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VALUATION OF STATOIL ASA USING MULTIPLES

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ABSTRACT

Uniform with prior research on the topic, this paper discusses the applicability of multiples valuation method using the four-step approach, but on the other hand, reflects the results to the Discounted Cash Flow method. In literature, the methods have been classified as being competing methodologies, multiples being the easier method to conduct, while Discounted Cash Flow method giving a more accurate view of the conditions of the company. The aim of this research was to find the fair value for the target company, Statoil, and conduct analysis from the results of both methods. The purpose for finding the fair value is to determine if Statoil is under- or overvalued by comparing the fair value to the actual share price.

The research questions were the following: "Is Statoil over/undervalued? How to maximize the accuracy of the results, and how to minimize most of the errors that affect the research accuracy?" The main result from the execution of both methods was that Statoil is undervalued, as the mean fair share price from the multiples method as well as the fair share price from the Discounted Cash Flow method, were greater than the actual share price of Statoil. Although, there were some biases in the calculations as well as choosing the peer companies for Statoil, those biases were pointed out as not being too significant.

Keywords: Fair value, multiples, four-step method, peer companies, equity, entity, DCF

INTRODUCTION

Valuation in itself is very important for companies, in order to make financial and operational goals and follow the progress in meeting them, and for analysts, investors and researchers, who are interested in the stock market or valuation of assets in general (Schreiner 2007; Damodaran 2011; Hitchner 2014). Valuation is also used in making forecasts and stock recommendations (De Franco et al. 2015). It can be argued that valuation doesn't lose relevancy but it is actually considered being a growing interest (Kjellberg, Mallard 2014).

This study will be examining the multiples of Statoil ASA, referred as Statoil from this point on, and comparing the multiples of the target company to the multiples of the peer companies from the same industry, energy, oil and gas. This research is focused specifically on the oil and gas industry inside the energy industry. The whole industry is ongoing fundamental challenges, for example climate change. Choosing Statoil as the target company for valuation was based on the fact that the company is one of the leaders in exploring opportunities in new energy as well as driving innovation in oil and gas around the world. (Statoil2018a)

The aim of this paper is to find a fair value for Statoil and reflect the results measured against the actual share price. First, a good pool of competitors in the energy industry is carefully conducted. Second, the appropriate multiples for this valuation are chosen. Third, the multiples of Statoil and its peers are calculated. Fourth, the multiples of the target company are compared to the peer companies in the same industry and to the industry average to find the fair value. This four-step method will be explained in the following chapters carefully and thoroughly. Finally, the results of the fair price compared to the actual share price are analyzed. From here we can find the two research questions:

Research question 1: Is Statoil over/undervalued?
Research question 2: How to maximize the accuracy of the results, and how to minimize most of the errors that affect the research accuracy?

This paper will be divided into three main parts, which contain the theoretical framework around multiples valuation and Discounted Cash Flow method, the methodology and the analysis and discussion around the results. The theoretical part of this paper will start by encountering and explaining the answer to the question, why are companies valued? As a continuation, the different methods of valuation will be addressed and valuation using multiples and valuation using discounted cash flow (DCF) method are compared briefly. The following sub-chapters will also cover more in depth the advantages and disadvantages of the multiples approach and what sort of different applications it has.

Secondly, there will be a discussion about the challenges of choosing peer companies and the need for similar operating and financial characteristics and the demand for similar prospects of key value drivers such as profitability, growth, and risk. The chapter will also hold information on the Standard Industrial Classification (SIC) codes as well as how the information is used more closely in deciding the peer companies from a group of similar companies. There will also be a brief introduction to Statoil and to the industry of oil and gas as a whole.

Finally, in the sub-chapter “choosing the multiples”, the theoretical framework concludes in covering the different multiples in theory and which are the most distinguishable from each category. In this sub-chapter the different categories of multiples relevant for this research, equity and entity multiples, are going to be discussed. It will also cover the theoretical basis of choosing multiples for valuation.

In the second part of this paper, the methodology used to calculate and analyze the valuation of Statoil is presented, and all of the multiples and the results of the calculations for those multiples of Statoil and the peers will be shown. Furthermore, the methodology of DCF is introduced and the results from those calculations are presented. In the third part the results shall be analyzed, based on the theory introduced in the theoretical part, using the methodology to value Statoil, and discuss these results and how they reflect on the research questions. Finally, there will be a conclusion on the topic where the results of the research will be once more addressed.

1. THEORETICAL FRAMEWORK ON VALUATION

1.1. Why are companies valued? The standard of value

Schmidlin (2014) writes in his book that company valuation is concerned with deriving the fair value of a company. This is a pretty good standpoint to start breaking down the need of valuation for companies themselves and for individual investors or groups of investors likewise. Hitchner (2014) continues by stating that businesses or their assets are valued for a variety of reasons, of which some of the more common purposes for valuation are, mergers and acquisitions, business planning, stock option planning and financial reporting and buy-sell agreements.

For investors the meaning of valuation drives from the fact that an investor does not pay more for an asset than what it is worth on the market at that current point of time. Ausloos, et al (2016), explain this relationship between the market price and the fair price as the Efficient market hypothesis (EMH). Basically, what it means is that the current stock prices of companies always include and reflect all the relevant information from their financial statements. So, as a result, the stocks are always fairly priced on the market. On the other hand, investors buy financial assets for the cash flows they expect to receive from them. As such, the price paid for any stock should reflect the cash flows it is expected to generate (Damodaran 2011). This means that even though, the market prices present the fair values of those assets, there is always a level of uncertainty of the development of that very price in the future, based on the fundamentals of that company and the industry. This is where different valuation methods come into play. The standard of value for investors is called the intrinsic value, which differs from the fair value relevant for accountants of a company (Hitchner 2014).

For companies, the most significant trend in accounting standard has been the shift towards fair value accounting, where assets are valued on the financial statements of the company at their fair values rather than at their original cost. The accountants inside a company have to meet these requirements by sharpening their valuation skills, as they are charged with valuing brand name, customer lists and other intangible assets. In addition, companies are required to immediately

reassess the value of their assets after an acquisition and evaluate their goodwill impairments in future periods. (Damodaran 2011) For companies, the standard of value used in their financial statements has two definitions. It can be stated as, the fair market value or the fair value. The fair market value states that it is the price at which an asset would change hands between a willing buyer and seller, neither being under any compulsion and both having reasonable knowledge of the relevant facts related to the trade. Fair value for financial reporting of companies does not differ too much from the fair market value description, as it states that fair value is the price that would be received to sell an asset in an orderly transaction between market participants at the measurement date. The real difference between the two is that fair value can contain more aspects of investment value than fair market value. (Hitchner 2014)

All in all, the need for some form of valuation is always present inside the companies and their reporting as well as for investors trying to "beat the market" by identifying mispriced stocks and acting accordingly to make profit (Penman 2006).

1.2. Valuation using multiples, the four-step approach

There are mostly only two different notable methods of valuation of a company: The multiples valuation method, which is conducted by using different multiples to evaluate the value of the company and the Discounted Cash Flows (DCF) method, which refers to assuming that the value of an asset equals the present value of all future cash flows. The multiples valuation method is faster and easier to use without that much information and the DCF method is of course easier to use when we have a better understanding of the future cash flows of the company.

Both of these methods have their advantages and disadvantages. Valuing firms using multiples of their financial statements is a simpler approach than the DCF method in theory and in practice, since it involves significantly less forecasting and acknowledgement of the future cash flows. However, implementing the multiples approach has its own challenges: choosing the appropriate multiples and choosing the peer companies to which to compare the multiples of the target company (Baker, Ruback 1999). Especially the challenges in choosing the peers emphasize research errors and outliers on the calculations, since finding truly comparable companies, they would have to have similar cash flows streams and that would require us to develop cash flow

projections for those companies. But, this would defeat the purpose of using the multiples approach instead of the DCF method, which is to simplify the valuation process (Soffer, Soffer 2003).

Furthermore, in order to create these cash flow projections, the DCF method needs an estimated appropriate discount rate to forecast the future cash flows. The method of multiples uses the most recent end of year financial data or forward-looking data and uses that information to calculate different variables to base the valuation of the company on. It avoids the problems of creating cash flow projections that the DCF method has and the selection of the appropriate discount rate by estimating it using historical data. (Baker, Ruback 1999).

When multiples and values are calculated for a target company, the results don't tell us too much by themselves unless they are put into the right context. There are three different choices that can be used to put those results into the right context, while making a multiples valuation on a company. Firstly, the multiples can be compared into the historical data of the same company. This method gives a view of how the company has improved overall and comparing the results to the long-term objectives of the company, further analysis on how well have they done in meeting those goals could be covered. Using this method of valuation, the bigger the sample of data and the timeframe is, more accurate of a view of the company's performance will be reached. However, to make the comparison for the multiple's development, you have to assume that the company's fundamentals have not changed over time. Comparing multiples across time can also be complicated because of the possible and likely changes in interest rates and the behavior of the mood on the market. (Damodaran 2012) This method is also used in DCF, since it is based on evaluating the history to calculate and forecast future cash flows.

Secondly, the multiples can be compared into the market. Here a comparison of those multiples of a company will be measured against the averages of the market for those same multiples. However, this method has a huge drawback on valuation accuracy, since different multiples can be considered good in an industry and otherwise considered bad in other industries. In this method the pool of peer companies should be much larger (even hundreds or thousands of companies), because you need to balance the outliers that the non-industry specific method brings. The third way, is to compare the results specifically to the industry. (Fernandez 2001)

Industry-specific multiples approach will give a better view about the company's performance than the non-industry specific market approach, since it compares the company to companies

similar to it. This will theoretically minimize the outliers in the calculation of the industry average multiples (Schreiner 2007). Using this method has one clear drawback, which is choosing the peer companies. However, this step of the process brings out the most errors and anomalies to the research, as said before, finding truly comparable companies would require projecting cash flows streams. There are also other ways to choose the peer companies, by region or size, as well as using a combination of two or more of the factors stated. Using the industry-specific method, the accuracy of the valuation is mainly based on two things: the choice of multiples and the choice of those peer companies. (Kang 2016)

This research will be focusing on the third method of multiples, the industry-specific approach. This method of multiples, is also known as the four-step process. It consists of the following steps to minimize errors in the analysis. First, selecting a sample of comparable companies for the target company. Second, choosing and calculating the multiples for those comparable peer companies as well as the target company. Third, creating the fair values from the multiples of the peers using a central statistics, such as the mean, the harmonic mean or the geometric mean. Finally, applying the aggregated multiple of the peers to the corresponding value of the target company under analysis in order to estimate if the multiples are different from the aggregated fair values in order to estimate the value of the company. Each of the steps in the four-step method has their own complexities. (Couto et al. 2017) These different steps will be further discussed in their sub-chapters 1.3 and 1.4. However, the next few sub-chapters 1.2.1, 1.2.2 and 1.2.3 will further discuss the advantages and disadvantages of the method of multiples, and its applications, as well as the DCF method.

1.2.1. The advantages and disadvantages of multiples valuation

As mentioned before, the main strength of the multiples valuation method is its simplicity of application. Calculating the multiples and implementing the four-step valuation process takes less time and requires fewer assumptions and information than the application of the DCF model. (Damodaran 2012)

A second advantage is the easy accessibility of multiples to investors through online platforms and financial newspapers. These information sources, for example Morningstar, publish common trading multiples of many firms daily, and update them regularly. Investors have access to research reports and the opportunity to put different analysts' target multiples and contrast them against the current multiples calculated from the financial data or obtained from the sources mentioned.

(Schreiner 2007) Many investors also use this kind of information to detect undervalued stocks by observing differences between the multiples within a set of comparable firms and then using that information in your advantage to sell or buy the stock of the company in question. This is called screening. (Penman 2006)

Screening also raises another issue for the investor. Using a single multiple uses only one piece of information and ignores the other information of the companies. Using multiple screens can be difficult and you have to get market knowledge to really know what information to trust. So, these issues are very much alike with the disadvantages of the whole process of multiples valuation. Since multiples valuation reflects the current mood of the market by measuring the fair market value of firm's stock, the value does necessarily equal to the intrinsic value, which means the actual value of a company, based on its true value including all aspects of the business, in terms of both tangible and intangible factors. (Penman 2006)

So can be seen, there are similarly many disadvantages and weaknesses of the multiples method. Firstly, by combining the key value drivers of a firm into a single number, multiples compact a great deal of information, but keep the information in a simple form. In other words, the biggest advantage of multiples valuation, its simplicity, is also its biggest weakness. The method doesn't take into account the different effects of profitability, growth, or risk amongst the peer companies or the target company. (Schreiner 2007)

Second, multiples are focused on a short period of time because they only represent where a firm is at a certain point in time (i.e. in the data on financial statements) and assume the key value drivers of the firm to remain in a steady state from that date onwards. Third, the fact that valuations based on multiples reflect the mood of the market also has a downside. It implies that using multiples can result in value estimates that are too high in industries that are overvalued or too low when the industry is undervalued. (Schreiner 2007) In contrast, DCF valuation is based on firm-specific growth rates and cash flows, so it is less likely to be influenced by market errors in valuation (Damodaran 2012).

1.2.2. Different applications of multiples valuation

A careful comparable analysis, comparing a company's multiples versus those of comparable companies or the whole market, can be useful for companies as well as investors to position the company and analyze its weaknesses and strengths. Some multiples are better than others while

taking a look at a certain industry, some might even be misleading because they are not fitting for that specific industry and thus, must be chosen optimally. (Kang 2016) Valuation based multiples can be separated into, multiples based on company's capitalization, based on company's value, and growth multiples (Fernandez 2001). These different multiples from each category will be introduced in the sub-chapter 1.4: "Choosing the multiples".

As mentioned in the last sub-chapter, multiples are an important tool used by many analysts, investors, researchers interested in the valuation of assets or generally interested in the stock market. They are the most common technique in equity valuation and are used in research reports and stock recommendations of both buy-side and sell-side analysts. Even in cases where the value of a corporation is primarily determined by discounted cash flow, equity as well as entity based multiples play the important role of providing a second opinion (Schreiner 2007). In other words, multiples are frequently used to translate the results of methodologies such as DCF into figures or as a complete alternative to estimate the value of a company in an easier and faster way (Couto et al. 2017). Among professionals, multiples are a widely accepted tool, but in the academic world they are still considered a subjective and understudied approach (Bhojraj, Lee 2002).

A multiple is simply a ratio, obtained dividing the market or estimated value of an asset by a specific piece of data on the financial statements of a company. Multiples valuation results are thus easier to explain to clients by the professionals than the results of the fundamental analysis method, a method of evaluating a security or a stock to measure its intrinsic value, by examining related economic factors, such as the overall economy and industry conditions, and overall financial conditions of the company and the company management. Furthermore, fundamental analysis is analyzing information in current and past financial statements, in conjunction with other firm-specific, industry data to forecast future payoffs and eventually arrive at a firm's intrinsic value (Penman 2004).

The main motivation of fundamental analysis is to identify mispriced stocks for investment purposes. However, even in an efficient market there is an important role for fundamental analysis, since it helps to understand the determinants of a firm's market value, thus facilitates investment decisions and valuation of private firms (Kothari 2001). However, all of the assumptions needed during the fundamental analysis are still similar to the multiples valuation, such as the risk, growth and the market mood and, thus the multiples method is equally applicable. (Couto et al. 2017)

1.2.3. Discounted Cash Flow method in short

Damodaran (2011) writes that in intrinsic fair value valuation, the valuation process begins with an assumption: The fair value of an asset is a function of the expected cash flows on that asset. In this form of standard of value, the intrinsic value, an asset being whatever, is estimated in a discounted cash flow (DCF) model, where the value of this very asset equals to the future cash flows it generates. In the valuation of a company, this approach determines the fair value of the share price for the target company by discounting the relevant future cash flows with an appropriate discount rate (Schmidlin 2014). The fair value then tells us more about the company and if it is under- or overvalued on the market. Within this model, there is a need for a more distinguished view of the direction of the company, its industry and its fundamentals so that it can be acknowledged whether the company is worth investing into, by creating the cash flow projections for the relevant items in its financial statements.

However, the DCF method can also be used in a very simplified way, where the direction of the relevant cash flows is trying to be predicted by analyzing the historical data in the financial statements of the company. This isn't as accurate to use as using the fundamental valuation method of Discounted Cash Flow, but it makes the calculations faster and gives us good enough view of the fair value of the company in comparison to the multiples valuation method. Schmidlin (2014) presents us with three different ways to establish the DCF method, equity method, entity method and the adjusted-present-value method. Each method has its own result from the calculations, as the equity approach finds the equity value and the other two methods find the entity value, by discounting the cash flows. In methodology, this research will be using the entity method of discounting the cash flows and the method will be further explained in that chapter.

1.3. Choosing the peers

Choosing the peers is one of the hardest steps in the four-step multiples valuation method. As mentioned before, finding truly comparable companies is extremely difficult, as they would have to have similar cash flows streams and that would require us to develop cash flow projections for those companies and it would defeat the purpose of using the multiples approach instead of the DCF method. This step of the multiples valuation method also raises the most outliers in the calculation of the multiples as non-comparable companies could have huge differences in their multiples (Soffer, Soffer 2003). However, using the DCF method as a mirror to the results of the

multiples valuation is presumed profitable to the accuracy of the whole valuation process (Schmidlin 2014).

In literature, there are three different ways to approach the selection of the peer group of companies. Firstly, the peer group selection can be based on industry classification. This means that companies which operate in similar industries should display similar risk and earnings growth characteristics. There are multiples different methods of classification such as Standard Industrial Classification (SIC), North American Industry Classification System (NAICS) and Global Industry Classification Standard (GICS). While using the SIC classification the accuracy of the P/E multiple, using a three-digit SIC code to select the peer companies, is preferable to a broader code but no improvement occurs when the four-digit code is chosen (Alford 1992).

The second approach argues that peer group selection should be based on companies with similar valuation fundamentals or economic characteristics such as profitability, growth, and risk (Bhojraj, Lee 2002). This method is very similar to the first one, but it lacks the idea of using the industrial classification codes. The third and the latest of the approaches, argues that peer group selection should be based on search traffic patterns on websites. The idea is that two firms that are frequently co-searched by multiple users are fundamentally connected or economically similar (Lee et al. 2015).

In prior research it is often required of the peers to have similar operating and financial characteristics as the firm being valued. In other words, they need similar key value drivers, profitability, growth, and risk, amongst the target company and the peer companies. In the search for an appropriate peer group, there have usually been two approaches, companies from the same industry and companies with similar current market prices. Thereby, the research has presumed firms from the same industry to have similar operating and financial characteristics by using one of the industry classification systems mentioned.

The prior research of the topic of peer company selection has also found that industry membership and a combination of risk and earnings growth are effective methods for selecting comparable firms, partitioning industries by risk or growth does not improve accuracy, and selecting comparable firms solely on the basis of risk or growth is not advantageous (Alford 1992). Also, using a combination of industry and profitability yield even more accurate valuations and two-

digit and one-digit SIC codes, perform significantly worse than more specific ones three-digit and four-digit SIC codes (Cheng, McNamara 2000).

1.3.1. The energy industry classification

Economic infrastructure refers to the all the internal services provided by the country in order to make business activities possible. The services include power, water, electricity, gas, roads and railways, airports and ports et cetera. As by this definition, the companies in the oil and gas industry and the energy industry as a whole, are part of the economic infrastructure. Economic infrastructure companies perform assigned specific functions in a specific territory usually using very expensive and unique infrastructure and that is why real property of these companies, makes the biggest share in the corporate capital structure. Management of infrastructure companies and their operating costs must include management of the structure and value of fixed assets. (Bivainis et al. 2009)

Bivainis et al. (2009) also mention that in the energy sector, the same stakeholder group may represent various interests depending on the type of company's activities. The residents of a certain area are usually more inclined to support companies which use renewable resources. The energy companies on the other hand, are interested in the development of new energy as well as driving innovation in the already known areas of energy such as oil and gas in this case of Statoil (Statoil2018a). The activities within the energy sector are controlled and coordinated by the State and various EU institutions.

The energy industry is very large in its operations. Taking a look at the SIC code classifications for the energy industry we find that the whole industry is really separated inside the classification. In order to find the primary SIC code that defines the industry and the peer companies of Statoil we need to break down the activities of Statoil. Statoil is among the world's largest net sellers of crude oil and condensate, the second-largest supplier of natural gas to the European market, and they have also substantial processing and refining operations (Statoil 2018a). The primary SIC codes for Statoil are thus, 1311, which means Crude petroleum and natural gas as well as, 2911, which means Petroleum refining (SIC codes 2018). These SIC codes are in 4-digit form, which is the most accurate form of classification of the industry. As said before, the accuracy of the research valuation is not improved significantly, while using the four-digit codes instead of the three-digit codes, but the accuracy is greatly improved whilst using more complex codes rather than the simple one- or two-digit codes (Alford 1992).

In their own research of these industry classifications, Lee et al. (2015) came to a conclusion that the GICS is more accurate in use than both the SIC and the NAICS codes. That is why the GICS is also incorporated into this research. Similarly, the GICS code for Statoil is 10102010, which means that the GICS Sector for Statoil is considered to be Energy and the sub-industry for Statoil is considered to be Integrated Oil & Gas. The GICS classification states that the code 10102010 holds oil companies, who are engaged in the exploration and production of oil and gas, as well as at least one other significant activity in either refining, marketing and transportation or chemicals (GICS2018). Ultimately, the choice of the appropriate industry benchmark classification system relies on some degree of subjective judgment.

1.3.2. Statoil and the industry

Statoil (2018a) describes the industry of energy, oil and gas as follows: "Our industry is experiencing fundamental challenges. From climate change and geopolitics to the energy markets, we are facing new realities. Some see them as threats. In Statoil, we believe our job is to turn them into opportunities. That's why we're looking for new ways to utilize our expertise in the energy industry, exploring opportunities in new energy as well as driving innovation in oil and gas around the world. We know that the future has to be low carbon. Our ambition is to be the world's most carbon-efficient oil and gas producer, as well as driving innovation in offshore wind. We're a company driven by solving tomorrow's energy challenges, today."

As mentioned before in this research, Statoil is one of the leading explorers for new oil and gas fields. They predict that oil and gas will continue to be society's primary energy sources for many years to come but at the same time they expect strong demand growth for renewables over the next decades. Statoil has established a new business area for New Energy Solutions to encourage profitable growth within these areas of wind energy as well as carbon capture and storage (CCS). By doing so, they try to reinforce the oil and gas solutions with renewable energy and other low-carbon energy solutions. (Statoil2018b) At the moment, Statoil is among the world's largest net sellers of crude oil and condensate and the second-largest supplier of natural gas to the European market. They have also substantial oil processing and refining operations. Statoil is thus, part of the "upstream" sector of oil and gas companies, which means that they specifically search for, drill, and extract crude oil, natural gas, and natural gas liquids (NGLs) (Hitchner 2014).

The company has over 50 years of oil and gas production experience and at the moment they are an international energy company present in more than 30 countries around the world, including several of the world's most important oil and gas provinces for example, North and South America, Africa and Oceania. The growth from a Norway-based company to an international force has been based on the fact that Statoil is actively seizing opportunities by building on decades of experience in oil and gas. Their ambition is to grow profitably and potentially expand into other sources of renewable energy, including further developing their already existing knowledge in offshore wind but combining known technologies in new ways to make wind energy possible in deep waters worldwide. As well as contributing further to their CCS project, which means removing carbon from gases and storing it safely to prevent it from contributing to climate change. (Statoil2018b)

The research has also presented the year ending 2017 financial statements for the purpose of giving an overview of the company that will be valued and to clarify the fact brought out by Bivainis et al. (2009) that the property and equipment make the biggest share in the financial statements of an economic infrastructure company such as Statoil. These simplified financial statements can be found in Appendices 1 and 2. The SIC and GICS codes for Statoil and the industry peer companies have also been included in Appendix 3.

1.4. Choosing the multiples

To value a company using multiples, we must first determine which multiples are the most appropriate for the research and to the preference of either market price or enterprise value based multiples, in other words, equity or entity multiples. Traditionally, practitioners prefer using equity value multiples. They contain some of the most used multiples in valuation, for example Price to Earnings (P/E), Price to Book (P/B), Price to Sales (P/S) and Price to Cash flow (P/OCF) or Price to Levered Free Cash Flow (P/LFCF) and Price to Earnings before Interest, Taxes, Depreciation and Amortization (P/EBITDA). These multiples scale the market price of common equity by the most important summary numbers in the financial statements; net income, book value of common equity, sales or revenues, and cash flow from operating activities (Penman 2004).

On the other hand, entity multiples contain for example, Enterprise Value to Earnings before Interest, Taxes, Depreciation and Amortization (EV/EBITDA) and Enterprise Value to Sales (EV/Sales) and Enterprise value to Cash flow (EV/OCF). These entity multiples are more complex

to calculate as they don't overlook the debt of the company as equity-based multiples do. Both equity and entity multiples have an advantage on being very easy to understand as well as calculate. Using multiples to estimate a value of a company are calculated in relation to capitalization and earnings at the chosen industry multiple such as mean, arithmetic mean or geometric mean for the peer companies (De Franco et al. 2015).

Traditionally, researchers prefer using equity value multiples because the market capitalization does not require a further adjustment for net debt as it is the case with entity value multiples.
In other words, the difference between the two categories, is that the valuation based multiples use the sum of market capitalization and debt, enterprise value, instead of using just the market capitalization, like multiples based on company's capitalization do (Cheng, McNamara 2000). Furthermore, Cheng and McNamara (2000) examine the accuracy of equity multiples, P/E and P/B, separately and a combination of both. In their research, they find that for both multiples using the same SIC classification combined with the ROE is the best method to select comparable peer companies. In similar prior research, Schreiner (2007) acknowledges that equity value multiples outperform entity multiples.

In addition to the general multiples, a growing number of analysts and other investment professionals employ forward-looking multiples of P/E. This means that the current price is compared to the forecasted forward earnings. This shift is supported by the rise in the availability of forecast data, both current and historical forecasts, through financial databases mentioned previously in this paper. If the forward P/E ratio is lower than the current P/E ratio, it means analysts are expecting earnings to increase; if the forward P/E is higher than the current P/E ratio, analysts expect a decrease in earnings. (Schreiner 2007)

In addition to the equity and entity multiples mentioned, there are several other ratios which don't directly measure the value of the company but instead the company's performance. The closest to valuation are profitability ratios, which are used to analyze the financial statements of the company to estimate and measure a company's ability to create earnings compared to the expenses incurred while generating these earnings during a specific period of time. The most notable multiples from this category are Return on Assets (ROA), Return on Equity (ROE), Profit Margin (PM), Net Profit Margin and Gross Margin. Of these values, ROE, is important for this research. As Cheng and McNamara (2000) implied, it is a very good multiple to use for choosing the peer companies for the target company alongside the industry classification system. ROE is a very

important figure for any company that has shares outstanding, since it tells the equity holders the ability to earn return on their investment (Ongore, Kusa 2013).

When valuing a firm using multiples, we can theoretically calculate a huge number of different multiples and analyze them. However, this does not make sense and usually it is sensible to restrict the number of multiples used to a set of multiples. All of the multiples have to be reasonable for the company they are calculated as well as suitable for the whole industry. Usually, it is reasonable to apply five to eight multiples. By doing so the analysis contains different views of the company as well as different valuations for the company from which even an average fair value multiple can be calculated to further the accuracy of the analysis. (Bonadurer 2003)

As Schreiner (2007) mentioned, firms in the financial industry for example banks and other investment firms and the oil & gas industry face broad accounting regulations. For these firms, applying book value multiples makes sense. Couto et al. (2017) also mention that there are also entity multiples that lead the analysis to smaller estimation errors. These multiples were the EV/TA, the EV/EBITDA, the EV/EBIT and the EV/OCF. They also agree with Schreiner (2007) on the fact that P/E and the P/B where the multiples with lowest estimation errors and their applicability is the best, when it comes to equity multiples.

The prior research on the topic of peer company selection has also found that industry membership and a combination of risk and earnings growth are effective methods for selecting comparable firms. The research also found out that separating industries by risk or growth does not improve accuracy, and selecting comparable firms solely on the basis of risk or growth is not advantageous (Alford 1992). In addition, using a combination of industry and profitability (ROE) yield even more accurate valuations and two-digit and one-digit SIC codes, perform significantly worse than more specific ones three-digit and four-digit SIC codes (Cheng, McNamara 2000).

1.4.1. Different multiples and their importance

Before the choice of mu1tiples, this paper will discuss the multiples and their importance and meaning. First, the most noticeable equity multiples will be defined and second, the most important entity multiple EV/EBITDA is discussed.

The P/E multiple measures the risk of a firm, and the effect of that perceived risk shows up in the value of earnings per share and cost of equity in the denominator. A firm with a higher cost of

equity will trade at a lower multiple of earnings than a similar firm with a lower cost of equity as seen from the formula of P/E. The P/E multiple is also very sensitive to ROE and that makes the two inseparable what comes to the multiples valuation.

Same comes to the P/B value. The market value of the equity in a company reflects the market's expectation of the earning power and cash flows. The book value of equity is the difference between the book value of the company's assets and the book value of its liabilities. The reason to use P/B value is usually the fact that the book value provides a relatively stable value that can be compared to the market price and that given reasonably consistent accounting standards all around the world, P/B ratios can be compared across similar firms for signs of under- or overvaluation. The ratio of price to book value is also strongly influenced by the return on equity. (Damodaran 2012)

A revenue multiple like P/Sales measures the value of the equity relative to the revenues that it generates. Similarly if the multiple would be EV/Sales, it would measure the value of the whole entity to the same revenues. Damodaran (2012) says that companies that trade at low revenue multiples are viewed as cheap relative to firms that have high revenue multiples. Though, the biggest disadvantage of focusing on revenues is that companies can generate high revenue while still losing significant amounts of money. Fundamentally, a company generates its value from its earnings and cash flow.

However, revenue multiples, especially P/Sales, have proved attractive to analysts for a number of reasons. First, unlike earnings and book value ratios, they are available even for the companies in huge financial trouble. Thus, the potential for errors when eliminating companies by outliers in the calculation of mean fair value, is far lower. Second, unlike earnings and book value, which are heavily influenced by accounting decisions on depreciation, inventory et cetera, revenue is relatively difficult to manipulate. (Damodaran 2012)

2. METHODOLOGY

The companies in the energy industry chosen as peer companies for Statoil, are Exxon Mobil corporation, Royal Dutch Shell, Chevron corporation, Total S.A, BP, ConocoPhillips, EOG Resources, Suncor Energy, Occidental petroleum corporation (OXY) and Phillips 66. They were chosen by their similar SIC, 1311 or 2911, and GICS, 10102010, classification codes in their primary area of business as well their similarities in size, regarding their market capitalization. All of the chosen companies are part of the list of top 20 energy companies in the world. This list of companies was further modified for better analysis, because some of the companies presented outliers for many of the multiples chosen for this research.

2.1. Multiples method

The method used to conduct this research is the four-step multiples valuation method presented prior in this paper: Gathering the peers, conducting the right amount of relevant multiples and calculating them to find the fair share price and comparing the acquired results into the industry average and how Statoil is positioned with its peers' multiples comparing to the actual share price. As mentioned in the sub-chapter "Valuation using multiples, the four-step approach", this methodology gives a better view about the company's performance than comparing it to the market or comparing it to the historical data, since this gives the ability to place the share price of the target company against the acquired results of the peers in the most accurate way possible. This would not be possible, if the results were reflected just against the historical data or the whole market. Using those methods would significantly damage the accuracy of the results, because comparing the results to the whole market would not consider that the good values for different multiples vary across different industries.

The harmonic mean of the peer companies without Statoil itself will be used as the comparable because it is more accurate than using the mean or geometric mean as it takes off some of the weight from the outliers in the calculation for the industry average (De Franco et al. 2015). From here the fair value for Statoil will be calculated for all of the multiples used in this research

separately as well as the mean fair value from the separate fair value multiples together. The harmonic mean for this multiples analysis is calculated as follows.

$$H = \frac{n}{\frac{1}{x^1} + \frac{1}{x^2} + \frac{1}{x^3} + \cdots + \frac{1}{x^n}}$$

Where

$n -$ The number of peer companies
$x -$ The value of the multiple in question for the corresponding company

Furthermore, multiples that will be used, are explained, and the reason for choosing certain multiples in this valuation is referred. For the sake of variety and better analysis, multiples from different categories are used. From the category, equity multiples, four of the most commonly used multiples, P/E, P/B, P/Sales and P/OCF will be used.

$$\text{P/E} = \text{Market Value per Share (P)/Net earnings per Share (E).} \quad (1)$$
$$\text{P/B} = \text{Market value per Share (P)/Book value per Share (B).} \quad (2)$$
$$\text{P/S} = \text{Market Value per Share (P)/Sales per Share (S).} \quad (3)$$
$$\text{P/OCF} = \text{Market Value per Share (P)/Cash flow per Share (OCF).} \quad (4)$$

From the category, entity multiples, three multiples that lead to smaller estimation errors, EV/EBITDA, EV/TA and EV/OCF are going to used (Couto et al. 2017).

$$\text{EV/EBITDA} = \text{Enterprise value (EV)/(EBITDA).} \quad (5)$$
$$\text{EV/TA} = \text{Enterprise value (EV)/Total assets (TA).} \quad (6)$$
$$\text{EV/OCF} = \text{Enterprise value (EV)/Cash flow per Share (OCF),} \quad (7)$$

Where EBITDA is Earnings before Interest, Taxes, Depreciation and Amortization and where Enterprise value is calculated as;

$$\text{Market Capitalization} + \text{Value of Debt} + \text{Minority Interest} + \text{Preferred Shares} - \text{Cash and Equivalents.}$$

Another ratio that will be used, ROE, is the most common ratio used to analyze the profitability and performance in companies as well as determine the peer companies for the target company (Cheng, McNamara 2000; Ongore, Kusa 2013).

$$\text{ROE} = \text{Net Income (NI)/ Total Shareholder's equity.} \quad (8)$$

As said before, the mean of the peer companies without Statoil itself will be used as the comparable to calculate the fair value for the share price of Statoil for the multiples measuring value. For the multiples measuring value, the calculation goes as follows:

$$\text{Fair value } (P/E) = \text{Peer value of } P/E \times \text{Real EPS.} \quad (9)$$

$$\text{Fair value } (P/B) = \text{Peer value of } P/B \times \text{Real Book Value per Share.} \quad (10)$$

$$\text{Fair value } (P/S) = \text{Peer value of } P/S \times \text{Real Sales per Share.} \quad (11)$$

$$\text{Fair value } (P/OCF) = \text{Peer value of } P/OCF \times \text{Real Cash flow per Share.} \quad (12)$$

$$\text{Fair value } (EV/EBITDA) = \text{Peer value of } (EV/EBITDA) \times \text{Real EBITDA/share.} \quad (13)$$

$$\text{Fair value } (EV/TA) = \text{Peer value of } (EV/TA) \times \text{Real Total assets/share.} \quad (14)$$

$$\text{Fair value } (EV/OCF) = \text{Peer value of } (EV/OCF) \times \text{Real Cash flow per Share.} \quad (15)$$

The data (Tables 1, 2 and 3) was calculated using the methodology explained. Once again, important to note is that it can be difficult to find well comparable companies and to use this method to value a company. This is the most challenging part of using the multiples valuation method. The following Tables 1, 2 and 3 present the results of the calculations.

Table 1. Statoil comparable company valuation multiples for 2017.

	ROE	P/E	P/B	P/Sales	P/OCF	EV/EBITDA	EV/TA	EV/OCF
Statoil	11.51%	17.91	2.06	1.35	5.72	4.20	0.85	6.59
Exxon	10.13%	16.89	1.71	1.40	11.07	9.67	1.09	12.59
Shell	6.56%	22.59	1.48	0.96	8.22	7.06	0.84	9.59
Chevron	6.16%	25.25	1.56	1.72	11.32	9.41	1.07	13.25
Total S.A	7.57%	18.03	1.36	1.04	6.97	5.46	0.65	7.07
BP	3.38%	42.73	1.44	0.60	7.65	6.89	0.64	9.32
ConocoPhillips	-	-	2.58	2.73	11.21	14.83	1.08	11.16
EOG	15.86%	25.54	4.05	5.89	15.47	15.64	2.28	15.93
Suncor	9.82%	14.20	1.39	1.97	7.06	6.08	0.82	8.17
Occidental	6.37%	45.08	2.87	4.72	11.83	12.42	1.54	12.92
Phillips66	18.62%	11.04	2.05	0.55	15.45	10.97	1.07	15.97
harmonic mean	7.39%	20.25	1.81	1.25	9.81	8.72	0.97	10.84

Source: author's calculations

Notes:

1. As seen from the table, some of the multiples contained outliers, which are distinguishable from the average. Eliminating these outliers from the table, brings the calculation of the fair price using each of the multiples closer to the reality.

Table 2. Statoil comparable company valuation multiples for 2017 without outliers.

	ROE	P/E	P/B	P/Sales	P/OCF	EV/EBITDA	EV/TA	EV/OCF
Statoil	11.51%	17.91	2.06	1.35	5.72	4.20	0.85	6.59
Exxon	10.13%	16.89	1.71	1.40	11.07	9.67	1.09	12.59
Shell	6.56%	22.59	1.48	0.96	8.22	7.06	0.84	9.59
Chevron	6.16%	25.25	1.56	1.72	11.32	9.41	1.07	-
Total S.A	7.57%	18.03	-	1.04	-	5.46	0.65	7.07
BP	-	-	1.44	-	7.65	6.89	0.64	9.32
ConocoPhillips	-	-	2.58	-	11.21	-	1.08	11.16
EOG	-	25.54	-	-	-	-	-	-
Suncor	9.82%	14.20	-	1.97	7.06	6.08	0.82	8.17
Occidental	6.37%	-	2.87	-	-	-	-	-
Phillips66	-	-	2.05	-	-	-	1.07	-
harmonic mean	7.46%	19.47	1.83	1.32	9.06	7.11	0.87	9.31

Source: Ekholm (2018), author's calculations

Notes:

1. In this table, the outliers were removed from the calculation of the harmonic mean for the further calculation of the fair share price of Statoil. This minimizes the errors in analysis of the fair value using multiples.

Table 3. The fair value for Statoil from the harmonic mean values of peers.

	P/E	P/B	P/Sales	P/OCF	EV/EBITDA	EV/TA	EV/OCF	Mean
Fair value USD	27.18	22.24	24.41	39.60	48.78	29.27	40.67	33.16
Actual share price USD	25	25	25	25	25	25	25	25
Difference	2.18	-2.76	-0.59	14.60	23.78	4.27	15.67	8.16

Source: Ekholm (2018), author's calculations

Notes:

1. The actual share price for Statoil was taken from the open price for Statoil on 25.4.2018

2.2. Discounted Cash Flow method

To get a more accurate result for the fair share price of the target company, Statoil, the methodology of multiples valuation is incorporated with a simplified Discounted Cash Flow method to compare the results of the four-step method into. As Schmidlin (2014) wrote in his book, it is essential to approach company valuation from different angles as one single valuation multiple often is not

enough for the assessment. This is regarding the valuation using multiples to find a fair value for the target company. He continued to explain that fair valuation ratios for each multiple chosen, should always be determined independently of each other and then establish the overall company value together with the result of the DCF analysis. In this way individual results can be mutually examined and verified. (Schmidlin 2014)

The methodology of this paper, thus, incorporates the DCF method in addition to the four-step multiples valuation method already presented. As mentioned prior in this paper, the DCF method, refers to assuming that the value of an asset equals the present value of all future cash flows. The method itself requires cash flow projections for the target company, in this case Statoil. The method used to calculate those cash flow projections for the needed items in the financial statements of Statoil, was to use the 3-year average of the yearly changes in those items by weights of 50%, 30% and 20%. The change in 2016-2017 having a weight of 50%, 2015-2016 having a weight of 30% and the change in 2014-2015 having a weight of 20%. This is a quite simplified method to forecast the items as it doesn't incorporate the possible fundamental changes in the macroeconomic or microeconomic environment of the industry.

The goal of DCF method is to calculate the present value (PV) of total shareholder's equity, discounting the projected Owner's earnings (OE) values for the upcoming 10 years of 2018-2027 with an appropriate discount rate and then dividing the result by the number of shares outstanding to find the fair value. This discount rate is calculated by using the Capital Asset Pricing Model (CAPM), which is calculated with the industry risk premium, risk-free rate and beta. As a result, this model calculates the cost of equity for Statoil, which is used as the discount rate in the DCF method. The information was found by using the Damodaran online database and presented in Table 4 below. CAPM is calculated as follows:

$$\bar{r}_a = r_f + \beta_a(\bar{r}_m - r_f) \quad (16)$$

Where

$\bar{r}_a$ – Cost of Equity
r_f – Risk-free rate
β_a – Unlevered beta of the industry of Gas and Oil
$\bar{r}_m$ – Industry Risk premium

Table 4. Beta, Risk premium, Risk-free rate and Cost of Equity.

Unlevered beta	0.95
Risk premium	6.26%
Risk-free rate	3.39%
Cost of Equity %	6.12%

Source: (Damodaran 2017); Ekholm (2018), author's calculations

The items needed to calculate the Owner's earnings (OE) for each year are Net Income, Depreciation and Amortization, the change in working capital i.e. delta working capital and Capital expenditures (CAPEX) and the values for each year are discounted to the present (Schmidlin 2014). The results for the growth rates of those items, as explained before, were, NI 23.4%, Depreciation -5.8%, CAPEX -12.8% and delta working capital 84.8%. As seen from those figures, it is very hard to forecast the appropriate growth rates for the items. Net Income was perceived to grow 23.4% for the next two years and the CAPEX was assumed to grow -12.8% for the next three years, since both of those rates would lead to exaggerated values of OE. Depreciation was assumed to grow -5.8% for the whole period of examination and delta working capital was assumed to remain stale for the entire period of examination. Those results can be seen in Appendix 4. The formulas used to calculate the total shareholder's equity are as follows:

$$OE = Net\ income + Depreciation +/- Change\ in\ working\ capital +/- CAPEX \quad (17)$$

$$Total\ Shareholder's\ equity = \frac{OE_1}{(1+r)^1} + \frac{OE_2}{(1+r)^2} + \ldots + \frac{OE_n}{(1+r)^n} + \frac{Terminal\ value}{(1+r)^n} \quad (18)$$

$$Terminal\ value = \frac{Owner's\ earnings_{n+1}}{Cost\ of\ equity - Terminal\ growth\ rate} \quad (19)$$

Where

Terminal growth rate = Average growth rate of OE during the period (2018-2027)

From these calculations we get the fair value by dividing the total shareholder's equity with the amount of share outstanding. The results are presented in Table 5 below.

Table 5. Total shareholder's equity, shares outstanding and fair value.

Total shareholder's equity	103619
Shares outstanding	3288
Fair value	31.51

Source: Ekholm (2018), author's calculations

3. ANALYSIS AND DISCUSSION

In this analysis, thoughts about the data provided in the Tables 1, 2, 3 concerning the multiples valuation approach and Tables 4 and 5 concerning the Discounted Cash Flow method, will be provided. There will be discussion regarding what it means for a company to have a higher or a lower multiple through the analysis of the multiples of Statoil. After that, there will be a more specific analysis of the results (Table 3) and the pure comparison of Statoil and the harmonic mean of the peer companies. Then, there will be a discussion about the linkage between the results of the multiples valuation fair values and the DCF fair value. Finally, thoughts and analysis on the original research questions will be provided:

R1: Is Statoil over/undervalued?
R2: How to maximize the accuracy of the results, and how to minimize most of the errors that affect the research accuracy?

To get the most accurate result, this analysis will start from the second research question and after analyzing and discussing the accuracy of the four-step method, only then reflecting these results to analyze the first research question of over- or undervaluation of the target company of Statoil. Once, done discussing solely the multiples valuation using the four-step method and its accuracy, there will be an inclusion of the DCF results to reflect the fair values into.

Regarding research question 2, in theory and in prior research it has been mentioned that the four-step approach would minimize the research errors considering finding the fair value for the target company through thoughtful choices of both the peer companies and the appropriate multiples (Schreiner 2007). Still as seen from the results for the companies in Table 1, we can see huge outliers in within different multiples. Few of the most noticeable being the P/B ratio of BP and Occidental petroleum corporation (OXY), of over double the industry average, at 42.73 and 45.08 respectively, the P/Sales ratio of BP at 0.60 EOG Resources at 5.89, OXY at 4.72 and Phillips 66 at 0.55 respectively, the EV/EBITDA multiple of EOG Resources at 14.83 and ConocoPhillips at 15.64 as well as the EV/OCF of EOG Resources at 15.93, OXY at 12.92 and Phillips 66 at 15.97.

As seen from those outliers, the same group of companies is repeatedly appearing on the list of those outliers. And of course the full list of outliers does not correspond directly to the ones mentioned as examples but this gives us one notable piece of data, which we can see by looking at the values of ROE of the companies most often mentioned in the list of outliers. Similarly to what Cheng and McNamara (2000) have pointed out, the value of ROE is very useful in determining a good pool of peer companies alongside the industry specification by either Standard Industrial Classification (SIC), North American Industry Classification System (NAICS) or Global Industry Classification Standard (GICS).

Taking a more specific look at P/B and ROE, in both cases of peer companies, with and without outliers taken out of the harmonic mean, the ROE and P/B value of Statoil go hand in hand against the industry averages of these multiples and more specifically in both cases the ROE and P/B values are higher than the industry average multiples. According to Damodaran (2012), this means that the company is trading at a price very close to its fair value. If the target company had low P/B and high ROE it would indicate that the company is undervalued and if the company were to have high P/B and low ROE in comparison to the industry average, it would indicate that the company is overvalued. This is explained by the relationship between P/B and ROE as it should not be surprising to have a company with high ROE to sell for well above book value and a company with low ROE to sell below book value.

Of course it is useful to consider ROE in the evaluation of P/B because they both factor in the book value of equity. Usually the two ratios correspond with each other and if one of them is considered high, the other is as well (Cheng, McNamara 2000; Damodaran 2012). This of course related to the fact that investors are willing to pay more (P/B) for a company which has good returns (ROE). But also according to Cheng and McNamara (2000), ROE can be also used to evaluate the fit of companies with the same industrial classification to become a good peer company. The differences in multiples across the whole peer company group is normal but having the same company being an outlier across all of the multiples would indicate that it has not been suitable for the peer company selection. And so, regarding this very useful piece of information about the outliers, the results of Table 2 were then calculated.

What comes to the research question 2, it must be said that the valuation using the four-step process must be conducted with much care and the multiples of different companies with the same industry

classification is alone not enough to decide what companies are best suitable for the valuation. This must be done by also analysing the ROE of these potential companies as this will minimize huge outliers among the other multiples whilst calculating the industry average.

What comes to research question 1, we must take a look at the different multiples of the peer companies (Table 2) and the fair share prices for Statoil (Table 3). As discussed already while determining the accuracy of R2, according to the data gathered by the author (Table 2), the P/E and ROE would indicate that Statoil is neither under- or overvalued. This is also confirmed in Table 3 as the fair value of the P/B multiples doesn't differ too much from the actual share price for Statoil. Actually taking a look at all of the equity multiples except P/OCF the peer values are quite similar to the actual share price of 25.00 USD. The fair values of P/B, P/E and P/Sales for Statoil, where 27.18, 22.24 and 24.41 respectively. The only equity-based multiple that indicates otherwise is the P/OCF multiple. The fair value of 39.60 is 58.4% higher than the actual share price of 25.0. This can be considered quite significant and it would indicate that Statoil would be very much undervalued.

Same can be said about the entity multiples, EV/EBITDA, EV/TA and EV/OCF. All of the fair values, 48.78, 29.27 and 40.67 respectively for those multiples can be considered significant indicators that the value of Statoil would be undervalued, except for EV/TA, which is only 17.08% higher than the actual value of the target company. However, while calculating the mean of fair values for the research multiples of Statoil and its peers (Table 3), it can be seen that the mean fair share price is 32.64% higher than the current share price (25.4.2018) of Statoil, being 33.16. This is also a quite significant difference between the fair value and the actual value of the share price and a strong indicator that the share price of Statoil would be indeed undervalued.

What comes to the addition of the Discounted Cash Flow method, it has to be said that the methodology used was very simplified and did not account for the part of fundamental valuation, whilst making cash flow projections for the items needed to calculate Owner's Earnings. This reduces the accuracy of the results but is still better than using just the naked version of multiples valuation (Schmidlin 2014). As said by Damodaran (2011), valuation almost never starts with a blank slate. Generally, views on a company are formed before you start inputting the numbers into the models and metrics that you use and not surprisingly, your conclusions tend to reflect these biases. In this case the biases reflect the analysis of historical data from the financial statements of Statoil to find the presumed growth rates for each of the item needed to calculate Owner's earnings

for the years of 2018-2027. For example the evolution of the values of Net Income was presumed to grow for two years and then remain stale for the rest of the research period.

The result of the Discounted Cash Flow analysis is however, quite straight-forward. Discounting the Owner's Earnings values, using the Capital Asset Pricing Model as the discount rate, gives us a fair value of 31.51 (Table 5). This can be related to the results of the multiples valuation and it can be said that Statoil is indeed undervalued. This result also tells us that the growth of 23.4% for Net Income and the growth of -12.8% CAPEX used for two and three years respectively, were somewhat desirable. If they would have been presumed to grow more the fair value calculation would have been higher.

Finally, the following Figure 1, contains the information of how the oil and gas industry has been valued for the years 2013-2018.

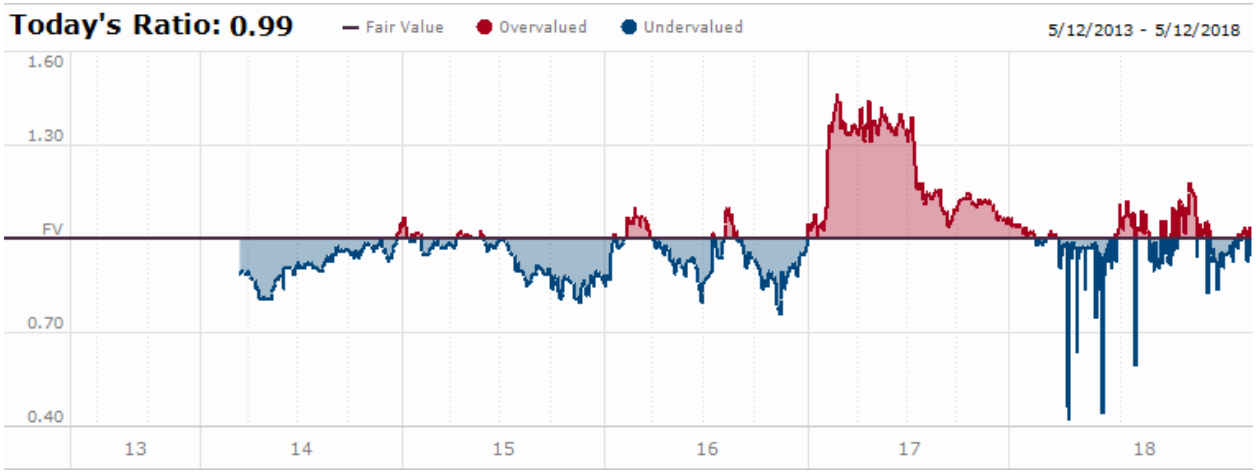

Figure 1. The fair value of oil & gas integrated, 2013-2018
Source: (Morningstar2018)

As seen from the Figure, the industry of oil and gas was undervalued for a long period of time during the years 2013-2016, but for the entirety of the year 2017, the industry was overvalued. As Schreiner (2007) has stated, the fact that valuations based on multiples reflect the mood of the market, implies that using multiples can result in value estimates that are too high or low in over- or undervalued industries. This is a good point to consider, but on the other hand, the industry was close to the fair value at the end of 2017, so the conclusion remains the same for Research question 1. This, and the fact that the DCF method gave similar results as the multiples analysis, the effect of Figure 1 to the research accuracy, can be kept with low significance.

Another bias in this research could have been with the companies chosen as the peer companies to compare the target company into, or in the choice of the target company to value. These sort of choices are almost never random, and how you make them can start laying the foundation for bias (Damodaran 2011). The choice of peer company selection was mostly based on the similarities in business activities represented by the same industry classification codes. The other basis was to try and compare some of the largest operators in the sector of oil and gas. This implication didn't include similarities in the share prices but instead in market capitalization. As seen from Figure 2 the average peer share prices are constantly almost triple the share prices of Statoil. However, the effect of this into the results is also quite minimal, since the fair prices calculated from the equity-based multiples were really close to the actual value, apart from P/OCF, the differences being P/B 2.18, P/E -2.76, P/Sales -0.59 and P/OCF 14.60.

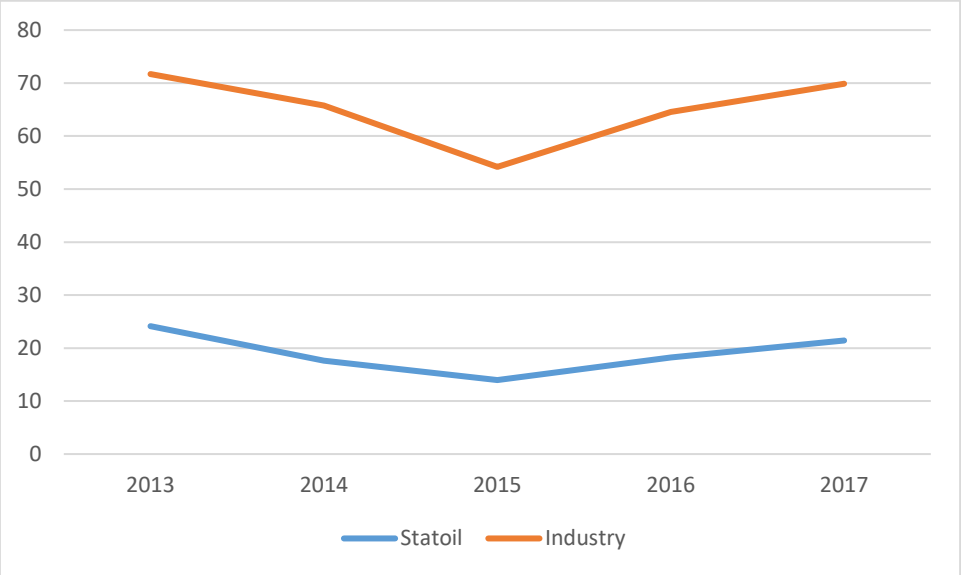

Figure 1. The ending year share prices of Statoil and the peers in dollars, 2013-2017
Source: (Morningstar2018)

CONCLUSION

The aim of this paper was to find a fair value for Statoil and compare the results against the actual share price of the company, through thoughtful analysis. Briefly, the methodology used was a four-step multiples analysis method in which: First, a good pool of competitors known as peer companies in the industry of oil and gas was conducted, second, a good number of multiples from equity and entity multiples was chosen based on their relevancy in prior research and calculated for the target company and its peer companies, third, the fair values were calculated using each multiple from the harmonic mean of the peer companies and fourth, the results were carefully analyzed comparing the multiples of Statoil to the harmonic mean fair value of the peer companies to find if Statoil is over –or undervalued. The results of that four-step multiples valuation were then compared to the calculation of fair value using the Discounted Cash Flow analysis.

The main results found using the methodology of valuation using multiples was that Statoil is undervalued what comes to its share price. This is indicated by the P/OCF, EV/EBITDA, EV/TA and the EV/OCF multiples as well as the mean fair price of the research multiples combined. The analysis found that the answer to Research question 1, was that Statoil is indeed undervalued and the answer to Research question 2, was that by eliminating the outliers, although being in some ways biased, gives us more an accurate result and that using the DCF method as a mirror to the results of the multiples valuation is presumed profitable to the accuracy of the results.

The applicability of the results for Research question 1 is somewhat limited to the fact that the industry was overvalued during the year 2017 but this was kept as a minimal limitation. On the other hand, the choice of peer companies could have better included companies with similar share prices as Statoil (Figure 2), but that choice was based on the fact that the peer companies as well as Statoil were some of the biggest oil and gas companies what comes to the market capitalization. This limits the applicability of the results as well, but not too much as the fair values for exactly equity-based (share price) multiples were very similar to the real share price of Statoil.

The possible further research could include companies from the same geographical area and with closer current share prices. The fact that Statoil is from Norway and most of the peer companies are based in the United States or Canada might have some effects on the end results of the multiples valuation.

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APPENDICES

Appendix 1. Simplified income statement of Statoil, 2017

Revenue	60999
Cost of revenue	36975
Gross profit	24024
Sales, General and administrative	738
Depreciation and amortization	8644
Interest expense	490
Other operating expenses	732
Total costs and expenses	10604
Income before income taxes	13420
Provision for income taxes	8822
Other	-8
Net income	4590

Source: (Morningstar2018)

Appendix 2. Simplified balance sheet of Statoil, 2017

Assets	
Cash and cash equivalents	3953
Short-term investments	8448
Receivables, Inventories and other	14788
Total current assets	27189
Gross property, plant and equipment	188656
Accumulated Depreciation	-125019
Net property, plant and equipment	63637
Other non-current assets	20274
Total assets	111100
Liabilities	
Short-term debt	4091
Other current liabilities	14925
Total current liabilities	19016
Long-term debt	24183
Capital Leases	-
Other non-current liabilities	28016
Total non-current liabilities	52199
Shareholders' equity	
Common stock	39861
Total Shareholders' equity	39861
Total liabilities and shareholders' equity	111076

Source: (Morningstar2018)

Appendix 3. Industry classification codes for Statoil and peer companies

	Primary SIC code	GICS code
Statoil	1311	10102010
Exxon	1311	10102010
Royal Dutch Shell	1311, 2911	10102010
Chevron	1311	10102010
Total S.A	1311, 2911	10102010
BP	1311	10102010
ConocoPhillips	1311	10102010
EOG	1311	10102010
Suncor	1311, 2911	10102010
OXY	1311	10102010
Phillips66	1311, 2911	10102010

Source: (SICcode2018; GICS2018)

Appendix 4. Owner's equity and its components for 2018-2027

	Net profit	Depreciation	Delta working capital	CAPEX	Owner's earnings	Discounted OE
2017	4590	8644	-425	-10755	2054	
2018	5663	8140	-425	-9376	4002	3772
2019	6987	7665	-425	-8173	6054	5376
2020	8620	7218	-425	-7125	8288	6936
2021	8620	6797	-425	-7125	7867	6204
2022	8620	6401	-425	-7125	7471	5552
2023	8620	6028	-425	-7125	7098	4971
2024	8620	5676	-425	-7125	6746	4452
2025	8620	5345	-425	-7125	6415	3990
2026	8620	5033	-425	-7125	6103	3577
2027	8620	4740	-425	-7125	5810	3209
n+1					6155	
Terminal					100636	55580

Source: author's calculations