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АНАЛИЗ СДЕЛОК ПО СЛИЯНИЮ И ПОГЛОЩЕНИЮ НЕФТЕГАЗОВОЙ ОТРАСЛИ С ИСПОЛЬЗОВАНИЕМ ЭКОНОМЕТРИЧЕСКИХ МОДЕЛЕЙ

Аннотация: В настоящее время увеличивается внимание к сделкам по слиянию и поглощению в секторе нефти и газа. Волатильность мировой экономики непосредственно оказывает влияние на количестве сделок по слиянию и поглощению.

В статье приведен анализ сделок за 2017 год, а также динамика показателей за период 2008-2017 гг. Основной целью данной статьи является выявить закономерность, а также определить самые значимые факторы, которые влияют на количество сделок. Исследование проводилось с помощью регрессионного анализа.

Ключевые слова: слияния и поглощения, эконометрические модели, регрессия, цены на нефть, мировые запасы нефти.

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ANALYSIS OF THE OIL AND GAS MERGERS AND ACQUISITIONS USING ECONOMETRIC MODELS

***Abstract:** At present, attention is being paid to mergers and acquisitions in the oil and gas sector. The volatility of the world economy directly influences the number of mergers and acquisitions.*

The article analyzes transactions for 2017, as well as the dynamics of indicators for the period 2008-2017. The main purpose of this article is to reveal the regularity, as well as to identify the most significant factors that affect the number of transactions. The study was carried out using regression analysis.

***Keywords:** mergers and acquisitions, econometric models, regression, oil prices, world oil reserves.*

We should start with the analysis of the goals and motivations of companies to commit mergers and acquisitions. Transactions M & A can be considered a common way to develop and expand the scope of the company. However, what are the specific objectives pursued by the company, performing mergers and acquisitions? Many people identify the following reasons for M & A transactions:

- The motive of monopoly, the increase in revenue and market power in the market, which leads to the advantages with such types of financing as loans. But usually in such cases it is necessary to approve government agencies;

- Synergistic effect is one of the main reasons for M & A. Synergetic effect means that when merging two companies - the productivity of a single company is higher than the sum of the productivity of the two companies separately or in other words $1 + 1 > 2$;

- Savings on the scale, which is often a consequence of the synergistic effect (let's say the reduction in the number of personnel in the combined company, including the company's management, which leads to more efficient management and lower costs);

- Obtaining tax benefits;

- Diversification of the company's business

Here we can see the main reasons for M & A transactions in the oil and gas sector:

- Consolidation of the oil and gas market by large players - there are fewer and fewer independent companies;

- Gradual transition of large companies from conventional assets to unconventional, even despite some difficulties of mining in an unconventional way;

- Desire for synergies and cost savings.

Let us analyze current situation in oil and gas M&A market. When oil prices plunged in 2014, many predicted a new wave of mega-mergers like those of the late 1990s. Few anticipated the volatility of the past two and a half years. In late 2016, widespread uncertainties confounded industry leaders who, worried about the strength of demand and the resiliency of shale and tight oil, wondered if OPEC would maintain curbs and fretted that recent exploration and production (E&P)

underinvestment would hamper production. These questions made it hard to plan for the future and reduced appetites for M&A in the first half of 2016.

Confidence in deal making returned as oil prices stabilized in late 2016, with nearly half the year's transaction value recorded in the fourth quarter. This momentum continued through the first quarter of 2017, when total deal value nearly tripled from the first quarter of 2016, boosting expectations for M&A in 2017 and beyond (see figure 1).

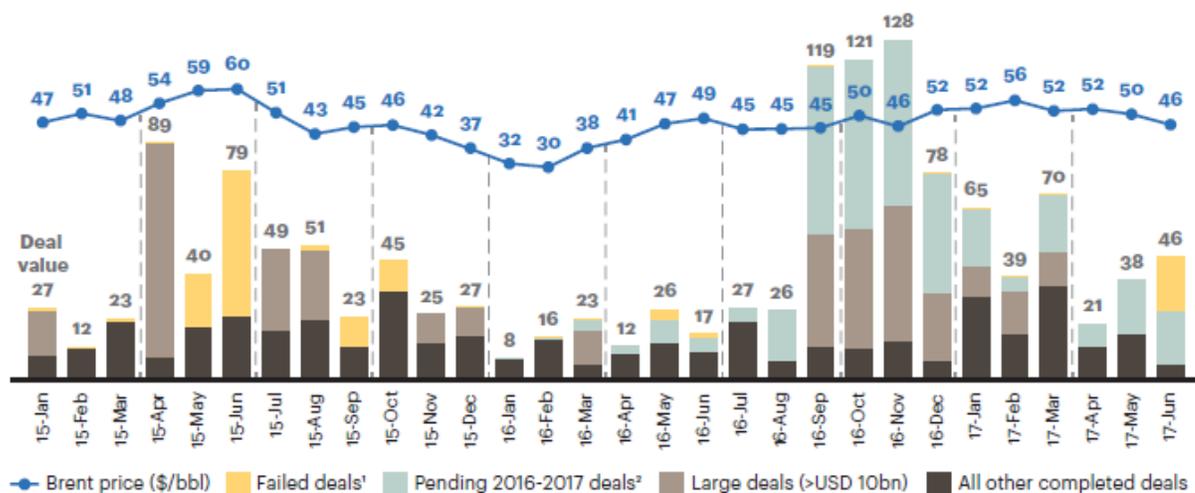


Figure 1- Monthly oil and gas transactions based on announced date (\$ billions)

If 2016 and 2017 deal totals look strong, it is partly because so many deals fell through in 2015. Companies abandoned \$106 billion worth of transactions, or 22 percent of the deals announced that year. Driving the record level of cancellations was a “lower for longer” oil price outlook that prompted many acquirers to reassess the value of target companies. Even the \$55 billion megadeal between Energy Transfer Partners and Williams fell victim to the trend in early 2016. After subtracting abandoned deals, aggregate deal value in 2015 was about 20 percent lower than the total announced and pending transactions. Deal failures dropped sharply in 2016, but nearly half the year's \$446 billion worth of deals had not closed as of May 30, 2017 (figure 2).

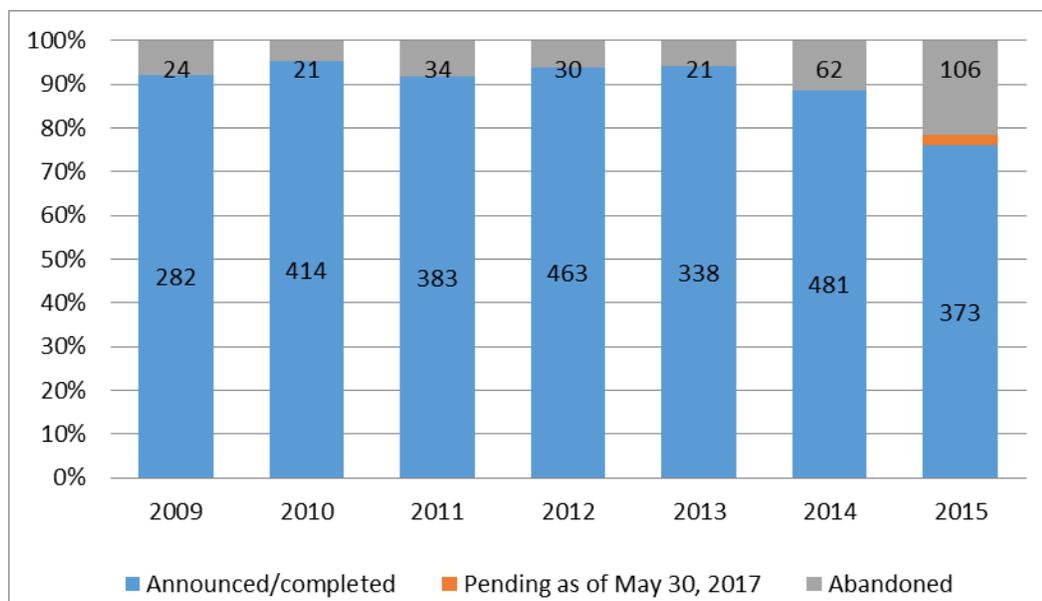


Figure 2- Announced and pending transactions (\$ billions)

So, M&A deals are influenced by different number of factors. Ofcourse among them we can name such as oil precices, global oil reserves and so on. Lets analyse in more details how various factors influence on the number of deals. In this article we will use regression analysis.

In statistical modeling, regression analysis is a set of statistical processes for estimating the relationships among variables. It includes many techniques for modeling and analyzing several variables, when the focus is on the relationship between a dependent variable and one or more independent variables (or 'predictors'). More specifically, regression analysis helps one understand how the typical value of the dependent variable (or 'criterion variable') changes when any one of the independent variables is varied, while the other independent variables are held fixed.

Regression models involve the following parameters and variables:

- The unknown parameters, denoted as β , which may represent a scalar or a vector;
- The independent variables, Y ;

- The dependent variable, X.

For analysis were chosen such dependent variables as: oil prices, fund size, global oil reserves, oil production, oil consumption (table 1).

Table 1

Initial data for analyses

Year	Y-Number of deals	X1-Brent price	X2-Fund size billion \$	X3-Global oil reserves (billion barrels)	X4-Oil production (billion barrels)	X5-Oil consumption (billion barrels)
2008	1872,00	72,39	210,00	1490,00	0,082	0,087
2009	2183,00	97,26	58,00	1529,50	0,083	0,087
2010	2386,00	61,67	73,00	1636,60	0,081	0,086
2011	2206,00	79,50	112,00	1675,30	0,083	0,089
2012	1832,00	111,26	173,00	1697,90	0,084	0,090
2013	1809,00	111,67	183,00	1701,00	0,086	0,091
2014	1823,00	108,66	122,00	1700,00	0,087	0,092
2015	1154,00	98,95	143,00	1697,60	0,089	0,093
2016	1305,00	52,39	36,00	1706,70	0,092	0,095
2017	755,00	43,73	9,00	1707,00	0,092	0,097

Why fund size was chosen and what was exactly meant by that? Like other mentioned factors in oil and gas, energy investment funds suffered as oil prices declined. Many private equity-backed companies struggling under heavy debt are producing lower investment returns and seeking fresh capital. As investors retreated from oil and gas, new capital raised by energy-focused funds dropped dramatically. Energy funds raised \$36 billion in 2016, the lowest total since 1999 (see figure). The pullback continued in the first half of 2017, when investors put only \$9 billion into energy funds. At the same time, funds have deployed a higher percentage of capital, reducing the dry powder available for new investments (figure 3).

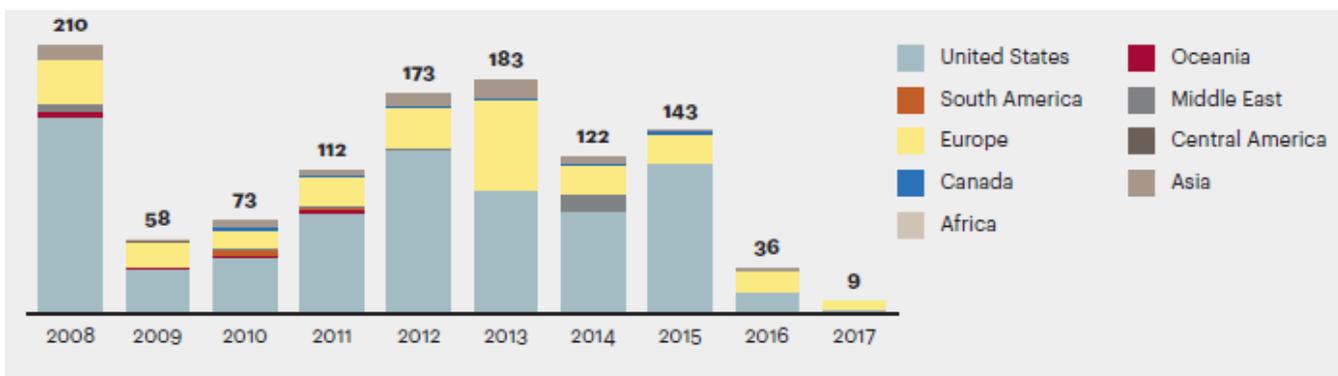


Figure 3 - Fund size by vintage year (\$ billions)

Due to regression analysis and especially T –Test, which is also called Student’s T - Test, it compares averages (means) and tells if they are different from each other. The t test also tells how significant the differences are; In other words, it lets us know if those differences could have happened by chance.

The main rule for this test is that significant factor should have t-statistic bigger than t-critical. These conditions allow us to make conclusion, which factor has the biggest influence. Analyses of M&A deals showed, that only one factor occurred significant, it is oil production (tables 2, 3)

Table 2

Final significant factor

Year	Y-Number of deals	X4-Oil production (billion of barrels)
2008	1872,00	0,082
2009	2183,00	0,083
2010	2386,00	0,081
2011	2206,00	0,083
2012	1832,00	0,084
2013	1809,00	0,086
2014	1823,00	0,087
2015	1154,00	0,089
2016	1305,00	0,092
2017	755,00	0,092

Table 3

	<i>coefficients</i>	<i>standard error</i>	<i>t-stat</i>
Y	10811,81	1767,753	6,116135233
X4-Oil production (billion of barrels)	-105256	20726,89	-5,078242247
t crit	2,364624		

From tables we can see that we have only one significant factor and to make sure that it influences on the number of deals we can analyze the result of R-square. In statistics, the coefficient of determination is the proportion of the variance in the dependent variable that is predictable from the independent variables. The coefficient of determination for a model with a constant takes values from 0 to 1. The closer the value of the coefficient to 1, the stronger the dependence. When evaluating regression models, this is interpreted as the model's correspondence to the data. For acceptable models, it is assumed that the coefficient of determination should be at least not less than 50% (in this case, the coefficient of multiple correlation exceeds 70% in absolute value). Therefore, we see that we have dependence of almost 79%.

Table 4**Regression statistics**

Multiple R	0,886854
R-square	0,786511
The normalized R-square	0,756012
Standard Error	199,7961

In conclusion it should be said, that all tests and models have advantages and disadvantages. For example, from the whole mentioned factors, we can say, that all of them have a special influence on the number of deals and chosen one from regression analyses could be argued. Nevertheless, the main aim of this investigation to prove

that every significant factor, which from one point of view must influence significantly, in the final analyses, occurred not such important among others.

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