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Graduate School of Management

Master in Management Program

**THE EFFECTS OF M&A DEALS ON THE COMPANY  
PERFORMANCE: THE CASE OF OIL AND GAS  
INDUSTRY**

Master's Thesis by the 2<sup>nd</sup> year student  
Concentration — Management  
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**ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ  
ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ**

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## АННОТАЦИЯ

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Год	2016
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Описание цели, задач и основных результатов	<p>Сталкиваясь с регулярными трудностями и конкуренцией в своей индустрии, нефтегазовые компании погружаются в совершение сделок по слияниям и поглощениям как один из способов укрепить свои позиции, что, однако, не всегда приносит желаемый результат.</p> <p>Целью данного исследования является установление и анализ конкретных эффектов, которые могут иметь различные характеристики сделок слияний и поглощений на финансовые результаты компаний в нефтегазовой индустрии. Сначала были собраны данные по компаниям и сделкам, и была проанализирована существующая литература по данному предмету. Затем была построена модель для раскрытия потенциальной взаимосвязи между факторами сделок и последующими финансовыми результатами компаний. После этого был произведен анализ результатов и даны практические рекомендации.</p> <p>На основе существующей теоретической литературы по данному предмету, следующие характеристики сделок по слиянию и поглощению были выбраны в качестве независимых переменных: 1) размер покупаемой компании; 2) способ оплаты; 3) размер купленной доли; и 4) тип интеграции. Финансовые результаты оценивались показателями ROA, ROE, Debt-to-Equity и Price-Earnings.</p> <p>Результаты исследования предполагают наличие положительного эффекта размера компании и оплатой акциями на показатель ROA и отрицательного эффекта на показатель P/E.</p>
Ключевые слова	Слияния и поглощения, финансовые результаты, нефтегазовая индустрия

## ABSTRACT

Master Student's Name	Iuliia Krasnorutckaia
Master Thesis Title	The effects of M&A deals on the company performance: the case of oil and gas industry
Faculty	Graduate School of Management
Main field of study	Management
Year	2016
Academic Advisor's Name	O. R. Verkhovskaya
Description of the goal, tasks and main results	<p>Facing constant challenges and competition in the industry, oil and gas companies dive into M&amp;A activity as one of the ways to strengthen their positions, which, however, does not always bring the aimed result.</p> <p>The goal of this research paper is to reveal and analyze particular effects that M&amp;A deals characteristics can have on the financial performance of companies in oil and gas industry. Firstly, the companies and deals data set was collected and the existing literature on the subject was analyzed. Secondly, a model for revealing a potential relationship between deals factors and companies subsequent performance will be built. Thirdly, the analysis of the results was made and practical recommendations were elaborated on the basis of the research outcomes.</p> <p>Suggested by the existing theoretical literature on the subject, the following characteristics of M&amp;A deals were chosen as independent variables: 1) size of a target company; 2) method of payment; 3) size of the acquired stake; and 4) type of integration. The financial performance was measured by ROA, ROE, Debt-to-Equity, and Price-Earnings ratios. The findings of the study suggest a positive effect of the size of the target company and of payments made with stock on the ROA ratio, and a slightly negative effect of the latter on P/E ratio.</p>
Keywords	Mergers and acquisitions, financial performance, oil and gas industry

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# **INTRODUCTION**

With the ongoing competition in the oil and gas industry, the recent drop in oil prices along with the increasing interest in new unconventional resources is expected to drive another wave in mergers and acquisitions among petroleum companies.

Mergers and acquisitions deals historically account for a high market turnover annually, and with the acceleration of globalization, changes in international economic and regulatory environments, competition, strong economic growth in several regions of the world and maturation of a number of emerging markets are increasing firms' competitive pressures (KPMG, 2016). With the aim to face these competitive pressures, many companies have realized they need to go global in trying to maintain a competitive edge.

## **Statement of the problem and its relevance**

Although managers in companies across the world usually claim their M&A decisions are strategically important for increasing the value of the company, at the same time, according to different researches, up to 62 per cent of all M&A deals turn out to be either disappointing, or complete failures (McKinsey&Company, 2015). This suggests an increasing importance of understanding the reasons behind particular financial results of M&A deals.

The following patterns determine the relevance of the research:

- the volumes of M&A deals in oil and gas industry are expected to grow in the nearest future due to: 1) the economic changes making it tighter to hold profit margins at the previous levels; 2) development of the unconventional resource market and the need to get competitiveness in the new field;
- a big proportion of M&A deals are considered unsuccessful and the reasons for those effects are not always known and investigated for;
- there is a lack of research aimed to identify particular characteristics of M&A that can cause positive or negative results for the financial performance.

## **Goal and objectives**

This paper aims to identify what factors of M&A deals can increase or decrease subsequent financial performance of acquiring companies in oil and gas industry.

To achieve the goal, the following objectives have been set:

- make a review of existing literature on the topic: to understand if the relationship of M&A on the companies' performance in general has been identified; to have an overview of the value chain of oil and gas industry; to identify any features of M&A deals within the industry;
- make a review of existing theories on possible explanations for post-M&A financial performance and formulate the hypotheses;
- develop the model to be used for the analysis of the data and gather the necessary data;
- analyze and discuss the obtained results and their business applicability.

## **Structure of the study**

Following the tasks, the structure of the present paper will include the following parts. The first chapter will provide a literature review with a focus on M&A-performance relationship, value chain and trends of the oil and gas industry, and M&A drivers within the industry. In the end, the conclusion and research gap will be discussed. In the second chapter, theoretical justification and corresponding hypotheses will be formulated. The third chapter includes the development of the model and provides the description of the sample and data collection. Further, in the fourth chapter the results of the empirical study will be presented and discussed. In the end, conclusions will be made and practical contribution of the study will be explained.

## **THEORETICAL BACKGROUND OF THE STUDY**

The present chapter examines existing literature on the topic. In the first subchapter, the previous studies determining existence of particular financial impact of mergers and acquisitions are analyzed. The literature is organized and grouped by criteria of scientific approach, obtained results, and deal factors under consideration. The second subchapter presents literature review on specificity of mergers and acquisitions in oil and gas industry, and explains the value chain and important aspects of oil and gas industry itself. Based upon the review, the knowledge gap is discussed, theory and corresponding hypotheses are formulated.

### **Relationship between M&A deals and company performance**

As most of mergers and acquisitions are fulfilled with the aim of improvement of subsequent performance of the companies in one or another way, the existence of implied connection between M&A and financial results receives an essential importance. Multiple studies exist on the topic, aiming to investigate if there is any effect M&A have on financial performance and if those effects correspond to managers' expectations or if they fail to be successful.

Authors' research interests vary in terms of methods, geographical borders, time periods, observations, and, what is most interesting, results. Several of the most important research works that contributed to the development of the topic were done by Straub et al. (2012), Gugler et al. (2003), Rani et al. (2015), Bruner (2003), Bertrand and Betschinger (2011), Liargovas (2011).

In terms of research approaches, the existing literature can be divided into four major groups: event studies, accounting studies, case, or clinical, studies, and surveys of executives.

In event-studies, researches primarily look at acquiring firms' long-term abnormal returns (e.g. Liargovas, 2011 and Yuce and Ng, 2005). The logic behind this is to compare the return earned by a company to its required rate of return, that is, the return that the company could expect to earn if it used other investment opportunities of similar risk instead of M&A. (Bruner, 2003) The company return for a specific day is estimated as the change in the share price of the company and dividends paid divided by the share price as of the previous day. The abnormal return is calculated as the difference between the received raw return and the return that was required on the market by Capital Asset Pricing Model (CAPM) or a return in a market index, such as S&P500.

Bruner (2003) emphasizes that it is important to distinguish between total received return and return that is enough for the M&A transaction to be considered successful. When the received

return is compared to the required return, one of the three conclusions regarding the overall financial result can be made: that the value was created, destroyed, or conserved. Value is created when the returns after the deal are higher than the required returns what means that net present value for shareholders is positive. In case the return is lower than it could have been from other investment opportunities, the value is destroyed. If both levels of return are equal and net present value is zero, this is not considered a failure. If the acquiring company requires a return of 15% and after M&A it earns it, it is as well not considered an additional value as it could be earned in other ways.

In accounting based studies, authors examine financial results of the companies before and after M&A transactions in order to check how the overall trend has changed. See, for example, Thanos and Papadakis (2012), Ahmed (2014), Rao-Nicholson et al. (2016), where authors compare the performance taking time periods of three years before the transaction and three years after it to check for results in the long-run. Paired sample t-test statistics is used to check for the difference in the ratios. The most widely used financial measures refer to profitability, operating efficiency, liquidity, and solvency ratios.

The best structured studies within this approach include matched-sample comparisons of the results (Yaghoubi et al., 2016). That is, based on the industry and the firm size, special control groups are created, and the performance of merging firms is compared to that of non-merging firms as a benchmark to see how different it is after M&A.

Some authors also combine the above mentioned methods in their research. For example, Liargovas (2011) identifies significant positive cumulative average abnormal returns received in the banking industry after the banks had undertaken M&A deals. Besides, the author examines operating performance of the banks by analyzing twenty financial ratios. By comparing the performance to that of the control group, the author comes to a conclusion that operating performance of the banks on average does not improve.

Another group of research studies focuses on quantitative methods and implies conducting surveys among executive management of companies whether the performance has improved or not after mergers or acquisitions. (Bruner, 2003) After the results are obtained, some generalization can be made across the industry or country. Joash and Njangiru (2015) used 14 companies as a sample for their study. First they conducted survey gathering information about firms' subsequent performance, and then incorporated the information into a multiple regression model. The findings showed that mergers and acquisitions raised shareholders' value and profitability of the firms.

Moctar and Xiaofang (2014) and Ivaldia and Verboven (2005) use a case study approach to determine if there is any effect of M&A on the financial performance of companies. The research is based on one transaction or a small set of those. By investigating deeply the details and background of the deals, researchers can come up with new insights that can better explain the performance aspects.

The existing research literature is contradictory in terms of particular effects that M&A deals bring to companies' performance. All studies can be divided according to the results they demonstrate into several groups: those that find positive relationship between M&A and financial performance, those that find a negative relationship, studies that find no effect attributed to M&A at all, and works that provide mixed conclusions depending on different aspects of the deals.

One of the most significant works that contributes to the research question is Robert F. Bruner's "Does M&A Pay?" (2003). The author examines 100 scientific studies on results of mergers and acquisitions as well as 14 informal surveys from 1971 to 2001. The author finds that the main reason for disputes over the positive or negative effects of M&A arises from the way in which positive returns are measured by acquiring firms. If the positive gains are compared to the require rate of return of companies it can happen that there is no additional value added as the company only earned its cost of capital. However, if the positive gains are measured in absolute values and not compared to the return benchmark, the evidence suggests that in most cases M&A deals create value. Based on his findings, Bruner concludes that mergers and acquisitions do pay. However, as he noted, successful M&As require much of planning, and significant cost-savings and value creation can be hard to realize.

Among authors whose findings as well suggest positive impact of M&A on a company's financial performance are Rani et al. (2015), Joash and Njangiru (2015), Grigorieva and Troickiy (2012), and Kling (2006).

According to Rani et al. (2015) there is a significant improvement in the long-term profitability of acquiring firms after M&A deals. The study examined the sample of 305 transactions that happened in the period between 2003 and 2008 in India. On the side of financial performance, the researchers primarily focused on such dimensions as profitability, efficiency and liquidity. The analysis showed that in post-M&A period, the ratios improved, especially, in terms of profit generated per unit sales. Authors come to a conclusion that an increase in EBIT indicator was primarily due to better operating margins as M&A allowed for an improvement in cost efficiency.

Joash and Njangiru (2015) investigated the effects of M&A on shareholders' value in acquiring companies. The sample consisted of 14 commercial banks in Kenya that had undergone mergers or acquisitions over the period from 2000 to 2014. The authors, as it was mentioned before, used questionnaires and regression to collect and analyze the information. The results showed that M&A deals could help increase shareholders' value in acquiring banks.

Yuce and Ng (2005) also found that M&A resulted in increased returns for companies, however, they pointed out that the returns were higher for companies if they acquired private firms rather than public ones if the payment was made with stock. The wide sample represented all mergers and acquisitions of Canadian firms from 1994 to 2000 that included 1361 acquirers, 242 targets, and 38 industries, including oil and gas. In the study, the market-based event-study method was used. In their findings, Yuce and Ng argue not only that the abnormal return was generated as a result of M&A, but also that it was the case for both acquirers and target companies. However, one of the main disadvantages of the study is that it examined only a 40 day period to determine the influence on financial performance. In other words, it did not check for any long-term effect to determine if the positive short-term increase would be outweighed by a negative long-term effect.

Although using a different approach in a more recent study, based on accounting measures, Grigorieva and Troickiy (2012) came to a similar conclusion that M&A transactions have a positive impact on operating efficiency of the BRIC countries and EBITDA/Sales indicators increased in a two year period after the deals.

The opposite results on the matter of relationship between M&A and financial performance are, however, also quite numerous. Researchers can accept different limitations for the purpose of their research, depending on the sample, time period, location, financial measures, and explanatory variables. Taking this into account, the corresponding difference in the results becomes reasonable.

Bertrand and Betschinger (2011) examine how particular deal, firm and industry level factors influence financial performance of acquirers in Russia. The sample consists of more 600 companies acquiring both domestically and abroad for the period between 2000 and 2008. Using a multiple regression model, Bertrand and Betschinger test dependence of companies ROA ratio on such factors as target firm size, ownership form, market share, number of previous acquisitions, etc. The scholars argue that as a result of M&A, performance of acquirers was reduced compared to that of non-acquiring companies. Furthermore, the authors make a

conclusion that the reason behind the destroying effect of M&A was in lack of experience and resources of Russian companies, especially when it came to cross-border transactions.

It is also should be considered that mergers and acquisitions can have a different impact when acquirers and target companies are examined separately. For example, M&A can enhance the performance of the smaller company that has been acquired, while it can dilute the value of the deal for the acquirer itself. In their study, Siegel and Simons (2010) conduct an analysis of 9400 acquirers and 16000 firms and plants that have been acquired in Sweden. The study was aimed to determine the effects of M&A on the performance of acquiring companies and on that of the companies under control. While the researches do not register any positive impact on the first group of companies, they suggest that the plants that were acquired still could increase their performance.

Adjusting the performance results by industry criteria can also show more negative effects than the overall research would present (Liargovas, 2011). In the study by the international consulting company, firms demonstrating healthy performance prior to the deal, generated significantly lower cumulative shareholder return after the deal. In the period of two years after M&A, 60 percent of the acquirers registered a drop in return on average of 10 percent (L.E.K. Consulting, 2016).

The majority of studies, however, cannot give unequivocal answers about the dependence of companies' financial performance on preceding M&A deals. As analysis of the literature shows, even in those cases when the relationship is identified, it can have different impact, positive or negative, depending on particular performance indicators (e.g. Bruner, 2003, Kalakkar, 2013, Gugler et al., 2003, Moctar and Xiaofang, 2014).

Some M&A deals can result, for instance, in increases in certain accounting indicators, but reductions in others (Gugler et al., 2003). In a study of mergers and acquisitions taking place around the world for a 15 years period, the effects that M&A have are analyzed by comparing financial indicators of merging companies with those of the control group of non-merging companies. According to the results, the acquiring companies experienced on average higher profits, but the sales were reduced after the deal. Further, when domestic mergers were compared with cross-border ones and manufacturing companies were compared with service companies, no significant difference was found regarding the prior results. To explain the difference in profit change, Gugler et al. examine the relative proportion of the deals that decrease profitability and those that decrease it in the sample. M&A that reduced profits and efficiency accounted for the larger share than the deals resulting in market power increase. The authors suggest that a larger

amount of value destroying deals can be explained by the big relative size of the companies participating in them, while the small share of positive effects – by small sized companies.

The effects of M&A can be different depending on whether they are being studied in a short-term or long-term period. Moctar and Xiaofang (2014) argue that in terms of efficiency and investment valuation variables, M&A deals have a significant negative effect short-term, but a positive effect in the long-run. However, in terms of liquidity the performance improved both short-term and long-term. The study was carried out with a sample representing merging and acquiring companies across Economic community of West African States (ECOWAS). For financial performance measuring, the ROA, ROE, EPS and liquidity ratio were adopted as indicators. The authors compared the two groups of merging and non-merging banks before and after the mergers. The three financial dimensions were then analyzed to reveal the differences in performance that could be explained by the M&A both right after the deals and three years later.

A broad study of factors influencing the success of mergers and acquisitions was done by Kalakkar (2012) with a sample of 109 deals from 2009 to 2011. The author examined the most suitable financial performance indicators according to the previous literature and chose return on assets, return on equity, profit per employee, income growth rate as dependent variables. On the side of explanatory factors the following ratios were collected: dividend payout ratio, total debt to capital ratio, long term debt, GDP growth, market Share, credit to deposit ratio, investment to deposit ratio, business per employee. The results of the regression analysis confirmed positive effect only on income growth rate. However, no other relationships were supported by the research findings.

Many studies that focus on developing markets also demonstrate mixed results. Ahmed (2014) points out the difference between effects on profitability, liquidity and efficiency after M&A deals. Thus, on the basis of the analysis of M&A deals in Pakistan from 2000 till 2009, it is concluded that liquidity and profitability significantly increase in post-merger period, whilst efficiency levels deteriorated. The overall performance was considered as having improved. In research on Indian M&As and its effects on companies performance, there were also mixed results observed by Leepsa and Mishra (2012); Kumar (2009); and Sinha et al. (2010).

Most scholars further suggest that in evaluating the success of financial performance after mergers and acquisitions particular deal characteristics should be taken into account (Bruner, 2003). Bertrand and Betschinger (2011) argue that despite the overall conclusion that M&A deal do pay, in practice, to achieve real gains, it implies many aspects that have to be fulfilled. Thus, the primary importance is in identifying what particular deal factors can make them pay.

Based on the current analysis of the existing literature, it becomes evident that in most cases scholars manage to identify the relationship between M&A and companies' performance in later years. This relationship can be positive, negative, or controversial, however, it is more frequently observed than no relationship at all. Besides, the possibility to create value itself is attributed to the deals background and factors as well as characteristics of the involved companies (Dutta and Jog, 2009)

## **Mergers and Acquisitions and Oil and Gas Industry**

While the main trends in M&A dynamics are determined by the overall economic activity level, the specificity of M&A in oil and gas industry is dependent on the factors attributable to the energy sector in general and oil and gas market in particular. In the present subchapter, we will, first, provide an overview of oil and gas industry, discuss its features, value chain and current trends, and then, examine the current state of M&A activity, its dynamics and motives with regard to the current situation in oil and gas industry.

### **Oil and gas industry value chain and trends**

Oil and gas industry, in its sense, includes all processes that are connected with exploration, extraction, transportation, refining, and selling oil, gas, and their subproducts. Oil and gas together provide the world population with approximately 60 percent of its daily energy demand. Oil accounts for the larger part of consumption among all petroleum products and represents on average 32 percent for Europe and Asia, 40 percent for North America and 53 percent for the Middle East. Nowadays, as petroleum products constitute the base raw resources for many producing companies worldwide, over 200 countries have invited oil producing companies to explore their territory to determine if there are oil reserves there (IHRDC, 2015).

To understand the main challenges faced by oil and gas companies and the motives behind their M&A activity, we will analyze their value chain. As it was popularized by Porter (1985), the value chain is a set of activities following one another that are required to bring the product from initial stages of creating the concept and organizing the process, through different steps of production to the final product or service that will be delivered to the customer.

All operations in oil and gas industry are divided into three major sectors: upstream, midstream and downstream. However, some authors include midstream into the downstream sector.

Upstream sector includes such activities as exploration of the underwater and underground fields for identification of potential oil and gas reserves, development of hydrocarbon reserves and subsequent extraction (production) of oil and gas (the World Bank, 2010). Upstream sector is also usually referred to as the exploration and production (E&P) sector. This sector is considered the core field in all oil and gas value chain and accounts for the biggest share in all M&A deals in terms of both number of deals and their volumes.

The proved oil and gas resources are the main assets by which companies in this industry typically compete. According to the Petroleum Resources Management System approved by Society of Petroleum Engineers (SPE) Board, reserves are “quantities of petroleum anticipated to be commercially recoverable by application of development projects to known accumulations from a given date forward under defined conditions. Reserves must further satisfy four criteria: they must be discovered, recoverable, commercial, and remaining based on the development projects applied” (SPE, 2007).

On the side of costs, the upstream stage requires significant upfront investments from the companies. This is so because due to the strict regulations, in order for oil or gas to be recognized as reserves, the detailed information about those reserves needs to be provided, and this often means additional expenses to the company.

Midstream sector activities primarily consist from transportation and storage of petroleum products. Transportation from production sites to refinery plants and afterwards to the distributors is typically done by pipelines, rails, barges, oil tankers or trucks. Those ways of transportation represent another concern in strategic planning and cost structure of producing companies. Most authors separate midstream sector from upstream and downstream, however, midstream often can include some operations from upstream and downstream sectors, for example, it can include plant processing of the natural gas as well as its transportation (PWC, 2011). For this reason, midstream sector is often included into the downstream and its activities are classified as downstream.

Downstream sector in the oil and gas industry involves refining of crude oil and processing and purifying of natural gas. It also includes marketing and distribution activities for obtained petrochemical products, such as petrol, gas, fuels, kerosene, asphalt, liquefied natural gas (LNG) and others.

Maintaining the downstream activities in the value chain requires high capital investments from the companies (PWC, 2011). The main facilities necessary for processing and distribution of oil

and gas products include refineries, LNG facilities, pipeline and transportation networks as well as retail distribution stations (UNEP FI, 2013).

Companies that operate in oil and gas industry are classified in literature by different criteria. Correspondingly to the industry value chain, there are upstream, midstream and downstream companies. Among the largest companies from the first and third groups in terms of production are, for instance, Saudi Aramco, NIOC, ExxonMobil, PetroChina, BP, Royal Dutch Shell, Pemex and Chevron. The midstream is represented by such companies as Aux Sable, Bridger Group, DCP Midstream, Enbridge Energy Partners, Enterprise Products Partners, Genesis Energy and other companies.

Besides the classification mentioned above, there are companies whose primary operations are oil field services. Such companies do not do exploration, transportation or production of oil and gas but provide professional services to these companies. Oil field services can include special facilities construction, providing and maintenance of drilling equipment and other assistance. Oil and gas companies that operate in all of the mentioned sectors are called integrated majors. The most frequently cited example is Exxon Mobil as it makes the whole set of work in extraction, transportation and distribution. As a rule, such companies focus on upstream and downstream activities, outsourcing the middle stages from more specialized companies.

The whole value chain in oil and gas industry is connected with various risks, both internal and external.

First of all, unlike producers in many other industries, oil and gas companies do not directly control the prices for their products. Rather, it is global demand and supply and economic conditions that influence the oil prices. Financial performance of the companies in this industry to a big extent depends on the spot prices for oil and thus reflects its market fluctuations. Therefore, the financial results to a certain extent also depend on the overall market conditions.

The primary factors that influence oil prices are: global supply and demand; macroeconomic situation, financial markets; US dollar exchange rate, and geopolitics (Lukoil, 2013).

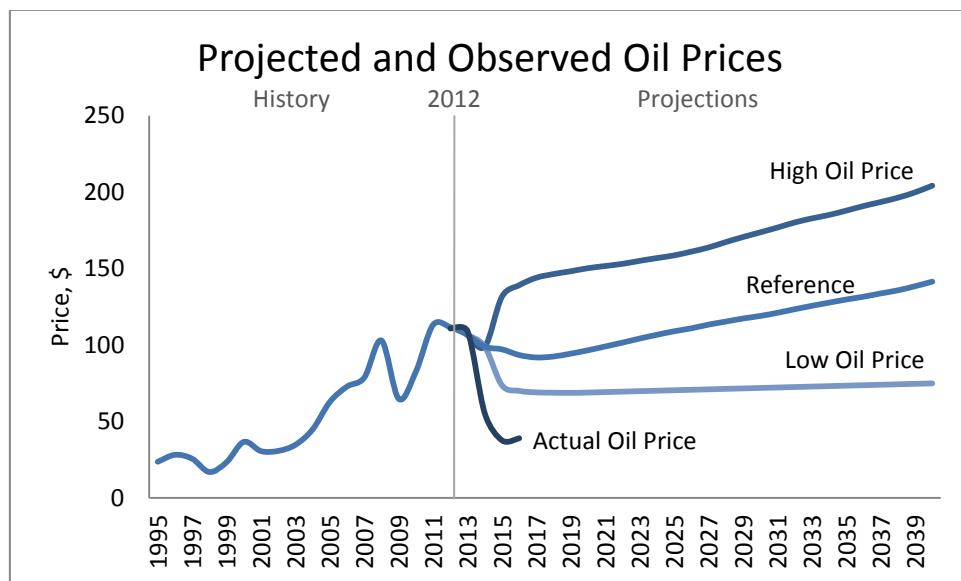
In terms of market demand and supply, the oil and gas industry has undergone several changes over the last period. On the demand side, the sharp decrease in the growth of energy demand was an unexpected change for the oil companies. While the total demand for gas and other sources of energy is expected to grow fast enough, the growth in demand for oil, especially if a form of automobile fuel, is starting to decrease. The global oil supply, however, is increasing and continued to growth during 2015, partially due to the production activity of OPEC countries (up

to 1 million barrels per day) and the US (approximately 0,8 million barrels per day) (Deloitte, 2016). According to the estimations of the US Energy Information Administration (EIA) (2015), the global oil supply increased almost twice as much as its consumption.

The most significant change occurred with the sharp drop in oil prices at the end of 2015. The price fell below historical points – below US \$40 per barrel which was more than 60 percent from the price as of summer 2014 (Bloomberg, 2016). In 2012 the US Energy Information Administration published its estimations regarding the oil prices forecast that included several scenarios: for the high oil price, low price and the reference price that the organization was expecting to see on the market (EIA, 2015). The Figure 1 demonstrates that the actual drop in oil price that occurred in 2014-2016 was even lower than the projections for the low-price scenario made by the organization.

Even before the collapse with prices, oil companies experienced pressure in achieving returns and growth. This sharp decline creates additional challenges for the companies as well as changes the structure of the industry (Deloitte, 2015). According to Bloomberg (2016), due to the lower oil prices, in 2015 US oil and gas companies lost more than \$300 billion in their market value. Today oil and gas producers have to adjust to the market imbalance taking into account the new circumstances.

**Figure 1. Projected and observed Brent oil prices**



Source: author's estimations based on EIA's forecast and data retrieved from Bloomberg. Energy

Apart from the situation with the oil price, another global shift in the industry began with the development of unconventional resources extraction. The most important examples are

represented by shale gas and shale oil. From the beginning of 2000s, oil and gas companies, especially those in the US, began to pay more attention to the nonconventional resources. As a result, by 2012 production of shale gas led to such a big decrease in gas prices, that it fell below the level of production costs. With the decline in prices, companies that were previously heavily investing into the exploration and extraction facilities for the shale resources had to reduce their volumes of production. Among the countries with the highest reserves of technically recoverable shale gas are: China, Argentina, Algeria, United States, Indonesia, Canada, Mexico, South Africa, Australia, Russia, and Brazil (EIA, 2013).

Among the other issues that oil and gas companies face are such question as taxation and environmental concerns. Taxation is traditionally one of the most critical considerations mentioned in the literature (e.g. the World Bank, 2010, Mitchell, 2012). Taxation regime of petroleum companies in many countries is one of the heaviest in comparison with that in other industries. In upstream oil and gas sector the tax levels depending on a country's policy vary from 40 up to 90 percent (Johnston, 2007). These high levels affect operational incentives, contractual agreements, assets allocation, strategic decisions as well as financial performance. Tax rates are, in turn, controlled by states with regard to current economic conditions. Therefore, the performance of oil and gas companies is affected both by internal and external decisions. Regarding to the environmental concerns, petroleum companies, especially in the midstream sector, are also subject to restrictions and sanctions when their activity results in air pollution, oil spills or other environmental damage (the World Bank, 2010).

International consulting and research companies (e.g. AtKearney, 2015) outline the following trends in the oil and gas industry for the future years:

- The global energy demand is expected to continue growing as the consumer class will reach up to 50 percent of population. However, the growth in demand for gas and unconventional energy resources is expected to be higher than declining growth in oil demand.
- Countries leading in oil production will agree to limit the overall oil production to allow the prices to be at the necessary levels. For example, countries from the Organization of Petroleum Exporting Countries (OPEC) and non-OPEC oil suppliers have conducted meetings to negotiate the appropriate volumes of oil production (Carlson, 2016).
- Unconventional resources driven by development in technologies will continue to grow in share, however, the production will be limited to prevent further drops in gas and oil prices.

- To overcome the refining crisis in Europe resulting from the decline in the industry, companies will have to shut down a part of their refining facilities producing approximately 1.5 million barrels per day.
- Stricter regulations on environmental protection are to come into force. Limitations for using sulphur in international bunkering will push the midstream sector towards alternative ways of transportation, which will result in additional costs, or alternative sources of energy like liquefied natural gas or LNG.

In the context of macroeconomic and industry specific changes, oil and gas companies will have to consider ways to optimize their processes to achieve competitive positions. England (2016) argues that one way to do it is through cutting capital expenditures and postponing large scale capital projects, cutting operating expenditures and number of employees or negotiating with suppliers for better prices.

Furthermore, the decrease in oil prices may cause many oil and gas companies to focus on gas as it can become a more important source of revenue. If the situation does not change for the oil sector, companies are expected to expand their portfolios and be more active in gas market as they will want to maintain their positions and become the gas industry leaders in future (Parry, 2015). For M&A activity, it will mean that more deals can be made in the gas sector than it used to be previously.

Thus, looking for potential cost reductions and production efficiency, oil and gas companies are also expected to look for business integration options and to go global to maintain the competitive edge. M&A activity of oil and gas companies, therefore, will be also driven forward.

### **Motivation for M&A of oil and gas companies**

The sharp decline in oil prices has reduced profit margins of oil and gas companies and made capital expenditures and ability for refinancing and raising new debt more tough questions. The price changes have reduced the asset value of and negatively affected overall valuation of many companies (Deloitte, 2015).

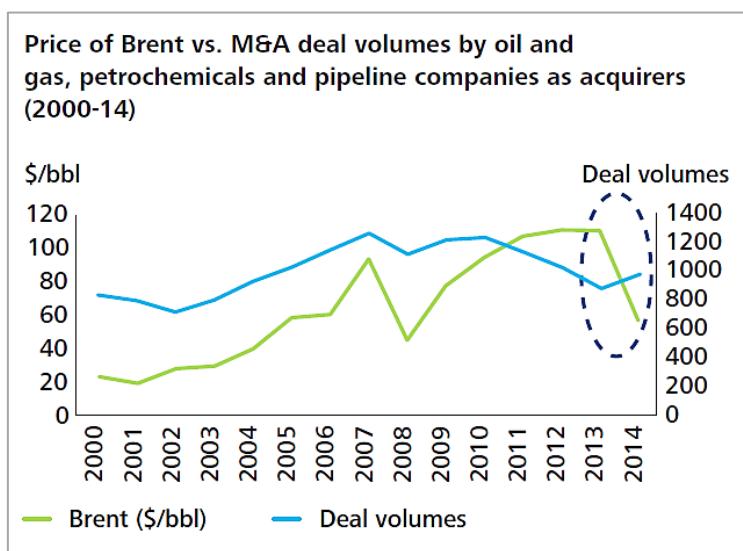
Scheck and Raice (2014) argue that in the new market situation, companies will need to find solutions to improve their returns on capital. The timeframe of recovery in oil market are not determined, therefore, the main challenge for both conventional and shale oil and gas companies

will be to adjust to the new situation and to cut costs and improve operational efficiency. One of the ways to achieve this may be in mergers and acquisitions.

According to a range of scholars, economists and international companies, the pressure that oil and gas companies now face can cause a new wave of mergers and acquisitions aimed at cost optimization and improvement of competitive positions (e.g. KPMG, 2016, Corrigan and Doshi, 2015, Clark et al., 2016). M&A deals have a wavy pattern depending on economic conditions that influence companies' stability. The general trend is that with increasing pressure on companies' profitability, the number of M&A deals also tends to grow.

The discussed findings are supported by the information in Figure 2, where it can be seen that the overall number of deals among oil production and service companies started to increase with the decline in oil prices.

**Figure 2. M&A volumes and oil prices**



Source: Deloitte (2015)

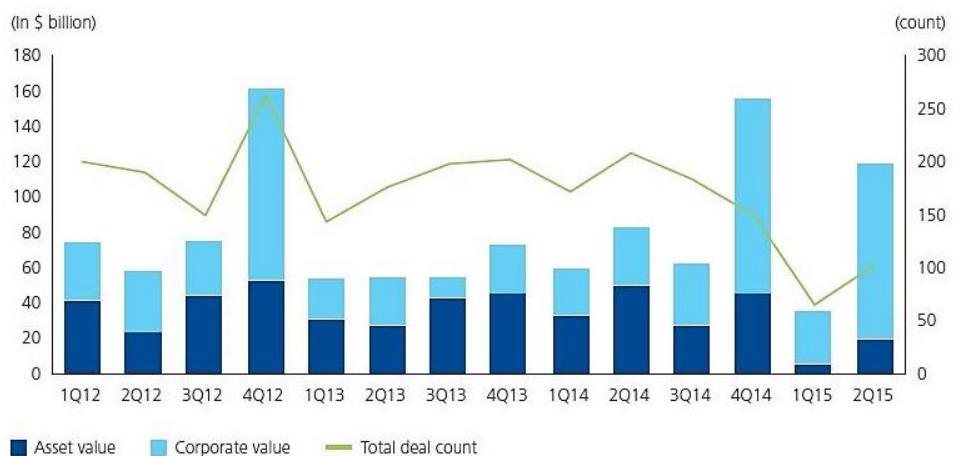
However, the first reaction to the decrease in the oil prices was negative. Because of the unstable situation companies are reluctant to undertake additional risks. According to IHS, the analytical company providing statistical information in petroleum industry, there is a difference in dynamics between high and low value deals. Thus, the overall trend in the number of small and mid-size deals the during 2015 was negative and the total transaction volumes for global upstream M&A deals in 2015 declined 22 percent to \$143 billion from \$184 billion in 2014 (IHS, 2016). However the dynamics is different for high value M&As. Indeed, a few deals with a high deal value have been announced since the prices decreased, for example M&A between

Shell-BG, Halliburton-Baker Hughes, Schlumberger-Cameron, or ETP-Williams (Deloitte, 2016).

The difference in the reaction can be explained by the two things. First, the growth in deals volumes is caused by several big-scale transactions where major companies want to achieve an even stronger position by acquiring other big players paying premium for them. This is especially common for the US market, where the new race for unconventional shale oil and gas can determine the financial future of petroleum companies, and thus, require big investments from their side. For example, in the second quarter of 2015, one deal between Shell and BG accounted for approximately 80 percent of the total value in M&A deals in the US.

Second, the relative decline in M&A's count is explained by weakened positions of many small and medium companies. Scheck and Raice (2014) suggest that low oil prices have put small and medium companies under the pressure and either make them reduce their property to refill their cash reserves, or to sell out completely.

**Figure 3. Oil and gas M&A deals by value and count**



Source: Deloitte (2016)

Indeed, according to AtKearney's research (2015), companies that were initially stronger, are now willing to use such an opportunity to optimize their own efficiency and costs through mergers and acquisitions. The historical overview of the M&A waves in relation to oil prices made by Scheck and Raice (2014) shows that, indeed, companies are more inclined to buy their competitors when their assets are under the market pressure. For example: in 2001 when the price fell down to \$45,8/B, Chevron acquires Texaco; in 2005 with oil price at the level of \$36,7/B, ConocoPhillips buys Burlington Resources; Exxon Mobil acquires XTO in 2009 when the price fell again down to \$35,5/B; in 2012 with the oil price at \$55,4/B Rosneft buys a stake in

TNK-BP from BP; further, after the latest drop in 2014 down to \$38,7/B Halliburton wants to acquire Baker Hughes (Scheck and Raice, 2014).

The patterns discussed above suggest that with the recent drop in the oil price, a new wave of M&As can be expected. Even though the market uncertainty can slow down the M&A activity in the beginning, in a long-run it can be used as an opportunity to grow. Looking at the three sectors separately can show that in the midstream sector, deals are growing both in terms of numbers and volumes. Thus, only shale producers increase the global midstream sector M&A activity 16 percent compared to the previous period.

The reasons for mergers and questions have been examined by many authors and firms (e.g. Dismas, 2013; Picardo, 2014; Oberg and Tarba, 2014). They can be connected with entering new markets, diversifying a customer base, achieving efficiency and synergy and so on. However, particular motives that drive M&A deals in each separate industry are different and depend on specific situation common to that market.

Capstone (2013) examines the main drivers for mergers and acquisitions in oil and gas industry. According to the research made by the company the main motives are as follows:

- Obtaining natural resources. The financial success in oil and gas industry depends on the amount of natural resources a company possesses and the corresponding amount of resources that it can receive its revenue from after selling them. Therefore, companies constantly need to replenish them. One way to add proven reserves to their own balance sheets is by making deals with other companies. Another advantage is that big producing companies can avoid the risks of exploration of new fields by acquiring already explored but undeveloped fields.
- Development of existing fields. While big oil companies, such as integrated majors, can afford integration forward and backwards, small and medium-sized companies usually focus on one or two value chain areas and cannot achieve the same profit margins. For example, exploration-oriented companies often cannot turn it into a successful revenue-generating asset. Therefore, such companies are interested in selling some assets or being merged with larger companies.
- Geographic diversification. Companies' revenues depend on both the quality of oil and gas and the costs that are associated with their production. These two characteristics vary across countries and depend on local factors. For instance, the total price, apart from the rest, depends on proximity of refineries, quality of the transportation pipelines and local train infrastructure, as well as local supply and demand factors. The study conducted by

Kimmeridge Energy firm (2013) examines such factors shows that oil in gas industry in the US is influenced by then depending on different regions in the country. Capstone (2013) argues that companies can minimize the risks by spreading their portfolios across different geographical locations.

- Acquiring know-how. Oil and gas companies have different core competences across the industry, for instance, some of them are more professional in deep-water exploration and drilling, some in horizontal drilling and others in deep-shale development. Given the importance of technological processes for the companies and the overall high costs of in-house research, many producers prefer to acquire those companies who possess the required know-how.
- Adjusting to taxes and regulations. The tax rates imposed on oil and gas companies are traditionally high, usually starting from 40 percent, therefore companies' perception of future changes in taxes and other regulations can also drive M&A transactions. On the contrary, if the prospects of future tax rates are negative, investors can close their announced deals (Capstone, 2013).

Summing up, mergers and acquisitions among oil and gas companies are driven not only by common to all industries factors, but much more by market situation within the industry itself. The recent drop in oil prices has slowed down the M&A activity globally. On the other hand, it has made companies look for cost optimization and scale increasing opportunities. The development of shale oil and gas extraction also reinforces the competition among petroleum companies. Understanding of the industry specific reasons for M&A discussed above can contribute to the further discussion of factors that lead to the success of M&A transactions.

## **Conclusion and research gap**

The review of the literature was aimed to provide an understanding of the state-of-the-art knowledge scope on the subject. The analysis was divided into several steps. First, a broad studying of papers on the existence of a relationship between M&A and financial performance was done. Second, business literature was analyzed to provide an overview of oil and gas industry in order to understand its specific aspects that can be used further for conducting the empirical research. Third, M&A activity was studied within the frame of oil and gas industry.

The questions of relationship between M&A deals and subsequent company performance have long been within scholars' attention. The existing literature employs different methods of

analysis, the most widely accepted from which are event studies, accounting studies, case studies, and qualitative methods such as surveys of executives.

There are four types of papers depending on the conclusions that authors made: studies that found a positive relationship between M&A and financial performance; studies that found that financial performance deteriorated; studies that provided mixed results depending on a variable tested; and papers where no relationship at all was identified.

Research articles providing evidence for the positive and for the mixed results represent the biggest group by quantity. Authors could identify, for instance, that M&A deals can accelerate sales or profitability, however, decrease other performance parameters.

Another feature of the literature analyzed is that authors suggest further research to determine what particular factor affect the results, and imply that specific deal characteristics should be studied (e.g., Bertrand and Betschinger, 2011). However, not many papers that would study this question at an academic level could be found. The few works on this subject were presenting confusing results because the primary objective there was to determine if any relationship exists, and particular factors were not of a primary interest. Besides, those works were typically based on an example of one country limiting the implications of the results.

Summing up, based on the literature review, we can conclude that the question of the effects of particular deal factor on financial performance still represents a knowledge gap, which the present research paper is aimed to cover.

Further in the second chapter, we proceed with literature review and existing theories in order to formulate our research hypotheses to be tested.

## THEORETICAL FRAMEWORK AND HYPOTHESES

The reasons of particular financial results of mergers and acquisitions in oil and gas industry have been discussed by DePamphilis (2013), Christensen et al. (2011), Schreiber (2013), Bruner (2003), Bertrand and Betschinger (2011) and others. In many studies the authors conclude that besides the motives and economic situation that strengthen financial performance after M&A, it is specific deal- and company-level factors that can affect the result. Therefore, in the given part of literature review, different conditions mostly with regard to companies' background and terms of deals will be analyzed.

### **Factors influencing post-M&A performance**

Probably the biggest contribution to the topic development was made by Thomas Straub (2007). In his work “Reasons for frequent failure in Mergers and Acquisitions: A comprehensive analysis”, the author made a wide research looking at the problem not from an angle of some particular determinant but from different perspectives. Thus, it was argued that for a deal to be successful, the following key success factors should be taken into account: strategic logic, organizational integration, and financial perspective. Strategic logic is reflected by six determinants: market similarities, market complementarities, operational similarities, operational complementarities, market power, and purchasing power. Organizational integration is reflected by: acquisition experience, relative size, cultural compatibility. Financial / price perspective is reflected by: acquisition premium, bidding process, and due diligence. All 12 variables are presumed to affect performance either positively or negatively. Besides that, the author determines three measuring criteria for post-M&A performance: synergy realization, relative performance (compared to competition), and absolute performance.

Yaghoubi and Yaghoubi (2016) suggest dividing possible factors into five different groups, namely: acquirer characteristics, target characteristics, bid characteristics, industry characteristics and macro-environment characteristics. Besides, different authors suggest that primarily bid characteristics are able to strengthen or weaken the value from mergers and acquisitions (e.g. Ismail et al., 2011).

Summarizing the existing research, below are presented characteristics that are most often cited as being important for consideration in M&A process.

#### ***Target company size***

According to the returns to scale theory, the more companies increase the scale of their production, the more likely they achieve cost efficiency due to the higher volumes of output. Scholars believe that acquiring bigger targets, oil and gas companies can increase their assets and outputs, and thus, increase their market power. The rule of increasing returns to scale states that if the total output grows more than the corresponding change in inputs, then an increased return to scale is achieved (Seth, 1990).

When the market powers of two companies are combined in one, there is likelihood that it will create synergy between them (Viverita, 2008). According to different authors (e.g. Straub et al., 2012, Tuch and O'Sullivan, 2007) the difference between relative sizes of acquiring and target companies is one of the main conditions of synergies and successful financial performance after M&A transactions. For example, Homberg et al. (2009) examined a number of mergers and acquisitions and made a conclusion that in order to realize the planned synergies, it is necessary that the acquirer is bigger than the target company, but the latter should be closer to the acquirer in terms of absolute and relative size.

Besides, one of the assumptions of the q-theory states that as the target size increases, the potential synergy gains also increase. Thus theory looks at M&A deals from the financial perspective. The effect is so because the higher value the target company represents the easier and faster the acquirer can achieve financial advantages compared to other competitors in the market (Lucas, 1978). Filipovic (2012) and Tuch and O'Sullivan (2007) suggest that bigger targets are associated with superior subsequent performance and that the smaller the ratio between the companies sizes is, the more successful their following performance can be.

Therefore, the target company size is assumed to have an impact on the following financial performance. Besides, as the size of the target company is primarily associated with effects on outputs and variable costs of the company, we exclude the solvency measures from this analysis. Based on the discussion of the given theories, we derive the first hypotheses of the research:

*Hypothesis 1a:* The bigger the size of a target company, the higher the acquirer's ROA ratio.

*Hypothesis 1b:* The bigger the size of a target company, the higher the acquirer's ROE ratio.

*Hypothesis 1c:* The bigger the size of a target company, the higher the acquirer's P/E ratio.

*Hypothesis 1d:* The bigger the size of a target company, the higher the acquirer's D/E ratio.

### ***Method of payment***

The two main methods of payment in M&A deals are payment with cash or with stock. According to Shleifer's and Vishny's (2003) theory of stock market driven acquisitions, the reason behind many stock driven acquisitions is an irrational overvaluation of the acquiring company's stock. That is, when company managers realize that the market share price is above its fair value, they are more inclined to use that excessive money on expanding the business through mergers and acquisitions. The theory implies that to serve the interests of the stockholders, managers use the overvalued stock to buy companies whose assets are less overvalued compared to their own assets. Shleifer's and Vishny's argue that in the long-run, the market makes corrections of the acquirers' stock which leads to negative long-run returns to the acquirers. However, Lehn and Zhao (2006) conclude that stock deals can benefit acquiring firms because the overvalued stock enables acquisition of such hard assets that probably would not be bought with cash, and this, in turn, can prevent even more negative long-run returns.

To assess the validity of these assumptions we formulate the next hypotheses:

*Hypothesis 2a:* Deals where stock is used as a method of payment are positively associated with the acquirer's ROA ratio.

*Hypothesis 2b:* Deals where stock is used as a method of payment are positively associated with the acquirer's ROE ratio.

*Hypothesis 2c:* Deals where stock is used as a method of payment are positively associated with the acquirer's P/E ratio.

*Hypothesis 2d:* Deals where stock is used as a method of payment are negatively associated with the acquirer's D/E ratio.

### ***Acquired stake size***

The control by a parent company implies a better applicability of the new managerial rules and processes. Those processes can directly affect the performance of the merged company and that is why the parent company might be interested in establishing a higher degree of control in the company that it bought. Such control is achieved when the management of the acquirer has the majority of voting rights while making strategic decisions. Therefore, buying a bigger stake can be considered a way of improving the influence of the parent company and, therefore, the resulting performance.

*Hypothesis 3a:* The bigger the acquired stake, the higher the acquirer's ROA ratio.

*Hypothesis 3b:* The bigger the acquired stake, the higher the acquirer's ROE ratio.

*Hypothesis 3c:* The bigger the acquired stake, the higher the acquirer's P/E ratio.

*Hypothesis 3d:* The bigger the acquired stake, the higher the acquirer's D/E ratio.

### ***Type of Integration***

Authors distinguish two major types of M&A deals on the basis of product and market. Thus, a merger is called horizontal when the two firms are operating and competing on the same type of product market and with the same geography. A vertical merger is a combining of companies that typically operate as a supplier and a customer to one another. Further, a backward vertical merger is viewed as an acquisition by a customer of his supplier, whereas in a forward vertical merger the supplier buys his customer, that is a way to new outlets (Dismas, 2013).

Vertical integration is considered a prominent feature of mergers and acquisitions in oil and gas industry (Luciani and Salustri, 1998; Bindemann, 1999). There are two major results of such integration: financial and operational. Financial vertical integration occurs when all stages of production in the value chain are controlled by one holding company that manages their cash flows. Operational vertical integration implies that there is a physical flow of commodities between different stages, for example, when crude oil and gas or ready products move In between of those stages. Key motivation for both financial and operational vertical integration are typically in securing the resources supply, to increase entry barriers for competitors, to maintain tax efficiency, to eliminate fees charged by intermediaries or to exploit price discrimination advantages (The World Bank, 2010).

With the high capital intensity of oil and gas industry, vertical integration can be especially useful in maintaining cost efficiency and profit margins (Gugler, 2003). Ismail et al. argues that only those M&As should be undertaken by companies with high capital load that are made within the same industry, and that unrelated transactions can destroy value. Taking into account that in oil and gas industry, there are three separate sectors with their own production cycles, it is reasonable to assume that within those sectors vertical mergers and acquisitions can have a more positive effect on companies' financial performance.

*Hypothesis 4a:* Vertical integration is, more than horizontal integration, positively associated with acquirer's ROA ratio.

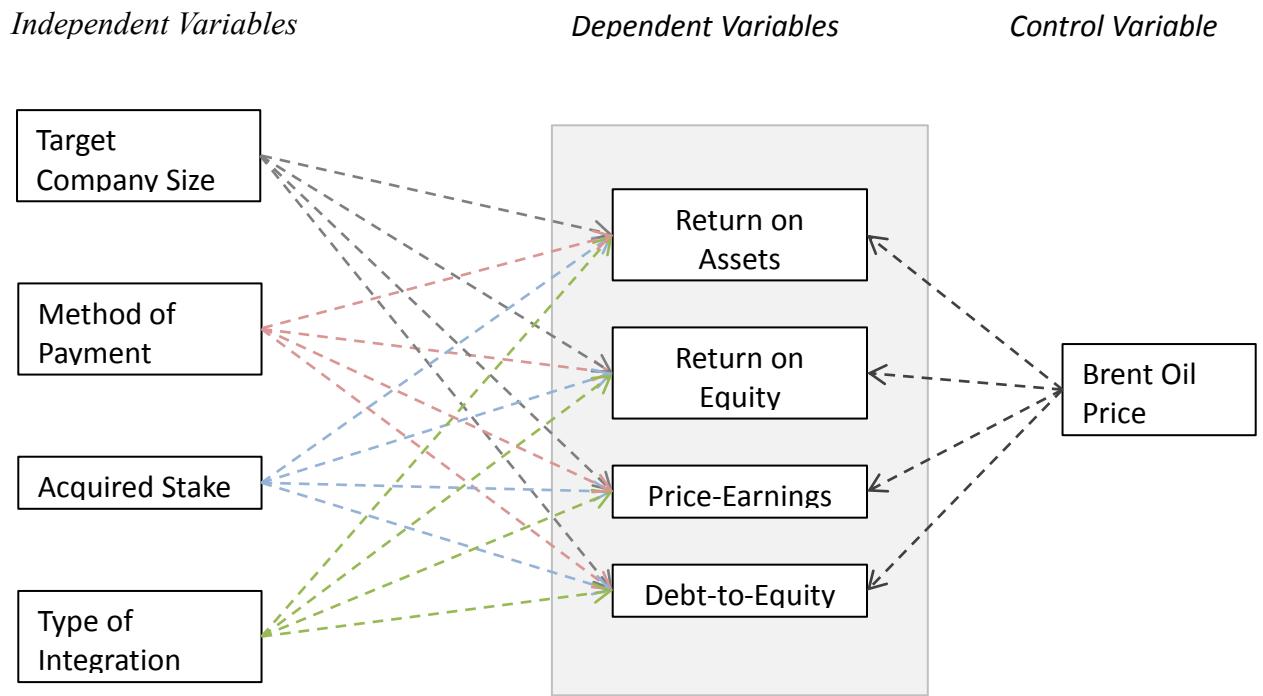
*Hypothesis 4b:* Vertical integration is, more than horizontal integration, positively associated with acquirer's ROE ratio.

*Hypothesis 4c:* Vertical integration is, more than horizontal integration, positively associated with acquirer's P/E ratio.

*Hypothesis 4d:* Vertical integration is, more than horizontal integration, positively associated with acquirer's D/E ratio.

The overall model for testing the developed hypotheses is depicted in Figure 4 and reflects the potential relationship between independent, dependent and control variables.

**Figure 4. Theoretical model for hypotheses testing**



In the next chapter we proceed with the research methodology and choice of the variables for our model.

## RESEARCH METHODOLOGY

The present chapter is aimed to explain the analytical technique used in the empirical study. The analysis of the effects of M&A deals factors on a company's financial performance will be based on the following steps: first, the data sample will be presented and analyzed and data collection and description methodology will be explained, second, the model that will be used for the analysis will be presented, and finally, the set of variables chosen for the model will be described.

### **Sample and Data Collection**

To test for the relationship between deals characteristics and subsequent performance of the companies, the data for M&A deals for the last 15 years has been collected. The initial dataset includes 1,132 deals made in oil and gas industry for the period from 01, January 2000 until 31, December 2015 over Europe and North America. After the list was adjusted for the missing data in key variables, the final sample consists of 110 M&A deals and companies. The sample includes international companies represented globally and, together for acquirers and targets, represents 21 different countries.

The required data on the deals characteristics was collected with the use of Zephyr database and Thomson Reuters Datastream. Information about companies' financial performance was gathered in Thomson Reuters Advanced Analytics database and, for some cases, companies' financial reports. The search strategy included filtering the data in several steps within the following limitations: the type of the deal was set to exclusively mergers and acquisitions; the status of the deal should be completed-confirmed; time period of the deals was chosen on and after 01/01/2000 and up to and including 31/12/2015; the industry in which companies operate should be Oil and gas extraction (with a primary code 13 according to US SIC industry classification); the status of an acquiring firm should be a publicly traded company; deal value was set not less than 10 mil USD; and European Union and North America were chosen as a geographical region. Regarding, the last three filters, we limited the type of the company to only listed companies due to unavailability of many types of financial and other data for private companies. The minimum size of the deal was set in order to ensure that the investments that are made by companies represent purchases that are significant enough to make any financial difference. Finally, we had to limit the geographical scope of our research because the differences in economic development in different parts of the world could result in different outcomes for the companies situated in those countries. Namely, as oil and gas industry is usually affected by external factors, to which companies may have different reactions depending

on the country, to avoid biased interpretations of the results countries with close economic positions were chosen.

## Method of analysis and model specifications

The choice of the statistical model for the given research is based on the analysis of prior studies and refers to the methods applied by the authors in papers on similar problematics. To determine whether particular characteristics could affect financial performance of the companies, in majority of the analyzed works, the *multiple regression* models were applied (e.g., Barrera-Rey, 1995; Levin, 1981; Isaksen et al., 2007; Lahiri, Narayanan, 2013 and others). While conducting the studies, it was assumed that there is a linear relationship between explanatory and dependent variables. Thus, in our work, we also assume a linear relationship between financial performance and the selected parameters of M&A deals.

As the model that we will apply is the multiple regression model, the general regression equation will look as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \varepsilon_t ; \quad (1)$$

Where:

- $Y$  – dependent variable;
- $X_1, X_2 \dots X_n$  – independent variables;
- $\beta_0 \beta_1 \dots \beta_n$  – unknown parameter of the model;
- $n=1, 2 \dots N$  – number of an independent variable;
- $\varepsilon_t$  – random error.

The given equation is further adjusted according to particular parameters chosen for each of the financial indicators.

For the purposes of the research, testing of the independent variables will be conducted both by including all of the variables into a multiple regression model (except for dummy variables that divide the sample into two groups each) and, in case where the combination of particular variables would be incompatible and leading to insignificance of the overall model (leaving significant only one or several variables), the effects of the independent variables on the financial indicators will be tested in separate regression models. Such a choice is also explained by the fact that certain variables will represent primary interest for our research in terms of their impact on particular indicators compared to other independent factors that are less supported by the theory and, thus, should not affect the analysis of the other hypotheses.

## Description of Variables

### Dependent variables

Identifying appropriate financial measures for dependent variables is essential for the correct testing of the proposed hypotheses. After having analyzed additional literature on the financial performance measurement, we conclude that there are several dimensions of financial performance that are typically considered by scholars. Financial performance measures are split into the following categories:

- profitability;
- efficiency;
- liquidity and solvency;
- market investor ratios.

In Appendix 2, the list of financial indicators most frequently used by scholars is presented. Based on the purpose of use of each indicator and on the aspects of oil and gas industry, several indicators that will be presented further in this chapter were chosen to be used in the research.

There is an important consideration regarding the methods of using these measures that should be taken into account.

We cannot choose to work with absolute accounting-based measures such as EBITDA or net income since these measures can be influenced by the accounting methods or the financing of the studied M&A deals. The problem with such measures is that after M&A deal was completed, the target company is included into the acquirer's business. In case of full acquisitions and mergers, companies begin to prepare consolidated financial reports where the results of the acquired company are already included. Indeed, when a random list of companies was checked by the author, and figures from pre- and post-deal reports were compared, it turned out that the growth or decrease in the acquirer's numbers in many cases was similar to the difference between their separate figures before the M&A deal. Therefore, we suggest that using absolute accounting numbers for the acquiring company after the deal and checking if those numbers were caused by the fact of M&A, will not introduce reliability to the present study. For example, if we test our hypothesis that the size of the target company can influence acquirer's post-deal profitability indicators, we would get the most likely result that it did affect it only because the total size has increased. For this reasons, we will use such relative measures that would be able to include both increasing and decreasing value sides of acquirers and targets.

Another justification of variables selection method needs the following to be considered as well. In order to determine whether there was a particular influence of deals on the resulting financial performance, it is necessary to view those financial performance indicators under a dynamic perspective. That is, we need not only to find the post-deal performance indicators, but to measure how M&A deals affected the changes that occurred in those indicators. To provide an example, if we take some final profitability indicator of post-deal performance such as ROA, and then run a regression to determine the role of one of the independent variables in it, we will only find the relationship between the size, or the volume of profits, and the variable. However, it will not help us determine whether the actual ROA was growing or falling over that period. That is, in case if the M&A deal actually resulted in a decrease of profitability or efficiency, but in the post-deal records the value of the indicator is still big enough, it can lead to a wrong conclusion about the effectiveness of the deal itself. As it is impossible to know whether the financial performance improved or deteriorated without knowing the pre-deal values, the percentage change in the corresponding figures over time should be determined. Therefore, we will base our analysis on the actual changes between pre- and post-deal company performance.

Summing up, the two criteria for the dependent variables have been introduced: first, they should not be based solely on accounting measures of acquirers where the financial results of targets have been incorporated; and second, the difference between pre-deal and post-deal performance in all of the selected indicators should be used in order to understand both the effects of deals characteristics and the actual result of the deals themselves.

### ***Return on Assets (ROA)***

Return on Assets is one of the important profitability ratios and measures in terms of relationship between assets and net profits. ROA shows how profitable a company is relative to its total assets and how efficient management is in using its total assets to generate earnings. As a ratio, ROA is useful both for managers and investors as it shows how well the company can convert the investments made into its assets into profits ("Financial Performance Indicators", 2016).

ROA comprises earnings that are available to owners and interest to creditors, because assets are financed by both owners and creditors. Therefore, this ROA can be computed with the formula below:

$$ROA = (Net\ income / Total\ assets) \times 100 \quad (2)$$

### ***Return on Equity (ROE)***

Return on Equity is a measure that shows how effectively a company's management uses investors' funds. Increasing ROE means that the company management is growing its value at an acceptable rate. ROE is calculated in the following way:

$$\text{Return on Equity} = \text{Net Income}/\text{Shareholder's Equity} \quad (3)$$

Although both ROA and ROE measure a return, or an ability to generate earnings from the investments, they do not exactly have the same meaning. The key factor that separates ROE and ROA is financial leverage, or debt. According to the balance sheet fundamental equation: assets = liabilities + shareholders' equity. This equation indicates that if a company carries no debt, its shareholders' equity and its total assets will be the same. It follows then that their ROE and ROA would also be the same. However, if that company takes on financial leverage, ROE would rise above ROA. So the rule is as follows: when debt increases, equity contracts, and since equity is the ROE's denominator, ROE, in turn, shows an increase. At the same time, when a company takes on debt, the total assets - the denominator of ROA - increase. Therefore, debt increases ROE in relation to ROA ("Financial Performance Indicators", 2016).

### ***Price-Earnings Ratio (P/E)***

The Price-Earnings ratio is one of the most widely used market ratios for determining whether shares are "correctly" valued in relation to one another. As the name implies, to calculate the P/E, it is needed to take the current stock price of a company and divide by its earnings per share (EPS):

$$\text{P/E Ratio} = \text{Market Value per Share} / \text{Earnings per Share} \quad (4)$$

A company with a low P/E ratio indicates that the market perceives it as higher risk or lower growth or both as compared to a company with a higher ratio. A stock's P/E shows how much investors are willing to pay per dollar of their earnings. Another interpretation of the P/E ratio is a reflection of the market's optimism concerning a firm's growth prospects (Kaplan, 2012).

### ***Debt-to-Equity Ratio (D/E)***

Debt-to-Equity ratio is used to measure a company's financial leverage and is calculated by dividing a company's total liabilities by its stockholders' equity. The D/E ratio indicates how much debt a company is using to finance its assets relative to the amount of value represented in shareholders' equity. A high debt/equity ratio generally means that a company has been

aggressive in financing its growth with debt. Aggressive leveraging practices are often associated with high levels of risk which can decrease the attractiveness of the company for potential investors. The formula for calculating D/E ratios is represented in the following way:

$$\text{Debt-to-Equity Ratio} = \text{Total Liabilities} / \text{Shareholders' Equity} \quad (5)$$

### **Independent variables**

Below the selected measures for explanatory variables will be presented. The variables were chose according to the purpose of the research, that is, with the focus on deal-related characteristics, and within the limitations of data available for the research.

#### ***Size of the target company***

The size of the target company will be measured not in absolute, but rather in relative terms. It is necessary to reflect the relationship between the size of acquirer's investments and the resulting performance. As a measure for the size of the companies their pre-deal capitalization figures will be used. The two values will be used to estimate the corresponding coefficient in each particular case. Capitalization is determined as the market stock price times the number of shares outstanding:

$$\text{Capitalization} = \text{Market price for a stock} \times \text{Number of outstanding shares} \quad (6)$$

#### ***Method of payment***

The two primary methods of payment in M&A deals are payments with cash and with stock. Therefore, the sample of companies will be split into two groups: those where the deal was financed with stock and those where the acquirer paid with cash.

The special case is represented by the deals where the deal value was split and paid in different parts, with stock and cash. Therefore, we should not use a dummy variable to describe the method of payment. Instead, the percentage rates will be used. Thus, the amount of money that was paid with stock will be represented by the ratio from 0 to 1.

#### ***Acquired stake size***

For the variable representing the size of the bought stake, we will use the percentage values retrieved from the Zephyr database.

#### ***Type of Integration***

Vertical integration occurs when companies buy such assets that are related to the production of the other value chain steps than the one that an acquirer operates in. Horizontal integration implies buying assets that are similar by type to those of an acquirer or its core competitors.

In the sample that we retrieved, the information about industry and business of acquirers and targets is available. Therefore, if the industry subtype of a buying company is the same as that of the target company, then the deal will be considered a horizontal transaction. Consequently, if the deal subtypes are different, the integration will be considered vertical.

A dummy variable will take the value of 1 if the integration is vertical and a value of 0 if the integration is horizontal.

### **Control variables**

The independent variables introduced before represent characteristic of M&A primarily on the deal, company or industry level. To control for these specific characteristics, introducing additional variables that will control for the external factors, such as changes in the industry or economy, is necessary.

### ***Composite Leading Indicators***

To control for the most influential outside effects on the side of global demand and supply, we introduce Composite Leading Indicators (CLI) as a control variable. Composite Leading Indicators is a system developed by OECD in order to register and evaluate the ongoing situation in the global economy. CLI are used with regard to business cycles, that is, when the CLI indices decline from the long-term trend, it means that the economic declines can be expected. CLI in most cases follow the economic indicators, and frequently predict the subsequent increases or declines (OECD, 2016). The data for the European and US markets was retrieved from the OECD website.

## RESULTS AND DISCUSSION

In the present chapter, the results of the data analysis are presented and interpreted. First, the focus will be on the variables explaining the impact of a target size company, of the amount of shares acquired, of the method of payment, and of the type of integration grouped for all dependent variables. Afterwards, the discussion of the effects showing statistical significance will follow. Based on the prior discussion, the corresponding conclusions will be derived. Finally, limitations and practical implication of the study results will be discussed.

### Results

According to the developed set of hypotheses and the adapted model, 16 linear regressions were run. The significance of the models and variables was tested at the 95% confidence level. As all the variables were set as coefficients rather than absolute numbers, the resulting effects should be interpreted correspondingly, that is, the slope is also represented in coefficients in all cases.

Table 1 below summarizes the results obtained when the effects of the size of a target company were tested against the difference in companies' performance before and after the M&A deal.

**Table 1. Relationship between target company size and financial indicators**

Independent variable	Dependent variables	ROA	ROE	Price/Earnings	Debt/Equity
Target company size	<i>Constant</i>	2,60	-12	0,28	-0,07
	<i>Coefficient</i>	<u>0,27</u>	0,06	-0,11	0,36
	<i>R Square</i>	0,08	0,0	0,07	0,02
	<i>P-value</i>	<u>&lt;.05</u>	>.05	>.05	>.05
	<i>Observations</i>	110	110	110	110

The target size relative to the size of the acquirer as an independent variable is significant as its p-value falls within the threshold of .05. The variable has a positive coefficient (.27) which means that with an increase of the size of the target each 10 percent, the Return on Assets is expected to increase 2,7 percent as well. The results for the ROE, P/E, and D/E financial ratios failed to be statistically significant.

Therefore, we can accept the Hypothesis 1a, and reject the Hypotheses 1b-d.

Table 2 presents the results for the second independent variable, the method of payment relative to the financial performance indicators.

**Table 2. Relationship between the method of payment and financial indicators**

<b>Independent variable</b>	<b>Dependent variables</b>	<b>ROA</b>	<b>ROE</b>	<b>Price/Earnings</b>	<b>Debt/Equity</b>
Method of Payment: Stock	<i>Constant</i>	1,65	2,89	0,29	-0,66
	<i>Coefficient</i>	<u>0,37</u>	-0,21	<u>-0,19</u>	0,15
	<i>R Square</i>	0,06	0,08	0,06	0,01
	<i>P-value</i>	<u>&lt;.05</u>	>.05	<u>&lt;.05</u>	>.05
	<i>Observations</i>	110	110	110	110

The stock as a source of payment proved significant at the 95% confidence level for two dependent variables, namely ROA and Price-earnings ratios. Therefore the stock method argument holds for the two dependent variables. The variable has a positive slope in case of impact on ROA (.37) and a negative slope in case of Price-Earnings dependence (.19). For the ROE and Debt-to-Equity variables, the results have a p-value higher than .05 which makes them insignificant.

Based on these results, we can accept the next two Hypotheses, 2a and 2c, and reject the Hypotheses 2b and 2d.

In the Table 3, the results for the type of integration as an independent variable are summarized.

**Table 3. Relationship between the type of integration and financial indicators**

<b>Independent variable</b>	<b>Dependent variables</b>	<b>ROA</b>	<b>ROE</b>	<b>Price/Earnings</b>	<b>Debt/Equity</b>
Type of Integration: Vertical	<i>Constant</i>	1,86	2,02	0,52	1,23
	<i>Coefficient</i>	-0,13	-0,35	0,16	-0,23
	<i>R Square</i>	0,02	0,07	0,04	0,01
	<i>P-value</i>	>.05	>.05	>.05	>.05
	<i>Observations</i>	110	110	110	110

The third, dummy, variable showed to be insignificant at the threshold of 95% level. Although the coefficients of the variable are higher than 10 percent in each case, the overall effect was too contradicting to determine any significant relationship. Therefore, the Hypotheses 3a-d do not hold and should be rejected.

Table 4 presents the results for the fourth explanatory variable, namely the size of acquired stock. Like the previous case, this variable does not prove to be statistically significant at explaining or predicting the changes in financial performance following M&A deals.

**Table 4. Relationship between acquired stake size and financial indicators**

Independent variable	Dependent variables	ROA	ROE	Price/Earnings	Debt/Equity
Size of Acquired Stake	<i>Constant</i>	1,60	1,70	0,73	0,88
	<i>Coefficient</i>	0,23	0,20	-0,16	0,28
	<i>R Square</i>	0,01	0,05	0,03	0,01
	<i>P-value</i>	>.05	>.05	>.05	>.05
	<i>Observations</i>	110	110	110	110

In the following subchapter, we continue with these results, discussing the effects that proved significant as a result of data analysis.

## Interpretations

The obtained results provide a vast field for discussion as they not only approved several of the formulated hypotheses, but also opened up some issues previously not included into the study.

The primary focus in the discussion of the results below will be placed on the statistically significant relationships, however, those hypotheses that were not significant will also be considered.

### *Target size*

Regarding the predictive relationship between the size of the companies that acquirers buy or invest into, and the following companies' performance, the positive result was identified for the changes in ROA ratio. This finding is in line with the previous theories and scholars' views (e.g., Seth, 1990). As argued by Leland (2007), to offer a sufficient level of potential, the acquisition should be of a substantial "critical mass" relative to the size of the acquirer's business. Indeed, as our findings imply, small enough companies could not contribute to companies' returns as it was done by bigger targets. Moreover, from a managerial point of view, M&A deals with smaller companies may receive not sufficient attention from management of the company and, therefore, the potential benefit of the deal would remain unrealized (Ravenscraft and Scherer, 2011).

There can be several possible explanations to the reason why the relative size of the target can cause, even though to a limited extent, the increase in the acquiring company's Return on Assets ratio.

If we look at the composition of the financial ratios, it becomes apparent that in order for any increase to be observed, either the profitability of the company should grow, or the amount of

assets should decrease relative to the earnings. According to the returns of scale and synergy theories, the bigger size of two companies can help achieve higher returns than if the two companies were operating separately (Tuch and O'Sullivan, 2007). According to Healy et al. (1992) companies that were merged have significant improvements in their efficiency and productivity after the M&A deal. Therefore, one of the reasons of the increase can be in the achieved efficiency and economies of scale.

Another explanation for the positive slope is in the difference between ROA ratios of acquiring and target companies. In a situation, when a company buys another company whose Return on Assets is significantly higher than that of the acquirer, then the resulting common return will be increasing making a figure between pre-deal targets' and acquirer's returns. To make a ROA of a target company positive, which can attract investors, it takes its return to be high. As the return is composed from a company's revenues and expenditures, most frequently, it means that the target company maintained an effective cost management system. And the latter, is often what an acquiring oil and gas company is looking for.

Regarding the effects of the company size on the ROE ratio, contrary to the theoretical expectations (Bruner, 2004; Ismail et al., 2011), the outcome effect showed to be insignificant. The result can be explained by the different structure of ROA and ROE indicators both acquirers and targets. Whereas ROA reflects the return on both liabilities and shareholders' equity, ROE shows returns relative only to the equity. So the effect on ROA and ROE can be different in case when the Equity side was affected compared to the Total Assets. If the return and liabilities are unchanged and the equity increased, the Return on Equity obviously increases. So when two companies merge, in accounting terms, the initially bigger equity of the target can increase the overall amount of equity of the combined firm, and thus prevent the ROE ratio from growing. Indeed, as it was noted by HIS (2016) in oil and gas industry targets with relatively high equity ratios are more attractive as high leverage can be especially risky to undertake.

The size of the target company as an explanatory variable also did not hold within the 95% confidence level when tested with Price-to-Earnings and Debt-to Equity ratios. As P/E ratio is a market ratio, it represents the reaction of the investors to the news about the M&A deal. According to the widely-known market efficiency theory elaborated by Eugene Fama (1970), the assets prices in the market reflect all the available information about those assets. It also suggests that prices can self-adjust reacting to the new information. So one of the explanations of the negative result can be that in case of M&A deals the prices in P/E ratio have already reacted to

the future potential earnings and, thus, did not increase significantly after the deal. This is especially the case when rumors about the deal appear long before the official announcement.

The theoretical assumption regarding the D/E ratio was that paying for the share in a bigger company can require many companies to increase their leverage taking new loans. Indeed, sometimes acquirers undertake transactions with targets that are even bigger than themselves (Ahern, 2010). However, the long term performance does not show any significant deterioration in the D/E ratio.

### ***Method of payment***

Choosing a source of payment represents an interesting case when a company can affect its balance sheet and stock market performance by actions that are not connected with their primary business. The results of the regression models show a positive relationship between paying with a company's stock and its future ROA ratio (.37) and a negative one between stock payments and company's Price-Earnings ratio (-.19).

The positive result for the ROA ratio suggests that the prior assumptions about its impact on profitability were correct. In general, this result falls into the rules of accounting. As it is known, the balance sheet of companies contains assets of the company on its left side, and liabilities and shareholder funds on its right side (Kaplan, 2012). The core accounting equation is as follows: total assets = liabilities + equity. So when oil and gas producers want to buy another company they have a choice either to pay with its cash, that is, the assets side, or with its stock, that is its equity and liabilities side. Therefore, when acquirers pay for the ownership in target companies, giving away their stock, the right side of their balance sheet decreases on the amount money equal to the price paid for the stock of the target company.

However, this practice turns out to have a drawback reflected in the market reaction. According to the theory of stock market driven acquisitions (Shleifer's and Vishny, 2003), M&A deals are often financed with stock to some extent because acquiring managers believe that the shares of their company are overvalued. Further, if acquirers' stock is overvalued before the M&A deal, then at some point the market corrects its price. When it happens, the value of the company's assets, in particular its stock, decrease proportionally. Consequently, the decrease in the assets part of the ROA ratio brings it to a bigger value.

Contrary to the theoretical expectations, the effects of the method of financing on ROE and D/E ratios did not prove significant at the 95% confidence level. According to the observations in the existing literature, when companies pay in cash rather than in stock, they have to take additional

loans because many of them do not have sufficient cash reserves especially for big deals and because using those reserves would decrease their current ratios (Rappaport and Sirower, 1998). Therefore, payments with stock would have an inverse effect to that of payments in cash. However, the result did not support this hypothesis

### ***Size of acquired stake and Type of integration***

The degree of corporate control reflected in the size of the stake that is acquired was assumed to be positively correlated with and affect the subsequent financial performance (e.g. Rani et al., 2015). In general companies look to acquire sufficiently big stakes to gain a certain degree of operating control and thus improve the performance (Bain, 2015).

However, the explanatory variable in the corresponding models did not show significant effect on the ration. Such a result can be connected to the specificity of oil and gas industry, namely, that managerial issues can be less reflected in the financial performance than they are in other industries. Oil and gas industry refers to ‘heavy production’ and resource dependent business. This implies that more than on the extent of organizational influence the financial performance depends on the external factors, which was reflected by the insignificant coefficients in the models. To support this idea, the chosen control variable representing global economic changes was significant and positively related to the changes in most of the models.

Regarding the type of integration, the theoretical assumption as well did not prove realistic. According to Isaksen (2011), this may be a result of the fact that in oil and gas industry there is the subdivision into the three sectors (upstream, midstream and downstream) that are sometimes behaving like separate industries within one, compared to other industries previously discussed by authors.

## **Practical and theoretical implications**

The present study provides results that are applicable to the current M&A issues in the oil and gas industry that need a managerial solution. The study also provides the existing theory with new question that should be considered, for instance, in research on management strategy of integrating companies. The analysis made in the present paper can be useful for the following categories of users:

- First of all, executive and operational management of oil and gas companies who are considering mergers or acquisitions of other oil and gas firms. Knowing the effects of

particular options that they choose with the contracting party on the future financial ratios can first, help avoid undesired risks and smoothen some negative effects, and second, achieve a better effect in their financial performance.

- Second, outside investors for whom it would be useful to realize more about the changes in the accounting ratios of oil and gas companies that occur after mergers and acquisitions.

The following recommendations can be given to oil and gas company management who consider participation in M&A deals:

- All else being equal, consider acquiring relatively large targets compared to your own company size and the one that has a higher efficiency ratios.

Return to scale can be bigger depending on the size of the business as well as on the ability of the target firm to manage its costs.

- All else being equal, choose stock financed method of payment if you have reasons to believe that your company's share price is being overvalued.

Paying with stock when the share price is undervalued can result in a situation when an acquirer actually has to give away more than it could. The market efficiency theory may be not always working perfectly, however, the market can adjust its prices according to the new incoming information, and in this case, the acquirer's P/E ratio can experience the corresponding decline in future.

## **Limitations and future research**

The present study was followed by certain limitations, especially on the stages of data gathering. The first limitation of the study results from the fact that a big part of the M&A deals involved private companies as targets. As it is known, financial assessment of the performance of private companies is especially tricky because legally they are not obliged to provide their financial information for a public access. As a result, the data for the chosen sample of deals over the period from 2000 to 2015 was not available for most of the target companies. In many cases, no accounting or market value data for those private companies could be found. Therefore, taking into account the number of required variables, the initial sample of 1,132 deals has shranked to 110 deals.

Another limitation follows from the previous one and is connected to data gathering issues. Namely, the range of independent variable that could be considered for the study was limited to

the amount of information that could be gathered. This resulted, in part, in relatively low R square which could be higher in case if more characteristics were included into the model.

Based, on the limitations of the present study, there is a room for the future scientific research to be done with regard to different industries, wider samples or different countries. One of the suggestions is to look more closely on the range of variables and to consider such strategically oriented decisions as, for example, replacement of the executive management of the target company after the deal, or exchange rate fluctuations resulting in opportunities or threats for acquiring companies.

## **CONCLUSION**

Present research paper was aimed to determine the relationship between mergers and acquisitions deals on financial performance of acquiring companies. As a result of the literature analysis, it was found that among the studies on this topic the results are contradicting and, while some of them identify a certain positive or negative relationship, the majority of them provide mixed results depending on the variables that are tested. Regarding particular factors that can affect the financial results, the following ones are supported by the corresponding theory. First, the size of the target company was assumed to influence financial performance positively due to returns-to-scale. Second, the method of payment, and more specifically, stock, was assumed to increase financial ratios compare to cash payments. Third, vertical integration was assumed to result in higher efficiency and increase financial indicators. And fourth, the size of acquire stake was assumed to result more effective governance due to a higher control and thus improve the performance. Based on the chosen variables, and formulated hypotheses, 16 linear regression models were constructed and implemented.

The results of the empirical study allowed to confirm three hypotheses. Namely, the target company size has a positive impact on ROA ratio; stock as a source of payment also showed to have a positive effect on ROA whereas a negative impact on P/E ratio. After the results were obtained and explained both relative to the initial theory and practical implementation. Managerial applicability was explained and several of the recommendations were to choose stock as a method of financing if the company's stock is overvalued, and to target relatively big companies as it has a potential of creating additional returns to scale. Finally, the research limitations and the scope for future research were also discussed.

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## APPENDICES

### Appendix 1. Financial performance indicators

Financial indicator	Source
<b>Profitability</b>	
EBIT <i>(Revenue - Operating Expenses)</i>	Gugler et al., 2003; Thanos, Papadakis, 2010, 2012; Rani et al., 2015
EBITDA <i>(Revenue - Expenses + Tax, Interest, Depreciation and amortization)</i>	Siegel, Simons, 2010
GPM <i>(Gross profit / Revenue)</i>	Rahman, Lambkin, 2015
NPM <i>(Net income / Revenue)</i>	Liargovas, 2011;
<b>Efficiency</b>	
ROA <i>(Net income / Total assets)</i>	Bertrand, Betschinger, 2011; Kalakkar, 2012; Moctar, Xiaofang, 2015
ROE <i>(Net income / Total equity)</i>	Bruner, 2004; Mboroto, 2013
ROCE <i>(Net profit / Capital employed)</i>	Rani et al., 2015
<b>Liquidity</b>	
CR <i>(Current assets / Current liabilities)</i>	Krishnakumar, Madhvi, 2012
QR <i>(Current assets - Inventories / Current liabilities)</i>	Mboroto, 2013
<b>Solvency</b>	
Gearing <i>(Total debt / Total equity)</i> ; or <i>(Total debt / Total assets)</i>	Ferrer, Tang, 2012; Bertrand, Betschinger, 2011
Interest cover <i>(EBIT / Interest paid)</i>	Viverita, 2008; Kalakkar, 2012
<b>Investor ratios</b>	
P/E <i>(Market share price / Earnings per share)</i>	Aybar, A. Ficici, 2009; Moctar, Xiaofang, 2015
EPS <i>(Net income - Dividends / Number of shares)</i>	Gelles, Douglas, 1996; Joash, Njangiru, 2015

Source: author's compilation based on the literature review

## Appendix 2. Academic research on M&A-Performance relationship (Extract)

Author	Year	Research question	Sample	Research method	Result
D.S. Siegel K.L. Simons	2010	Increase in performance of the acquirer; Increase in performance of the plant; A partial acquisition leads to a higher performance than a full acquisition	16,000 plants, 9,400 firms	Regression	<ul style="list-style-type: none"> <li>• No effect confirmed</li> <li>• Value created</li> <li>• Value created</li> </ul>
N. Rani, S.S. Yadav, P.K. Jain	2015	Increase in financial performance by fin. ratios	383 deals	Paired t-tests	<ul style="list-style-type: none"> <li>• Value created</li> </ul>
Robert. F. Bruner	2004	Investment returns from M&A are higher than the required returns	12 surveys and 120 scientific studies	Qualitative	<ul style="list-style-type: none"> <li>• Value created (Target - sizable positive market returns; bidders, with exceptions, – zero adjusted returns; bidders and targets combined – positive adjusted returns)</li> </ul>
O. Bertrand M.-A. Betschinger	2011	Improvement in the economic performance	609 acquirers. Russian. 2000-2008	Regressions	<ul style="list-style-type: none"> <li>• Value deteriorated</li> </ul>
K. Gugler, D.C. Mueller, B. Burcin Yurtoglu, C. Zulehner	2003	Mergers result in significant increases in profits. Mergers result in significant increases in sales.	1265	T-tests, event study	<ul style="list-style-type: none"> <li>• Value created</li> <li>• No effect confirmed</li> </ul>
S. Kalakkar	2012	Increase in financial performance	109 deals	Regressions	<ul style="list-style-type: none"> <li>• Value created (Income growth)</li> <li>• Value deteriorated (others)</li> </ul>
G.O. Joash, M.J. Njangiru	2015	Increase in shareholders' value in acquiring companies	14 banks, 2000-2014	Interviews, regression	<ul style="list-style-type: none"> <li>• Value created</li> <li>• Value created</li> </ul>
P.Liargovas	2011	Positive impact on financial indicators	26 banks, 1996-2004, Greece	Paired t-tests	<ul style="list-style-type: none"> <li>• Value deteriorated</li> </ul>
R.C. Ferrer, A. Tang	2012	Effects on stock price	94 companies, 2006-2010	Panel data regression	<ul style="list-style-type: none"> <li>• Value created (Asset turnover, P/E, Dividend payout)</li> <li>• No (all others)</li> </ul>
N.B. Moctar, C. Xiaofang	2014	Effects on liquidity, performance and investment valuation	4 banks	Comparison (case study)	<ul style="list-style-type: none"> <li>• Confirmed</li> </ul>

Source: author's compilation based on the literature review

### Appendix 3. Statistical model outputs

#### Size of the target company and ROA ratio

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,281341
R Square	0,079153
Adjusted R Square	0,061941
Standard Error	1,560709
Observations	110

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	22,40297	11,20149	4,598667	0,012135
Residual	107	260,6318	2,435812		
Total	109	283,0348			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	2,599761	0,480867	5,406399	3,94E-07	1,646498	3,553025	1,646498	3,553025
Size	0,274689	0,117457	1,998081	0,043245	0,001844	0,467534	0,001844	0,467534
CLI	0,235638	0,122351	1,92592	0,056768	-0,00691	0,478184	-0,00691	0,478184

#### Method of payment and ROA ratio

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,248431
R Square	0,061718
Adjusted R Square	0,04418
Standard Error	0,822017
Observations	110

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	4,755822	2,377911	3,519118	0,0331
Residual	107	72,30122	0,675712		
Total	109	77,05704			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	1,652067	0,258935	6,380226	4,63E-09	1,138757	2,165376	1,138757	2,165376
CLI	0,211661	0,123926	1,707964	0,090543	-0,03401	0,45733	-0,03401	0,45733
Stock	0,375124	0,165025	2,273135	0,025015	0,047981	0,702266	0,047981	0,702266

## Acquired stake and ROA ratio

### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,140502
R Square	0,019741
Adjusted R Square	0,001418
Standard Error	0,840204
Observations	110

### ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	1,521178	0,760589	1,077409	0,344141
Residual	107	75,53586	0,705943		
Total	109	77,05704			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	1,596579	0,433942	3,679244	0,000368	0,73634	2,456819	0,73634	2,456819
Acquired stake (%)	0,230995	0,382949	0,6032	0,547652	-0,52816	0,990147	-0,52816	0,990147
CLI	0,235684	0,127053	1,855004	0,066349	-0,01618	0,487552	-0,01618	0,487552

## Type of integration and ROA ratio

### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,213621
R Square	0,045634
Adjusted R Square	0,027795
Standard Error	1,061304
Observations	110

### ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	5,762853	2,881426	2,55816	0,082177
Residual	107	120,5213	1,126367		
Total	109	126,2841			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-21,8426	11,25485	-1,94073	0,054922	-44,154	0,468838	-44,154	0,468838
Vertical	-0,21871	0,245009	-0,89265	0,374047	-0,70441	0,266994	-0,70441	0,266994
CLI	0,233127	0,112262	2,076631	0,040231	0,01058	0,455673	0,01058	0,455673

## Size of the target company and ROE ratio

### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,270631
R Square	0,073241
Adjusted R Square	0,055919
Standard Error	0,803309
Observations	110

### ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	5,456803	2,728402	4,228074	0,017089
Residual	107	69,04774	0,645306		
Total	109	74,50455			

	<i>Coefficients</i>	<i>Standard</i>		<i>P-value</i>	<i>Lower</i> 95%	<i>Upper</i> 95%	<i>Lower</i> 95,0%	<i>Upper</i> 95,0%
		<i>Error</i>	<i>t Stat</i>					
Intercept	-22,0358	8,519747	-2,58644	0,011041	-38,9252	-5,14641	-38,9252	-5,14641
Size	0,055546	0,060447	0,918916	0,360206	-0,06428	0,175374	-0,06428	0,175374
CLI	0,232878	0,084989	2,74011	0,007198	0,064398	0,401358	0,064398	0,401358

## Method of payment and ROE ratio

### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,277371
R Square	0,076935
Adjusted R Square	0,059681
Standard Error	0,801707
Observations	110

### ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	5,731987	2,865993	4,459065	0,013802
Residual	107	68,77256	0,642734		
Total	109	74,50455			

	<i>Coefficients</i>	<i>Standard</i>		<i>P-value</i>	<i>Lower</i> 95%	<i>Upper</i> 95%	<i>Lower</i> 95,0%	<i>Upper</i> 95,0%
		<i>Error</i>	<i>t Stat</i>					
Intercept	-21,0662	8,556561	-2,46199	0,015413	-38,0286	-4,10381	-38,0286	-4,10381
CLI	0,222902	0,085414	2,609651	0,010361	0,053578	0,392226	0,053578	0,392226
Stock	0,18289	0,161911	1,129571	0,261183	-0,13808	0,503861	-0,13808	0,503861

## Acquired stake and ROE ratio

### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,223362
R Square	0,049891
Adjusted R Square	0,032132
Standard Error	0,813367
Observations	110

### ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	3,717083	1,858541	2,80931	0,044697
Residual	107	70,78746	0,661565		
Total	109	74,50455			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	1,700607	0,420081	4,048279	9,78E-05	0,867844	2,533369	0,867844	2,533369
Acquired stake (%)	0,200116	0,370717	0,539808	0,590451	-0,53479	0,935019	-0,53479	0,935019
CLI	0,23314	0,086518	2,694696	0,008183	0,061628	0,404653	0,061628	0,404653

## Type of integration and ROE ratio

### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,293957
R Square	0,086411
Adjusted R Square	0,069334
Standard Error	0,797581
Observations	110

### ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	6,437996	3,218998	5,060236	0,007947
Residual	107	68,06655	0,636136		
Total	109	74,50455			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-22,0717	8,458139	-2,60952	0,010365	-38,8389	-5,30439	-38,8389	-5,30439
Vertical	-0,28519	0,184127	-1,54887	0,124365	-0,6502	0,079821	-0,6502	0,079821
CLI	0,234183	0,084366	2,775791	0,006502	0,066937	0,401429	0,066937	0,401429

## Size of the target company and P/E ratio

### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,261931
R Square	0,068608
Adjusted R Square	0,051199
Standard Error	1,15798
Observations	110

### ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	10,56884	5,284418	3,940896	0,022315
Residual	107	143,4782	1,340918		
Total	109	154,0471			

	<i>Standard</i>			<i>P-value</i>	<i>Lower</i>	<i>Upper</i>	<i>Lower</i>	<i>Upper</i>
	<i>Coefficients</i>	<i>Error</i>	<i>t Stat</i>		<i>95%</i>	<i>95%</i>	<i>95,0%</i>	<i>95,0%</i>
Intercept	0,282428	0,356783	0,791594	0,430349	-0,42485	0,989709	-0,42485	0,989709
Size	-0,1177	0,087148	-1,35055	0,17969	-0,29046	0,055063	-0,29046	0,055063
CLI	-0,15854	0,097689	-1,62288	0,107558	-0,3522	0,035119	-0,3522	0,035119

## Method of payment and P/E ratio

### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,246004
R Square	0,060518
Adjusted R Square	0,042958
Standard Error	1,162998
Observations	110

### ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	9,322637	4,661318	3,446281	0,035443
Residual	107	144,7244	1,352565		
Total	109	154,0471			

	<i>Standard</i>			<i>P-value</i>	<i>Lower</i>	<i>Upper</i>	<i>Lower</i>	<i>Upper</i>
	<i>Coefficients</i>	<i>Error</i>	<i>t Stat</i>		<i>95%</i>	<i>95%</i>	<i>95,0%</i>	<i>95,0%</i>
Intercept	0,292794	0,366344	0,799231	0,425927	-0,43344	1,019029	-0,43344	1,019029
CLI	-0,13971	0,09815	-1,42341	0,157528	-0,33428	0,054864	-0,33428	0,054864
Stock	-0,19788	0,233479	-0,94176	0,048438	-0,68273	0,242964	-0,68273	0,242964

## Acquired stake and P/E ratio

### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,17866
R Square	0,031919
Adjusted R Square	0,013824
Standard Error	0,932972
Observations	110

### ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	3,070875	1,535438	1,763986	0,176307
Residual	107	93,13668	0,870436		
Total	109	96,20755			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	0,73099	0,481854	1,517035	0,132207	-0,22423	1,68621	-0,22423	1,68621
Acquired stake (%)	-0,16087	0,425231	-0,37831	0,705952	-1,00384	0,682103	-1,00384	0,682103
CLI	-0,16453	0,094737	-1,73675	0,085309	-0,35234	0,023271	-0,35234	0,023271

## Type of integration and P/E ratio

### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,188929
R Square	0,035694
Adjusted R Square	0,01767
Standard Error	0,931151
Observations	110

### ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	3,434044	1,717022	1,980321	0,143052
Residual	107	92,77351	0,867042		
Total	109	96,20755			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	0,517332	0,296252	1,746256	0,083636	-0,06995	1,104617	-0,06995	1,104617
Vertical	0,163082	0,217435	0,750024	0,454886	-0,26796	0,594121	-0,26796	0,594121
CLI	-0,16746	0,093266	-1,79556	0,075388	-0,35235	0,017425	-0,35235	0,017425

## Size of the target company and D/E ratio

### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,132518
R Square	0,017561
Adjusted R Square	0,00802
Standard Error	5,227953
Observations	110

### ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	52,27444	26,13722	0,956304	0,28757
Residual	107	2924,47	27,33149		
Total	109	2976,744			

	<i>Standard</i>			<i>P-value</i>	<i>Lower</i>	<i>Upper</i>	<i>Lower</i>	<i>Upper</i>
	<i>Coefficients</i>	<i>Error</i>	<i>t Stat</i>		<i>95%</i>	<i>95%</i>	<i>95,0%</i>	<i>95,0%</i>
Intercept	-0,07327	1,610776	-0,04549	0,963805	-3,26644	3,11991	-3,26644	3,11991
Size	0,361788	0,39345	0,919528	0,259888	-0,41818	1,141756	-0,41818	1,141756
CLI	0,039014	0,099565	0,391844	0,195953	-0,15836	0,23639	-0,15836	0,23639

## Method of payment and D/E ratio

### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,113572
R Square	0,012899
Adjusted R Square	0,068433
Standard Error	0,859204
Observations	110

### ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	0,964666	0,482333	0,653363	0,1225
Residual	107	73,82315	0,738231		
Total	109	74,78781			

	<i>Standard</i>			<i>P-value</i>	<i>Lower</i>	<i>Upper</i>	<i>Lower</i>	<i>Upper</i>
	<i>Coefficients</i>	<i>Error</i>	<i>t Stat</i>		<i>95%</i>	<i>95%</i>	<i>95,0%</i>	<i>95,0%</i>
Intercept	-5,66936	10,51702	-0,53907	0,59104	-26,5348	15,1961	-26,5348	15,1961
Stock	0,153664	0,18008	0,853308	0,195528	-0,20361	0,510938	-0,20361	0,510938
CLI	0,068316	0,104914	0,651166	0,316433	-0,13983	0,276461	-0,13983	0,276461

## Acquired stake and D/E ratio

### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,080657
R Square	0,006506
Adjusted R Square	0,012064
Standard Error	0,938759
Observations	110

### ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	0,617461	0,30873	0,350325	0,205264
Residual	107	94,29564	0,881268		
Total	109	94,9131			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	0,880968	0,484843	1,817018	0,072013	-0,08018	1,842113	-0,08018	1,842113
Acquired stake (%)	0,281104	0,427868	0,656987	0,5126	-0,5671	1,129303	-0,5671	1,129303
CLI	0,001744	0,003358	0,519418	0,204542	-0,00491	0,0084	-0,00491	0,0084

## Type of integration and D/E ratio

### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,123108
R Square	0,015156
Adjusted R Square	0,003253
Standard Error	0,931779
Observations	110

### ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	1,429596	0,714798	0,8233	0,241742
Residual	107	92,8986	0,868211		
Total	109	94,3282			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-1,32265	9,881264	-0,13385	0,093769	-20,9111	18,2658	-20,9111	18,2658
Vertical	-0,26968	0,215107	-1,25371	0,212678	-0,69611	0,156742	-0,69611	0,156742
CLI	0,001194	0,003385	0,252767	0,424957	-0,00552	0,007904	-0,00552	0,007904