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Master in Corporate Finance

The evaluation of middle-term influence of M&A deals on market performance in Oil and Gas industry in the USA

Master's Thesis by the 2nd year student
Concentration — Corporate Finance
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ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

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АННОТАЦИЯ

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Название магистерской диссертации	Оценка среднесрочного влияния сделок слияний и поглощений на рыночные показатели компаний в нефтегазовом секторе США
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Описание цели, задач и основных результатов	Исследования о влиянии сделок слияний и поглощений являются одной из наиболее обсуждаемых и исследуемых тем среди теоретиков в финансовых научных кругах. Кроме того исследования по этой теме могут дать релевантные рекомендации для практиков – менеджеров компаний, инвесторов и других участников рынка. Целью этой магистерской диссертации является выявление оценка среднесрочного влияния сделок по слиянию и поглощению на рыночные показатели в нефтегазовом секторе по средством эмпирического анализа. Для достижения этой цели были изучены данные о сделках на американском рынке нефтегазового сектора. Были сформированы предположения о взаимосвязях переменных, которые также тестировались на значимость с помощью эмпирического метода. Кроме того были изучены предшествующие работы на тему влияния сделок слияния и поглощения на рыночные и финансовые показатели компаний. Для оценки влияния в качестве главного эмпирического инструмента был выбран метод динамических портфелей. В качестве метода оценки значимости взаимосвязей был выбран регрессионный анализ. На основе полученных результатов были сформированы выводы и рекомендации. Результаты работы демонстрируют значительный совокупный положительный эффект от сделок слияний и поглощений на рыночные показатели в моменты подъема рынка и роста цены на нефть. И малую эффективность в периоды спада рынка. Цена на нефть в свою очередь показали негативную взаимосвязь с количеством сделок на нефтегазовом рынке США.
Ключевые слова	Сделки слияния и поглощения, рыночные показатели, среднесрочное влияние, нефтегазовый рынок

ABSTRACT

Master Student's Name	Maksim A. Nozhenko
Master Thesis Title	The evaluation of middle-term influence of M&A deals on market performance in Oil&Gas industry in the USA
Faculty	Graduate School of Management
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Description of the goal, tasks, and main results	Among studies in finance, the impact of mergers and acquisitions is one the most discussed and studied topics for researchers. In addition, this kind of topic provides essential recommendations for business part - managers, investors and other market participants. The key goal of this master's thesis is to estimate the medium-term impact of mergers and acquisitions on market performance in the oil and gas sector of USA by using empirical analysis. To achieve this goal, we analyzed data of M&A transactions in oil and gas sector in the USA. Also, we implied two assumptions about the correlation of the variables, which were also tested for significance by the empirical method. In addition, were reviewed previous papers about the influence of M&A on market and operating performance. The method of dynamic portfolios was chosen as the main empirical tool for influence estimation and regression analysis for estimation of relations' significance. The results of the work showed the positive effect of M&A deals on market performance at the periods of market's growth, and less efficiency in periods of market recession. Also, we found the negative increasing amount of deals at the period of low oil price.
Keywords	M&A, Oil&Gas, market performance, dynamic portfolio

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Introduction

The effectiveness of transactions on the transfer of corporate control remains one of the central themes in the academic finance works of recent years. Evaluation of the influence M&A transactions is necessary for improving the quality of financial justification for mergers and acquisitions and growth value of companies as a result of M & A.

For the last 6 years, the M&A market recovered after crisis 2008. According to Institute For Merger, Acquisition & Alliances, the turnover of M&A transactions from 1985 to 2016 achieved more than 33 bills. USD in the result of more than 300 000 deals.

The growth in activity of the M & A market forced to increase the number of studies that examine the effectiveness of data transactions and factors that determine the success of mergers and acquisitions. The problem of mergers and acquisitions is actively discussed not only in academic literature but in business and press publication as well. In recent years, it has become particularly relevant in view of the growing uncertainty in the financial markets, as well as the unprecedented global investment transactions, many of which have proved unsuccessful.

Despite that M&A market includes almost all industries, some of them should be considered as special cases. Such industry is oil and gas sector. This sector has some own specificity. The oil and gas industry, which is chosen by paper's author for research is one of the most significance industries for the world economy. It is the key industry for a whole pool of countries, especially which keeps to the export-oriented economy. The sector expects the stable flow of investments on more than 25 trillion $ US during 2015-2040 years. Oil accounting more than 10 % of world commodity market, more than any other commodity. The volatility of oil prices has a direct and crucial impact on GDP, geopolitical relationship or on growth and developing on the economic environment in the whole world. Moreover, oil is a bargaining chip for a huge number of market's participant. What is mean that the paper could be useful for markets participants also, not only for investors or managers.

Oil is not an only macroeconomic indicator, this commodity could also consider as determinant which has a direct impact on M&A market. The influence of oil price on M&A market force companies to change their policy in term of deals. History shows, that after the moment when oil prices reach their minimum values, usually, the oil industry experiences the growth in number deals of mergers and acquisition. Oil prices fell in the early 1980s and late 1990s, and in both cases, this led to an increasing in M&A transactions in the industry. Decreasing in prices in the mid-2000's led to the fact that large companies began to acquire small ones. And now, when oil prices have fallen by 40% since June 2014 and then slightly normalized, the industry expects an increasing number of deals. M&A market is expected to revive thanks to positive changes (based, among other things, on OPEC decisions) in investor moods. Although the price of $ 60 per barrel does not push investors to

a sharp rise in activity in the market, a certain confidence in further positive growth exists. Strong players, tuned to the "bullish" trend of oil prices, will find enough amounts of attractive offers, which allow hoping on increasing in the number of transactions.

The U.S. oil and gas industry (O&G) has experienced a tremendous amount of growth in the last decade or so due to the development of horizontal drilling and fracking technology. In the meantime, the industry has experienced heavy merger and acquisition (M&A), especially in the upstream sectors. While these M&A activities may be related to the aggregate M&A waves in the country, they are unique in their own respect. We recognize that the M&A activities in the energy industry in general, the oil and gas sectors in particular, can be different from the traditional sense of the M&A activities.

It is of particular interest to research the middle-term effect from using M&A by companies during periods of a large drop in oil prices (2008-2009,2014-2016) and high volatility. This paper aims to explore the influence of middle-term impact of M&A on market performance in Oil&Gas industry.

Key goal:

- To estimate the middle-term market performance from M&A transactions in Oil&Gas industry of USA and explain results via external factors.

The several tasks were identified in this work:

- To identify the M&A process, consider main historical and present trends for the last years.
- To analyze empirical and theoretical research about influence of M&A papers on performance in Oil and Gas industry
- To analyze approaches of previous papers and justify dynamic portfolio approach.
- Collect data for relevant analysis
- To estimate cumulative abnormal return by using a dynamic portfolio approach.
- To test the relations on significance by using regression analysis

The paper includes both theoretical and practical parts. Theoretical part consists of topic's justification and literature review. From the point of the author, it is relevant to review previous cases from different countries and sector for understanding main direction for research. Another part of literature review concentrated on overview of approaches which were used for estimation of the influence of M&A on operating and market performance. The reason why both operating and market performance were observed is a desire to understand what limitation of each performance could be.

The empirical part consists of two main pieces. In the first, we going to estimate cumulative average abnormal return (CAAR) of two portfolios as the main indicator of the influence of M&A deals. The idea of dynamic portfolio approach is to create two portfolios

of companies, return of which will be summed for estimation of the influence of M&A transactions. The result of this piece is the CAAR graph. For an explanation, we going to plot CAAR with external factors such as oil price, the return of companies from S&P 500 index (in oil and gas sector) and a number of deals for the same period.

We going to conduct regression analysis in order to estimate the significance of relations between factors which were listed before. For this analysis 2 assumptions were formulated:

- The cumulative abnormal return of two portfolios has significant positive relation with Oil&Gas indexes.
- There is a negative relationship between Oil price and the number of M&A deals in Oil and Gas sector in the USA.

Finally, the paper aims to make the recommendations for investors and management of oil and gas companies to perform M&A depending on market's condition

Chapter 1. Theoretical review of empirical and fundamental M&A research

1.1. Definition of M&A

Mergers and acquisitions are significant and complex corporate actions. In recent years, there has been a strong increasing in a number and volume of mergers and acquisitions in the world. The rapid increasing in the number and volume of M & A transactions at the international level happened also due to the involvement of a large number of regions and the expansion of the scope of international transactions (Khusainov, 2008).

The traditional concept of M&A means the merging of two companies to form a new venture (merger) or the acquiring of one company by another (acquisitions).In O&G sector, especially in upstream segment M&A activities are typically more broadly defined to include the acquisition of O&G assets such properties and reserves, not necessarily just the acquisition of the entire business entity. While different definitions and classifications of the O&G industry M&A exist, we classify the Property involves transactions of land that have been evaluated to have proven reserves.

For better understanding M&A process it's necessary to introduce the difference between merger and acquisition.

According to Reed 2007, the word merger means the legal process in which one corporation combines with another and disappears after that. It's can be compared when one river falls in another river, like, The Kama falls to Volga river.

While the acquisition is the process after that the buyer becomes the owner of the whole company or some current company's assets and stocks. The company which sells the assets or stock usually called as a *target.* (Reed 2007). The acquisition is a broad term which means the transfer of ownership from one company to another, while the merger is a legal specific process, which may or not may follow to the acquisition. It is obviously that all merger processes should be licensed and legal. If the process has cross-border nature then laws of both countries (states, regions) should be considered and observed.

According to conventional financial theories, M&A activities are typically pursued strategic purposes and efficiency gains by achieving operational and financial synergies (Brealey, et al 2010, Gregoriou et al 2007). In general, two different views of the merger and acquisition activities were offered. One of these views is the so-called behavioral explanation of merger and acquisitions, and the other is the contrasting, neo-classical view of merger and acquisitions. Shleifer and Vishny (2003) first argued that the stock market valuations drive a substantial portion of the merger and acquisition; the companies whose stocks were overvalued tend to bid for the assets of the under-valuated firms. While Shleifer and Vishny (2003) model may rely on some irrational behavior of target firm managers and misinformation on the aggregate market for these behaviors to occur, Rhodes-Kropf and

Viswanathan (2005) proposed a model based on the rational behavior of the managers and imperfect information about the valuation of the firms. Their model also suggests that stock market performance tends to drive the merger and acquisitions in the economy. Empirical support of the behavioral explanations of merger and acquisitions have been provided by Rhodes-Kropf et al. (2004), Dong et al. (2003), Ang and Cheng (2003) and so on. It is also generally known that merger and acquisition activities increase during periods of stock market booms.

Neo-classical theory of merger and acquisitions rely on fundamental shocks to the economy or industry to explain merger and acquisition behavior. Coase (1937) and Gort (1969) are among the first to explain that economic factors are behind the industrial organization and structure, and firms' investment behavior. The industries react to the economic or industry shocks by reallocating assets through mergers and acquisitions. In this line of argument, one of the enabling conditions is the capital environment. While the economic or industry shocks (including technological, regulatory and so on) provide motivation for mergers and acquisitions, the lower capital cost makes it possible for firms to engage in asset acquiring activities. In this sense, the capital liquidity theory modifies the neo-classical theory in an important way. Empirical evidence supporting this line of argument has been provided by Harford (1999), Schlingemann et al. (2002), as well as others. Harford (2005) showed that while economic, technological, and regulatory shocks provide the fundamental reasons for mergers and acquisitions, the overall capital market liquidity conditions cause these activities to form waves.

From practice side, McKinsey says in their report (Capturing value from M&A in oil and gas: Implications for integration, 2015) that M&A process is good option to address a problem such as a collapse oil price and further intensification of pressure on cash flow.

The fundamental reason of M&A processes is synergy effect. It can be financial improving or strategic growth. Doesn't matter what type synergy is the purpose, in common we just call it synergy effect. As the history shows not all deals concludes with positive synergy effect.Synergy is mutually reinforcing teamwork which provides much higher performance than if the companies worked separately. The concept of synergy most often aims to compensate shortcomings, when participants give each other "missing" element (complement-driven). Nevertheless, it occurs also with mergers aimed at strengthening the advantages (supplement driven). Most programs diversification is based either on the first or the second approach, depending on the from a nature of investors.

The economic motivation for mergers and acquisitions is different, but in most cases, it is the expansion of sales markets or production synergies and financial benefits, which can lead to an increasing in the cost of equity.

Transactions of mergers and acquisitions can be divided into two types: horizontal and vertical. Horizontal integration involves the merger of companies from one industry, located at one

stage of production. A typical example of horizontal integration is the takeover by the Bank of America of another Merill Lynch bank in the midst of the 2008 economic crisis for $ 50 billion. At the same time, vertical integration aims to capture one or more production stages, such as raw material production, marketing or retail sales. An example of this kind transaction is the acquisition by Google of DoubleClick for $ 3.1 billion in 2007.

There exist hostile and friendly types of deals. Hostile takeover (hostile takeover) is an offer to buy shares the public company, which was rejected by the board of directors of this company (target).

In common, most of the acquisitions are a friendly type. Friendly acquisitions deals suggest that both the buyer and the seller are voluntarily going to the conclusion of the transaction. They are based on mutual agreement interests two or more parties that believe that they it's better to cooperate than confront to each other.

1.1.1. Stages of M&A process

Usually, the process starts from two initial stages of the merger or acquisition. At the first stage, the potential buyer determines the company's characteristics, which he wanted to acquire. In the second stage, he is trying to find those companies, which satisfy or approaching to his criteria.

Buyers divided into two most common categories. One part seeks to buy a company that will function as part of the already existing company from the same sector, for increasing market share for example, while others search for an object for a separate investment (it can be none-core assets).

The first type of buyers called "strategic" (Reed 2007) seeks opportunities for absorption strengthen, expanding, and developing existing operations via acquisition process. The most significant part of the analysis for this buyer will be aimed at finding a company that can offer a strengthening relationship with its own directions of business.

Another type of buyers is a "financial" acquirer (usually a group of investors), who may not be interested in the relationship of the acquired company with its other assets at all. The main concern here is to determine whether the company will generate sufficient cash flow to pay back and provide profit from the transaction. In some cases, profits can be obtained in the form of dividends, in others - by reselling the company (or its units) to the next buyer, purchasers, or public share placement. In most cases, such a buyer minimizes relationship between the companies that he owns. It helps to decrease the influence of the other companies in the case of sale or refinancing.

In common, any M&A deal can be divided into two parallel processes, which are necessary for success. These are financial and law sides. Despite, that this paper concentrated on explanation and analysis of financial part of M&A process, the jurisdiction is a very significant part, which also

should be considered for better understanding M&A processes in the USA. In each industry exist their legislative nicely, however, despite this, a number of common points can be singled out. Here listed most essential point from the law side:

- Antitrust. Associations of certain types of business require the filing of documents in accordance with the Law of Hart-Scott-Rodino.
- Information disclosure to shareholders. Public companies should take into consideration that they have to send required documents the SEC.
- Environmental concerns. For example, the buyer may be faced with the fact that both federal legislation and state law oblige him to pay for cleaning, even if the pollution was not due his fault or he did not know about it.
- U.S. ownership of foreign assets. Federal legislation requires reporting about some industrial or commercial assets that belong to foreign physical and legal persons. Also, the law may prohibit possession some of them, including vessels, aircraft, registered under the US flag, telecommunications, newspapers, nuclear power plants and some military industries.And obtaining an authorization from the Ministry of Justice (DOJ) or the Federal Trade Commission (FTC).

The second fundamental stage of M&A process is valuation. Price is an essential indicator for the deal. Every time in sell process it is necessary to take into account the whole complex circumstances and assess their impact on price. Often the evaluation conducted in an extremely poor way and that's why can be challenged in court, sometimes years later. Valuation requires special knowledge, for this reason, it is better to assign it, specialists. Nevertheless, the evaluation process requires supervision by managers both buyer and seller. In most cases, the valuation process should be based on production operations any significant transaction related to mergers/acquisitions and should be supported by the opinion of professional appraisers who specialize in determining the value of existing companies (industries). This condition is desirable due that possible bias from the intermediaries or sellers. Moreover, any insider valuation can be revised in the court.

1.1.2. Valuation technique

In this chapter listed and explained the most popular methods of valuation (Foster 2007)

The replacement value method.

This method is simpler than others, however the most labor-intensive of them. In the essence here the buyer divides all assets into hard and soft assets and estimates them. Hard assets represented in the form of land, buildings, inventories, work in progress, etc. While soft assets include the cost of hiring new people or such marketing instruments as trademark and copyright. Estimated cost

compares with the seller's price or uses for determining prices and negotiations. With the right approach, this can be the best method of evaluation, because it allows determining how much the buyer will cost to create a similar company at the moment, without any difficulties associated with determining accounting profit in the future.(Reed 2007).

The Investment, or Average Rate of Return, Method

This method uses more often than others to evaluate acquisitions. It consists of comparing the projected average income with projected average investments In the project. Required projected average yield is hurdle rate, which in most cases represents the cost of capital for the buyer.

The Payback Method.

One of the most tested methods of assessing the acquisition. It comes from the capital budgeting experience and its still uses in cases of acquisition of equipment and other fixed assets. The essence of this method is that the company can determine the period of time through which the invested capital must be returned. For example, after purchasing a computer-controlled machine or a batch of such machines, their price plus the cost of delivery, installation, training of maintenance personnel, etc. should be pay off in 3-5 years, otherwise, no one will invest in capital investments. Evaluation based on the payback period is a simple method, which can be used even those who do not have a special financial education, it easily fits into the budgeting and marketing programs.

The IRR Method.

The idea of this method is to find such a discount rate at which the present value of future cash flows brought by investments is equal to the cost of investment. The IRR is acceptable if it is equal to or higher than the hurdle rate.

The Market Value Method.

It's came from investment banking and still uses for due diligence procedure. The MV method assumes using such indicators as the ratio of price to equity (P / E) of public companies to determine the price or price range.

The Discounted Cash Flow Method.

In essence, it allows you to estimate the net present value of future. Cash flows or profits through risk-based discounting.

When the deal is finished the integration, process starts. As this paper investigates the post-deal performance then the process of valuation of successful integration will be considered in further chapters. In nutshell, it is necessary to say that good integration force to make great efforts to combine two or more companies after they became a single property. As mentioned earlier, there are two main types of the takeover: strategic and financial. Most likely, only a strategic buyer will be able to integrate the absorbed company in one piece. On the contrary, the financial buyer, rather, will leave the acquired company alone, giving it only capital and management.

1.1.3. History of M&A

The largest M & A market is concentrated in Western countries, in particular in the USA. It is also essential reason why this market was chosen for research. Actually, the practice of mergers and acquisitions has developed a long time. Its highest peak in the M & A market reached the 20th century in the USA due to the wide distribution of "junk bonds", i.e. bonds with a low credit rating and high-interest income.

The U.S oil and gas (O&G) industry has a tremendous amount of impact on the U.S. economy. In the past several decades, energy prices, especially oil price, influenced aggregate economic activities and caused economic fluctuations at the national and international levels. The U.S. O&G industry has experienced its own transformation more recently, particularly due to the development of new technology in horizontal drilling and fracking. These new technologies have enabled exploration and production (E&P) activities in previously unexplored territories and have caused oil and gas production booms unseen in many years, especially since mid-2000. While these booms have led to interesting and important price dynamics and responses to the changing prices, it also provides some unique perspective on the merger and acquisition (M&A) activities in the industry, especially in the upstream sectors of the industry.

The M&A activities have experienced some difficulties in the U.S. O&G industry. In the early 2000's, M&A activities in the industry were relatively inactive, but the activities started to pick up towards the middle of 2000. Hsu, Wright, and Zhu (2014) depicted some general patterns in the M&A activities in the upstream sectors of the U.S. O&G industry. They observed a general upward trend in the M&A activities during the period of 2006 to 2013. While there was a rapid increase in M&A activities prior to the 2008 recession, the recession appeared to have slowed down the M&A activities. The post-recession M&A activity peaked in 2011 and then tapered off towards 2013. They also noted that while there were some large transactions in terms of the transaction values, most of the deal values in the sectors were smaller than 300 million dollars. In addition, most of the M&A activities occurred in a few geographical locations such as Gulf Coast, Midcontinent, Rockies and Permian Basin, which is not surprising as these locations are the major U.S. O&G producing areas. One of the interesting patterns noted by Hsu, Wright, and Zhu (2014) is that the activities by each shale region exhibited some wave patterns with the formation of the waves at different times. For example, Barnett, Hayesville, and Fayetteville saw some early movement of the M&A activities, while the latecomers included Bakken Shale and Mississippian Lime in North Oklahoma/Southern Kansas.

During the time, the M&A processes have changed. These are fairly for stages of M&A deals, industries, and law side. According to DePamphilis (2009), history knows several M&A waves.

From the point of M&A market in the petroleum sector, significant deals have been almost in each wave.

1. 1897-1915 – Horizontal consolidation. Increasing concentration in Primary Metals, Transportation, Mining. In 1907 was finished the first one of the most significant consolidations in Oil and Gas sector. The group Royal Dutch - Shell was established in 1907 through the merger of the Royal Dutch Petroleum Company and The Shell Company Ltd. This merger was mainly due to the need for competition in the world market with the American company Standard Oil.
2. 1916-1929 – Largely horizontal consolidation. Post World War I boom.
3. 1965 – 1969 – Growth of conglomerates. This period characterized by financial engineering and conglomeration.
4. 1981-1989 –Relative weakness of U.S. dollar, rising stock market and underperformance of conglomerates against stock market led to Retrenchment era. Which characterized by increasing in using of junk bonds to finance the transaction. At this period in 1984 Standart Oil Co. of California merged with Gulf Oil Corporation. The transaction value was 13.4 B $. Also, Texaco Inc. merged with Getty Oil Co for 10.1 B$.
5. 1992- 2000 – Age of strategic mega-merger. Highest levels of transactions numbers and prices were recorded in this period. M&A market in the petroleum industry in this time presents one of the most interest cases. In 1998 was finished the greatest petroleum merger between Exxon and Mobil. In the result of which Exxon got 70 % and Mobil 30% of the new company. However, considering the size and importance of the deal, legislation procedure took an essential time period. And the process was over in 1999 after Federal Trade Commission and European Commission. After transaction in 77 B, $ the new giant's capitalization was 238 B $. Moreover exactly at this period experienced an explosion in cross-border M&A deals throughout Asia, Europe, and South America (Merger and Acquisition in Oil and Gas Industry, C.Corlay, and d.Hubby 1999).

The second huge deals were conducted between British Petroleum and Amoco. The new entity called BP-Amoco became a third-world company in the point of view turnover and oil reserves. The company lost the first place among producers of natural gas in the USA, but it was still biggest oil producer in British North Sea and the United States.

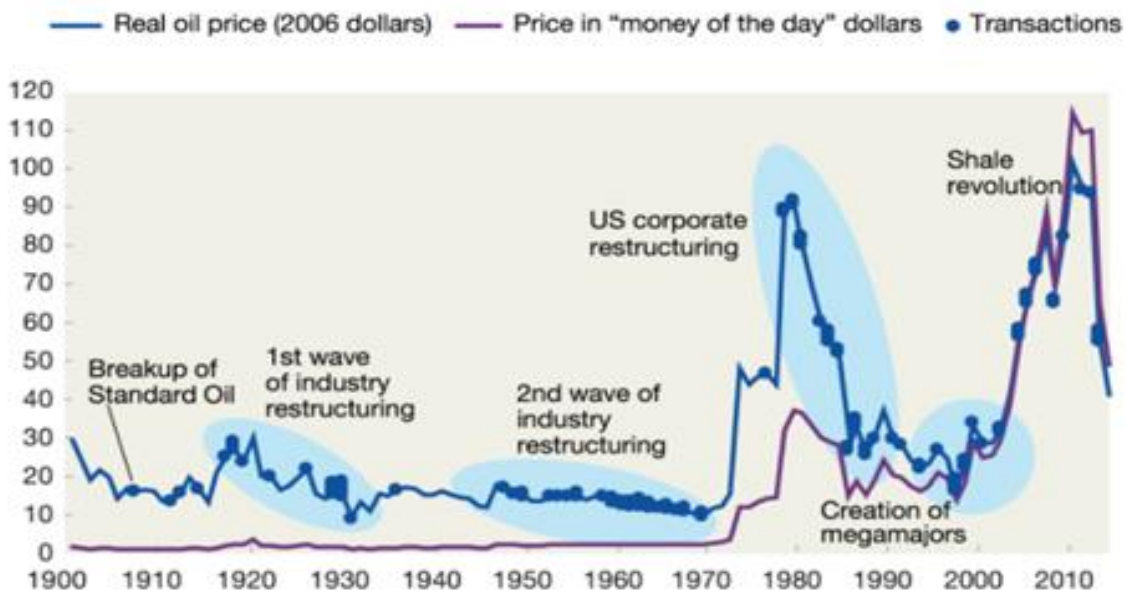


Fig. 1. *M&A waves in oil and gas industry*

As it was said in introduction historically, the volatile crude oil price and low economic growth or geopolitical changes force the industry to increase activities in consolidation processes. In the result of a stock market crash due to rapid changes in oil prices in the 1980s and 2000s companies were stimulated for merger and acquisition activities (K.S. Reddy, En Xie,2017).

Meanwhile, the industry has evidenced by the large-scale M & A deals in the western space in 1999 when there was a market-force toward 'rising crude oil price'. According to financial economics literature, the higher stock price valuations (Mitchel ML,1996) economic shocks of different industries (Shleifer A,2003), and instability in the oil prices and other increased risks (Weston JF, 1999) drive a significant amount of business consolidation transactions in the oil and gas industry.

Also, the industry has indicated an unpredictable crude oil price signaling in recent years, especially from 2010. This volatility behavior, coupled with rising production costs and negative cash flows, has intensified the market for cross-border M & A transactions in the oil and gas sector. In other words, the sector has been reported by a massive amount of oil and gas deals since 2010 when there was actually a significant drop in the crude oil price.

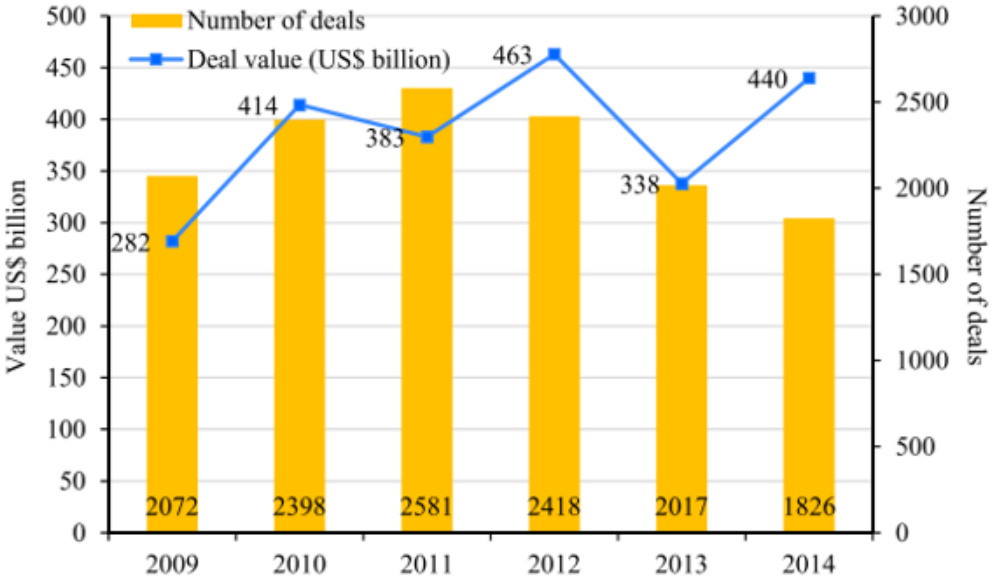


Fig. 2. *Number and value of M&A deals in USA market*

For Kearney (AT Kerney, Mergers and Acquisitions in Oil and Gas,2015), number of deals (value) in the oil and gas industry has significantly increased at a rate 17% (64%), from 2072 transactions (US$282 billion) in 2009 to 2418 deals (US $463 billion) in 2012, and further reported by 1826 deals (US$440 billion) in 2014.These lines suggest that the industry has received a significant attention not only from the price analysts and academic researchers but also from the international press.

1.1.4. M&A in Upstream U.S. Oil and Gas Industry

The activities of firms in the upstream sectors of the U.S. O&G industry typically follow the exploration, development and production sequence. Exploration is the important first step in locating sources of the O&G reserves, and whether they are economical or non-economical to recover. Frequently, as technology improves, O&G extraction becomes more efficient, costs tend to drop on a per-barrel or per MMBtu basis, and the previously non-economical reserves may become economical to explore. The horizontal drilling and fracturing technology, in a sense, is a revolution in the O&G industry, as it redefined the economics of O&G drilling and production. Though horizontal drilling is more expensive than vertical drilling in absolute terms, horizontal drilling can also have the benefit of increased asset recovery, which can decrease average drilling costs. If horizontal drilling techniques are found to increase average drilling costs, it would not be advantageous for the firm to engage in horizontal drilling.2 Furthermore, horizontal drilling can reduce the need for drilling multiple well sites, which can reduce capital costs if multiple vertical wells are necessary. Once the source of O&G is located, development will take place before the actual extraction of O&G could occur.

To a firm in the O&G industry, finding reserves is an important step to exploration. Reserves are such an important asset of O&G companies because they define the future of the O&G companies and their values. As production reduces available reserves, companies in the O&G industry are in a constant state of looking for new reserves. There are many ways that a firm can replenish the depleting reserves. Looking for a new drilling prospect at an unexplored location represents a risky business investment, however, this carries a benefit of first movers in new territories. As a result, the price of the acreages or drilling prospect is usually very low as the reserve prospect is not certain. Purchasing an asset directly from a selling company or directly acquiring a company is another way to acquire the needed asset for many O&G companies. Frequently, the exploration cost would have been borne out by the offering company, and as a result, the prices of these assets are usually higher.

When a new play begins development, O&G companies begin to discover reserves, the O&G companies that did not invest in such plays before the beginning will usually choose to enter, causing asset prices to rise. Despite the fact that the prices of the assets have started to rise quite significantly, the profit potential and avoided initial exploration costs would be attractive enough for other late comers to enter the market. Many companies choose to enter due to strategic considerations as well. In particular, some international oil companies would choose to enter the newly developed plays as they search to expand their reserve base.

After the initial stage of the development, initial production serves as a signal to the potential asset acquirers about the value of the reserve assets. It is generally the case that as production becomes prolific, the value of the reserve assets (or unproven reserve assets) tends to climb quickly and significantly, which would encourage more M&A activities in the upstream sectors. In this sense, production, and M&A activities in the upstream sectors of the O&G industry are expected to be positively associated with each other.

Similarly, higher oil price increases the value of the reserve assets even when there is no increase in the amount of the reserves. The values of the O&G companies depend heavily on the value of their reserve assets, and the valuation of the reserve assets hinge on the oil and gas prices. Therefore, we expect that the O&G M&A activity is positively correlated to the price of oil.

1.2. Review of previous studies

In most papers about the relationship between stock returns and M&A, scientists are considering the effect of the announcement date and the finishing of the M&A transaction on price fluctuations before and after the event. Actually, for the last 30 years, scientists have published hundreds of studies of the financial performance of companies in the post-merger period, and few of these researches have been able to define failure, as well as success.

The basis of these approaches is the event method, which is also used to some extent in this work. Nevertheless, I would also like to my work to consider the results of researchers who considered the impact of M&A deals on operation performance, where researchers used other statistical methods. The main reason for consideration such type of papers is the difference and ambiguity in the received results, which express the necessity to analyze the connection between M&A deals and market performance.

1.2.1 The influence on operating performance

A lot of scientists already tried to examine the connection between financial indicators and M&A deals. Nevertheless, most of them got completely different results. Levine and Aaronovitch (1981) concluded that there was no evidence of any significant difference between the acquiring and target firms for the profit related variables and their growth.

In 1983 Ikeda and Do found that post-merger performance was higher than before. They used such parameters as profitability, efficiency, growth, and research and development. However, Scherer in 1988 discovered that in long term period companies didn't show any improvement after M&A

Improvements in post-M&A operation performance were discovered by Healy, Palepu, and Ryback in 1992. He mentioned that the assets productivity increases in comparison with other companies in same industry. The strong positive relationship between horizontal acquisition and variables such as long-term debt/total assets, long-term debt/market value, market value/book value, and asset growth and sales growth in post –merged period were established in 1996 by Lee, Pamela, and Gayle.

Rau and Vermaelon (1998) found that the acquiring firms under-perform during the three years after M&As while tender offers earned a small but statistically significant positive abnormal return.

In 21-st century several researchers defined that target companies in the financial sector often benefit from the transaction. While the shareholders of the companies-buyers, usually, do not receive significant benefits from mergers and acquisitions (DeLong, 2001, Beitel et al., 2004; Kirchhoff, 2006; Asimakopoulos, Athanasoglou, 2013 et al.). However, conclusions about international transactions in the United States or the European Union vary. If the effectiveness of European geographical expansion as a whole is proved, then transactions initiated by companies from the US, in most cases are ineffective.

Researchers from Tilburg University examined about 21 papers of previous studies about the impact of M&A on the performance of the company during their study (Renneboog, Oosting, Martynova, 2007). Nine of them showed that post-acquisition indicators were improved. While 12

papers demonstrated deterioration in companies performances and the absence of any significant changes.

According to Moeller and Schlingemann (2004), the post-acquisition performance in US target companies remains the same if more sophisticated approaches to measure changes applied. Meanwhile, some researchers concluded that that company has significant improves after takeover (Heron and Lie, 2002; Linn and Switzer, 2001).

Asian and UK studies are more controversial. For example, Powell and Stark (2005) found essential improving, while Dickerson (1997) determined crucial decreasing in the post-acquisition performance. Rid and Foster (2011) says that after comparing the results of 17 major studies of long-term results after the merger, conducted from 1965 to 1997 in ten cases, unsuccessful mergers averaged 55% (or vice versa - 45% of success cases).

In most cases, researchers tried to specify their papers according to countries, type of deals or other determinants. The most popular and essential determinants listed below:

- Type of the deal's payment. It could be cash, stocks or mixed type. A number of papers show that there no any significant correlation between method of payment and post- acquisition performance. (Linn and Switzer, 2001; Ghosh, 2001; Moeller and Schlingemann, 2004)
- Type of acquisition. There no clear proof that proves whether friendly or hostile deal impact on performance in a better way.(Switzer, 1996; Linn and Switzer, 2001; Heron and Lie, 2002; Moeller and Schlingemann, 2003)
- Type of industry. Company target could be from the same industry or another. It is customary to think that the policy of diversification will lead to financial synergy; such an approach can bring a number of problems. That happens because a new acquisition could be from completely another sector, which implies another strategy and operational approach, bureaucratic delays and etc. However, while earlier studies confirm these conjectures (Healy et al., 1992; Heron and Lie, 2002), later studies find the relationship between diversifying takeovers and poor post-merger performance insignificant (Powell and Stark, 2005; Linn and Switzer, 2001; Switzer, 1996; Sharma and Ho, 2002).
- The size of the target. According to the analysis of McKinsey (McKinsey Quarterly, January 2012) which considered 1 000 nonbanking organizations from 1999 till 2010, those companies who complete many smaller deals without large one showed the higher performance than those who did large deals. However, most of the empirical evidence reports no significant relation between the relative target size and post-merger performance (Renneboog, Oosting, Martynova, 2007).
- Domestic or cross-border deals. One of the leading assumptions is that difference in cultures and legislation could influence in a negative way on the deal. Meanwhile, cross-border deals lead to new markets and improve R&D. In his research Gugler (2003) says about the crucial impact of international mergers on long-term performance.

• Cross-border deals. Moeller and Schlingemann (2003), Goergen and Renneboog (2004), Martynova and Renneboog (2006b) show that that firms acquiring foreign targets experience significantly lower takeover announcement returns than their counterparts acquiring domestic targets. The worldwide cross-border M & A market for the 'mining, quarrying and petroleum sector' in terms of the transaction value (number of deals), has markedly increased from US $6 billion (204) in 1990 to US$48 billion (366) in 2001, and further escalated to US$154 billion (990) in 2011 but surprisingly declined by US$28 billion (432) in 2015. Overall, the market has witnessed over 13000 announced transactions for US$774 billion during the last twenty-six years, 1990–2015. Even more interesting, over 60% of transactions and nearly 80% of value have actually reported in the last decade, 2005–2015.

Table 1. Studies about influence of M&A on operating performance

Author(s)	Sample period	Market	Sample size	Performance measure	Result
Powell & Stark (2005)	1985-1993	UK	191	Profit after tax	Improvement
Rahman & Limmack (2004)	1988-1992	Malaysia	113	Net income	Improvement
Heron & Lie (2002)	1985-1997	US	859	Net income	Improvement
Linn & Switzer (2001)	1967-1987	US	413	Pre-tax cashflow	Improvement
Parrino & Harris (1999)	1982-1987	US	197	Pre-tax cashflow	Improvement
Switzer (1996)	1982-1987	US	324	Pre-tax cashflow	Improvement
Healy, Palepu & Ruback (1992)	1979-1984	US	50	Pre-tax CF	Improvement
Moeller & Schlingemann (2004)	1985-1995	US	2362	Pre-tax CF	Improvement
Gugler, Mueller, Yurtoglu & Zulehner (2003)	1981-1998	World	2753	(1) EBIT (2) Sales	Improvement
Sharma & Ho (2002)	1986-1991	Australia	36	Pure cashflow	No changes
Ghosh (2001)	1981-1995	World	315	Pre-tax cashflow	No changes
Herman & Lowenstein (1988)	1975-1983	US	56	Net income Ebit	No changes

Mueller (1980)	1950-1970	Belgium, Germany, The UK, US, France, Netherl, Sweden	Different per country	Profit after tax	No changes
Lev & Mandelker (1972	1952-1963	US	69	Net income	No changes
Kruse, Park, Park Suzuki (2002)	1969-1992	Japan	46	Pre-tax cash flow	Decreasing in performance
Yeh & Hoshino (2001)	1970-1994	Japan	86	Net income	Decreasing in performance
Dickerson, Gibson &Tsakalotos (1997)	1948-1977	UK	1443	Pre-tax profit	Decreasing in performance
Clark & Ofek (1994)	1981-1988	US	38	EBIT	Decreasing in performance
Meeks (1977)	1964-1972	UK	223	Pre-tax profit	Decreasing in performance
Hogarty (1970)	1953-1964	US	43	Capital gains	Decreasing in performance

The whole pool researchers used to determine operating performance via such indicators as cash flow (pure, pretax), operating income, EBIT, revenue, sales and etc. to measure post-acquisition performance. However, it could be the very questionable approach. For example, pre-tax operating cash-flow most of them does not take into consideration changes in working capital (Gosh, 2001; Heron and Lie, 2002; etc). Also, the question which period should be applied for consideration of these variables is very tricky.

Not only previously considered determinants play a crucial role in the efficiency of merging. In addition to the researchers, the analysis of the efficiency of transactions is also carried out by various commercial companies. For example, McKinsey's consulting company, in its study, dedicated to the effectiveness of mergers and acquisitions, identified a group of low- and high-performing companies. Highly performing companies have been characterized by the fact that they have already achieved or exceeded their objectives relative to transaction costs and obtained synergy effect. On the contrary, low-performing companies did not achieve these figures after the transaction was completed. As a result, the company identified several issues that high-performance companies do differently. So, for example, such companies evaluate their portfolios for acquisition, joint-venture,

and divestiture opportunities several times a year, instead of 1-2, as other companies do. (How M & A practitioners enable their success, McKinsey)

1.2.2 The influence of M&A on market performance

The first works about the impact of mergers and acquisitions transactions on stock prices of stock market companies appeared later. We can distinguish two main approaches used in these works: analysis of profitability for the shareholders of the target company and analysis for the acquirer company (Khusainov, 2008). Analysis of the profitability of shareholders of the acquirer companies is contradictory. The authors of various works strongly disagree about the impact of acquisitions on the profitability of companies. The authors of these works can be divided into two camps. The first claim that the buyer companies have a negative excess return. Others prove the opposite. The variety of results can be explained by the differences in approaches for samples analysis and methodologies.

As in the case with studies about the influence of M&A on operating research, the papers about M&A and market performance can be divided into groups depending on the analyzed segments of M & A transactions. The first set of works studies only the largest transactions. For example, the work of researchers from business schools of Massachusetts and Harvard Universities (Healy, Palepu, Ruback, 1992) analyzes a sample of the 50 largest American mergers of 1979-1983. The results of the research showed that the M&A allowed the companies to increase operating cash flows, which led to positive excess stock returns around the time of the announcement of transactions. The authors concluded that the share prices of companies grew as a result of high market expectations regarding the improvement of the financial condition of the merged firms.

Bruner in his study (2002) used a long period sample for 1971-2001. The author divided the results of the research into two parts: the effect of the announcement on the prices of shares on acquires and on target companies. The result of the study showed that the shareholders of the target company experienced a high surplus profitability, unlike the shareholders of the acquired company, which returns on their share price remain unchanged.

The authors of the second set of scientific papers examine M&A transactions by using geographic basis. Thus Renneboog and Goergen (2003) in their work investigated a sample of European transactions, which consisted of 56 mergers, 41 friendly and 40 hostile acquisitions. The results of their work showed that announcements of large acquisitions lead to increasing in the capitalization of the target companies by 9% and of the acquired companies by only 0.7%.

The Eckbo and Thornburn (2000) conducted a similar study for M&A transactions of Canadian companies. This study examined a sample of 1 800 Canadian transactions for the period from 1964 to 1983.The authors divided the sample into two parts: the acquisition of Canadian companies by Canadian companies and acquisition of Canadian Companies by American Companies.

The results of the work showed that in cases where the Canadian company acts as a buyer, there was a positive excess return after the announcement of the transaction. At the same time, US companies in Canada receive a statistically insignificant profitability.

The next set of studies examines the impact of mergers and acquisitions in certain industries. For example, in (Beitel, Schiereck, Wahrenburg, 2002), the authors examined the impact of M&A transactions on stock returns on a sample of 98 major European mergers and acquisitions over the period 1985-2000 in bank industry. The results of the work were similar to the results of studies for US banking sector (Pilloff, Santomero, 1998) and showed that the market reaction to announcements of mergers and acquisitions can be partially predicted. For example, it turned out that successful banks-buyers can be identified by the choice of the target company. Successful buyers choose relatively small and rapidly growing companies as a target for acquisition. Moreover, banks are more successful after acquiring companies with better quality management (with a higher market-to-book ratio). The authors concluded that the ability to predict the market reaction to certain M&A banking transactions can be extremely useful for bank managers and shareholders who seek to increase the company's value.

Researchers of the last set of works isolate samples by specific types of transactions. In his work Mulherin (2000) studied only pending transactions on a sample of 1,305 companies in the 1990s; Jarrel and Poulsen (1989) considered only the effect of acquisition and came to results similar to Renneboog and Goergen (2003) results. It is not surprising that the conclusions obtained on not crossed samples are often very different. On such samples, a comparison of the results of various studies is difficult. As already noted above, the variation of the conclusions can also be explained by the differences in the used methods of analysis. In works which studied the influence of mergers and acquisitions the anomalous return in some cases determined by ratio to the market, in others - relative to the historical yield of shares, and in the third - relative to the similar companies (Khusainov, 2008).

Significant differences of papers also lie at studying time interval for shares volatility. In the most cases for the event date researchers take the day of the first mention of the deal. Nevertheless, there are a number of works which analyze the profitability of shares relatively to the closing date of the transaction. So, in the paper (Servaes, 1991) the author considered the dynamics of shares at the time when the deal is finished, but Loughran and Vijh (1997) in their work took the period for 5 years after the deal closed. Even though most of the work considered the day of the first report of the transaction as event day, the time window around the event of the announcement also varies significantly. This range varies from one day (Mulherin, Boone, 2000) to two months before and after the transaction (Maquiera, Megginson, 1998).

1.2.3 Dynamic portfolio approach

One of the first works that studied the influence of corporate events on the share prices of companies was Dolley's paper (1933). The author of this work investigated the effect of fragmentation of shares on stock prices. The sample consisted of 95 splits that occurred over the period 1921-1931. In 57 cases there was a price increasing and in 26 cases a decreasing.

From the beginning of the 1930s to the end of the 1960s, the level of complexity of the studies was improved (MacKinlay, 1997, p. 14). Improvement consisted in an attempt to detect the movement of stock prices, which are not related to the events under investigation. For this purpose, events that occurred approximately at the same time as other potentially significant events were deleted from the sample. Examples of such works are (Barker, 1956; Ashley, 1962).

The approach of the dynamic portfolio was first used by Jaffe (1974) and Mandelker (1974). Also was advocated by Fama in 1998. Yu. Fama studied the influence of the fragmentation of shares by removing from the sample those events that occurred at one time with announcements of increasing dividend payments. After these initial studies, the method was improved. The modifications were designed to overcome the difficulties caused by the neglect of statistical assumptions by the authors of early works. These modifications are described in detail in [Brown, Warner, 1985].

Then it was widely used in Stafford's work (2000) for estimation the influence managerial decision on long-term stock price performance. The idea was to create portfolio depending on the event (managerial decision), which a company did in some period. And then put the company in the portfolio for n periods. It was an essential improvement for traditional Abnormal Return portfolio and Event Study Approach. A similar method was used in their work by Bartram and Brown (2011), where researchers examined the influence of hedging on the share price.

In Russia, the method was used by Okulov (2012) for examination of the impact on stock price performance. Two portfolios were created in this work depending on existence company's hedging strategy.

The method includes several stages.

The first stage is choosing the sample of companies depending on some relevant for the case criteria. It could be range by capitalizations, sectors, countries etc. According to the type of event, companies split into two portfolios in accordance with calendar scale.

The second step is an estimation of companies returns by using daily, weekly, month or any other scale prices by the formula:

$$R_{i,t} = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}} \quad (1)$$

Where P i, t and R i, t - the price and return of i - shares at the time t.

And estimation of average returns each portfolio:

$$R_{p,t} = \frac{1}{N_p} \sum_{i=1}^{N_p} R_{i,t} \text{ (2)}$$

where Np is the number of shares in the portfolio at time t - 1.

Further, estimation of abnormal return between two portfolios by the formula:

$$AR_i = R_{h,t} - R_{u,t} \text{ (3)}$$

where h and u - A and B portfolios, respectively.

Finally, all abnormal return is cumulate for estimation CAAR:

$$CAAR_T = \sum_{t=1}^{T} AR_t \text{ (4)}$$

The method can be applied only if the event is known and clearly defined in time. The event allows evaluating the behavior of stock prices (profitability) during the long-term period after some announcement of a specific corporate event.

The practical advantage of dynamic portfolio method is the fact that the size of the abnormal return shares, observed during the period, makes it possible to assess the impact of the event on the shareholder's wealth or market performance of the company.

This methodology is an important tool in capital market research. In particular, it allows testing the hypothesis of an effective market. The systematic deviations of abnormal return certain type of corporate events are incompatible with the hypothesis with the effective market. Conversely, if the abnormal return is close to zero, it is said that the capital market is effective.

Chapter 2. Methodology and empirical results

2.1 Methodology

Two methods were used in the research: dynamic portfolio approach (which was considered previously) and regression analysis.

The first stage of analysis is a key point in the paper and it estimates middle-term market performance by using stock prices and portfolio's return. The result of this stage is estimated cumulative abnormal return between two portfolios. If CAAR is positive then we can say that middle-term market performance with M&A in current period higher that market performance caused organic growth at the same period.

Regression analysis applies for explanation results via current variables. Regression analysis uses for estimation correlation between variables. The model has a dependent and explanatory model. The result of this stage is regression model with significant or not significant coefficients. Coefficients show whether the relation is significant or not. If the regression shows significance then we can imply that the relation between a dependent variable and the independent variable is also essential. The sign before the coefficients says whether the relation is positive or not.

Dynamic portfolio approach

The idea of dividing shares into two groups and forming two portfolios is necessary in order to smooth out the individual characteristics of the behavior of each individual stock. These features are determined by random fluctuations in demand and supply for shares of this company. This approach allows to include in one portfolio companies with similar characteristics from the same industry. Based on the sample of 46 companies two dynamic portfolios were formed on the basis of weekly prices. The prices were extracted from Thomson Reuters database.

The methodology of portfolio preparation was as follows. There are two portfolios: A and B. After completion (not an announcement) of the M & A transaction, the company stays in the portfolio A throughout the year. At the end of the year, the company moves from Portfolio A to portfolio B, until the next transaction occurs. If the company made another transaction during the year in which the transaction was carried, the term of the company's presence in A's portfolio was prolonged according to the specified date of the transaction (see appendix 3) Such overlap inevitably and a similar situation was considered in the works of Stattford (2000) and Okulov (2012).During the study, a number of companies in portfolio A consisted of 4 - 20 companies in the time period for 10 years.

Return per share and the average return on the portfolio was calculated by using weekly prices obtained from the Reuters database.

The next step is the estimation of weekly cumulative return. The excess return was summed up weekly, and as a result, we obtained the cumulative abnormal return of A portfolio with respect to the B portfolio (Cumulative abnormal return, CAAR) accumulated by the time.

During the analysis of the CAAR's dynamics, we can make assumptions about the superiority of middle-term performance at the market and, as a result, return of one portfolio over another. Running ahead, in our case, the difference is positive and this is mean that return of companies from portfolio A exceeds the return of companies from B portfolio.

Regression analysis

This stage consists of two main regression.

The first uses to find a correlation between cumulative abnormal and Index S&P 500 (Oil sector). This regression aims to examine CAAR and Index's dynamic for creation some recommendation depending on market condition. For example, if at the period when Index grows CAAR also shows positive moving, then we can suppose that at the period of growing market M&A strategy will show better results than an organic growth strategy.

The model of regression is:

$$CAAR_T = \alpha + \beta_1 * X + \varepsilon$$

Where :

α – constant variable

β_1 – vector of unknown coefficient

X – Index S&P 500 (Oil sector)

ε – random variable

The second regression includes Oil price and the Number of deals in the petroleum industry in the USA as independent variables.

The model of regression is:

$$CAAR_T = \alpha + \beta_1 * X + \beta_2 * Y + \varepsilon$$

Where :

α – constant variable

β_1, β_2 – vectors of unknown coefficients

X – Oil price

Y - Number of Deals in petroleum industry in the USA

ε – random variable

As variables represent time series, then before regression analysis was conducted all necessary test for autocorrelation, heteroscedasticity, normal distribution of residuals, multicollinearity. Following variables were considered for regression models:

Index S&P 500(Oil sector)

The indicator represents an average weekly price of a share of companies which included to the index. S&P Select Industry Indices are designed to measure the performance of narrow Global Industry Classification Standard (CIGS) sub-industries. The Index comprises stocks in the S&P Total Market Index that are classified in the GICS oil & gas exploration & production sub-industry. We could include Dow-Jones Oil & Gas index, but both indexes showed the same dynamic. That's why there is no sense to include two indexes. Data were taken from Thomson Reuters data

Oil price

The variable represents an average weekly price of Brent crude oil. It is measured in US dollars. The average price means that indicators represent the mathematical mean of price per barrel. As it was mentioned before oil price has an almost direct influence on M&A market in the oil&gas industry. That's why we imply that oil price is one an essential indicator which should be included in the model. From managerial implication viewpoint, this indicator should be considered by managers for deal's evaluation and forecasting. It is assumed that there is an interrelation between CAAR and the price of oil.

Number of deals in petroleum industry in the USA

The variable represents a number of transactions completed over a month in the US O&G industry accordingly to deals criteria. The majority of M&A occurs during either an industrial crisis, sharp economy recovery or during an increase in the rate of inflation, in other words in conditions of significant changes. We imply that oil has an impact on a number of deals.

History knows numerous cases of the relationship between the price of oil and the number of transactions in the oil industry. Therefore, we consider it relevant to introduce this variable into the regression model and to assess the significance of the relation

2.2 Data collection

The shares of the companies under consideration are traded on US exchanges. This is the biggest M&A market from the point of deals quantity and the most available from the point of accessibility of information. All companies are also registered in the United States.

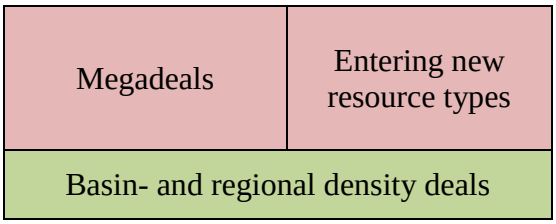
All acquisitions were horizontal. It is mean that only deals between Oil producers were considered. There no deals between producers and oil service companies or with companies from associated industries. Its condition was included due to avoid distortion of results due to deals and a possible return from non-core assets.

Only friendly acquisitions were considered in the paper. This is for we imply that the market under consideration is efficient and has fair competition. That's why hostile acquisitions could to add some bias in the results.

The main criteria for deal's screening were the deal's size and the ratio to the company's capitalization. The sample of transactions consists of deals with transaction's size at least $ 100 million, which constitute no more than 30% of the market capitalization of company's sample. This condition is included in order to exclude megadeals and focus on companies with capitalization, not more than 9 billion $. The point of this paper examines how oil companies of low-average size in the upstream sector of USA improve their market performance due to increasing similar assets (basins, wells, land).

According to McKinsey classification (2016) there exist 3 types of M&A deals in the Oil-gas industry.

Table 2. Classifications of oil producers:



Source: McKinsey (2016)

Megadeals are very crucial M&A events, which synergy able to cut cost and optimize processes of oil exploration by scaling. This type of deals excluded due to the rarity of such events.

Entering new resources means that the company changes the type of extraction. For example, a moving from offshore to onshore deep water extraction. This type of deals excluded because offshore projects require a different approach to assessing both the transaction and the deal's results which are implied another reaction of market's participants.

In present works were considered only deals the goal of which is increasing the amount of basins (land, wells) or regional basis density. This type of deals is interesting because such deals mean increasing of production (or plans for increasing) and possible cost reduction. Such type of acquisition reduces costs because the acquirers already have some projects in the area. It is mean that the company knows the geography and geology of the region and these pros definitely help to increase synergy of assets from the deal. In addition, they can capture synergies by decreasing regional costs, consolidating vendor contracts within basins, and optimizing overlapping operations.

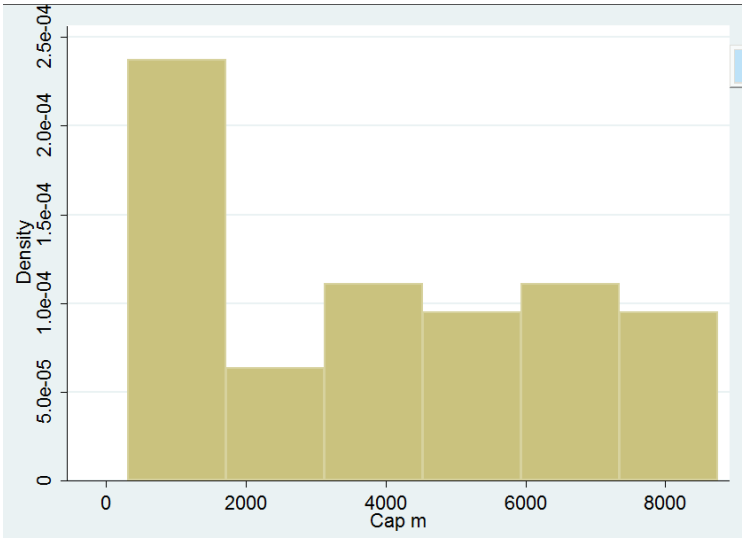


Fig. 3. *Histogram of companies capitalization (mil.$)*

The sample of companies consists exclusively of oil producer's companies for acquirers and for targets as well. Absorptions of non-core assets, including related oilfield service and associated companies, were excluded from the sample.

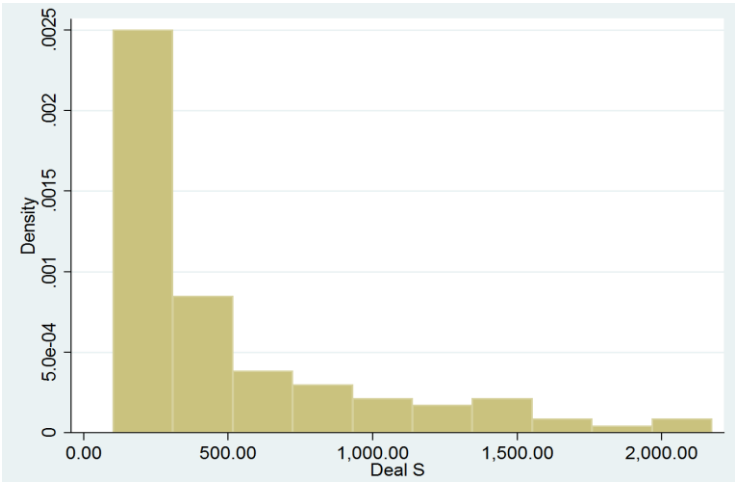


Fig. 4. *Histogram of deals size (mil.$)*

As can be seen, both markets capitalization of companies and deals size have not a normal distribution. In the case when the distribution is not normal the using of median instead the mean is more relevant approach due to the existence of sample's ejections. This is because the mean is too sensitive to extremely high and low values. Below is a general overview of the deals and the annual amount of companies in each portfolio.

Table 3. Descriptive statistic

Type of portfolio		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
A	From	4	7	6	4	5	8	5	4	4	5
	To	8	10	18	11	15	22	11	9	10	12
B	From	17	20	20	23	27	30	29	23	31	34
	To	20	27	28	29	31	33	34	31	39	41
Deals descriptive statistics											
Median		250	222	243	246	287	344	224	450	385	445
Mean		501	493	600	615	452	495	401	510	460	680
Standard deviation		230	224	390	450	370	540	540	590	765	540
Min		115	103	105	108	154	107	147	198	102	197
Max		1475	1787	494	1400	1458	1479	1544	1725	2773	2455
Companies descriptive statistic											
Median		3 381 626 954									
Mean		3 894 209 214									
Standard deviation		2 771 355 334									
Min		316 067 463									
Max		8 751 552 952									

An average number of companies in portfolio A for 10 years was 8. And 28 companies for portfolio B. Such ratio between amount companies of portfolios was expected, due that acquisition is a process from the point of time. That's why companies spent a lot of time for this process. Also, not all companies able conduct more than one transaction at the same time. There were not cases when a company performed the deal more than 3 years in a row.

As can be seen from the table the highest number of deals appeared during 2009 and 2012 years. 2012 was one of the most successful years for oil and gas sector. At this time, upstream sector's deals were more than 71% of total oil and gas deals. As for 2009, it was the year of transition to the "buyer's market", where investors with huge free cash flow showed the highest activity. Most of them were state-controlled companies. At the same time, other companies continued to seek and apply new survival strategies in the current economic situation - such transactions as the exchange of debt for a stake in the company's capital. Transactions in the energy and oil and gas sector were dominating at the M&A market. Exactly at this year the value of

transactions set almost the record in 440 billion $. In 2014, it was already 370 billion $. And in 2015 it was 260 billion $.

A sharp decline in oil and natural gas prices along with a high level of uncertainty played a role in the situation on the M & A market in the oil and gas sector in 2014 - 2015. It was a reason why the number of companies from portfolio A decreased. A number of factors played a role in the volatility of oil prices: it is the lifting of sanctions on Iran, and a decrease in optimism about the prospects for the Chinese economy and fears about a global decline in demand for energy. The oil and gas industry passes through a structural change - before decisions on investments in this industry were determined by the perception of a "resource shortage," now the reserves of oil and gas seem to be numerous.

According to forecast China national oil companies should have used this situation for acquisitions. But despite this, they concentrated in their own assets. This was an additional reason for declining in number and value of deals.

2.3. Empirical research

As we discussed in methodology part, the first part of the analysis is an estimation of cumulative abnormal return between two portfolios. There was created special time scale system in Excel (Appendix), where the process of portfolio creation was conducted. The table shows yearly mean and median of CAAR and AR for 10 years

Table 4. Descriptive statistic of AR and CAAR

		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
AR	Mean	-0,33%	0,52%	-0,21%	0,14%	0,66%	0,14%	-0,41%	-0,01%	-0,13%	0,33%
	Median	-0,36%	0,76%	-0,43%	0,12%	1,16%	0,25%	-0,24%	-0,15%	0,57%	0,44%
	SD	1,74%	2,65%	2,72%	2,23%	3,41%	2,03%	1,60%	1,69%	3,41%	5,16%
CAAR	Mean	-4,17%	0,27%	10,85%	3,58%	38,23%	51,62%	48,71%	30,48%	32,56%	29,28%
	Median	4,52%	2,06%	9,30%	3,19%	40,35%	51,84%	53,75%	30,49%	34,74%	32,14%
	SD	4,39%	7,20%	5,67%	5,88%	9,97%	4,84%	10,51%	3,45%	9,21%	9,84%

Mean and Median show no significant difference except for 2011, what indicates to the relative normality of the distribution. The average deviation shows that in 2016 abnormal return had the greatest volatility. The average value of CAAR has positive dynamics and positive values for all periods, except for 2007. Due that this is average annual values, the actual weekly data of CAAR, possibly, will show a bit different dynamics.

After estimation of average return, abnormal return and cumulative abnormal return we put results on the graph (Fig 4), which is below. As it was mention according to weekly values of CAAR,

the CAAR's curve shows 2 two periods, where the middle-term market performance of organic growth was higher than the performance of M&A strategy.

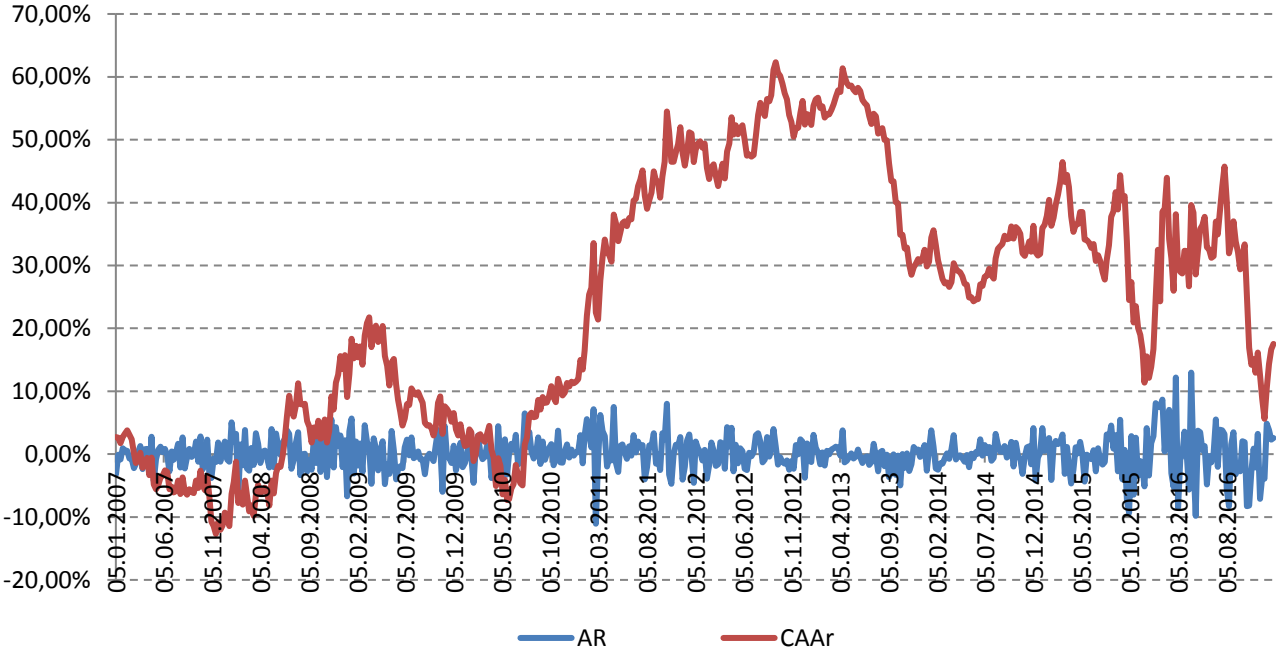


Fig. 1. *Cumulative abnormal returns*

The first implication which we can do is that the dynamic of CAAR was positive in most of the long term period, and it's mean that the shares of companies which performed M&A at the moment (t) had higher liquidity, and in the eyes of investors had higher interest. What is mean that middle-term performance these companies at the period (t) were higher than companies which used organic growth? Between 2007 and mid-2008, as well as in mid-2010, CAAR was in negative terms, suggesting that the medium-term performance at the time (t) was higher for companies whose development strategy was based on organic growth. To explain this behavior of the curve, we will introduce the average return curve of the S&P500 index of the US oil sector further.

The first regression model showed the significance of the coefficient

Table 5. Results of the first regression model

	Coefficient	Prob>F	R-squared (Adjusted)	Number of observation
SP500	-0.2174	0.0000	0.4829	

As we can see R-squared is not essential. That's why we conducted the second regression:

Table 6. Results of the second regression model

	Coefficient	Prob>F	P>|t|	R-squared (Adjusted)	Number of observation
Oil	0.0049		0.00		
Deals	-0.0088	0.0000	0.00	0.6927	
Sp500	0.0048		0.012		

Here we can see that all coefficients are significant and R-squared higher than in the previous model. What means that the relation between the variable in this regression also significant and confirms the Hypothesis 2. Very important point is that the coefficient of variable ”Deals” has a negative sign, while signs of Oil is positive. It is express that Oil price and a number of deals have a negative relation. This finding confirms the assumption that the number of deals in Oil & Gas industry increases during low oil price (K.S. Reddy, En Xie,2017; McKinsey 05/2016).

2.4 Main findings

This part will examine the results of empirical studies and their interpretation. And in the beginning, we plotted the curve of Index S&P 500 to the CAAR graph.

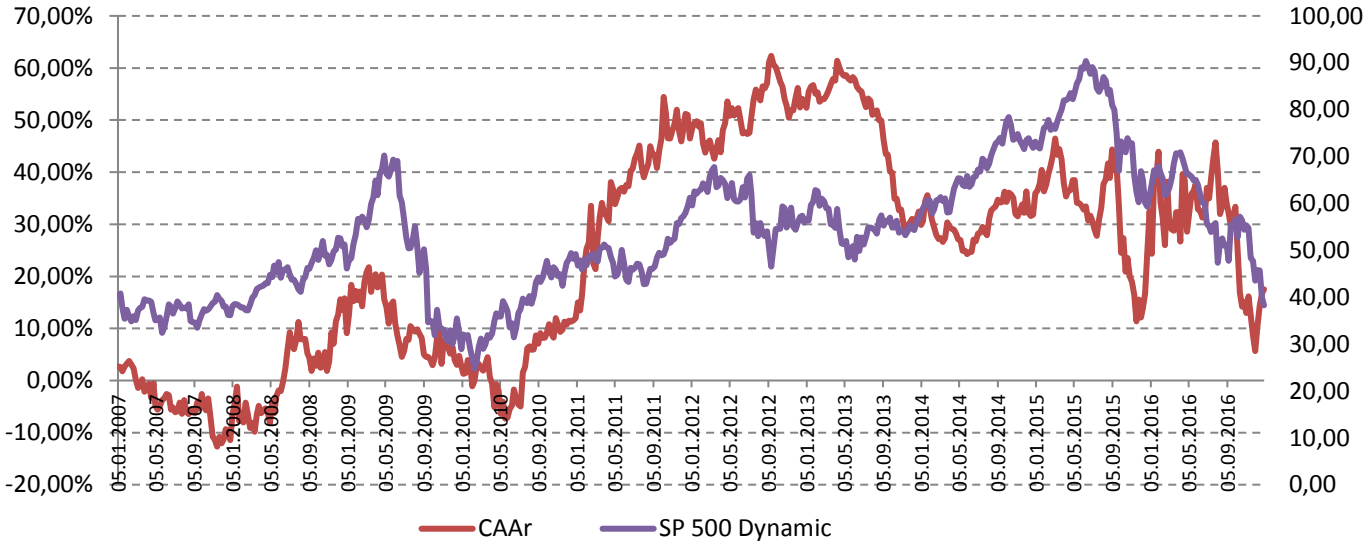


Fig. 2. *Comparison of cumulative abnormal return and SP500 oil and gas index*

At the preliminary analysis of the chart, a significant correlation between the S&P 500 return curves and the CAAR dynamics curve becomes apparent. While the market is growing, CAAR shows positive results. As can be seen, the negative values of CAAR were achieved during periods of drops in the index. This observation allows to suppose that the strategy of mergers and acquisitions is superior to the strategy of organic growth at the time of growth, and vice versa - in times of falling

markets in the eyes of investors, companies that carry out M & A have less value. Probably, this is connected with the risk of uncertainty when the market falls, and conversely, at the time of growth, investors expect more positive results from the deals.

The significantly positive effect of M&A could be expected. The acquisition in Oil&Gas industry in upstream sector in most cases implies the obtaining of company or assets, which increase the oil production of the acquirer (wells, discoveries, basins). It inspires confidence to investors and attracts more buyers in production reveal toe potential value of the assets. In addition, higher output growth increases the value of the assets, thus attracting more sellers to sell the assets. This is consistent with Ng and Donker's (2013) finding that sellers time the market to sell the assets.

Further, we plotted oil price curve and the number of transactions in the oil and gas sector of the United States to CAAR's graph. As we can see Oil price curve has positive long term relation with CAAR's curve, but with a time lag. The lag's period is approximately 1 month.

According to the second regression model, where we examined the relationship between CAAR and three variables – Oil Price, the return of S&P 500 companies in the Oil industry and the number of deals, we found that variable "Deals" has a negative sign. We can find at least two cases (in circles) where after oil price drop the number of deals increased essential -2009 and 2012 years.

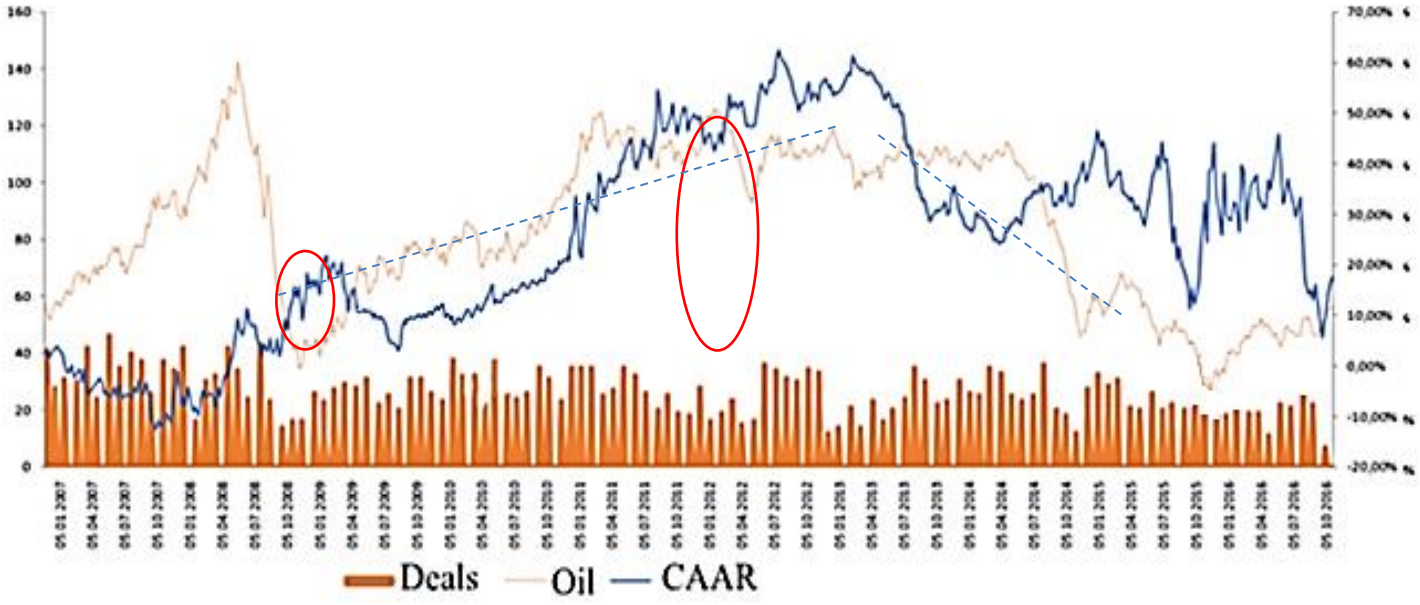


Fig. 3. *CAAR in comparison with oil price and a number of deals.*

As it was mention before the oil price plays a crucial role in M&A activity. So, we can make an assumption that the expectation of market's participants about the companies, which perform M&A growth instead organic growth in the period of low oil prices, are more positive, which has a direct impact on market price. This graph proved that the low oil prices intense M&A activity in oil and gas industry in USA market.

Oil and gas prices, especially the oil price, are the other most significant variables in explaining M&A activities (Kuang-Chung Hsu, 2015). The Brent price comes in significantly with

a one-month lag. In addition, there are some significant lagged price effects (varying from 1 to 12 months) for some cases. The positive effects of oil and gas prices on M&A activities can be based on two explanations. As oil and gas prices increase the value of the E&P firms, the higher valuation of the firms enables the companies to acquire the assets they need for future production. In addition, the increased value of oil and gas also increases the expected value of the assets, thus making it a value maximizing activity for the managers of the firms to pursue.

2.5 Managerial implication

On the results from the previous chapter, we can do at least two recommendations for managers and investors.

According to CAAR graph (Fig.2) and results of the first regression model, it is relevant to say that investors should draw attention for companies which performed M&A transactions during the period of market growth if they oriented on "bullish trend", and conversely to set eyes on companies with organic growth during market falling. But it very important to understand where will be the breaking point of current trend. For example, it is relevant to buy into the company which did M&A at the time when market felt to the bottom. After that moment the market going to grow, and the return of the company which did M&A with some lag also going to grow faster than company which keeps on organic growth at this moment.

The second implication says that as oil price and the number of deals have a significant contrary relation. This assumption was also proved by other researchers (K.S. Reddy, En Xie,2017). The main reason why managers consider the opportunity to perform M&A at low oil price period is a desire to cut cost for the company in some area or segment. Also often managers expect other additional bonuses such as mutual technical expertise exchange. In 2016 the deal between General Electric and Baker Huges was announced. In the result, the new entity will be able to operate in more than 120 countries with a huge amount of equipment and service diversity. It is a very fitting example for our sample because Baker Huges is oil service company, but it expresses the logic of possible benefits from acquiring.

However, if the recommendations about acquiring are quite clear, then the question appears why companies could to consider the opportunity to sell some asset if it represents such an important part of the companies, which provide an opportunity for additional earnings. There can also be two reasons for explaining this decision for creating a recommendation.

The first is obvious and suggests that these companies have acquired a large number of assets at a much lower price. And now it's time to return the investment by selling the purchased assets at a higher price. Here portfolio managers or CEO have to take into consideration current price and initial price for the decision-making process. If to match results which we received from the paper with this

overview, we create a recommendation for those companies who did M&A previously not sell their acquired assets during falling market. Therefore the company able to get much more profit for the assets on growing market or even peak point.

Another reason is slightly more complex and specified. The point is the market liquidity condition. The traditional literature on capital market liquidity claims that as the market liquidity increases, then a loan to finance the M&A activity for the company became more available. The tightness of the debt market is measured typically by the interest rate spread between the industrial and commercial rates and the federal fund's rate. As the spread increases, the debt market tightens, becoming harder to borrow funds from the market to finance the M&A activity. That's why this observation suggests a negative relationship between the spread and M&A activities. But oil and gas industry has own specify. The companies from this segment require a large amount of capital to finance current activity, as drilling or exploration activities typically have a high capital load. We often can meet a huge amount of capital budgeting and expenditure by the oil and gas companies. At the time of inaccessible sources for credit oil companies have to continue to explore oil fields and produce oil. And one of the ways to finance their activity and support capital expenditures is to sell assets. Here appears assumption that less available credit and unprofitable rate have a positive relation with total M&A activity in oil and gas sector. Also, we can consider the situation when oil price is high. In this condition, the sale of least attractive assets becomes more profitable. It is could be a very efficient strategy for oil companies from exploration and produce a segment for financing future capital expenditures and other activities.

In this way, we formulated two managerial implications for buy positions and for seller positions.

2.6 Research limitations

Limitation of current work could be spat in two parts. The first piece is limitations which concern to sample of data. The first criteria is that to the sample were included only producers of oil, in other words, companies from the upstream segment. But it should be taken into consideration that there exist midstream, low stream and oil service companies in oil and gas market. There could be another type of assets which companies acquire and as a result another logic for estimation and market's expectations. In last time, the share of upstream segments in M&A deals decreases in comparing with midstream. This is because transportation projects became more essential than it was previously. Moreover, both target and acquirer were taken from oil and gas industry, from one side we explicit bias, but in other it could be interesting to know how oil and gas companies diversify their

asset and how the diversification influences on the market performance. Other limitations are deal's size and company capitalization.

From the point of methodology, dynamic portfolio approach provides an essential instrument for estimation the influence on market performance, but there could be overlapping. Some companies had performed M&A in three years to row, and by using this approach it is impossible to estimate from what transactions the company received the result. From our viewpoint this approach relevant for a period of one year, in another case the result could be biased. If it, for example, some mega deals, where the process of integration is very time consuming such type of methodology could be useless.

In the regression model were considered only external factors. It is possible to suggest that for some companies such factors as financial indicators before and after the deal, the size of the company or existence of another activity have very crucial meaning.

All these limitations create an area for further studying of the influence of M&A on market performance.

Conclusion

In this paper were examined the influence if M&A middle-term market performance in oil and gas industry in the USA. The goal of this study was to estimate the middle-term market performance from M&A transactions in Oil&Gas industry of USA and explain results via external factors.

In the first chapter, we shortly gave the definition of M&A, described stages and historic trends. Then we considered previous papers and studies about the impact of M&A on operating and market performance. As can be concluded from this part of the research there exists a lot of papers dedicated to the influence of M&A on the performance of companies. However, despite which type of performance was analyzed, most of the authors received different results. The main approaches which were used for estimation performance of the companies are regression analysis and event study. The main limitations of papers dedicated to operating performance are a variety of possible indicators for estimation performance and uncertainty in periods for which these indicators should be analyzed. In common, most of the authors used event study approach for estimation market performance, which implies usually 180 days for estimation period. That's why the dynamic portfolio approach was introduced in this first chapter.

The first piece of the second chapter is methodology description, where dynamic portfolio approach application was described and how portfolios were created. In the result, we received two portfolios – A and B. Portfolio A measures performance from using M&A transactions and portfolio B measures performance of organic growth without M&A transactions. Data collection process described which criteria were applied for creating data selection. In the result, we received about 46 companies and 150 deals for the period of 10 years. After estimation process, the dynamic portfolio approach showed that the using M&A transactions give a high market performance during the growth period of oil and gas market. This conclusion justified by positive CAAR, which is mean that the performance of portfolio A is higher than portfolio B. For an explanation of these results the CAAR graph was combined with index S&P 500 in the beginning after we added oil price and the amount of M&A deal in oil and gas sector.

After CAAR's calculating and graph's plotting we applied regression analysis consisted of two regression models. The regression model confirmed a significant correlation between CAAR and other three factors. Two assumptions were confirmed by regression analysis. Firstly, CAAR has significant positive correlation with oil price and oil and index S&P 500, which says about higher market performance after M&A during the period of growing index. Secondly, the analysis confirmed the negative relation between oil price and a number of deals. This implication proves previous studies that claimed that during low oil price period M&A activity increases.

This research makes an essential contribution to the pool of previous papers about the middle-term influence of M&A transactions on market performance.

From the point of managerial implication, this work gives recommendations to managers of companies to perform or not perform M&A to their companies, depending on market's condition. In the other hand, its contribution gives some signals to another participant of the market to buy shares of companies also depending current condition oil and gas market.

In order to clarify recommendations, it is necessary to say about limitations, which were also considered. First of all, it is a sample of data. It is very important during the decision-making process to take into consideration the restriction of capitalization and deal's value. Moreover, there were examined only companies which acquired assets from upstream sector. M&A deals with downstream and midstream companies could give another result from the point of market performance. Also, there was considered only traditional producers of oil without offshore or another unconventional resource.

Another part of limitation concerns of approach for performance estimation. In the dynamic portfolio, approach overlapping was observed. This is mean that some companies had performed M&A deals three years to the row. From the point of this method, it is impossible to estimate the accurate contribution from each transaction. Also, only external factors were included in the regression model, without other internal factors which may influence the results of the deal in a direct way.

In the end, key goal and set task were achieved during the paper. All assumption were tested and received results allowed to make an essential recommendation for business society. Identified limitations create an opportunity for further research.

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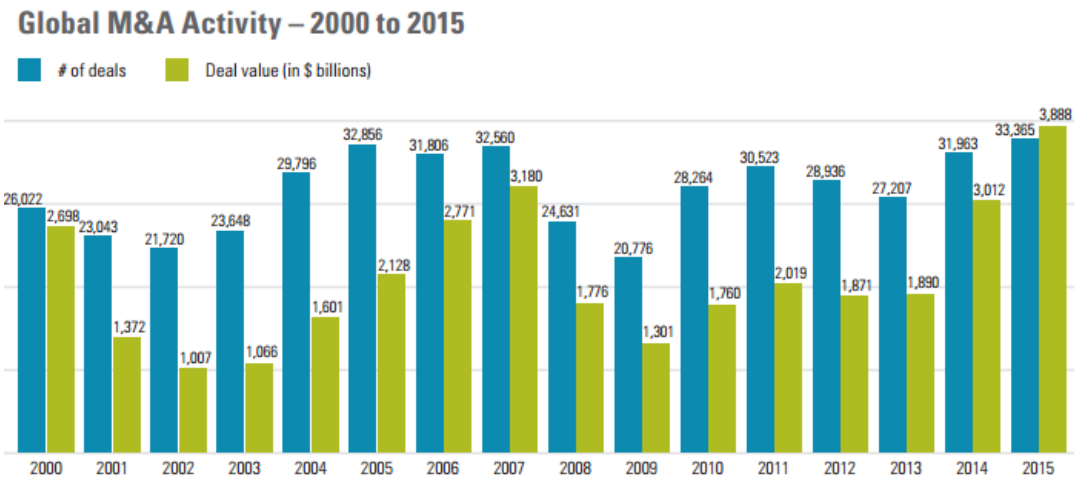
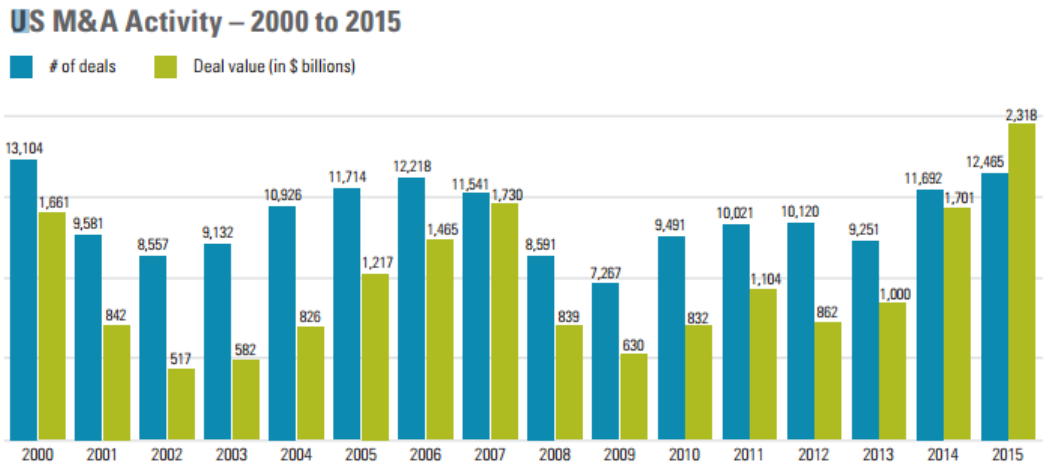
Appendices

Appendix 1. Global M&A activity (2000-2015)



Appendix 2. US M&A Activity (2000-2015)



Appendix 3. Example of Excel sheet with portfolio distribution

Ticker	Code	03.10.2014	10.10.2014	17.10.2014	24.10.2014	31.10.2014	07.11.2014	14.11.2014	21.11.2014	28.11.2014	05.12.2014	12.12.2014	19.12.2014	26.12.2014	02.01.2015	09.01.2015	16.01.2015	23.01.2015	30.01.2015	06.02.2015	13.02.2015	20.02.2015	27.02.2015	06.03.2015
U:XCO	ACO-US	2,96	2,31	2,68	2,79	3,05	3,28	3,24	3,78	2,94	2,71	2,24	2,62	2,38	2,09	1,9	1,89	1,85	1,99	2,51	2,52	2,18	2,1	1,89
@ATLS	ATLS-5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9,58	8,44
U:QEP	QEP-US	30,25	25,38	23,18	24,32	25,07	25,87	24,52	25,33	20,44	22,24	19,37	20,53	19,59	19,99	19,93	19,89	20,25	20,22	21,92	22,59	22,86	21,48	21,16
U:OXY	OXY-US	92,0486	87,828	84,7584	85,8711	85,3052	84,4515	83,1277	84,0294	76,5186	81,4466	74,1896	81,4866	82,0164	80,6169	77,5082	78,028	78,8177	79,9672	81,7165	83,0759	80,0672	77,8481	74,7393
U:DNR	DNR-US	14,13	12,77	12,42	12,41	12,4	11,76	11,2	10,15	8,26	7,43	6,4	8,32	8,13	7,92	7,31	6,85	6,8	6,9	8,89	8,66	8,91	8,4	8,3
U:RRC	RRC-US	66,77	63,41	67,32	66,62	68,4	73,09	71,92	72,2	65,65	58,93	54,18	59,87	54,57	55,4	50,29	49,58	48,64	46,27	51,66	50,84	51,84	49,54	48,75
U:EPE	EPE-US	16,73	14,53	14,13	14,84	14,6	15,23	14,82	15,93	10,69	9,3	7,47	10,13	10,91	10,46	9,18	9,26	9,41	10,35	13,36	12,9	12,56	11,25	10,47
@MEMP	MEMP-US	22,09	19,64	20,88	21,5	20,93	17,17	16,37	16,32	13,76	14	13,13	14,41	14,77	15,65	15,45	14,99	16,47	17,18	17,53	17,35	17,41	18,17	18,26
@VNRSQ	VNRSQ-5	26,94	22,26	24,87	26,16	24,8	25,19	24,48	26,07	23,22	20,23	15,22	18,29	16,74	16,82	15,85	13,35	13,35	14,8	18,13	18,09	17,28	16,58	16,19
U:PE	PE-US	19,3	18,69	18,03	17,31	16,97	16,42	17,95	17,9	12,64	12,63	11,51	15,92	16,27	16,02	14,3	15,72	16,83	16,77	17,59	17,28	16,36	14,89	13,5
U:APA	APA-US	86,95	79,91	72,85	75,81	77,2	76,52	73,35	75,7	64,09	61,64	56,44	64,82	63,96	63,83	60,69	62,25	62,88	62,57	68,33	67,05	66,22	65,84	63,13
U:CXO	CXO-US	116,92	105,56	104,84	108,99	109,03	117,88	117,84	121	95,25	95,44	85,36	98,98	100,63	101,01	99,42	105	106,72	110,85	114,48	117,11	117,22	108,92	111,11
@GPOR	GPOR-US	51,49	44,47	47,19	48,73	50,18	55,16	52,56	54,52	47,73	40,45	38,46	43,78	41,45	42,98	40	36,7	39,29	38,49	41,94	43,74	43,01	45,81	45,47
U:WTI	WTI-US	10,58	9,29	9,39	9,1	9,09	9,31	9,72	10,69	7,53	6,49	5,68	7,63	7,49	7,43	6,11	5,87	5,55	5,06	6,31	6,55	6,25	5,97	6,35
@BBEP	BBEPQ-5	19,83	16,2	15,77	16,91	17,29	16,61	15,55	15,57	13,21	10,29	8,12	7,82	7,02	7,63	6,43	4,87	5,4	6,56	8,38	7,85	7,59	7,17	7,5
U:PES	PES-US	12,41	11,1	10,76	11,06	9,18	8,4	8,2	7,57	6,04	5,79	4,22	5,99	5,46	5,57	4,96	3,92	4,41	4,14	5,1	5,74	5,87	5,32	5,7
U:NBL	NBL-US	65,17	58,72	56,59	57,43	57,63	56,51	56,11	57,71	49,18	50,59	43,86	51,19	47,22	46,88	43,57	45,49	46,27	47,74	47,72	50,79	49,08	47,23	45,39
U:COG	COG-US	31,28	29,34	30,95	31,23	31,1	33,62	33,62	34,44	33,04	30,81	30,09	31,78	29,88	30,1	30,05	29,04	28,48	26,5	26,83	28,1	28,06	29	27,92
U:XEC	XEC-US	120,82	112,43	109,14	109,16	113,67	118,34	117,56	122,16	104,95	104,87	98,5	113,62	110,88	106,88	101,05	98,95	100,25	103,2	110,09	112,01	115,9	109,68	109,44
U:SWN	SWN-US	34,79	33,92	31,99	31,64	32,51	36,5	33,75	34,46	32,18	30,15	28,71	31	28,67	27,17	24,68	25,01	25,35	24,79	26,48	27,36	27,55	25,08	23,65
U:OAS	OAS-US	39,58	33,42	30,44	30,44	29,96	27,75	26,55	27,49	18,38	14,24	12,33	17,16	16,62	17,04	15,33	13,68	12,91	13,44	18,65	16,84	16,65	14,33	13,7
U:CPE	CPE-US	8,1	6,69	5,95	6,31	6,56	6,64	6,26	6,72	4,91	4,73	4,54	5,69	5,5	5,38	5,21	5,37	5,65	5,45	7,1	7,37	7,37	7,32	7,3
U:SM	SM-US	73,16	60,98	58,99	60,34	56,3	54,25	52,11	54,39	43,45	33,18	30,84	38,76	38,67	38,37	35,76	35,92	35,91	37,82	48,14	48,56	47,24	48,52	44,49
@UPLMQ	UPLMQ-5	22,67	21,21	22,97	22,41	22,8	23,86	22,92	23,59	19,85	17,3	14,68	15,77	13,14	13,16	11,81	14,18	13,58	12,75	15,14	15,67	16,21	16,27	16,22
U:SPP	SPP-US	33,5	26,9	25	26,2	24,75	23,4	23,6	24,8	22,8	19,5	17	15,846	14,1	14,7	14,6	14,4	12,605	13,2	14,9	13,6	13,9	13,6	16,488
@SWTF	SWTF-5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
U:CRK	CRK-US	83,8499	68,7	61,35	57,1	59,2	57,15	59,05	60,75	44,3	33,4	26,3	36,15	34,1	35,15	28,3	24,5	23,3	20,2	29,6	30,45	30,75	26	24,4
U:COP	COP-US	74,77	70,36	68,08	70,07	72,15	72,16	71,41	73,64	66,07	67,85	62,45	70,98	69,88	68,92	64,92	63,08	64,65	62,98	67,49	69,88	67,38	65,2	62,79
U:NFX	NFX-US	35,13	30,21	27,1	29,54	32,61	33,57	33,66	35,12	27,23	25,85	24,13	28,48	26,97	26,6	24,5	25,88	28,49	29,78	30,79	32,24	32,09	33,03	32
U:RSPP	RSPP-US	24,84	23,86	24,92	24,33	24,47	25,14	27,84	29,08	21,76	21,35	21,03	25,85	26,46	25,25	23,95	26,41	28,33	26,8	27,58	28,48	28,11	27,16	28,29
U:RICE	RICE-US	26,25	22,78	24,72	24,71	26,43	29,18	25,05	26,68	24,9	22,76	23,91	25,57	21,82	22,02	19,3	16,84	18,35	17,08	18,4	19,13	19,75	19,58	18,76
U:LPI	LPI-US	21,47	19,62	17,5	18,92	18,96	19,08	17,71	17,04	10,45	9,18	7,76	10	10,42	10,9	9,4	9,04	9,28	9,81	13,33	13,25	13,08	11,93	11,63
U:WLL	WLL-US	73,5	62,78	59,2	61,66	61,24	59,44	56,56	59,43	41,77	37,25	27,61	34,31	33,99	33,19	31,28	28,28	28	30,02	37,95	38,53	38,15	33,83	34,03
U:BSM	BSM-US	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix 4. Example of Excel sheet with deal's selection process

	Texas Petroleum Investment Co	220	16-Nov-2012	Gulfport Energy Corp	220	15-Feb-2013	Southwestern Energy Co	394	02-Feb-2015
	Northstar Offshore Energy Partners LLC	160	18-Oct-2012	VOGO Eagle Ford LLC	515	31-Jan-2013	Southwestern Energy Co	300	02-Feb-2015
	Vanguard Permian LLC	445	29-Jun-2012	EXCO Operating Co LP	685	31-Jul-2013	Synergy Resources Corp	505	14-Jun-2016
	NFR Energy LLC	231	31-Dec-2011	Chaparral Energy Inc	160	18-Dec-2013	Tecolote Holdings LLC	131	17-Nov-2016
	Concho Resources Inc	1,000	02-Jul-2012	QR Energy LP	110	06-Aug-2013	White Star Petroleum LLC	200	02-Jul-2016