Attractiveness of Large Oil Companies for External Investors in 2004-2013

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Abstract

This paper examines the relationship between the investment attractiveness of the oil companies and the various indicators of their financial and economic performance. The research follows a quantitative approach covering 22 large oil companies from 12 countries in 2004-2013. The results of the study shows that when investors make decisions about investments in oil companies, such factors as the change in operating expenses per one barrel, level of sales per employee, and the presence of sufficient reserves, but not the current financial performance of oil companies, play a decisive role. This is due to the specific features of the oil industry, such as the long-term and risky nature of investments, and the great importance of oil deposits.

Keywords: Oil & Gas industry, Firm Performance, Oil Companies, Crude Oil

1. Introduction

The current economic situation, marked by the presence of unstable external and domestic economic environment, and falling oil prices, forces companies worldwide to take urgent measures to improve their performance in order to survive in the market. “The steep drop of oil prices from over $100 a barrel to below $50 in the spring of 2015, caused serious financial difficulties for oil companies, as well as increases their financial commitments, which many of them cannot exercise”. [1].

The structure of analyses is as follows. Section 2 represents the literature revue. Section 3 gives the methodology of research and description of data. Section 4 describes the construction of an empirical model. Section 5 gives the interpretation of the empirical results. Finally, section 6 concludes.

2. Literature Review

In the market economy, it is equally important to obtain satisfactory financial results as well as validation of the capital market, through the estimation of the market value of the shares of listed companies. The efficient markets theory (EMT) supports the idea the market accurately reflects information about the economic and financial situation of companies [2]. The view was that when information arises, the news spreads very quickly and is incorporated into the prices of securities without delay [3]. However, investors are not always rational, as they do not always correctly interpret the information and have short-term gains in the foreground. As a result, pricing irregularities and predictable patterns in stock returns can appear over time and even persist for short periods of time [3].

Because of availability of a wide range of oil and gas companies, investors have to relate to some simplified indicators that can help them in selecting the most appropriate investment solutions.

2.1 A simple indicator of investment attractiveness of oil and gas companies

All of the performance measures can be considered under the concept of "value-based management", whereby the performance of the company is measured by its return to the shareholders, which includes dividends paid to the shareholder and the capital appreciation of the company [4]. It is expected that the greater the value to the shareholder, than the better its performance is (Fig. 1).

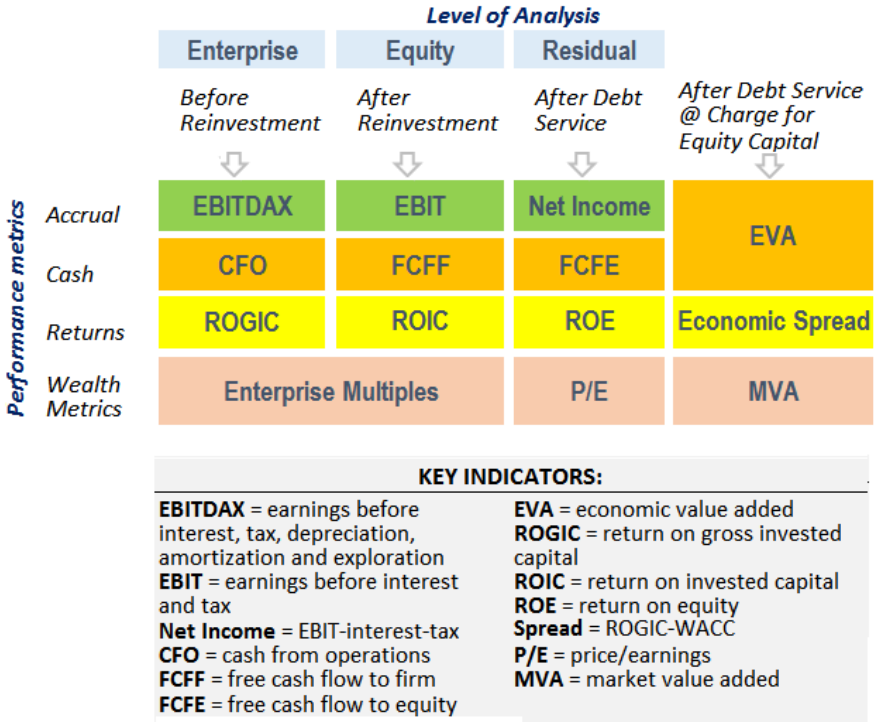

Fig. 1. Levels of analysis and different types of valuation metrics for oil companies
Sources: Developed by the authors on the basis of Harper [5].

The price/earnings (P/E) ratio measures the amount that investors are willing to pay for each dollar of a firm's earnings. The level of this ratio indicates the degree of confidence that investors have in the firm's future performance. The higher the P/E ratio, the greater is the investor confidence [6].

McCormack and Vytheeswaran [7] tested total shareholder return of the largest oil and gas companies such as EBITDA (earnings before interest, tax, depreciation and amortization), RONA (return on net assets), after-tax earnings, ROE (return on equity), and free cash flow, and financial indicators and found very weak or non-existent relations. More robust relations were established when Economic Value Added (EVA) and reserves were introduced in the model.

Since the late 1990s, a commonly used measure to assess shareholder return is the return on capital employed (RoACE), which is defined as net income adjusted for minority interests and net financial items (after tax) to average capital employed. However, this indicator has a number of problems [8].

RoACE falls in period of investments, and boosts in periods of disinvestments. This causes strong stimulus of oil companies to short-term behavior, which means cost cutting and value-maximization of existing reserves instead of investments in new assets. The perception of RoACE as an important value-driver is not supported by the model, build by Osmundsen, and *et al.*, [9] on 14 major international oil and gas companies for the period 1990-2003. Another metric used to evaluate the performance of oil companies is the enterprise value/earnings before interest, tax, depreciation, and amortization (EV/EBITDA). This indicator relates the value of a company and allows judging the effectiveness of its business, regardless of its debt burden, and the method of depreciation [10].

Nevertheless, for oil companies the enterprise value to earnings before interest, tax, depreciation, amortization and exploration expenses (the EV/EBITDAX index) is a better indicator. It is similar to the EV/EBITDA index but neutralizes exploration expenses. It is widely used in the US in order to eliminate the effect of differences in accounting for exploration expenditures.

The production per day (EV/BOE/D) can be used as another indicator to evaluate a company's performance, as it is well suited to compare the company with its competitors and allows quickly understand whether it is traded with a premium or a discount. However, this does not consider production on undeveloped properties and the cost of their development [10].

2.2 Possible explanatory factors of investment attractiveness

Table 2. The results of various studies on the identification of a company's performance factors

Study	Results
Chua and Woodward (1994), the US oil industry in 1980-1990 [11]	P/E has not statistically significant relations with dividend payout, net profit margin, asset turnover, financial leverage, interest rate, and Beta Future cash flow and proven reserves are statistically significant factors for the stock price
Quirin *et al*., (2000), US oil and gas exploration firms in 1993-1996 [12]	Statistically significant relations of earnings and book value of equity with reserves replacement ratio, reserves growth, production growth and the finding costs-to-depreciation ratio
Petter Osmundsen *et al*., (2006), 14 international oil and gas companies for the period of 1990-2003 [9]	Variation of the stock price in company valuations is mainly explained by oil price, oil and gas production, and only to some extent reserve replacement
Victor (2007), 55 oil and gas companies in 1999-2006 from the editions of Energy Intelligence's Top 100 [13]	Market capitalization as proxy for a company's performance has strong relations with its total output, and revenues, but not with number of employees and reserves. No strong relationship is observed between profitability and asset base.
Roden and Lewellen (1995) [14], Titman & Wessels (1998) [15], Hadlock and James (2002) [16], Berger & Bonaccorsidipatti, (2006) [17], Margaritis & Psillaki (2010) [18]	A positive relationship between debt level and a firm's performance
Myers (1984) [19], Fama & French (1999) [20], Booth *et al*., (2001) [21], Haung and Song (2006) [22], Chakraborty (2010) [23], Salim and Yadav (2012) [24]	A negative relationship between debt level and a firm's performance
Pouraghajan *et al*., (2012) [25], 350 companies listed in Tehran Stock Exchange in 2006-2010	A significant positive relationship between the weighted average cost of capital (WACC) and corporate performance (ROA and ROE), between a firm size and profitability ratios.
Regalli and Soana, 122 listed companies in the Stock Exchange of America in 2002, 2004 and 2006 [26]	Cost of capital (WACC) has a significant negative relationship with growth criteria of earning per share and price to earnings ratio (P/E) but a positive relationship with ratio of market value to book value of equity (M/B)
Dayanandan & Donker (2011), 200 largest oil and gas companies listed on the US stock exchange in 1990-2008 [27], Olivier Manikom and Charles Guillermet (2014) in the Eurozone from 2004 to 2013 for 11 companies from 10 countries [28]	Crude oil prices positively and significantly impact the performance of oil and gas companies. The recent financial crisis negatively influenced oil prices and the financial performance of oil and gas companies.
Iskakov and Yilmaz (2015) [29]	Price risk has a profound impact on the long-term sustainability in today's energy market

3. Methodology and Data

As a methodology for assessing the investment attractiveness of a company, we used technique developed by Tolkachenko [30], but improved by us. The proposed algorithm for determining the investment attractiveness of the company is shown in Fig. 2. The calculation of the investment attractiveness of a company is carried out in four stages:

3.1 Stage I: Analysis of the Financial Condition of a Company with the Seven-Factor Model

It is based on using the 7-s factor model proposed Gilyarovskaya and Sobolev [31]. It, in turn, is based on the model of Dupont, but unlike it reflects the impact on the asset's profitability are not three but 7-s factors (Table 3).

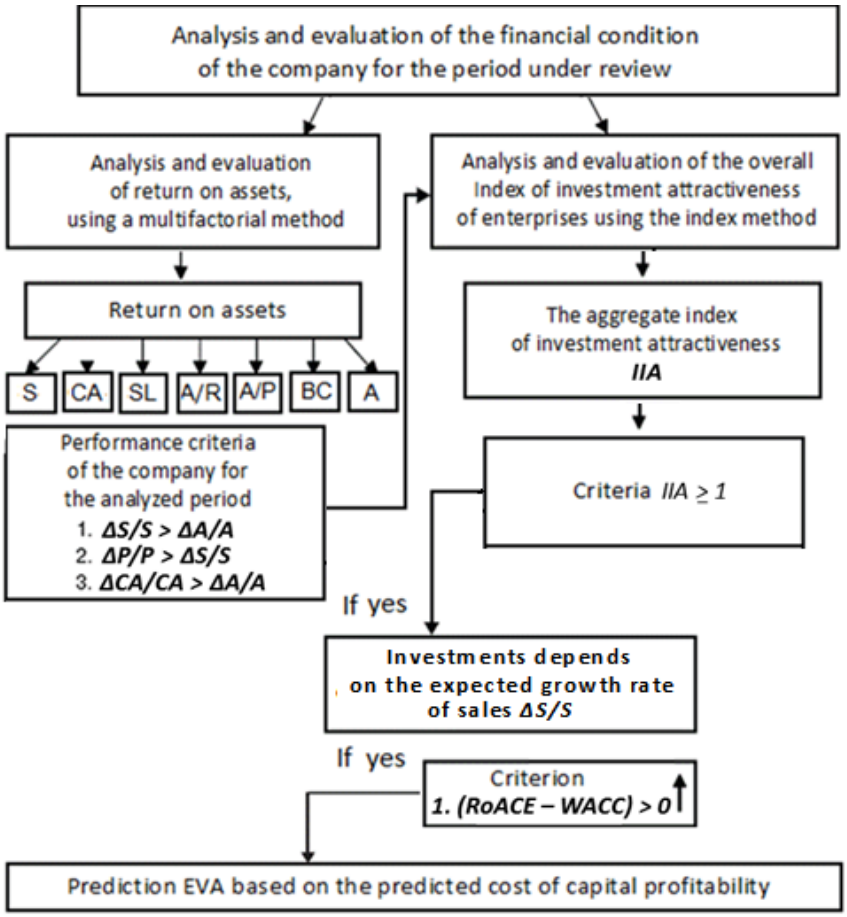

Fig. 2. Algorithm for determining the investment attractiveness of oil companies
Source: Developed by the authors on the basis of Tolkachenko [30]

Table 3. Key indicators of the performance of a company, based on seven-factor model

Abbreviation	Names of variables
P	Net income (= EBIT-interest and tax)
S	Sales
CA	Current assets
SL	Short term liabilities
A/R	Receivables
A/P	Accounts payable
BC	Borrowed capital
A	Assets

The 7-s factors model shows the influence of various operating and financial factors on the change in the return on assets of the company:

$$ROA\ (return\ on\ assets) = P(Net\ income)/A(Assets)$$

$$ROA = \frac{P}{S} \times \frac{S}{CA} \times \frac{CA}{SL} \times \frac{SL}{A/R} \times \frac{A/R}{A/P} \times \frac{A/P}{BC} \times \frac{BC}{A}$$

$$ROA = a \times b \times c \times d \times k \times l \times m$$

where,

$$a = ROS = P/S$$

This indicator shows the influence of the price policy and sales of a company on its profit, received in the reporting year. The ratio widely used to evaluate a company's operational efficiency. It is also known as a firm's "operating profit margin".

$$b = CATR = S/CA$$

Current assets turnover ratio shows the efficiency of the use of current assets. It measures a company's ability to generate sales from its assets by comparing net sales with average total assets.

$$c = CR = CA/SL$$

The current ratio, characterizes the solvency of the company, supposing full realization of its inventories and the return of its receivables. It measures a company's ability to pay short-term obligations.

$$d = SL/(A/R)$$

The ratio of short-term liabilities of the company to its receivables. This ratio describes the degree of coverage of short-term obligations of the company's by its receivables. By analyzing its value and dynamics it is possible to estimate the financial stability of the company.

$$k = (A/R)/(A/P)$$

The turnover ratio or the ratio of receivables to payables reflects the coverage of accounts payable characterizes the company's dependence on the creditors and debtors. It can also serve as a security assessment firm against inflation: the smaller the value, the greater the degree of protection.

$$l = (A/P)/BC$$

The ratio of accounts payable to its borrowed capital, which characterizes the structure of its liabilities.

$$m = BC/A$$

The ratio of debt capital to assets of the company, characterized its financial stability as a whole, shows the ratio of equity and debt financing sources of the company.

Thus, the 7-s factors analysis shows the current dynamics of the resulting index and the influence of different factors on the increase or decrease of assets return. At the same time, in order to ensure sustainable long-term growth of the company, the following specified performance criteria must be maintained:

1) $\Delta S/S > \Delta A/A$ – the growth rate of the company's sales, should exceed the growth rate of its assets. Compliance with this ratio prevents investments in unprofitable assets.
2) $\Delta P/P > \Delta S/S$ – the growth rate of the company's net income should exceed the growth rates of its sales. Compliance with this ratio prevents the company from leaving the prospective and profitable market segments.
3) $\Delta CA/CA > \Delta A/A$ – the growth rate of the company's current assets should exceed the growth rate of its total assets. Compliance with this ratio prevents the freezing of the funds of the company in long-term assets.

If a company develops a positive trend in return on assets and meets specified performance criteria, it will be interesting to investors. For the evaluation of investment attractiveness of a company, the index of its investment attractiveness is calculated.

3.2 Stage II: Determination of the Overall Index of Investment Attractiveness of the Company

It is carried out by the method of Aniskin [32]. At the beginning, the indices of particular factors changes are calculated and then the integral index of investment attractiveness of the company is determined as the multiplication of the particular indices:

$$IIA = \prod_{i=1}^{n} IIA_i,$$

where IIA_i – relative index of a particular factor i. The value of the index of investment attractiveness allows investors to conclude whether the firm is attractive or not for investing. If $IIA > 1$, then the investment attractiveness of the company is growing for the analyzed period, if $IIA = 1$, then it remains unchanged, if IIA <1, then the company's investment attractiveness is reducing.

3.2 Stage III: Determination of the Company's Need for Investment

The need for investment (*I*) required to ensure the expected sales growth, calculated as the difference between the change in net assets, which depends on the process of production and marketing, and the volume of funds raised from internal sources of the company. In mathematical terms, it is the formula:

$$I_1 = \Delta S \times \left[\left(A/S_0\right) - \left(SL/S_0\right)\right] - P_1,$$

Where:

I_1 – the company's need for additional investment in the next period;

A – the value of assets in the reporting period, which directly influence the process of production and marketing;

SL – the value of the company's short-term liabilities in the reporting period that are in direct proportion to the scale of production and marketing activities of the company;

ΔS – the absolute deviation of projected sales (B_1) from actual sales (S_0) of the company;

P_1 – the expected value of net income in the next period, left at the disposal of the owners of the company.

The net profit of the company (P_1) in the next period is calculated by the equation:

$$P_1 = P_0 \times S_1/S_0 \times (1 - t),$$

Where:

S_1 – sales in the next period, which is found as multiplication of the growth rate of sales $g = \Delta S/S$ on the volume of sales in the current period (S_0);

P_0 – the expected value of the income before interest and tax in the reporting period;

t – income tax rate.

3.3 Stage IV: Modelling of Economic Value Added (EVA)

After finding the value of investments needed for the development of the company, it is important to determine the cost of raised funds and what growth of company's market value these investments can provide. It is therefore advisable to calculate the economic value added (*EVA*). The index is calculated as follows:

$$EVA = \underline{NOPAT} - IC * WACC = (\underline{NOPAT}/IC - WACC) * IC = (RoACE - WACC) * IC,$$

where:

NOPAT - Net Operating Profit After Tax;

IC – Invested Capital

The increase of *EVA* on invested capital (*EVA/IC*) occurs if a return on invested capital (*RoACE*) is higher than the rate of return of an investor (*WACC*) for a given period.

There are possible *three relations of EVA/IC with the behavior of investors:*

1. *If RoACE*= WACC, then *EVA/IC = 0*. In this case, the market gain of investors by investing in such a company is equal to zero.
2. If *RoACE* > *WACC*, then *EVA/IC* > 0. This means that the market value of a company exceeds its net assets book value that encourages investors to invest in the company.

3. If *RoACE* < *WACC*, then *EVA/IC* < 0. This leads to a decrease of the market value of the company. In this case, investors lose the part of invested capital.

The proposed method of evaluation of investment attractiveness of the company since its base laid by two indicators-return on assets and economic value added, takes into account the experience of the company, as well as its expected future activities. However, the ratio *EBITDAX/ACE* seems to being a more objective indicator of an oil company's investment attractiveness than as of *RoACE*, given the eminent features of these companies as high taxes, capital and exploration expenditures. As *EBITDAX/ACE* relates to the company's earnings per unit of invested capital before interest, tax, depreciation, amortization and exploration costs. This ratio is more effective indicator of the performance of an oil company as it determines its investment attractiveness, regardless of its debt burden, fiscal policy, depreciation method and exploration costs. Therefore, the more precise formula for the comparison of oil companies of various sizes and operating in different countries will be as follows:

$$EVA/IC \approx EBITDAX/ACE - WACC,$$

where:

EBITDAX – earnings before interest, tax, depreciation, amortization, and exploration expenses accounted only for the successful efforts. In our study, because of lack of information on successful efforts of oil and gas companies, so we use it as main indicator of the investment attractiveness of these companies.

ACE – the average capital employed.

WACC – the weighted average cost of capital.

On the other hand, instead of *EVA/IC* the index *EV/BOE/D* can be used. This multiplier is also known as "The price for the current barrel" (price per flowing barrel) and is one of the most important indicators of investment attractiveness of oil and gas companies. The basis of its calculation is enterprise value (enterprise value) and the daily production rate (daily production) in barrels of oil equivalent per day (*BOE Per Day*, *BOE/D*). It is well suited for comparing a certain company with its competitors [10].

In our study, we use instead of *EVA/IC* a proxy indicator of the investment attractiveness of oil and gas companies – the capital cost per 1 barrel of oil and gas in oil equivalent, because it is easy to calculate. It represents the ratio of capital expenditure to the current production of oil and gas for each company in oil equivalent. This indicator includes only capital expenditures. Given that the oil and gas business is a capital-intensive business, where the share of capital costs in total costs accounts about 60%, such an assumption would be quite convincing. Instead of WACC, since such information is difficult to find, we use a number of proxy variables that reflect different costs of investment in oil production in various oil and gas companies.

The data sample includes a set of 22 oil and gas companies of 12 countries (Table 4). As the data sources were used data of various companies included in the Rystad Energy database, as well as data collected from websites, analytical and statistical materials of companies. The name of indicators and methods of their calculation are given in Table 5. Some of them are related to the analysis of national oil companies, offered by Paul Stewens [33].

Table 4. Name of oil and gas companies represented in the sample and their websites

Repsol (Spain)	Shell (Netherland-UK)	Tatneft (Russia)
ExxonMobil (USA)	Chevron (USA)	Gazprom-Neft (Russia)
Petrobras (Brazile)	Sinopec (China)	KazMunaiGas (Kazakhstan)
BP (UK)	GazProm (Russia)	Eni S.p.A. (Italy)
OMV (Austria)	Rosneft (Russia)	Total (France)
Pemex (Mexico)	Novatek (Russia)	CNPC (China)
ConocoPhillips (USA)	Lukoil (Russia)	
Statoil (Norvay)	Surgutneftegaz (Russia)	

Table 5. Key variables of investment attractiveness and methods of their calculations

Variables	Description of variables and method of their calculation
CAPEX	Capital expenditures in current US dollars
Capex_bar_oe_d	The capital cost per 1 barrel of oil and gas in oil equivalent per day. It is the ratio of capital expenditure to the current production of oil and gas for each company in oil equivalent.
Opex_bar_oe_d	Operating expenses per 1 barrel of oil and gas in oil equivalent per day. It is the ratio of current production costs to the volume of oil and gas production for each company in oil equivalent.
Output_cap	Labor productivity per employee. Is the ratio of the volume of oil production to the number of employees?
Sales_cap	Sales in current US dollars per employee. It is the ratio of oil sales to the number of employees in the company.
Roace	Return on investment in the company. It is defined as net income adjusted for minority interests and net financial items after tax (NOPAT), as a percentage ratio of average capital employed or the sum of shareholders' funds and net interest-bearing debt (C).
Ebitda_ACE	A measurement of a company's capital profitability. It is equal to earnings before interest, tax, depreciation and amortization (EBITDA) divided by the Average Capital Employed (ACE). Because EBITDA excludes depreciation and amortization, it can provide a cleaner view of a company's core profitability.
RRR	The reserves-replacement ratio shows the covering of the company's production with new reserves of oil. It is calculated as the ratio of the increment proven reserves to the volume of its production. A ratio of 100% means current production is sustainable, above 100% means it can grow, and below 100% means it is likely to decline.
RPR	Reserves-to-production ratio is the ratio of proven reserves of the company to its current production volumes.
Int_sale	The company's ability to perform interest payments on loans. Defined as the ratio of interest paid on the income of the company to its sales. This indicator shows the investment attractiveness of the company from a commercial point of view, as an object that brings a certain amount of revenue per person.
Int_debt	The burden of debt service. It is defined as the ratio of interest payments on loans to the sum of domestic and external debt of the company.
Eff_tp	The efficiency of the technological process the ratio of the selling price of 1 barrel of oil produced by the company to the world price of 1 barrel of crude oil
Price_risk	Price risk is the ratio of the standard deviation of the current price from its average value for the period under consideration by different companies.
Risk_ roace	The risk of changes in return on average capital employed (ROACE) is the ratio of the standard deviation of its current value from its average value for the period under consideration.
Risk_ ebitda	The risk of changes in return on Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) is the ratio of the standard deviation of its current value of from its average value for the period under consideration.
Debt_burd	The burden of debt is the ratio of domestic and external debt to net income before tax and interest payments.
Tax_burd	The tax burden is the ratio of tax payments to the company's net income before tax and interest payments.

Our panel data includes 132 observations, which enables us to build an econometric model on. Due the short review period (from 2008 to 2013), the using of a time series proves impractical.

4. Construction of Verifying Empirical Models

The stability of variables was checked by using ADF technique. All of variables are stationary in levels. The relationship between the firm's investment attractiveness and its determinants is estimated by the equation:

$$Ln(capex_{bar_{oed}}) = \alpha_1 * ebitda_{ace} + \alpha_2 * ln(opex_{bar_{oed}}) + \alpha_3 * int_{sale} + \alpha_4 * output_{cap} + \alpha_5 * sales_{cap} + \alpha_6 * eff_{tp} + \alpha_7 * rrr + \alpha_8 * rpr + \alpha_9 * debt_{burd} + \alpha_{10} * tax_{burd} + \alpha_{11} * price_{risk} + \alpha_{11} * risk_{ebitda} + \varepsilon \quad (1)$$

The expected sign of *ebitda_ace* is positive, since foreign investors desire to receive more profit from their investments in oil and gas companies.

Investors are more interested to invest in already producing companies which associated with fewer risks, so the expected sign of the change in operating expenses per 1 barrel - *ln (opex_bar_oe_d)* is positive.

The effect of debt financing on the profitability of the company may be twofold. If the trade-off hypothesis is correct, then we can expect a positive sign for the explanatory variables *debt_burd* and *int_sale*. On the contrary, the tax increase has always a negative impact on production. Therefore, we should expect a negative sign of the variable *tax_burd*.

Indicators *output_cap* and *sales_cap* reflect net production and purely commercial productivity in oil and gas companies, and we expect a positive impact of these variables on the investment attractiveness of oil and gas companies. Expected sign of *eff_tp* is positive, since the higher is the level of added value, produced by companies, so greater will be their investment attractiveness. Given the specificity of oil and gas business, which assumes long term investments, the ensuring the company's production program with sufficient oil and gas reserves is of great importance. Therefore, we expect a positive sign for *rrr и rpr*. In addition, we expect the negative impact of price and investment risks on the interest of investors to invest in oil and gas companies. This is a main reason of negative signs of *risk_ebitda* and *price_risk*. The results of our modelling efforts are represented in the Table 6.

Table 6. Results for Oil and Gas Companies Investments for 2008-2013 (22 major oil and gas companies)

Variables	**Models**					
	1 model	2 model	3 model	4 model	5 model	6 model
Log(opex_bar_oe_d)	0.8894*** (22.6866)	0.8797*** (21.3619)	0.8799*** (21.2933)	0.8799*** (18.9991)	0.8057*** (18.5605)	0.8864*** (20.9507)
Sales_cap	0.1365*** (5.0705)	0.0869*** (3.0064)	0.0873*** (3.0050)	0.0873*** (4.2856)	0.1219*** (3.9400)	0.0700** (2.4143)
Rrr	1.1815*** (2.7322)	0.3267 (1.5736)	0.3208 (1.5382)	0.3208 (1.3360)	0.2623 (1.3144)	0.3523* (1.6583)
Int_sale	0.8815*** (3.2050)	0.5224** (2.4664)	0.5413** (2.4966)	0.5413*** (2.6227)	0.8309*** (2.9108)	
Ebitda_ace			-0.0683 (-0.4465)			-0.0198 (-0.1225)
Output_cap				-0.0151*** (-3.9254)	-0.0146*** (-3.7010)	
Eff_tp					0.0116 (0.4275)	
Debt_burd					-8.97E-05 (-1.6193)	2.26E-05 (0.5046)
AR(1)		0.7522*** (13.0528)	0.7530*** (13.012)	0.7249*** (11.7081)	0.7229*** (11.4764)	0.7596*** (13.2876)
C	-0.9160** (-2.073)	0.04778 (0.1889)	0.0728 (0.2804)	0.3223 (1.3029)	0.2865 (1.1461)	0.0848 (0.3172)
Observations	132	131	131	131	131	132
Adjusted R-squared	0.837	0.928	0.928	0.936	0.936	0.925
Durbin-Watson stat	0.605	2.072	2.072	2.105	2.086	2.054
F-statistic	169.74	338.59	280.39	317.39	240.34	266.56

*Note: t-statistic in parentheses: ***p<0.01, **p<0.05, *p<0.1. Source: Authors' Computations*

All models, except the first, meet the basic standard statistical criteria. This is indirectly confirmed by the high coefficients of determination (90%), the F-statistic (more than 170) and the Durbin-Watson ratio are within the required standards. In addition, the high values of t-statistics in the explanatory variables in all models, except for certain variables, are talking about it.

The coefficients on *Log(opex_bar_oe_d), Sales_cap, rrr* are positive and significant in the base model or Model 1. This model shows that the change in operating expenses per one barrel, the high level of sales per employee, sufficient oil and gas reserves are important conditions for the investment attractiveness of oil companies. A positive sign of the variable *Int_sale* assumes a positive relationship between a company's ability to perform interest payments on loans and its production as it become more attractive to potential investors.

Model 2 is similar to the Model 1, except of the coefficient AR include with one lag. With its help, the serial autoregression was removed from the model, which led to a sharply increased explanatory power of the model and its sustainability. As a result, the model determination coefficient has increased from 83.5% to 92.8%, the F-statistic – from 170 to 338, and the Durbin-Watson coefficient – from 0,605 to 2,072.

In the Model 3, contrary to expectations the growth rate of *Ebitda_ace* did not increase the investment attractiveness of the company. Its negative sign indicates this. However, this does not really matter, since it was not statistically significant. We did the same calculations for indicators *RoACE* and received similar results. Before us, Osmundsen and *et al*., [9] on the example of 14 major international oil and gas companies for the period 1990-2003 got similar results. This means that investors investing in oil and gas companies are more interested in having a stable long-term resource base than the current performance of oil companies. This is not surprising, since the prominent feature of the oil and gas business is its high risks due to the long-term nature of investments. Results of the Model 4 shows that, contrary to established beliefs, the actual growth of labor productivity in the oil and gas companies (excluding the impact of international oil prices) leads to a reduction of investments in such companies. If the company receives sufficient income, it less needs to raise funds from outside investors.

Adding variables such as technological development (*eff_tp*) and financial leverage (*debt_burd*) to the model has not improved it (Model 5), because of low statistical significance of these indices.

Thus, we can conclude that the current level of technical development, as well as financial indebtedness of oil and gas companies did not affect the growth of their attractiveness for investors in the period under review. This once again proves that the key criterion for investors who make decisions about investing in the oil and gas business is the availability of oil and gas reserves sufficient for long-term stable operation of the company, rather than its current financial position or economic performance. Adding to the model parameters *Ebitda_ace* and *debt_burd* instead *int_sale* did not improve, but rather deteriorated the model. The coefficient of determination fell from 93.6% to 92.5% (Model 5). However, both variables are not statistically significant.

5. Conclusions

After analyzing 22 large oil companies from 12 countries over the period of 10 years data from 2004 to 2013, we concluded that long-term investment decisions in oil and gas industry differ significantly from other sectors. It is due to its specific features, such as the long-term and risky nature of investments, and a large importance of raw material stocks for the securing of the feeding of production.

The list of indicators to which investors give high priority, also varies greatly. Our analysis helps to identify the most important of them. A high coefficient of determination of about 93%, obtained for the model, confirms its high explanatory power. It shows that we are correctly identified factors that explain the behavior of investors in the industry. These include the change in operating expenses per one barrel, a high level of sales per employee and sufficient oil and gas reserves, which account for 92.8% of the investment attractiveness of various oil and gas companies.

Study of the effects of *Ebitda_ace* or *RoACE* on the investment attractiveness of oil companies allowed making a conclusion that investors in the oil and gas industry are more interested in the presence of a stable long-term resource base than in the current financial stability of companies. This is due to the specifics of the business in oil and gas industry, which is the long-term, and where the

company's success depends on the availability of sufficient stock of raw materials. Therefore, in this industry, strategic investors invest mainly focusing on long-term results, rather than the short-term profitability of companies. We also found that in oil & gas industry over the period under review there is a positive relationship between companies' ability to perform interest payments on loans and their production as they become more attractive to investors.

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