sukumaran S. K. (2016). An empirical study on the valuation of oil companies. *OPEC Energy Review*, *40*(1). doi: 10.1111/opec.12064.

Blumenshine, N., & Wunnava, P. (2010). The value of green: the effect of environmental rankings on market cap. *Technology and Investment*, *1*. doi: 10.423 6/ti.2010.14030.

Charlo, M., Moya, I., & Muñoz, A. (2017). Financial performance of socially responsible firms: the short- and long-term impact. *Sustainability*, *9*, 1622. doi: 10.3390/su9091622.

Domnikov, A., Chebotareva, G., Khomenko, P., & Khodorovsky, M. (2017). Risk-oriented investment in management of oil and gas company value. *International Journal of Sustainable Development and Planning*, *12*(05). doi: 10.2495/SDP-V12-N5-946-955.

Dyck, A., Lins, K. V., Roth, L., & Wagner, H. F. (2019). Do institutional investors drive corporate social responsibility? International evidence. *Journal of Financial Economics*, *131*(3). doi: 10.1016/j.jfineco.2018.08.013.

Eder, L., Filimonova, I., Nemov, V., Komarova, A., & Sablin, K. (2019). Ecological aspects of economical development: issues of forecast greenhouse gas emissions in road transport in Europe and regions of Russia. *E3S Web of Conferences*, *80*, 03010. doi: 10.1051/e3sconf/20198003010.

Eder, L. V., Provornaya, I. V., Filimonova, I. V., Kozhevin, V. D., & Komarova, A. V. (2018). World energy market in the conditions of low oil prices, the role of renewable energy sources. *Energy Procedia*, *153*. doi: 10.1016/j.egypro.2018.10.068.

Ewing, B. T., & Thompson, M. A. (2016). The role of reserves and production in the market capitalization of oil and gas companies. *Energy Policy*, *98*. doi: 10.1016/j.enpol.2016.09.036.

Filimonova, I. V., Eder, L. V., Komarova, A. V., Provornaya, I. V., & Nemov, V. Y. (2018). Resource regions of Russia: socio-economic indicators and innovative development. *IOP Conference Series: Earth and Environmental Science*, *206*, 012020. doi: 10.1088/1755-1315/206/1/012020.

Fjaertoft, D., & Lunden, L. P. (2015). Russian petroleum tax policy – continuous maneuvering in rocky waters. *Energy Policy*, *87*.

Horobet, A., Vrinceanu, G., Popescu, C., & Belascu, L. (2019). Oil price and stock prices of eu financial companies: evidence from panel data modeling. *Energies*, *12*(21), 4072. doi: 10.3390/en12214072.

Howard, A. W., & Harp, A. B. (2009). Oil and gas company valuations. *Business Valuation Review*, *28*(1). doi: 10.5791/0882-2875-28.1.30.

Jaimovich, N., & Rebelo, S. (2017). Nonlinear effects of taxation on growth. *Journal of Political Economy*, *125*(1). doi: 10.1086/689607

Kaiser, M. J. (2013). Oil and gas company production, reserves, and valuation. *Journal of Sustainable Energy Engineering*, *1*(3).

Kryukov, V., & Moe, A. (2018). Does Russian unconventional oil have a future? *Energy Policy*, *119*. doi: 10.1016/j.enpol.2018.04.021.

Kumar, S., & Shetty, S. (2018). Does environmental performance improve market valuation of the firm: evidence from Indian market. *Environmental Economics and Policy Studies*, *20*(2). doi: 10.1007/s10018-017-0192-7.

Lins, K. V., Servaes, H., & Tamayo, A. (2017). Social capital, trust, and firm performance: the value of corporate social responsibility during the financial crisis. *Journal of Finance*, *72*(4). doi: 10.1111/jofi.12505.

Lu, L. W., & Taylor, M. E. (2018), A study of the relationships among environmental performance, environmental disclosure, and financial performance. *Asian Review of Accounting*, *26*(1). doi: 10.1108/ARA-01-2016-0010.

Liu, N., Liu, C., Guo, Q., Da, B., Guan, L., & Chen, H. (2019). Corporate social responsibility and financial performance: a quantile regression approach. *Sustainability*, *11*, 3717. doi: 10.3390/su11133717.

Misund, B. (2016). Vertical integration and value-relevance: empirical evidence from oil and gas producers. *Cogent Economics & Finance*, *4*(1). doi: 10.1080/23322039.2016.1264107.

Misund, B., Asche, F., & Osmundsen, P. (2008). Industry upheaval and valuation: empirical evidence from the international oil and gas industry. *International Journal of Accounting*, *43*(4). doi: 10.1016/j.intacc.2008.09.007.

Murguia, J., & Lence, S. (2014). Investors' reaction to environmental performance: a global perspective of the Newsweek 's "Green Rankings". *Environmental and Resource Economics*, *60*. doi: 10.1007/s10640-014-9781-0.

Nureev, R. M., & Busygin, E. G. (2019). Biggest public oil companies: impact of external and internal factors on capitalization. *Finance: Theory and Practice*, *23*(5). doi: 10.26794/2587-5671-2019-23-5-87-100.

Osmundsen, P., Asche, F., Misund, B., & Mohn, K. (2006). Valuation of international oil companies. *Energy Journal*, *27*(3). doi: 10.5547/ISSN0195-6574-EJ-Vol27-No3-4.

Sabet, A. H., Agha, M., & Heaney, R. (2018). Value of investment: evidence from the oil and gas industry. *Energy Economics*, *70*. doi: 10.1016/j.eneco.2018.01.006.

Shrivastava, M., & Tamvada, J. P. (2019). Which green matters for whom? Greening and firm performance across age and size distribution of firms. *Small Business Economics*, *52*(4). doi: 10.1007/s11187-017-9942-y.

Acknowledgments

The study was carried out with the financial support of the Russian Foundation for Basic Research in the framework of research project 18-310-20010.

Annex

Table 1. Groups of factors affecting capitalization of the company

Group of factors	Factor	Effect on investment attractiveness
Macroeconomic	GDP (x_{it}^1)	By analyzing the values of this indicator, conclusions about the growth or stagnation of the economy can be made
	Inflation (x_{it}^2)	Reflects depreciation of money. With rising inflation, a drop in company capitalization is observed
Microeconomic	Revenues (x_{it}^3)	Revenues are a quantity that demonstrates the financial stability of a company
	Net profit (x_{it}^4)	The growth of the company's profit indicates its effective activity and contributes to the growth of capitalization
	Tax payment (x_{it}^5)	This indicator shows the tax burden of companies. The more tax payments, the less financial resources that go into the development of large projects
	ROA (x_{it}^6)	This financial indicator characterizes the effectiveness of investing each unit of money in the organization's property and is an important factor for investors in making investment decisions
	ROE (x_{it}^7)	This coefficient demonstrates the efficiency of using the firm's capital to maximize profits.
	Ratio of borrowed capital to equity (x_{it}^8)	This indicator can reflect possible risks and whether the position of the company is stable. The use of borrowed funds can contribute to the growth of enterprise profits on the one hand and the risks of business losses on the other.
Industry	Oil export (x_{it}^9)	This indicator informs the investor about the considerable value of the company's capitalization. It depends on the level of production.
	Oil refining (x_{it}^{10})	High values of this indicator indicate a high demand for hydrocarbons. It depends on the level of production and reserves.
	Oil production (x_{it}^{11})	The higher the company's oil production, the more profit it will be able to make. Thus, the higher its investment attractiveness.
	Proven oil reserves (x_{it}^{12})	The larger the oil company's reserves, the more reliable it seems to the investor.
Additional	"Green Factor" (x_{it}^{13})	Reflects the influence of the presence of companies' strategies to reduce negative environmental impacts on the investment attractiveness

Table 2. Significance of factors of investment attractiveness for oil companies of Russia

Capitalization	Cap	Coef	P>t	[95% Conf. Interval]	
Ln (net profit)	np2	0.396453	0	0.332327	0.892579
Ln (tax payments)	taxes2	-0.336561	0.021	-0.38	-0.32244
Ln (proved reserves)	value2	0.587609	0.012	0.392566	0.782653
Dummy variable ("green factor")	green	0.241883	0.003	0.173254	1.319651
Constant	cons	9.690564	0.75	8.723859	10.65727