UNIVERSITY OF STAVANGER BUSINESS SCHOOL

MASTER'S THESIS

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TITLE:

Valuation of Statoil ASA

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Executive Summary

The oil and gas market has in recent years been exposed to greater instability and price fluctuates due to various events on the supply side. Climate concerns and the declining costs of alternative energy solutions has also raised uncertainty of the future demand for oil and gas. Statoil ASA is a Norwegian multinational energy company, and by revenue, among one of the world's largest oil and gas companies. This implies that Statoil`s value will be dependent on future prices for oil and gas. Even though the company has announced that it will aim to become a broader energy company in the years to come.

Considering this current business environment, the purpose of this thesis is to estimate Statoil`s equity value in order to compare it with the current market value. The problem statement of this thesis is defined as follows: *What is the per-share equity value for Statoil ASA?*

To answer the problem statement, share price estimates was found by using the intrinsic, and relative valuation approach. The intrinsic approach was based on the discounted free cash flows of the firm and resulted in a share price estimate of 28.2 USD. However, further analysis indicates that this estimate is very sensitive to changes in the assumptions for future growth and the cost of capital. Alternative scenarios for oil and gas prices was also explored in order to observe for changes in the share price estimate. Key findings indicated, not surprisingly, that Statoil is indeed exposed to the future price levels of its main selling commodities. Although, this analysis also revealed an almost zero downside for Statoil`s current market value in a scenario where the world is able to fulfill the objectives of the Paris Agreement.

Various multiples where used in the relative valuation approach. The results indicated wide spreads for the share price estimates. Although, the median value of 33 USD for all multiples suggests the same as the value found by the main case in the fundamental approach. The stock is currently being undervalued by the market.

Preface

This master thesis represents the final work of a two-year master level program in applied finance at the UiS Business School.

The subject of this thesis is chosen based on my interest for the valuation field. Choosing the scientific tools and methods, combined with the need for self-judgment and assumption making is something I find quite intriguing. The choice of company is based on my interest in the global energy markets, and in particular, the potential changes oil and gas companies will face in the coming years.

Although this has been a challenging process, the subject has helped me gaining more insight about the drivers and mechanisms in the oil and gas industry. But not least, I have also been able to apply the skills acquired during my training in order to come up with a conclusion for the problem statement.

I would like to thank my Supervisor Mads Holm for his support and advice during the semester.

Stavanger, June 2018

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Kjetil Byberg

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1. Introduction

This chapter provides the background for the selected problem statement. It further presents the information sources used, as well as an overview for how the thesis is composed.

1.1 Choice of Subject

The oil and gas industry has been exposed to various challenges over the recent years. The industry has been prone to rising costs up until the oil price plunge in 2014, which was occurred by rising supply and the evolvement of unconventional shale. The fall in oil prices represented a major challenge for most companies, which triggered them to become more efficient. The industry has also faced a gradual political and societal pressure. Especially in the wake of the Paris agreement in 2015, there has been an evolving focus on shifting away from traditional fossil fuels to new sustainable energy solutions. These geopolitical changes combined with the emergence of new sustainable energy sources has led to higher uncertainty regarding the future demand for oil and gas, and hence the respective price paths.

Based on my interest for the energy markets, the financial field of study, and in light of these recent historic events, I have decided to do a valuation of the Norwegian Oil and Gas Company, Statoil. I have selected Statoil because it's a company which has shown a good ability in adapting to the recent changes mentioned above. The company has managed to cut their costs in order to become more robust, as well as communicating their willingness in adapting to a low carbon future through their announced strategy.

With these factors serving as a context, the purpose of the thesis is to find an estimate for Statoil`s equity value in order to compare it to the current market price. The problem statement is defined as follows:

What is the per-share equity value for Statoil ASA?

1.2 Methodology

The data used in this thesis are qualitative and quantitative secondary publicly announced data. The data is primarily collected from annual reports and official company webpages. Other

sources consist of various financial service providers such as *yahoo finance*, in addition to relevant parts from the curriculum.

1.3 Thesis Structure

Based on the choice of company and problem statement, which is described in this chapter, the thesis will continue with a presentation of Statoil ASA in chapter 2. The main goal is to give a brief introduction to the company with focus on its operations and strategy. In chapter 3 the various valuation approaches will be presented with a following discussion on which specific valuation technique that are chosen for this valuation. Statoil`s revenue streams are essentially derived from the sale of oil and gas products. Chapter 4 will give an introduction to the oil and gas markets and then present outlooks based on demand, supply, and other important factors that can influence this market in the future. Based on the information from these chapters, a cash flow estimation will be conducted in chapter 5 in order to find Statoil`s equity value in chapter 6. The value found in chapter 6 will then be analyzed in chapter 7, by changing the various input parameters used in the cash flows, as well as the discounting rate. A relative valuation will be presented in chapter 8, and together with the fundamental value and sensitivity analysis the concluding remarks can finally be presented in the last chapter. Figure 1 presents the roadmap for this thesis:

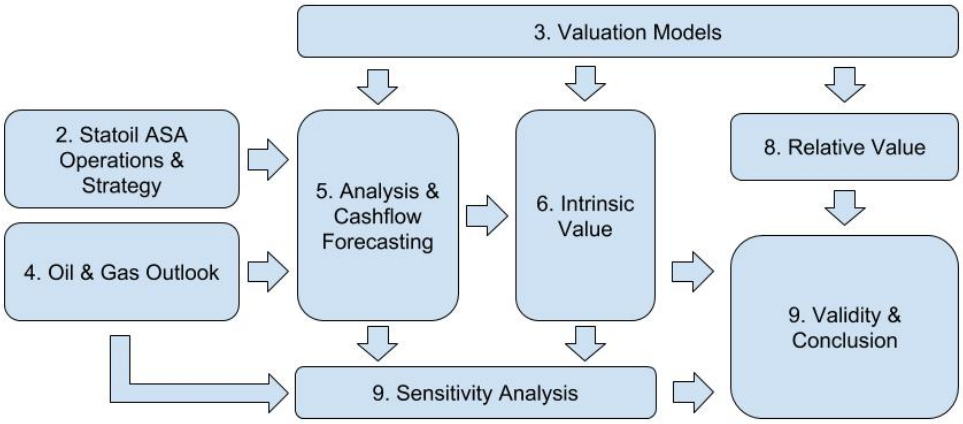

Figure 1: Thesis Structure *(Created by Author)*

2. Statoil ASA

Statoil ASA is an international energy company listed on the Oslo Stock Exchange (STL) and NYSE (STO). Statoil was founded in 1972 by the Norwegian parliament. The decision was unanimous and based on the desire that the state should be a part of the country's oil production that were evolving in the 70`s. Today the Norwegian Government is the largest owner with 67% of the shares, and the company is headquartered in Stavanger. Statoil has operations in 30 countries with approximately 20.500 employees.

2.1 Company structure

Statoil can be characterized as an integrated oil and gas company, meaning that the value chain is vertically integrated spanning from the early phase exploration through production, processing and sales. These activities are divided into several business areas such as the Development and Production for Norway, USA, and International, respectively called DPN, DPUSA and DPI. Whereas DPN is managing exploration and production activities on the Norwegian Continental Shelf (NCS), DPUSA in the US and Mexico and DPI who manages all other international activities. Exploration (EXP) manages the worldwide exploration activities from new, unexplored acreage to familiar areas such as the NCS. The Marketing, Midstream and Processing (MMP) business area manages the necessary activities needed after the oil and gas is lifted from the reservoir. These activities include transport, processing and marketing/trading. Figure 2.1 gives a simplified illustration of Statoil's operations.

Figure 2: Company Structure *(Created by Author/Statoil 2018)*

Other business units such as the Global Strategy and Business Development (GSB), New Energy Solutions (NES), and Technology, Projects and Drilling (TPD) could be categorized as areas who relates to technology development and administration.

2.2 Exploration

Statoil are involved in exploration activities both on the Norwegian continental shelf as well as internationally. On the NCS, the company holds exploration acreage in developed and matured areas with existing infrastructure such as the North Sea and Norwegian Sea. They also have acreage in the Barents Sea which offers new frontier opportunities. During 2016 and 2017 the company participated in 14 and 17 exploration wells, respectively. In which all of these are distributed across all three regions mentioned above. In 2018 the company expects to complete 25-30 exploration wells on the NCS, focusing on exploration near existing infrastructure.[1] Internationally, the company holds acreage and are involved in exploration drilling in both frontier areas at various geographical locations, as well as exploration drilling in matured areas such as the Gulf of Mexico and UK. Although Statoil scaled back its international involvement in 2017, they are planning to increase the activity in 2018 with the completion of 8-10 wells. These includes familiar areas where the company already has ongoing operations, as well as new frontiers such as Argentina. Table 1 illustrates Statoil's historic exploration activity for the past 3 years, spread across the different regions:

Year		*2017*	*2016*	*2015*
NCS	***North Sea***			
	Operated by Statoil	5	9	11
	Operated by partners	1	2	3
	Norwegian Sea			
	Operated by Statoil	5	2	5
	Operated by partners	0	0	1
	Barents Sea			
	Operated by Statoil	5	0	0
	Operated by partners	1	1	1
	NCS total	*17*	*14*	*21*
International	***Americas***			
	Operated by Statoil	2	5	8
	Operated by partners	4	2	2
	Africa			
	Operated by Statoil	0	0	3
	Operated by partners	0	0	3
	Other regions			
	Operated by Statoil	4	0	2
	Operated by partners	1	2	0
	International total	*11*	*9*	*18*
Exploration wells in total:		**28**	**23**	**39**

Table 1: Statoil`s Historic Drilling Activity *(Created by Author/ Statoil 2018)*

[1] Statoil, Annual Report and Form 20-F 2017. p. 25

2.3 Development and Production

Statoil's oil and gas production has been lying just below 2000 mboe[2] each day for the past years. In 2017 however, the daily production breach the 2000 level with a daily production of 2080 mboe/day. The NCS alone accounts for over 50% of this number, with a daily production averaging approximately 1250 mboe over the last 3 years. Large Statoil operated fields such as Troll (gas part), Oseberg, Gullfaks and Aasgard stands for almost half of the daily production in 2017. However, big partner operated fields, such as Ormen Lange and Skarv also makes a significant contribution to this number. Production from Statoil's international operations is primarily derived from fields in America and Africa. Statoil's interests share in shale fields, such as Marcellus and the Bakken formation, together with their own operated offshore field, Peregrino in Brazil makes up for a large part of the Americas production. In Africa, Statoil has ownership interests in various fields located in Angola, Nigeria and Libya.

In terms of products that are produced, the share between oil and natural gas are fairly the same on the NCS. In fact, the portion of natural gas has succeeded oil and condensate on the NCS in terms of barrels of oil equivalents. For instance, in 2017 there was an average daily production of 1334 mboe, where 742 mboe came from natural gas[3]. Statoil's international production is however dominated by oil and condensate with 415 mboe from a daily total of 588 mboe in 2017.

In addition to the existing production, Statoil has several major development projects that are expected to go on-stream over the next years. Field developments such as Aasta Hansteen, Utgaard, and Johan Sverdrup are a few among many on the NCS. Internationally there are also ongoing projects in Brazil and North America where Statoil has significant share of equity interest. Among all of these field developments, the Johan Sverdrup field stands out in terms of size and potential production. Historically, it is among the biggest oilfields on the NCS, and the first phase is planned to go on-stream late in 2019 with an expected production of 440 000 barrels of oil each day. The second phase is planned to start in 2022, expecting 660 000 barrels a day at plateau. Statoil is the operator of the field, and with a 40% equity share, the field will

[2] mboe: Thousand Barrels of Oil Equivalents
[3] 742 mboe/day corresponds to 118 mmcm/day as stated in 20-F 2017

make a significant impact on the company's daily production. Although, increased production from new fields will be partially offset by declining production rates in existing fields.

2.4 Reserves

Oil and gas companies such as Statoil are dependent on being able to maintain a certain production level. Production and sales of these commodities are the core activity that generates revenue and hereby gives the profits that makes sure that the companies can live another day. Oil and gas produces will therefore be completely dependent on the amount of reserves which would enable it to continue its operations, and keep the unit costs at healthy levels. Reserves can be categorized as either proved or unproved. Proved reserves are oil and gas quantities that are recoverable from known reservoirs, and could be further divided into proved developed and proved undeveloped reserves. According to the annual report 2017, Statoil had an estimated amount of 5367 mmboe[4] at the end of 2017, up from 5013 mmboe at the end of 2016. The reserve replacement ratio[5] for 2017 was at 1.5, meaning that Statoil was able to add more reserves than it produced for the period. This is a significant change from the latter years where the ratio has been under 1. The already developed reserves accounts for over 60% of the total proved reserves, meaning that they are ready to be produced without any substantial investments being made in drilling of wells, and building infrastructure and processing capacity. When analyzing the reserves and replacement ratio for oil and gas companies, it is important to keep in mind the various factors that are involved. Reserve levels are, among others, influenced by accounting revisions, acquisitions and equity share sales, and should therefore be threated accordingly. Geographically, these reserves are spread across the various regions where Statoil operates, with the largest share on the NCS.

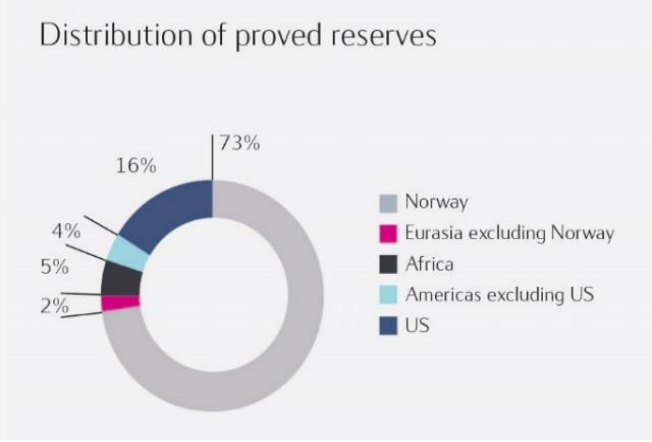

Figure 3: Reserves Distribution *(Statoil 2018)*

[4] mmboe: Million Barrels of Oil Equivalents
[5] Reserve replacement ratio (RRR): change in reserves/produced volumes for a given period

2.5 From Oil- to Energy

The global climate concern has shifted the world's political views on fossil fuels, especially since the Paris conference in 2015. The focus on a low carbon future and sustainability has also grown more important in Statoil's strategy for the future. With the new business area, New Energy Solutions (NES), Statoil aims to diversify their current portfolio which is mainly exposed towards oil and gas, to gradually grow larger within the areas of new sustainable energy and technology solutions. Through NES, the company has already invested in, and developed wind parks such as the Dudgeon wind farm and Hywind Scotland, and at the end of 2017 they had a total of 290 megawatts of wind power in production with an additional 190 megawatts under development. The company has also made acquisitions in solar power. In March 2018, Statoil also announced that they will change the name to Equinor, getting rid of the "oil" name. According to the board of directors this change will support the company's future ambitions of becoming a broader energy company. The company expects that 15-20% of the annual capital expenditures will be directed towards new energy solutions by 2030. Prior to the oil plunge in 2014/15 the oil and gas industry experienced rising costs and diminishing returns. In 2014 Statoil implemented the STEP[6] program, aimed at reducing OPEX through efficient operations and continuous improvements. These elements remain as a focus in the current strategy. Figure 2.5 illustrates the company's current strategic focuses.

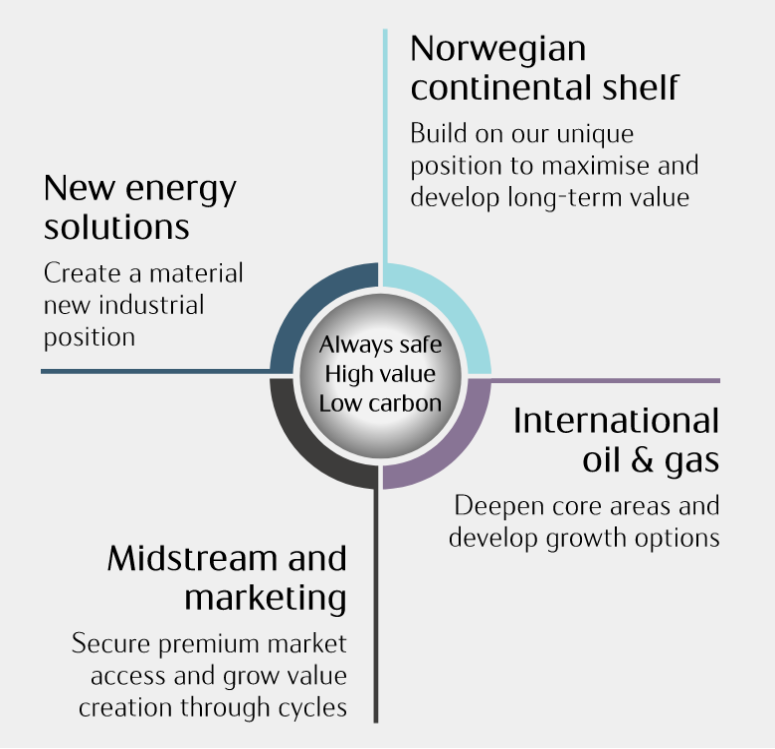

Figure 4: Statoil`s Strategic Focus *(Statoil 2018)*

[6] STEP: Statoil Technical Efficiency Programme

3. Valuation Models

This chapter will provide an overview over the main valuation approaches that can be applied when valuing companies and assets. Starting with the fundamental, or intrinsic approach, the market approach, and then the options based approach. Next, I will give an introduction over which valuation methods I have found most suitable, when valuing Statoil ASA. This section will go further in depth for the chosen methods.

3.1 Intrinsic Valuation

Intrinsic valuation is based on the fundamental factors of the company, such as the cash flows, growth prospects and the risk of the business. In other words, it's all about the business itself. The discounted cash flow method (DCF) is the most common tool used for finding the intrinsic value of a company. Future cash flows are estimated based on the company's historical financial performance and assumed growth going into the future. These cash flows are then discounted back to a present value using a suitable discount rate that reflects the overall risk of the company. Although the DCF analysis is the most widely used tool for fundamental valuation, it is not the only technique. Asset based approaches, such as the net asset value (NAV) is used to determine what it would cost to rebuild the business. Other models in this category worth mentioning is the dividend discount model (DDM) and the residual income model.

3.2 Relative Valuation

Relative valuation is a market based approach which entails looking at similar companies or assets operating in the same business with similar characteristics. These similar companies are often called peers or comparables. As opposed to the fundamental approaches, especially the DCF model, relative valuation using comparables is less time consuming and are often used by analysts because it's easy to do and do usually not require a lot of assumptions.

3.3 Option based Valuation

An option could be defined as the right, but not an obligation to invest or buy something. In other words, having an option means that you have some kind of flexibility when it comes to a decision. Option based valuation is used to put a value on this kind of flexibility. If a company is faced with an opportunity to receive a certain cash flow in the future, but have not yet exercised this opportunity, one can apply this approach in order to determine a value of this decision based

on different outcomes on certain factors. For example, in the oil and gas industry it is common to apply the real option method to value investments in oil fields as the profitability in such projects often are determined by the future oil prices. This allows companies to value the flexibility of either deferring, if the oil price is low, or vice versa if the oil price is high.

3.4 Choice of Valuation Model

I have decided to use two different approaches when valuing Statoil ASA. First I will start out with a fundamental approach in order to find an intrinsic value for the company. For this approach I will use the discounted cash flow analysis (DCF). As a supplement to the DCF I will use the market approach and try to find some suitable comparable companies to get an impression on how Statoil is performing compared to its peers in the market. I have decided not to pursue the real option approach, due to its complex nature. My opinion is that this method would be more suitable if the task had been to value an isolated project or investments decision.

3.4.1 Discounted cash flow analysis (DCF)

When applying this method, one can choose to discount the cash flows to the equity holders[7], or the cash flow to all the claimholders[8] of the firm, including both equity and debt investors. In this valuation I have chosen to estimate the free cash flows for the firm. The FCFF can be calculated as given by Formula 1:

$$FCFF_t = EBIT_t\,(1 - tax\ rate) + Depreciation_t - CAPEX_t - \Delta\, NWC_t \qquad \textit{Formula (1)}$$

Where:

$EBIT_t(1 - tax\ rate)$ = Earnings before interest and taxes (minus tax) for given period *t*
$Depreciation_t$ = Depreciation for the given period *t*
$CAPEX_t$ = Capital expenditures for the given period *t*
$\Delta\, NWC_t$ = Change in net working capital for the given period *t*

[7] FCFE: Free Cash Flow to Equity
[8] FCFF: Free Cash Flow to Firm

The next step will be to calculate these estimated future cash flows back to the present time by applying an appropriate discount rate. When calculating the present value of cash flows to both equity and debt holders, it is also important that the discount rate reflects the weighted cost for all of the firm's capital. By using the average weighted cost of capital, the denominator remains consistent with the cash flows in the numerator. The total value of the firm can be calculated as given by Formula 2:

$$Enterprise\ Value = \sum \frac{FCFF_t}{(1+WACC)^t} + \frac{TV}{(1+WACC)^t} \qquad \textit{Formula (2)}$$

Where:

$Enterprise\ Value$ = Total value of the firm

$\sum \frac{FCFF_t}{(1+WACC)^t}$ = Present value of cash flows in transition period

$WACC$ = Weighted average cost of capital

TV = Terminal value / continuation value

Unless the valuation is done for a specific project with a defined lifetime, it is necessary to compute a value for the continuing period as most companies' lifetime are indefinite.
This continuation value will represent all the future cash flows beyond the period of explicit budgeting. These cash flows are usually assumed to grow at some constant rate, denoted by g[9]in Formula 3:

$$Terminal\ Value = \frac{FCFF_{t+1}}{(\mathrm{WACC}-\mathrm{g})} \qquad \textit{Formula (3)}$$

From the enterprise value, we can obtain the company's equity value by using equitation 4:

$$Equity\ Value = Enterprise\ Value - Net\ interest\ bearing\ debt^{10} \qquad \textit{Formula (4)}$$

[9] Steady state growth rate
[10] Net debt: (Short term debt + long term debt) –cash & cash equivalents

3.4.2 Cost of capital

As mentioned above, when using the DCF it is necessary to discount the future cash flows back to the present time with an appropriate rate. The cost of capital could be defined as the opportunity cost of the capital invested in a company. Meaning that if you chose to invest in a certain company, the opportunity cost is what you will give up doing this investment. A company is usually financed with two components; equity and debt. These components will have different risk attached to it and must therefore be approached separately during the calculation. A common approach when calculating the equity cost of capital is the capital asset pricing model (CAPM).

A common way of defining this model is given by Formula 5:

$$r_e = r_f + \beta_e(r_m - r_f) \qquad \textit{Formula (5)}$$

r_f = Risk free rate: The rate at which investors can borrow and save, risk free. This rate is generally determined by using the yields on default-free government bonds.

r_m = The market return: Under the CAPM, the market portfolio is a well-diversified, efficient portfolio representing the non-diversifiable risk in the economy[11].

β_e = Equity beta: The beta is a measurement of the asset returns compared to the returns of the market. It measures the volatility compared to the market. A beta of 1 indicates that the asset returns are in perfect correlation with the market. A beta bigger than 1 indicates that the asset has larger fluctuations (more volatile) than the market.

The second component of a company's capital structure is the debt. The debt cost of capital is equivalent to the interest rate of the debt, and can be found in the financial statements of the company. Interest rates are expenditures and should therefore be adjusted for the tax deductibility. The Weighted Average Cost of Capital (WACC) model enables us to find the average cost of capital given a certain capital structure with different kind of capital costs. This model is given by Formula 6:

[11] Berk & DeMarzo, 2014, p. 401

$$WACC = \frac{E}{V} * r_e + \frac{D}{V} * r_d * (1 - t_c)$$ *Formula (6)*

Where:

r_e = Equity cost of capital,

r_d = Debt cost of capital,

E = Equity, D = Debt, V = E + D,

t_c = Tax rate

$\frac{E}{V}$ = Equity proportion of total financing,

$\frac{D}{V}$ = Debt proportion of total financing

By using this model, we need to assume that the capital structure of the company is constant during the time we estimate the future cash flows. If not, it is necessary to calculate the WACC in accordance with changing capital structure.

3.4.2 Valuation using multiples

The economic rationale implied in this approach is the "law of one price". If we consider two completely identical companies that generates the same cash flows, the law of one price will suggest that they should be equally valued in a perfect competitive market. Even though companies are operating in the same industry selling the same products, it would be fairly unrealistic to identify completely identic companies in the market. There will always be difference in scale whether it's operational or financial. However, valuation multiples allow us to adjust for these differences through a ratio between value and some other measure. The first step in this approach will be to identify companies in the same industry with similar operations and structure. These companies[12] will be presented in chapter 8. The next step involves choosing which multiple(s) to use. Some commonly used multiples are presented below:

[12] Comparable companies: Hereby referred to as the "Peer Group"

Price Multiples – Multiples based on a company`s market price is commonly used in relative valuation. These ratios are used in relationship to a known fundamental indicator. Some commonly used ratios are expressed below:

$$P/E = \frac{Price}{Earnings} \qquad \textit{Multiple (1)}$$

$$P/B = \frac{Price}{Book\ Value\ of\ Equity} \qquad \textit{Multiple (2)}$$

$$P/S = \frac{Price}{Sales} \qquad \textit{Multiple (3)}$$

Enterprise Value Multiples – Multiples based on a firm's enterprise value are also commonly used in relative valuation. Unlike the pricing multiples, these multiples represent the total value of the firm, rather than just the equity value. These multiples are advantageous when comparing firms with different amounts of leverage[13]. Two common ratios are presented as multiple 4 and 5 below:

$$EV/EBITDA = \frac{Enterprise\ Value}{Earnings\ Before\ Interest\ Tax\ Depreciation\ \&\ Amortization} \qquad \textit{Multiple (4)}$$

$$EV/EBIT = \frac{Enterprise\ Value}{Earnings\ Before\ Interest\ \&\ Tax} \qquad \textit{Multiple (5)}$$

Industry Specific multiples – Sources of value creation differs across industries and business segments. In oil and gas, common measures often relate to production and reserve levels. In 2009, two financial analysts published an article[14] about valuation in the oil and gas industry, mainly focusing on the market approach. The article presents different multiples based on industry specific factors. Some of these multiples will be further explained in chapter 8.

[13] Berk & DeMarzo, 2014, p. 289
[14] Howard H.W. and Harp, A.B. 2009 Oil and Gas Company Valuations. Business Valuation Review 28

4. The Market for Oil & gas

Oil and gas prices serves as a very important factor for Statoil, and directly reflects the company's revenues from year to year. The first part of this chapter gives an introduction to the international oil and gas industry, which Statoil is a part of. The last parts will present the current status and future outlook for oil and gas in the global energy market.

4.1 The International Oil and Gas Industry

Looking at the oil and gas business in a historical retrospect, the developments in this industry can roughly be divided into two eras'. The pre-OPEC era, and the OPEC era. Oil was first discovered in Pennsylvania, United States, in the late 1850`s. In the early days the industry was characterized by great competition and fluctuating prices, until the establishment of Standard Oil Company in 1870, which gained control over the industry. Standard Oil was dissolved in 1890 and divided into several separate units[15]. Some of these units are today known as ExxonMobil, and Chevron. Together with Royal Dutch Shell, and the Anglo-Persian Oil Company (BP) these where the so-called seven sisters. In the period late 1920s to 1960 these international integrated companies controlled the supply chain and had significant influence over the market.
OPEC was established in 1960 by five leading oil producing states[16]. The purpose at that time was to coordinate the corresponding countries policies to secure a fair and stable return for their petroleum output. From the establishment in 1960 and up until today, OPEC has exercised policies spanning from demand stabilization to production cuts, including the embargo imposed against the U.S. in 1973. OPEC is in fact holding an active role today, as they are holding back production in order to re-balance the market due to the 2014 oil price plunge, triggered by excessive supply.
Historically, the industry has been dominated by International Oil Companies (IOC`s) like the ones recently mentioned. But ever since the establishment of OPEC in the 1960s there has been a gradual nationalization of the industry resulting in the emergence of National Oil Companies (NOC). More than two thirds of the global oil reserves are located in the Middle-East, leaving the remainder scattered throughout the rest of the world. Within OPEC, five Middle Eastern

[15] Standard Oil of New Jersey, Standard Oil of New York, Standard Oil California, Standard Oil Indiana, and Standard Oil of Ohio.
[16] Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela

member countries account for about 70% of the reserves in 2009, with Saudi Arabia alone holding close to 26%[17]. This skewed reserve distribution dominated by Middle Eastern NOC`s combined with OPEC`s cartel model, makes it arguable to say that today's oil market is less than perfectly competitive.

4.1.2 Commoditization of oil and gas

Up until the 1980s the oil market was dominated by contract sales. During the 1980s spot transaction became more important in the oil market, and by the middle of the decade the majority of international traded oil was dominated by spot-transactions. The de-integration of the industry during the 1970s and the increasing production outside of OPEC was two contributing factors that led the spot market to develop. The spot market allowed for better pricing information as well as it facilitated for risk sharing among new market participants such as brokers and traders. Today the oil market is the largest commodity market in the world[18]. The two most important benchmarks for oil pricing is the Brent crude oil (North Sea) and the West Texas Intermediate (WTI). Oil is available as the underlying asset on many derivatives, including forwards and futures contracts, swaps and different types of options.

As for natural gas, the market structure is somewhat different. The physical attributes of natural gas complicate transportation which results in these markets being divided into geographical regions, mainly consisting of Europe, US and Japan. Although, LNG has had a growing role in the recent years, and could potentially make these markets less captive and more integrated with each other. Historically, the pricing of natural gas has been less transparent compared to the oil market. Although, during the 1980s and 1990s there has been a period of deregulation and elimination of government monopolies resulting in a more competitive structure as transportation and distribution companies became a part of the business. As the market became less integrated the spot market emerged and trading became more transparent. Today there are several so-called hubs that serves as trading locations for natural gas. The National Balancing Point (NBP) in the UK, and the Henry Hub in North America are examples of two influential hubs in terms of volumes and transactions.

[17] Bhattacharyya, 2011, p. 340
[18] Hull, 2012, p. 750

4.2 Current Status and Outlook

As of today, oil and natural gas accounts for approximately 50% of the global energy mix, and the demand for crude oil is over 90 million barrels each day. Products derived from crude oil are mainly used for transportation purposes. As shown in figure 4.1, nearly 50% are used for road transport, an additional 16% goes to other transportation sectors, such as aviation and shipping, leaving the transportation portion nearly two thirds of the total oil product in the European Union. In contradiction to oil, natural gas is mainly used for electricity generation and building heating. It's considered to be a fairly "clean" fossil fuel, and therefore is gaining momentum as a replacement for coal which is a more carbon intensive source of energy. Growth in the global economy and population are considered as fundamental macroeconomic drivers for the growth in oil and gas demand. But due to the evolving climate concern, there is also a growing focus on replacing these fossil fuels by the use of policies, energy efficiency and renewable energy sources

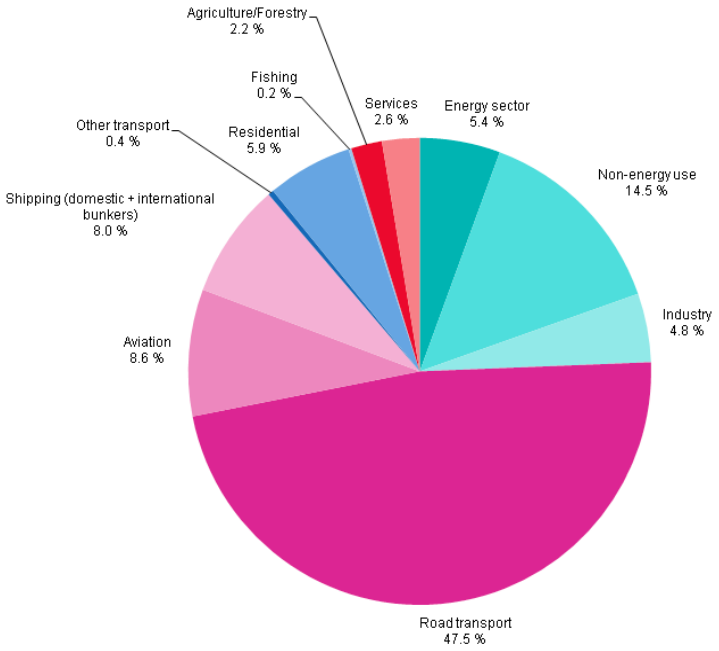

Figure 5: Consumption of Oil in the European Union *(Eurostat 2018)*

For instance, the LCOE[19] from solar and wind has declined significantly over the recent years, and are currently representing a threat to conventional electricity generation from coal and to some extent natural gas. Electric vehicles and the falling cost of battery technology is another example of technology that could potentially put a dent in the global oil demand. With the emergence of these new technologies, in combination with increasing levels of energy efficiency and new policies, it is arguably to say that there is a current change in the global energy context.

[19] LCOE = Levelized Cost of Electricity: Used to compare the cost of energy from different sources.

4.3.1 Market outlook

Several energy outlook reports are published every year, by both autonomous agencies and industry players. BP's "Energy Outlook" and the International Energy Agency's "World Energy Outlook" are two examples of well renowned publications that are often referred to in media and among market analysts. The scenarios presented in these reports are manly built upon exogenous assumptions such as given levels of economic growth, population, and demographics. However, in the recent years, and especially after the Paris Agreement in 2015, climate policies, carbon markets and new energy solutions has gradually become more important as they are incorporated in the scenarios of these market outlooks.

4.3.2 World Energy Outlook 2017

The International Energy Agency (IEA) is an autonomous agency established in 1974. IEA was initially designed to help countries coordinate collective responses to major oil supply disruptions, such as the embargo imposed by OPEC in 1973. Today IEA consist of 30-member countries and its mandate has expanded beyond energy security issues to include areas focusing on economic development and environmental awareness. Each year the agency publishes the world energy outlook (WEO), which focuses on energy markets, technology and policies. In the WEO 2017 there are 3 main scenarios:

New Policies Scenario

Presented as the base case and described as the "central scenario" in the outlook. This scenario is based on current as well as announced commitments made across different countries. The aim of the scenario is to provide insight about where the energy sector is headed with the current policy ambitions.

Current policies scenario

This scenario is based on today's policies and can be looked upon as a "business as usual" case. As opposed to the new policies scenario this scenario excludes already announced policies and only consider the measures that are in place as of mid-2017.

Sustainable Development scenario (SDS)

This scenario differs significantly from the scenarios above. The Current Policies and New Policies scenario uses current and announced policies as a point of departure to see where the energy sector is headed. In the SDS scenario the approach is somewhat the opposite as it starts looking at a vision of where the energy sector needs to go in regard to the climate concerns, and then works back to the present time. Key elements in this scenario is climate stabilization, clean air, and energy access for all.

These scenarios are all built on the same assumptions in regard to economic growth, population, and demographics. IEA assumes that the global GDP will grow at an average compound rate of 3.4% each year. For the population growth, IEA uses the United Nations projections which assumes the global population to rise from 7.4 billion in 2016 to 9.1 billion in 2040. Factors such as policies and energy prices differ across these scenarios. Price projections for oil, gas, and coal, across the different scenarios are given in table 2:

				New Policies				Current Policies		Sustainable Development	
Real terms ($2016)	**2000**	**2010**	**2016**	**2025**	**2030**	**2035**	**2040**	**2025**	**2040**	**2025**	**2040**
IEA crude oil ($/barrel)	38	86	41	83	94	103	111	97	136	72	64
Natural gas ($/MBtu)											
United States	5.9	4.8	2.5	3.7	4.4	5.0	5.6	4.3	6.5	3.4	3.9
European Union	3.8	8.2	4.9	7.9	8.6	9.1	9.6	8.2	10.5	7.0	7.9
China	3.5	7.4	5.8	9.4	9.7	10.0	10.2	10.4	11.1	8.2	8.5
Japan	6.4	12.1	7.0	10.3	10.5	10.6	10.6	10.8	11.5	8.6	9.0
Steam coal ($/tonne)											
United States	37	63	49	61	61	62	62	62	67	56	55
European Union	46	101	63	77	80	81	82	81	95	67	64
Japan	44	118	72	82	85	86	87	86	101	71	68
Coastal China	34	127	80	87	89	90	91	90	101	78	77

Table 2: Price Projections by Scenario *(IEA WEO 2017)*

5. Analysis & Forecasting

In order to estimate Statoil`s future cash flows I will use the financial statements from previous years as a point of departure. Together with the company -and market specific information provided in the previous chapters, the goal is to come up with reasonable estimates that reflects the future expectations for the company and the industry in which Statoil operates. I have chosen a forecasting period of 10 years, which allows me to do specific forecasting for a period of changing commodity prices. Choosing a 10-year horizon also makes it possible to capture the period before and after significant projects such as the first and second phase of Johan Sverdrup.

5.1 Revenue

Statoil`s revenues are primarily derived from produced and sold oil and gas volumes. The future revenues are primarily estimated based on the future expectations for the prices of oil and gas, as well as production volumes

5.1.1 Oil and gas prices

Chapter 4 gave a brief presentation of IEA's World Energy Outlook 2017. This outlook contained 3 main scenarios, of which the New Policies Scenario was considered as the main case. I have chosen to use the future projections from this scenario as a guiding for the price development. Table 2 from chapter 4 presents the price outlook for oil and gas across the 3 main scenarios in WEO 2017. In the New policies scenario, oil prices are expected to reach 84 and 94 $/bbl. in the year 2025 and 2030 respectively, which corresponds to an annual average growth around 2.5% from today's levels. As for the gas prices, I have chosen to use the price development for the European market as a guideline. This is the market that Statoil is mostly exposed to in terms of production and sales. Natural Gas in the European Union are projected to reach 7.9 and 8.6 $/Btu in the years 2025 and 2030. This corresponds to an annual average growth of about 1.8%. Assuming that Statoil`s share of oil and gas production will remain equal, this will give an average growth of a little over 2% annually for oil and gas prices combined.

5.1.2 Production volumes

Statoil`s daily production, proved reserves and reserve replacement ratio for the last three years are presented in table 3:

Year	2015	2016	2017	**Average**
Oil and gas production (mboe/day)	1971	1978	2080	**2010**
Proved oil and gas reserves (mmboe)	5060	5013	5367	**5147**
RRR (annual)	0,55	0,93	1,5	**1**

Table 3: Historic Oil and Gas Production *(Created by Author/Statoil 2018)*

Statoil's daily production has on average been around 2000 mboe/day for the last three years. The company has shown the ability to replace depleting reserves in existing fields with new findings as the three-year average reserve replacement ratio is 1. This may indicate that the current production is to remain at the current levels for the years to come. Although, there will always be uncertainties associated with such assumptions, due to the probability of major financial transactions taking place. These can be sales of equity shares and/or major acquisitions. The produced volumes originate from oil and gas fields that operates under different production phases. Some fields have recently gone on-stream, some produces at plateau, whilst others are in the stages of declining production. Instead of looking at the details for each of the licenses in Statoil`s portfolio, I have decided to make a general assumption that declining production rates from older fields will be offset by the startup of new fields. However, the Sverdrup field is worth mentioning as it stands out compared to other field developments in terms of size and production output. The Johan Sverdrup phase 1 is scheduled to start production in late 2019 with an estimated production of 440 000 barrels a day. The second phase is scheduled to go on-stream in 2022, and will give the field a capacity to produce 660 000 barrels a day. With an equity share of 40%, this will increase Statoil's production with 176 000 barrels per day as the field goes on-stream. After phase 2 this number increases to 264 000 barrels per day.

5.1.3 Revenue growth

The revenue growth is based on the equally weighted average growth for oil and gas prices, as well as the future growth in production volumes. Current price levels are used as prices for the first year in the budgeting period. This leads to a 34% estimated increase in revenue from 2017

to 2018, which is mainly explained by the positive price developments in the recent year. Beyond 2018, the prices are estimated to increase in accordance to the price paths outlined by the New Policies Scenario.

The production volumes are expected to remain at the 2017 levels until the subsequent years of the Johan Sverdrup phase 1 and 2. Under the general assumption made in section 5.1.2, production volumes are estimated to be constant from 2025 and beyond. This implies that revenue growth mainly will be driven by increasing oil and gas prices for the rest of the budgeting period. The revenue growth is presented in table 4:

Year	2017	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Oil ($/bbl)	49,1	69	71,5	73	75	77	79	81	83	85	87
%Δ		*41 %*	*3,6 %*	*2,1 %*	*2,7 %*	*2,7 %*	*2,6 %*	*2,5 %*	*2,5 %*	*2,4 %*	*2,35 %*
Gas($/Mbtu)	5,5	7,0	7,1	7,3	7,4	7,5	7,7	7,8	7,9	8,1	8,2
%Δ		*27 %*	*1,8 %*	*1,8 %*	*1,8 %*	*1,8 %*	*1,8 %*	*1,8 %*	*1,7 %*	*1,7 %*	*1,7 %*
Average oil and gas		*34 %*	*2,7 %*	*1,9 %*	*2,3 %*	*2,2 %*	*2,2 %*	*2,2 %*	*2,1 %*	*2,1 %*	*2,0 %*
Production	2080	2080	2080	2205	2249	2249	2294	2317	2317	2317	2317
%Δ		*0,0 %*	*0,0 %*	*6,0 %*	*2,0 %*	*0,0 %*	*2,0 %*	*1,0 %*	*0,0 %*	*0,0 %*	*0,0 %*
Revenue	**61187**	**81930**	**84152**	**90841**	**94720**	**96835**	**100901**	**104095**	**106265**	**108449**	**110646**
Growth		***34 %***	***2,7 %***	***7,9 %***	***4,3 %***	***2,2 %***	***4,2 %***	***3,2 %***	***2,1 %***	***2,1 %***	***2,0 %***

Table 4: Statoil`s forecasted Revenues. *(Created by author)*

5.2 Expenses

Statoil's expenses comprise the ongoing costs of its operations. This includes direct purchases, operating, drilling and other administrative expenses that incurs under normal operations, as well as depreciations expenses. The historical figures from the last four years are presented along with the revenue in table 5[20]:

[20] See Appendix A for forecasted expenses in the budgeting period.

Year	2014	2015	2016	2017
Revenue	99264	59642	45873	61187
%Δ		-39,9 %	-23,1 %	33,4 %
Purchases (net of inventory variation)	47980	26254	21505	28212
%Δ		-45,3 %	-18,1 %	31,2 %
Operating expenses	11657	10512	9025	8763
%Δ		*-9,8 %*	*-14,1 %*	*-2,9 %*
Exploration expenses	4666	3872	2952	1059
%Δ		*-17,0 %*	*-23,8 %*	*-64,1 %*
Selling, general and adm. expenses	1159	921	762	738
%Δ		-20,5 %	-17,3 %	-3,1 %
Depreciation, amort. and net impairm. losses	15925	16715	11550	8644
%Δ		5,0 %	-30,9 %	-25,2 %

Table 5: Statoil`s Historical Expenses *(Created by Author/ Statoil Annual Reports)*

5.2.1 Purchases (net of inventory variation)

This post relates to the cost of liquids purchased from the Norwegian State, as well as the cost of liquids and gas purchased from third parties. These volumes are essentially managed by Statoil`s Marketing, Midstream and Processing division and will therefore have a strong relation to the market. The historical annual changes can be observed in the table above, which indicates a rather similar trend to Statoil`s revenues. I therefore assume that the purchases will follow the same growth path as the revenues.

5.2.2 Operating, selling, general and administrative expenses

This is the ongoing costs incurred by the company's operations. These include transportation costs, plant and facility maintenance, personnel cost etc. Statoil's operating and administrative costs has significantly decreased over the recent years. Even though there was a 33.4% revenue increase from 2016 to 2017, operating and administrative expenses has continued its trend by decreasing 2.9% and 3.1% respectively. This is most likely a result from the ongoing focus on continuous improvements and other cost reducing initiatives. This trend is therefore estimated to continue into the first year of the budgeting period as there could still be a potential for additional efficiency gains. However, in the longer term it should be more likely that the operating expenses move in line with the rest of the company, and the general economic growth.

5.2.3 Exploration expenses

Exploration expenses are either capitalized or expensed depending on whether the well is commercially viable or not. This makes the forecasting somewhat more difficult because of the uncertainty of success in future drilling campaigns. Exploration expenses stated in Statoil's annual reports consist of the drilling activity itself, the net changes between capitalized and expensed exploration expenditures as well as net impairments. According to the latest report, expenses from drilling activity has declined over the past three years. This decline could mainly be explained by less drilling activity after the 2014 oil price plunge. But it is also due to increased drilling efficiency and technology improvements leading to more cost effective drilling operations. Statoil is dependent on maintaining its reserve levels in order to secure future production levels. Exploration is therefore an important activity in order to organically maintain and potentially grow the reserve base. As mentioned above, the amount of expensed exploration expenditures will depend on the rate of success or not. But despite of this uncertainty I think it is fair to assume that expenses will increase in line with increased drilling activity over a longer time perspective. Higher commodity prices for oil and gas could also lead to the sanctioning of more drilling campaign in the future. As this will influence the cost benefit analysis used for the investment decision

The exploration expenses are estimated to rapidly increase up to higher levels before they eventually align with the general growth of the company. This assumption is based on the company's fundamental need to organically secure future reserves and production levels, combined with a somewhat positive pricing outlook for oil and gas.

5.2.4 Depreciation, amortization and net impairment losses

This is a non-cash expense that indirectly affects the cash flows due to its tax deductibility. Depreciation and amortization is related to the depletions of producing fields and the general value reduction of plant, equipment, and other intangible assets. Impairment losses occurs when there is a sudden or unexpected change in an assets value. Table 6 presents the depreciation, amortization and net impairment losses as a percent of the revenue from 2010 to 2017:

Year	2010	2011	2012	2013	2014	2015	2016	2017
Depreciation/Revenue	9,6 %	7,7 %	8,4 %	11,4 %	16,0 %	28,0 %	25,2 %	14,1 %
Average	9,2 %				20,8 %			
	15,0 %							

Table 6: Historical depreciation/revenue *(Created by Author /Statoil Annual Reports)*

This expense has been higher than normal in the recent years. This is mainly due to higher net impairment losses triggered by the sudden oil and gas price reduction that started in 2014. Combined with the recent year's lower revenues, the ratio between depreciation and revenue has increased from 2014 to 2016. Although, this trend has changed from 2016 to 2017, mainly explained by increasing revenues and lower impairment losses, led by higher market prices. I consider the 2010-2013 average as more representable for the future periods. The depreciation is therefore set to 10% of the revenue for the budgeting period. Table 7 presents the estimated depreciation amortization and net impairment losses for the budgeting period:

Year	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Depreciation	**8193**	**8415**	**9084**	**9472**	**9684**	**10090**	**10410**	**10627**	**10845**	**11065**
Revenues	81930	84152	90841	94720	96835	100901	104095	106265	108449	110646
Depr./Revenue	*10 %*	*10 %*	*10 %*	*10 %*	*10 %*	*10 %*	*10 %*	*10 %*	*10 %*	*10 %*

Table 7: Forecasted Depreciation *(Created by Author)*

5.3 Net working capital

Net working capital can be defined as the difference between current assets and current liabilities[21]:

$$NWC = Current\ Assets - Current\ Liabilities \qquad \text{Formula (7)}$$

[21] Berk & DeMarzo, 2014, p. 242

The change from year to year will affect the cash flow either positive or negative. For instance, if the working capital increases, it implies that the company bind up more funds, which again results in a negative effect on the cash flow. The change in net working capital can be defined as follows:

$$\Delta NWC_t = NWC_t - NWC_{t-1} \qquad \text{Formula (8)}$$

The historic net working capital are calculated by using formula 6. These figures are presented in table 8 below. Statoil`s net working capital has on average been around 15% of the revenues for the past 4 years. However, this is a period where the revenue has changed a lot due to the events in the oil and gas market. As the revenue declined significantly in 2015 and 2016, the net working capital has become larger related to the revenue, assuming that there is a certain lag in adjusting parts of the current assets and liabilities. In 2017 the net working capital accounted for 11% of the revenues which is closer to a longer historical perspective spanning over 6 years:

Year	2012	2013	2014	2015	2016	2017	Average
Total current assets	183	238,8	34272	28154	24859	25820	
Total current liabilities	163,5	166,9	24085	15363	16744	19017	
Net Working Capital	19,5	71,9	10187	12791	8115	6803	
Revenues	704	619	99264	59642	45873	61187	
NWC/Revenues	**2,8 %**	**11,6 %**	**10,3 %**	**21,4 %**	**17,7 %**	**11,1 %**	**12,5 %**

Table 8 Historical NWC/Revenues[22] (Created by Author/Statoil Annual reports)

The 12.5% average from the past 6 years are positively affected by the less representative values in 2015 and 2016. By excluding these years, the average decreases to 8.9%. I believe that the net working capital to revenue ratio will continue to follow the current decreasing trend before stabilizing between 9% and 12.5%. This implies that the net working capital will grow in line with the revenues and the company's general activity. The ratio is set to 10% from 2021 and

[22] Note: Year 2012-2013 presented in NOK

beyond. The change in net working capital can then be found by using formula 8. Table 9 presents the estimated change in net working capital for the budgeting period:

Year	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
NWC	6964	7574	8630	9472	9684	10090	10410	10627	10845	11065
%Δ	2 %	9 %	14 %	10 %	2 %	4 %	3 %	2 %	2 %	2 %
Revenues	81930	84152	90841	94720	96835	100901	104095	106265	108449	110646
NWC/Revenues	8,5 %	9,0 %	9,5 %	10 %	10 %	10 %	10 %	10 %	10 %	10 %
Δ NWC	***161***	***610***	***1056***	***842***	***212***	***407***	***319***	***217***	***218***	***220***

Table 9 Forecasted change in NWC *(Created by Author)*

5.4 Investments (CAPEX)

Investments, or capital expenditures (abbreviated CAPEX) can be defined as the funding's needed to purchase new property, plant and equipment in order to maintain current operations and securing further growth[23]. These expenditures will have a direct effect on a company's cash flows. As for Statoil, it means that these expenditures are used for maintaining and upgrading existing fields as well as new field developments. The oil and gas industry is a capital-intensive industry where investment decisions are based on a cost-benefit framework which depends on, inter alia, the future price expectations for oil and gas. As seen from table 10 below, Statoil's capex has been decreasing for the last years, in line with the revenues. Although, in relation to the revenues, a lagging effect can be observed. This can probably be explained by the fact that as a new project is sanctioned in times where the market projections are positive, the actual costs for these projects does not occur until the tender process are done, and the actual building and manufacturing are started.

Year	2014	2015	2016	2017	Average
Capital expenditures	19497	15518	12191	10755	
%Δ		-20 %	-21 %	-12 %	
Depreciation	15925	16715	11550	8644	
Capex/Depreciation	122 %	93 %	106 %	124 %	*111 %*

Table 10: Historical Capex/Depreciation *(Created by Author/ Statoil Annual Reports)*

[23] Berk & DeMarzo, 2014, p. 32

The ratio between capex and depreciation has on average been 111% percent for the last four years. According to Damodaran`s database, this ratio is 107% for integrated oil and gas companies in Western Europe, and 104% for integrated oil and gas globally. The ratio is set to be 105% for the future budgeting period, as it seems to be a reasonable ratio in terms of the expected growth of the company. The estimated capex for the budgeting period are presented in table 11:

Year	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Capex	**8603**	**8836**	**9538**	**9946**	**10168**	**10595**	**10930**	**11158**	**11387**	**11618**
Depreciation	8193	8415	9084	9472	9684	10090	10410	10627	10845	11065
Capex/Depreciation	105 %	105 %	105 %	105 %	105 %	105 %	105 %	105 %	105 %	105 %

Table 11: Forecasted Capital Expenditures *(Created by Author)*

5.5 Tax rate

There is a certain level of complexity regarding the taxation of oil and gas companies operating in several countries. As a Norwegian company, Statoil's earnings are subject to the standard Norwegian corporate tax of 23%. In addition to the corporate tax there is a profit-based special tax of 55% that applies to companies producing and selling petroleum on the NCS[24]. Statoil's international operations will also be exposed to various taxation regimes across the different countries. There are basically two different approaches to determine the tax level for the future earnings. The first way is to calculate the average effective tax rate from previous years to be used as a future tax rate. The second approach is to use the statutory tax rate, or marginal tax rate that applies for the company. Damodaran[25] argues that the marginal tax rate will be the safest choice because the difference between marginal and effective tax rates is caused by temporary differences between accounting and tax books. He also argues that the marginal tax rate is more suitable as a future rate rather than effective tax rates based on the past. Table 12 presents

[24] As of 2018 the corporate tax is adjusted from 24% to 23%. The special petroleum tax is adjusted from 54% to 55% in order to maintain a total statutory tax rate of 78% for the petroleum industry. www.norskpetroleum.no
[25] Damodaran, 2012.

Statoil`s effective tax rates from 2009 to 2017, which gives a historic average of 72%. (This average excludes the years 2015 and 2016).

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017
Income Before Tax	114,9	136,8	213,8	206,7	138,4	17898	55	-178	13420
Income Tax	97,2	99,2	135,4	137,2	99,2	14011	5225	2724	8822
Effective Tax rate	*84,6 %*	*72,5 %*	*63,3 %*	*66,4 %*	*72 %*	*78 %*	*>100%*	*>100%*	*65,7 %*

Table 12: Historical tax rates[26] *(Created by Author/Statoil Annual Reports)*

I consider the marginal tax rate as a reasonable tax rate for Statoil's future earnings. This is because the effective tax rate from the table above is fairly close to the marginal tax rate. Through the recent year's annual reports, Statoil has also stated that the effective tax rate on the profit earned by the DPN business did approximate the statutory tax rate.

5.7 Calculating Future Cash flows

The free cash flows for the firm can now be calculated using formula 1 presented in chapter 3:

$$FCFF_t = EBIT_t\,(1 - tax\ rate) + Depreciation_t - CAPEX_t - \Delta\ NWC_t$$

The estimated free cash flows for the firm are presented in table 13:

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
EBIT	25350	26055	28414	29740	30372	31914	33068	33768	34469	35171
tax	0,78	0,78	0,78	0,78	0,78	0,78	0,78	0,78	0,78	0,78
EBIT(1-t)	5577	5732	6251	6543	6682	7021	7275	7429	7583	7738
Depreciation	8193	8415	9084	9472	9684	10090	10410	10627	10845	11065
Capex	8603	8836	9538	9946	10168	10595	10930	11158	11387	11618
Δ NWC	161	610	1056	842	212	407	319	217	218	220
FCFF	**5006**	**4702**	**4741**	**5227**	**5986**	**6110**	**6435**	**6681**	**6823**	**6965**
Δ FCFF		*-6,1 %*	*0,8 %*	*10,3 %*	*14,5 %*	*2,1 %*	*5,3 %*	*3,8 %*	*2,1 %*	*2 %*

Table 13: Forecasted FCFF (Created by Author/Appendix A)

[26] Note: Year 2009-2013 presented in NOK

6. Valuation

This chapter starts with the estimation of Statoil's weighted average cost of capital, which is necessary to obtain in order to discount the cash flows estimated in the previous chapter. The chapter then concludes with the presentation of a share price estimate based on the company`s equity value.

6.1 Cost of Capital

The estimated free cash flows for the firm (FCFF) needs to be discounted with a rate that reflects the weighted average risk for both equity and debt holders. In order to calculate the average weighted cost of capital it is necessary to find Statoil's equity cost of capital, debt cost of capital, as well as the capital structure. Having obtained these input variables, the weighted average cost of capital can be calculated using formula 6, presented in chapter 3.

6.1.1 Equity cost of capital

The equity cost of capital can be calculated using the capital asset pricing model, introduced as formula 5 in chapter 3. The risk free rate, market risk premium and beta must be obtained before using the model.

Risk free rate

As mentioned in chapter 3, the risk-free rate is generally determined by using the yields on government bonds. Depending on the issuing countries, such debt securities are most often considered to be free from default risk. However, they will be subject to interest rate risk unless the maturity is equal to the horizon of the investment. A common practice is to use long term yields on US government treasury bonds[27]. As the cash flows in this analysis represents an eternal perspective, it seems appropriate to choose a duration of at least 10 years. As of today, the 10-year and 20-year yields are 2.97% and 3.03%. The risk-free rate is therefore set to 3%[28].

[27] Robert Bruner, et al., "Best Practice in Estimating the Cost of Capital: Survey and Synthesis", Financial Practice and Education 8 (1998): 26.
[28] https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yield (09.05.2018)

Market risk premium

The market risk premium is the excess returns of the market over the risk-free rate[29]. A common approach for estimating the market risk premium is to use the historical average excess returns of the market over the risk-free rate. Although, very old data does not necessarily have much relevance for today's market, and many researchers believe that future expected returns for the market are likely to be closer to recent historical numbers compared to older ones. Historical excess returns of the S&P 500 compared to one-year and ten-year U.S. Treasury securities has been 7.7% and 5.9% respectively, in the period from 1926 to 2012. As for a more recent period, spanning from 1962 until 2012, these premiums are 5.5% and 3.8%[30]. Suggesting that there is a declining trend in the market risk premiums. The returns from the more recent period also correspond to Damodaran`s dataset for risk premiums by different countries and regions. These numbers are based on the respective country's credit rating and shows an equity risk premium of 5.08% for the Nordic countries as well as the United States. Based on these sources I find it reasonable to set the market risk premium to 5%.

Beta:

For listed companies such as Statoil, the beta can be estimated by using the historical returns of the stock compared to the ones of a market index. This method is commonly known as the regression approach. The beta is estimated by regressing the historical monthly returns against the market returns for OSEBX and the S&P 500. Table 14 presents the beta estimates, by using the regression approach:

Market Index	S&P 500	OSEBX
β 5 yrs (2013-2017)	0,76	1,35
β 3 yrs (2015-2017)	0,87	1,21
β 2 yrs (2016-2017)	0,43	1,07
β 3 yrs (2014-2016)	0,83	1,49

Table 14: Regression betas *(Created by Author/Appendix B)*

As seen from the table, the stock tends to have smaller fluctuations than the market when compared to the S&P 500. As for the OSEBX the trend is opposite. This is a somewhat

[29] $Market\ risk\ Premium = r_p = r_m - r_f$

[30] Berk & DeMarzo, 2014, p. 406, Table 12.1

interesting observation because the S&P 500 is generally considered to be a broader and more diversified index compared to OSEBX. Regression betas are usually estimated in periods ranging from 2-5 years. Damodaran argues that there is a certain trade off when choosing the estimation period. Longer periods provide more data, but older historic data is not necessarily representable for the current time as firms tend to change. On the other hand, choosing a shorter period could make the estimation more affected by significant firm specific events occurring in the period. Table 14 presents betas for 4 different time periods. The variation in beta estimates over these periods could suggest that the stock has been driven by the recent events in the oil market. For instance, the lower beta estimates in the 2-year period from 2016 to 2017, represents a time with more stable and increasing oil prices. As opposed to the higher beta estimates in the 3-year period from 2014-2016, which represents the period where the oil price plunged and gradually recovered. I consider the 5-year, S&P 500 estimate as the most appropriate because it is based on a broader period representing various market conditions, as well as the S&P 500 is considered to be a broader benchmark than the OSEBX.

Alternatively, a beta estimate could be obtained using an industry approach. Damodaran publishes unlevered betas for a wide selection of industries on his webpages[31]. As of January 2018, this estimate is 1.14 based on 48 firm in the global integrated oil and gas industry. As this is an unlevered estimate for the industry, it must be adjusted so that it reflects Statoil`s leverage. This adjustment can be done by using the following formula:

$$\beta_{Levered} = \beta_{Unlevered}\left[1 + (1 - t)(\frac{D}{E})\right] \qquad \text{Formula (9)}$$

The formula assumes that there is no risk associated to the company's debt. Based on Statoil`s credit rating, I consider the debt beta to be 0. (See section 6.1.2.). The levered beta can now be calculated by using Statoil`s debt/equity ratio[32]:

$$\beta_{Statoil} = 1{,}14[1 + (1 - 0{,}23)(0{,}37)] = \mathbf{1,46}$$

[31] Damodaran Online, 2018

[32] Debt/Equity Ratio: 76308/28274 = 0,37 (See table 17)

Due to the high spread between the regression betas and the levered industry beta, I have chosen to take an average between them. The average is set between the levered industry beta and the 5-year regression beta with S&P as benchmark. This results in a beta estimate of 1.11 which is close to the average risk in the market. I think this is a reasonable estimate that is representative for the future average. Statoil`s beta is set to 1.1.

Having found the necessary input variables, the capital asset pricing model can be utilized to calculate Statoil`s equity cost of capital:

$$r_e = r_f + \beta_e(r_m - r_f) = 3\% + 1{,}1(5\%) = \mathbf{8{,}5}\%$$

6.1.2 Debt cost of capital

There are several approaches to estimate a company's cost of debt. The interest expenses and interest-bearing debt can be used to calculate the cost of capital directly from the financial statements. Or the credit rating of the company or any outstanding bonds could be used to find the default spread, which in turn is added to the risk-free rate to obtain an estimate. Statoil has a well-diversified portfolio of outstanding bond issuances. These bonds have varying maturity dates and rates depending on the start date, as well as different currencies where the majority are in EUR and USD. Due to the complex nature of dealing with different currencies maturity dates and so forth, I have decided to calculate Statoil's interest rate from the information found in the recent year's financial statements. Table 15 presents these calculations as well as the annual weighted average interest rate which is explicitly stated in the 10-K form:

Year	2014	2015	2016	2017	Average
Gross Interest-Bearing Debt	31154	32291	31673	28274	
Interest expenses from bonds, bank loans, leases and other	1205	971	1043	903	
Calculated Interest rate	3,87 %	3,01 %	3,29 %	3,19 %	***3,34 %***
Weighted average interest rate stated in 20F-2017 & 20F-2016	3,78 %	3,39 %	3,41 %	3,50 %	***3,52 %***

Table 15: Historical Interest rates *(Created by Author /Statoil Annual Reports)*

Alternatively, the cost of debt can be estimated by using the company`s credit rating in order to find a default spread. This rating can be obtained directly from agencies such as Moody's and Standard & Poor. As of today, Statoil states that these two agencies have a current rating for the company at Aa3 and A+[33]. As an alternative, a synthetic rating can be found from the company's interest cover ratio. This ratio is calculated by dividing the company's EBIT over the interest expenses. Table 16 presents Statoil`s interest cover ratio from the last 4 years:

Year	2014	2015	2016	2017	Average
EBIT	17877	1368	79	13771	
Interest Expenses	1205	971	1043	903	
Interest Cover Ratio	*14,84*	*1,41*	*0,08*	*15,25*	***7,9***

Table 16: Historical Interest Cover Ratio *(Created by Author / Statoil Annual Reports)*.

Statoil`s interest cover ratio has on average been 7.9 for the last 4 years. Damodaran regularly updates a table on his websites that translates interest cover ratios to credit ratings and default spreads[34]. This table gives a synthetic rating of Aa2/AA when using a 7.9 interest cover ratio, which is similar to the rating given by the two agencies mentioned above. The table further suggests a default spread ranging from 0.72% to 0.9% based on the synthetic rating as well as the rating given by the two agencies. I find it reasonable to use the average between these spreads,

[33] https://www.statoil.com/en/investors/our-debt-and-credit-ratings.html (15.04.2018)
[34] http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ratings.htm (15.04.2018)

which is 0.81%. The debt cost of capital can now be calculated by adding the risk-free rate to the default spread:

$$r_{debt} = r_r + r_s = 3\% + 0{,}81\% = \mathbf{3,81}\%$$

Statoil`s pretax cost of debt is set to 3.81%.

6.1.3 Capital structure

In order to calculate the weighted average between the cost of equity and the cost of debt, it is necessary to find the correct ratio between the two. Book values can be looked upon as a "snapshot" at a certain point of time and is therefore easily outdated as these values will change every day for publicly traded companies. The market value of Statoil's equity is thereby calculated by multiplying the current share price[35] by the numbers of outstanding shares. As for the debt, Statoil is financed with both bank loans and outstanding bonds. Contrary to the market value of equity, the market values for debt are harder to obtain because bank loans, and some of the outstanding bonds, are not traded in the market and will only be stated as a book value at certain points in time. In order to estimate a likely capital structure going into the future, I have retrieved Statoil's gross interest-bearing debt from the latest annual report and compared the capital structure with the industry average from Damodaran`s database[36]. Statoil's debt and equity weights are presented in table 17 along with the industry averages from Damodaran`s database. The capital structure is very similar to the industry average and therefore considered to be reasonably as a target for the future.

Capital Structure	Equity Value	Debt Value	EV (D+E)	E/(D+E)	D/(D+E)
Statoil	76635	28274	104909	**73 %**	**27 %**
Damodaran datasets:					
Oil & Gas Integrated Global				72,6 %	27,4 %
Oil & Gas Integrated Europe				68,5 %	31,5 %

Table 17: Capital Structure *(Created by Author/Statoil Annual Reports)*

[35] Share Price as of 29.03.2018: USD 23,45 *(Yahoo Finance)*
[36] http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datacurrent.html (02.05.2018)

6.1.4 WACC

Having all the necessary input variables estimated, Formula 6 from chapter 3 can now be used to calculate the weighted average cost of capital:

$$WACC = 0{,}73 * 8{,}5\% + 0{,}27 * 3{,}81\% * (1 - 0{,}23) = \mathbf{7{,}00}\%$$

Statoil`s weighted average cost of capital is set to 7%.

6.2 Present value

The present value of the cash flows estimated in chapter 5 can now be calculated using the weighted average cost of capital found in the previous section.

6.2.1 Transition Period

The first part of formula 2 presented in chapter 3 are utilized in order to obtain the present value of the transition period:

$$\text{Present Value}_{Transistion\ Period} = \sum \frac{FCFF_t}{(1 + 0{,}07)^t} = \mathbf{40129{,}6}$$

The discounted cash flows for each explicit year are presented in table 18 below. The sum of each year equals the value presented in the calculation above.

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
FCFF	5006	4702	4741	5227	5986	6110	6435	6681	6823	6965
Discount factor	1,070	1,145	1,225	1,311	1,403	1,501	1,606	1,718	1,838	1,967
DCF	**4679**	**4107**	**3870**	**3988**	**4268**	**4071**	**4007**	**3888**	**3711**	**3540**

Table 18: Discounted cash flows from budgeting period. USD millions (own creation)

6.2.2 Continuing period

Formula 4 presented in chapter 3 implies that the perpetual cash flows will grow at a stable rate. It`s reasonable to select a growth rate that reflects the expected growth in the economy. Choosing a growth rate smaller than the general expectation for the economy will automatically assume that the company's value will diminish and eventually vanish. On the other hand, selecting a growth rate bigger than the general expectations for the economy will automatically assume that the company's value will increase relative to the rest of the economy in all perpetuity. The cash flows for this period are therefore expected to grow equal to the expected growth in GDP. Most central banks, including FED[37], ECB[38] and the Central Bank of Norway[39] operates with an inflation target approximately around 2%. The growth rate for the continuing period is therefore set to 2%. The terminal value is calculated using formula 3:

$$Terminal\ Value = \frac{6965(1 + 0{,}02)}{(0{,}07 - 0{,}02)} = \mathbf{142080}$$

This terminal value represents a perpetual annuity in the consecutive year after the budgeting period. The present value can be obtained by applying the second part of formula 2:

$$Present\ Value_{Terminal\ Value} = \frac{TV}{(1 + WACC)^t} = \frac{142080}{(1 + 0{,}07)^{11}} = \mathbf{67501{,}1}$$

[37] FED: Federal Reserve System (US)
[38] ECB: European Central Bank
[39] The Norwegian Government has recently announced changes in the monetary policy: Inflation target is changed to 2% (from 2.5%) Source: https://www.regjeringen.no/no/aktuelt/ny-forskrift-for-pengepolitikken/id2592551/ (02.03.2018)

6.3 Share price

The present values calculated in the section above both stems from the estimated free cash flows for the whole firm. This means that both equity and debt holders are entitled to these cash flows. In order to calculate the share price, it is first necessary to find the value that accrues to the equity owners of the company. This can be done by subtracting the net interest-bearing debt from the firm value, as given by formula 4 presented in chapter 3:

$$Equity\ Value = 40129{,}6 + 67501{,}1 - 15437^{40} = \mathbf{92193,71}$$

The share price can then be found by dividing the equity value by the number of outstanding shares[41]:

$$Share\ Price = \frac{92193{,}71}{3268} = \mathbf{28,21}$$

7. Sensitivity and Scenario Analysis

The forecasting and valuation done in the previous chapters are based on several assumptions about the future. Even though these estimates are carefully reviewed, there will always be some degree of uncertainty attached to them. The intention of this chapter`s analysis is to see how the value of the share price varies as certain underlying assumptions are changed. These assumptions are related to the commodity prices (i.e. oil and gas prices), the cost of capital, and the future growth rate. I believe that the assumptions related to these factors are the most decisive for the share price estimate. They are also more or less determined by external events in the market and the general economy, in which Statoil has limited influence over.

[40] Net interest bearing debt, Annual Report and Form 20-F 2017
[41] Weighted average number of ordinary shares outstanding (in millions), Annual Report and Form 20-F 2017

7.1 Steady state Growth

The long-term growth rate for the continuing period was set to be 2%, which is quite similar to the inflation targets for FED, ECB and the Central Bank of Norway. Although, this growth estimate could deviate as it relies on various macroeconomic components in the economy, such as productivity, technology and consumption. Figure 6 presents the changes in Statoil`s share value as the assumption for future growth spans from zero to four percent growth:

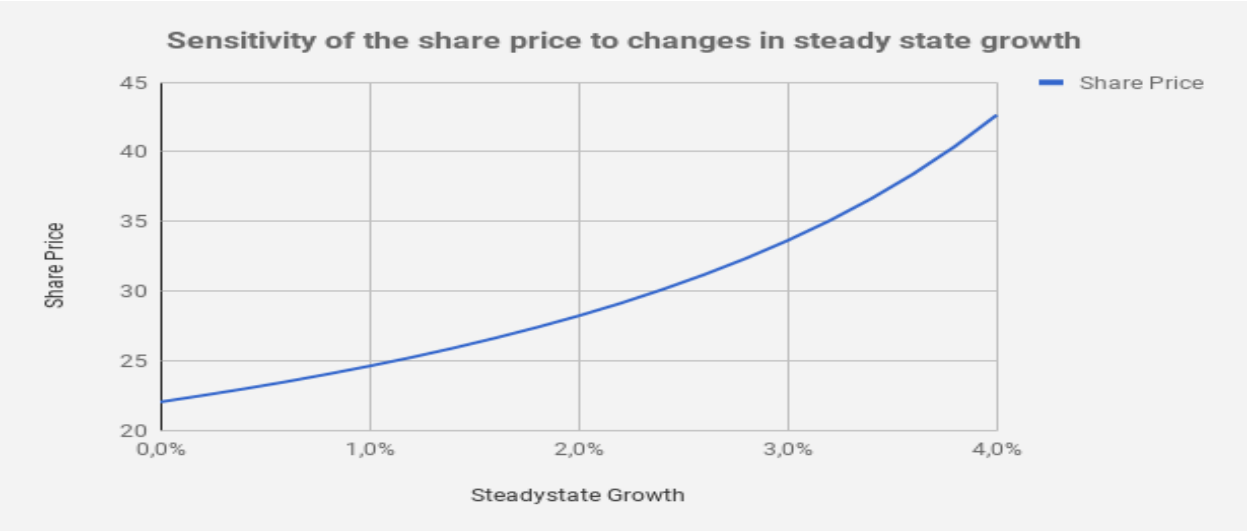

Figure 6: Share price sensitivity to steady state growth *(Created by author)*

The convexity of the graph indicates that there will be an increasing positive change in the share price as the growth increases, which indicates that the upside is larger than the downside. This is logical because the steady state growth is only affecting the value of the continuing period, leaving the down side limited to the present value of the transition period. This effect can be confirmed by table 19 below. A 20% decrease in the growth rate affects the share price estimate negatively by 5.6%, whilst a 20% increase affects the share price estimate positively by 6.7%.

%Δ Growth	-20 %	-10 %	-5 %	-1 %	**0 %**	1 %	5 %	10 %	20 %
Growth	1,6 %	1,8 %	1,9 %	1,98 %	**2 %**	2,02 %	2,1 %	2,2 %	2,4 %
Share price (USD)	26,6	27,4	27,8	28,1	**28,2**	28,3	28,65	29,11	30,1
%Δ Share price	-5,6 %	-2,9 %	-1,5 %	-0,3 %	**0 %**	0,4 %	1,6 %	3,2 %	6,7 %

Table 19: Share price sensitivity to steady state growth *(Created by author)*

7.2 Cost of Capital

The cost of capital calculated in section 6.1 is based on the weighted average between the estimated cost of equity and debt. These variables are in turn based on various assumptions which makes the WACC estimate even more exposed to changes. Figure 7 presents the changes in share value along with changes in the weighted average cost of capital:

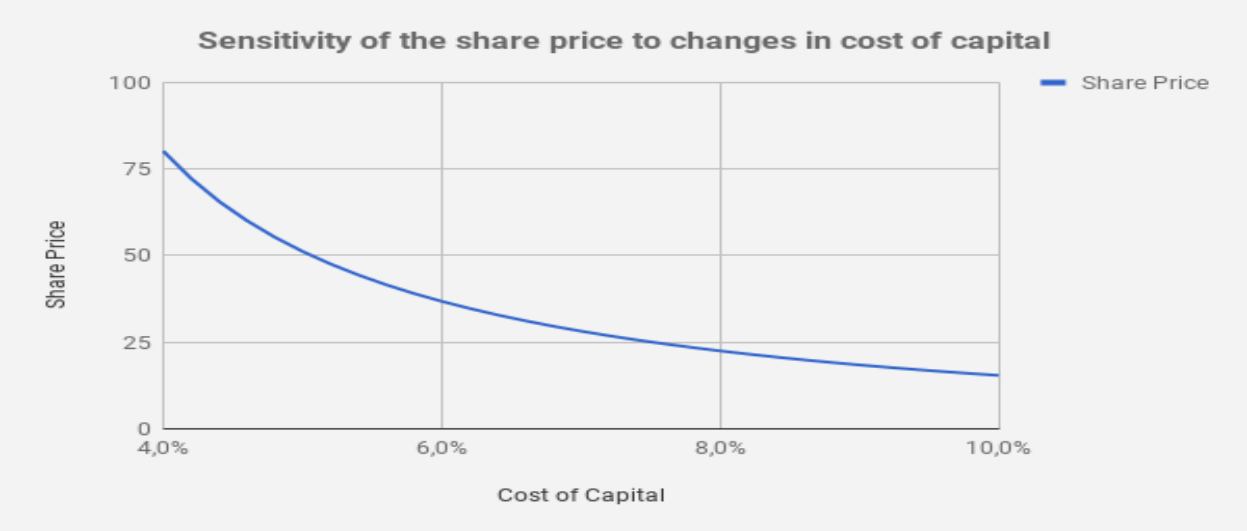

Figure 7: Share price sensitivity to cost of capital *(Created by author)*

The convexity of the graph indicates an increasing positive effect for the share price estimate as the cost of capital decreases. This effect can be observed by looking at table 20 below. A 20% decrease in the cost of capital will affect the share in a positive direction by 48%. This is significantly larger than the 27% change occurring at a 20% increase of the cost of capital.

%Δ Cost of capital	-20 %	-10 %	-5 %	-1 %	**0 %**	1 %	5 %	10 %	20 %
Cost of capital	5,6 %	6,3 %	6,7 %	6,9 %	**7,0 %**	7,1 %	7,4 %	7,7 %	8,4 %
Share price (USD)	41,6	33,8	30,8	28,7	**28,2**	27,7	26,0	24,0	20,7
%Δ Share price	48 %	20 %	9 %	2 %	**0 %**	-2 %	-8 %	-15 %	-27 %

Table 20: Share price sensitivity to cost of capital *(Created by author)*

7.4 Commodity Price Scenarios

In a sensitivity analysis, one component is changed in order to see how it would affect the value of the company. As for oil and gas prices, this would imply changing the company's revenue as

the price assumptions for these commodities are set higher and/or lower. This is slightly unrealistic because as the revenue changes there will assumable be a change in the cost components as well. A scenario approach considers the effect of changing several parameters instead of just one. The aim of this section is to see how Statoil`s equity value is affected when alternative price outlooks for oil and gas are used to forecast the future revenues. Revenues are calculated based on the same approach that were explained in section 5.1.1. The pricing outlooks will be based on the "Sustainable Development Scenario" (SDS Scenario) and the "Current Policies Scenario", briefly introduced in section 4.3.2. Figure 8 is presented in IEA`s WEO 2017 and illustrates the oil price outlook across these scenarios including a low oil price case, which are not discussed.

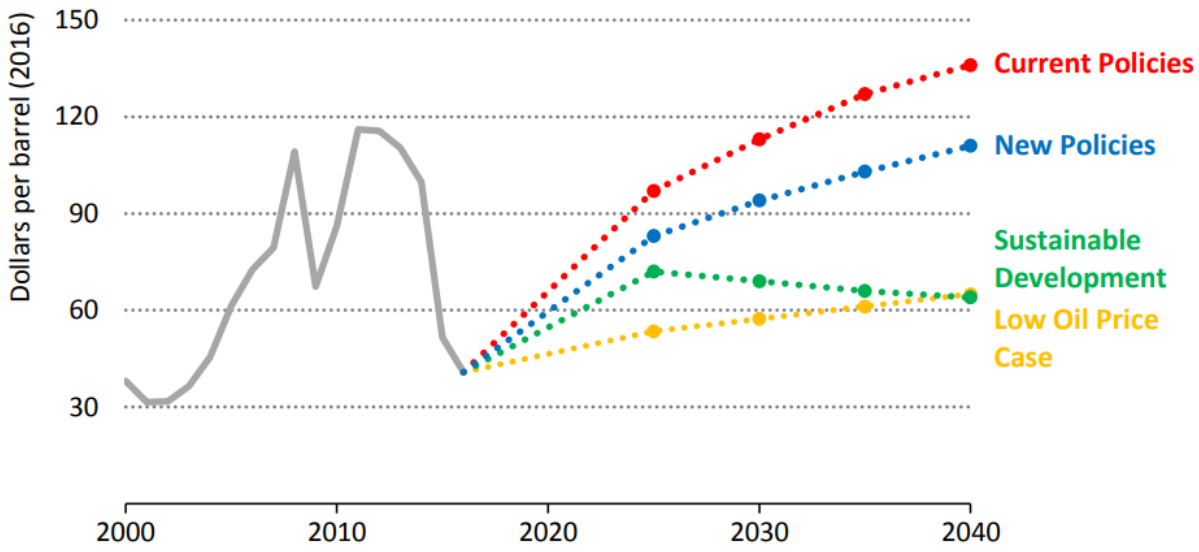

Figure 8: Average IEA crude oil import price by scenario and case (IEA WEO 2017)

7.4.1 SDS Scenario

Table 21 presents the estimated revenue and revenue growth based on the price paths outlined by the SDS scenario:

Year	2017	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Oil ($/bbl)	49,1	69	69,4	69,8	70,2	70,7	71,1	71,5	72,0	71,4	70,8
%Δ		*41 %*	*0,60 %*	*0,60 %*	*0,60 %*	*0,60 %*	*0,60 %*	*0,60 %*	*0,60 %*	*-0,8 %*	*-0,8 %*
Gas($/Mbtu)	5,5	7,00	7,00	7,00	7,00	7,00	7,00	7,00	7,00	7,06	7,11
%Δ		*27,3 %*	*0,0 %*	*0,0 %*	*0,0 %*	*0,0 %*	*0,0 %*	*0,0 %*	*0,0 %*	*0,8 %*	*0,8 %*
Average oil and gas		*34 %*	*0,30 %*	*0,30 %*	*0,30 %*	*0,30 %*	*0,30 %*	*0,30 %*	*0,30 %*	*0,0 %*	*0,0 %*
Production	2080	2080	2080	2205	2249	2249	2294	2317	2317	2317	2317
%Δ		*0,0 %*	*0,0 %*	*6,0 %*	*2,0 %*	*0,0 %*	*2,0 %*	*1,0 %*	*0,0 %*	*0,0 %*	*0,0 %*
Revenue	**61187**	**81930**	**82176**	**87353**	**89362**	**89630**	**91692**	**92884**	**93163**	**93171**	**93178**
Growth		***34 %***	***0,3 %***	***6,3 %***	***2,3 %***	***0,3 %***	***2,3 %***	***1,3 %***	***0,3 %***	***0,0 %***	***0,0 %***

Table 21 Revenue calculations based on SDS Scenario (Created by Author)

In accordance with table 2, the oil prices are set to reach 72$ per barrel before declining for 64$ per barrel towards 2040. The gas prices are set to remain at 2018 levels until 2025, as they are set to slowly increase to 7.9$ per mbtu towards 2040. The growth in gas prices are offset by the decrease in oil prices, leaving the increase in production as the main source of revenue growth in the budgeting period.

7.4.2 Current Policies Scenario

Table 22 presents the estimated revenue and revenue growth based on the price paths outlined by the Current Policies scenario. The oil prices are assumed to averagely grow at 5% each year, reaching 97$ per barrel in 2025. After 2025 the prices are assumed to grow at a lower annual rate of 2.3%, reaching 136$ per barrel in 2040, as given by table 2. Gas prices are assumed to averagely grow by 2.3% each year up to 2025, before slowing down to 1.65% each year reaching 10,2$ in 2040. As a result, the revenue growth is mostly driven by the assumed price development for oil and gas.

Year	2017	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Oil ($/bbl)	49,1	69	72,4	76,1	79,9	83,8	88,0	92,4	97,0	99,2	101,5
%Δ		*41 %*	*5,0 %*	*5,0 %*	*5,0 %*	*5,0 %*	*5,0 %*	*5,0 %*	*5,0 %*	*2,3 %*	*2,3 %*
Gas($/Mbtu)	5,5	7,00	7,16	7,33	7,49	7,67	7,84	8,02	8,21	8,34	8,48
%Δ		*27 %*	*2,3 %*	*2,3 %*	*2,3 %*	*2,3 %*	*2,3 %*	*2,3 %*	*2,3 %*	*1,65 %*	*1,65 %*
Average oil and gas		*34 %*	*3,6 %*	*3,6 %*	*3,6 %*	*3,6 %*	*3,6 %*	*3,6 %*	*3,6 %*	*2,0 %*	*2,0 %*
Production	2080	2080	2080	2205	2249	2249	2294	2317	2317	2317	2317
%Δ		*0,0 %*	*0,0 %*	*6,0 %*	*2,0 %*	*0,0 %*	*2,0 %*	*1,0 %*	*0,0 %*	*0,0 %*	*0,0 %*
Revenue	**61187**	**81930**	**84916**	**93108**	**98361**	**101951**	**107704**	**112704**	**116815**	**119107**	**121447**
Growth		***34 %***	***3,6 %***	***9,6 %***	***5,6 %***	***3,6 %***	***5,6 %***	***4,6 %***	***3,6 %***	***2,0 %***	***2,0 %***

Table 22: Revenue calculations based on Current Policies Scenario (Created by Author)

7.4.3 Share price

The ratios between revenues and capital expenditures, net working capital and depreciation are all held constant in accordance to the assumptions made in chapter 5. A change in revenue will then imply changes to all these parameters resulting in changes in both cash inflows and outflows. Table 23 presents the present values and the calculated share price for the two scenarios:

Scenario	Sustainable Development	Current Policy
Steady state growth	2,0 %	2,0 %
Weighted average cost of capital	7,0 %	7,0 %
Present value of transition period	36559	42701
Present value of terminal value	54123	76948
Enterprise value	90682	119649
Net Interest-Bearing Debt	15437	15437
Equity value	75245	104212
Shares outstanding (millions)	3268	
Share Price	**23,0**	**31,9**

Table 23. Share Price based on scenarios (Appendix C and D)

As for the sustainable development scenario, the share price estimate is 18% lower than the share price calculated in section 6.3, whilst based on the current policy scenario, the share price is 13% above.

7.5 Summary

The sensitivity and scenario analysis indicates substantial changes in the share price estimate as the assumptions for future growth, commodity prices and cost of capital are changed. The sensitivity analysis reveals that the cost of capital has a greater impact on the share price compared to the steady state growth. Although, the convexity of the respective graphs indicates that the upside is larger than the downside for both of them.

The scenario analysis clearly indicates that Statoil is affected by changes in the oil and gas prices. Although, the estimated share prices based on these scenarios does not consider potential changes in the operating, drilling and administrative expenses as opposed to lower or higher commodity prices. In the annual report 2017, Statoil states that the company aims to build a more resilient, diverse and option-rich portfolio. This is stated in the context of the company being exposed to market cyclicality, geopolitical shifts, and the increasing momentum for low carbon solutions. Therefore, it could be reasonable to expect a smaller downside for the company value under a SDS scenario due to the company`s increased ability to make organizational changes, selling assets, and so on. There could however be an opposite effect in a high commodity price case, such as the current policy scenario. Higher prices tend to implicate a higher activity level in the industry. A higher activity level could then lead to scarcity in labor and other input variables which eventually leads to higher operating costs through salary-levels and the cost of services delivered by the suppliers.

8. Relative Valuation

As a supplement to the intrinsic value found in chapter 6, a market approach can be used to find a relative value for the Statoil share. The first step in this approach is to identify similar companies with the same characteristics in terms of business segment, risk and operations. This group of companies can be called a peer group, and will be presented in the next section. Estimates based on the different multiples will then be presented in section 8.2.

8.1 Peer Group

Exxon Mobile Corporation - Exxon Mobile is the world's largest publicly traded oil company, headquartered in Texas, United States. The company is listed on NYSE under ticker XOM. It's a fully integrated oil and gas company involved in almost every aspect of the industry, from exploration to refining and sales.

Chevron - Chevron is also amongst the world's biggest international oil companies. The company is headquartered in California, United States. The company is publicly traded and listed on NYSE, with ticker CVX. Like Exxon, this company is also involved in almost every aspect of the oil and gas industry. Some of the core areas are the west coast of America, and the US gulf coast.

ConocoPhillips – American oil and gas company headquartered in Houston, Texas. Listed on the New York Stock Exchange. ConocoPhillips is considered as the largest independent E&P company in the world. It's a pure play company focused on the exploration and production segment. ConocoPhillips is the operator of the Ekofisk field located on the NCS, in the southern part of the North Sea.

Total – French international oil and gas company headquartered in Paris, France. Listed on Euronext exchange. Involved in the whole oil and gas value chain spectrum. The company also has a significant involvement in renewable energy sources.

BP plc – British international oil and gas company headquartered in London, England, listed on London Stock Exchange. The company operates worldwide including the North Sea. Its main segments are oil & gas exploration and production as well as marketing and refining oil products.

ENI – Italian international oil and Gas Company headquartered in Rome, Italy. Considered as one of the global supermajors with operations spanning from exploration and production to refining and power generation. The company are also involved in construction and drilling activities through Saipem. Listed on the Borsa Italiana Stock Exchange with the Italian government owning almost one third. ENI is also the operator of the Goliat field in the Barents Sea on the NCS.

8.2 Valuation using multiples

Each multiple will have various advantages and disadvantages associated to them depending on the companies for which they are used. Instead of choosing a few selected multiples, I have decided to use both the price -and enterprise multiples presented as multiples 1 to 5 in chapter 3. This makes it possible to do a broader assessment in terms of deciding upon a reasonable relative value for Statoil. I have also decided to include two industry specific multiples that are presented in the 2009 article referred to in chapter 3. The authors highlight these multiples as key pricing metrics that should be considered when valuating oil and gas companies. These are presented as multiples 6 and 7:

$$EV/Daily\ Production = \frac{Enterprise\ Value}{Oil\ and\ gas\ production\ (mboe\ per\ day)} \qquad \textit{Multiple (6)}$$

$$EV/Proved\ Reserves = \frac{Enterprise\ Value}{Proved\ oil\ and\ gas\ reserves\ (mmboe)} \qquad \textit{Multiple (7)}$$

Table 24 presents the calculated multiples for each individual company in the peer group, as well as their mean and median value. Statoil`s multiples are also presented on the right-hand side of the table for comparison reasons, and has not been considered in the calculation of the mean and median value. The multiples are based on relevant numbers from the most recent financial statements, found in the respective company's annual reports (See appendix E). Financial figures are presented in USD for all companies except ENI, which are using EUR as currency. ENI`s

figures are converted to USD by using the rate as of 31.12.2017[42]. The P/E and EV/EBIT ratio are not calculated for ConocoPhillips due to negative earnings in 2017.

Peer Group multiples	Exxon Mobile	Chevron	Conoco-Phillips	Total	BP	ENI	***Average***	***Median***	Statoil
Price/Earnings *(trailing)*	15,89	23,5	NA	17,58	39,2	15,4	**22,3**	**17,6**	16,67
Price/Book	1,67	1,46	2,24	1,36	1,35	1,10	**1,5**	**1,4**	1,92
Price/Sales	1,32	1,60	2,35	1,02	0,55	0,79	**1,3**	**1,2**	1,26
EV/EBITDA	8,99	8,65	15,35	5,92	7,00	5,49	**8,6**	**7,8**	4,48
EV/EBIT	18,27	26,22	NA	13,61	19,41	13,27	**18,2**	**18,3**	7,30
EV/Daily Production *(mboed)*	86,9	96,1	59,4	66,6	51,7	46,2	**67,8**	**63,0**	48,3
EV/Proved Reserves *(mmboe)*	17,6	22,5	16,2	14,9	9,6	11,2	**15,3**	**15,6**	18,7

Table 24: Peer Group Multiples *(Created by Author/appendix E)*

Price multiples

The P/E (Trailing[43]), P/B, and P/S ratio implies a relative value somewhat lower than the fundamental value estimated in chapter 6. One exception is the mean trailing P/E, which is significantly higher. This can probably be explained by the high ratio for BP, and to some degree Chevron. The median trailing P/E is however, more in line with the estimated fundamental value.

Enterprise value multiples

The EV/EBITDA and EV/EBIT ratios both implies a significantly higher price compared to the fundamental value. EV/EBIT suggests a share price of 69.9 and 70 USD for the mean and median, which is over 100% higher than the estimated fundamental value. These ratios could suggest that Statoil outperforms its peer group in terms of the respective earnings measure, related to the enterprise value.

[42] Currency EUR/USD as of 31.12.2017: 1.19. Source: https://xe.com/currencycharts/
[43] Trailing Price-To-Earnings: Based on the earnings from the recent fiscal year (i.e. 20F-2017 reports)

Industry specific multiples

The EV/daily production ratio are slightly higher compared to Statoil`s own measure, which indicates that Statoil are producing more than the peer group related to its enterprise value. This implies a somewhat higher share price than the one estimated in chapter 6. The EV/proved reserve ratio is however lower than Statoil`s own measure. In relation to enterprise value, this indicates that Statoil's reserve base is averagely lower when compared to its peer group.

Table 25 presents Statoil's share price based on the different multiples. The share price is calculated based on the mean and median value from the peer group. Although, based on the variations observed in the peer group, I consider the median measure as the most appropriate as it limits the influence imposed by the outliers. Based on the median values, the overall average for all the multiples indicates a share price of USD 33, which is 17% above the fundamental value calculated in chapter 6.

Share Price based on multiples (in USD)	*Average*	*Median*
Price pr. Share (***P/E)***	31,4	24,7
Price pr. Share (***P/B)***	18,6	17,2
Price pr. Share (***P/S)***	23,7	21,8
EV/EBITDA:		
Enterprise value *(USD mill)*	192046	175369
Market cap *(USD mill)*	168162	151485
Price pr. Share	51,5	46,4
EV/EBIT:		
Enterprise value *(USD mill)*	250013	251636
Market cap *(USD mill)*	226129	227752
Price pr. Share	69,2	69,7
EV/Daily Production (mboe/d):		
Enterprise value *(USD mill)*	141044	131086
Market cap *(USD mill)*	117160	107202
Price pr. Share	35,9	32,8
EV/Proved Reserves (mmboe):		
Enterprise Value *(USD mill)*	82335	83561
Market Cap *(USD mill)*	58451	59677
Price pr. Share	17,9	18,3
Average Share Price	**35,4**	**33,0**

Table 25: Share Price Based on Mulitples *(Created by Author/appendix E)*

9. Validity and Conclusion

The first part of this chapter presents and discusses factors that could serve as a source of error because of the limitations in the fundamental analysis. The last section will present and discuss the results from the analyses conducted in previous chapters, before making the concluding remarks.

9.1 Sources of Error

Company valuations tend to be subject for various simplifications and assumptions. This section will discuss some key factors that could potentially alter the outcome of the estimated cash flows presented in chapter 5.

9.1.1 New Energy Solutions

Historically, Statoil has been looked upon as an oil and gas company which are dependent on the production and selling of oil and gas. Over the last few years the company has gradually started to present itself as a broader energy company. Through its current strategy the company aims to grow in the renewable segment. As mentioned in chapter 2, the company is expecting 15-20% of its capital expenditures to be directed towards new energy solutions by 2030. By entering a new market segment, the company could potentially be subject to changing profit margins, cost structures and taxation regimes, which eventually will affect the company cash flows. This subject is however not addressed in the estimation of the future cash flows as the current state of the company is more or less characterized by being an oil and gas company. The forecasting period also assumes that it will be "business as usual" in the years to come. The forecasting of future revenues are estimated to follow the growth of the oil and gas price projection given by the "New Policies Scenario". This approach assumes that Statoil`s revenues are highly dependent on the prices for oil and gas. These assumptions could therefore be a source of error as the company aims to expand its operation within the renewable segment in the coming years.

9.1.2 Seasonality and cash flow timing

The fundamental analysis model are divided into yearly periods assuming that each cash flow arrives at the end of the period. In reality the cash flows will be spread out during the year. This simplification is however considered to be necessary in order to avoid the analysis being too detailed. As for commodity prices, the model does not take into account potential "intra year"

price fluctuations imposed by seasonality. Such seasonal variation are mostly related to gas prices as this energy product are used for electricity production, meaning that the demand will be dependent on weather and season. I expect the effects from these variations and cash flow timings to play a minor role in the present value estimate for the 10-year budgeting period, which again accounts for about 35% of the total present value of the company.

9.1.3 Currency exposure

USD represents the primary economic environment for Statoil ASA, and is therefore considered as the functional currency for the company. As mentioned earlier, Statoil`s revenues are primarily derived from the sale of oil and gas volumes. According to the company's annual reports, the cash flows from sales are mainly in USD together with the operating expenses and capital expenditures. Although, some elements are in NOK. These are mainly taxes, a portion of the operating expenses and capital expenditures, as well as dividends to the shareholders on the Oslo Stock Exchange. The fundamental valuation analysis does not take into account the currency risk represented by these payments in NOK, because it is assumed that such risk are actively hedged by the company's currency management.

9.2 Conclusion

Figure 9 presents the share price estimates for the intrinsic and market valuation approach. The table presents three different price ranges based on the discounted cash flow method. Beginning with the main case that where forecasted in chapter 6 and followed by the two remaining scenarios from IEA`s WEO 2017, presented in chapter 7. The price ranges represents a steady state growth spanning from 1.5% to 2.5%. This is done in order to give a better visualization of the values and how they are influenced by the assumed growth rate.

Share price estimates based on the market approach are visualized through the next price ranges in the figure. The first one presents all the multiples used, followed by a separate range for each type of multiples used. Each multiples are independent of each other as they represent a key metric based on different factors. It is possible that this could be a part of the explanation why there is such a wide spread of values across the multiples. The median value based on all the multiples was presented by table 25 in the previous chapter and shows a share price of 33 USD.

The red line in figure 9 illustrates the average between the median multiples value and the main case used in the discounted cash flow method. This combined estimate suggests that the stock is currently being undervalued in the market by 30.5%.

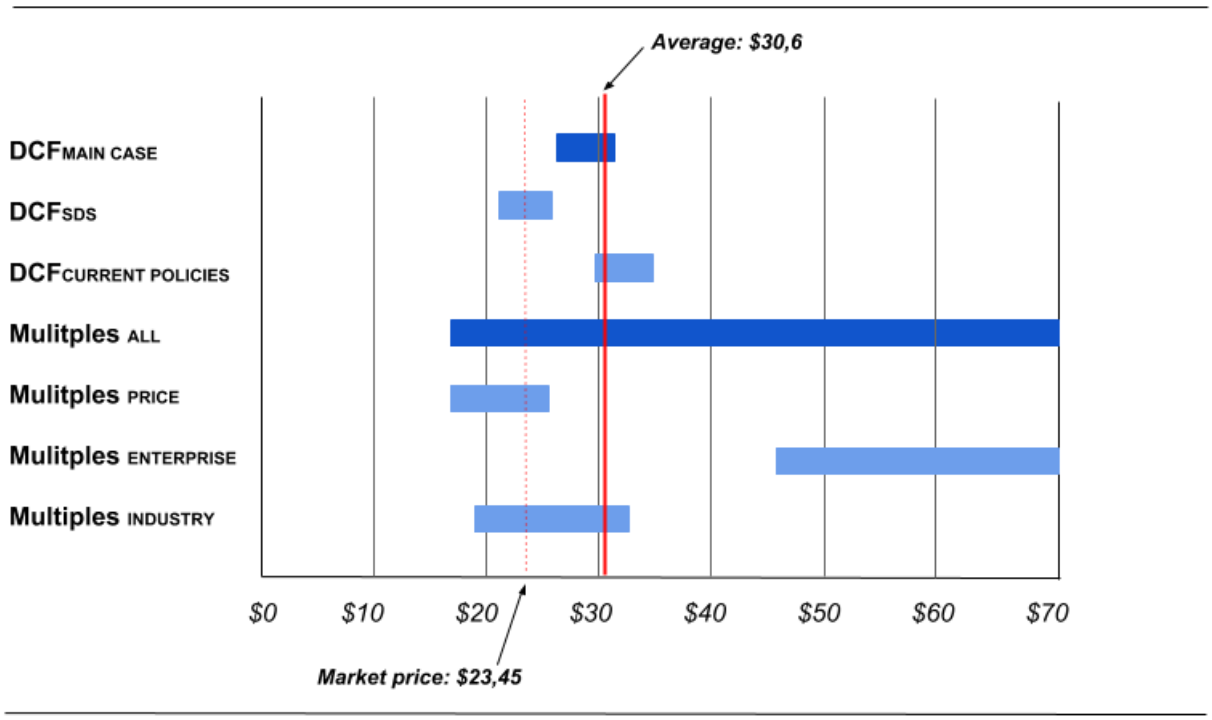

Figure 9*:* Share price based on valuation approach *(Created by Author)*

The purpose of the thesis was to find an estimate for Statoil`s equity value in order to compare it to the current market price. The main case in the discounted cash flow method was built upon the price projections in WEO 2017`s *New Policies Scenario*. The share price estimate from this approach suggests that the stock is currently being undervalued by the market. The median value from the relative approach underpins this statement. Although, due to the inconsistent and widely spread values obtain in the relative approach, I have chosen to emphasize the results obtained from the main case in the discounted cash flow method. As of the 29th of March 2018, the stock was priced at 23.45 USD[44]. The conclusion indicates a share price of 28.2 USD, suggesting that the stock is currently undervalued by 17% in the marketplace.

[44] The analysis are based on information up until Q4 2017 (I.e. annual report 2017, published at 23 March 2018).

The sensitivity and scenario analysis indicates that the share price estimate will be sensitive to changes in the steady state growth, cost of capital, and future price levels for oil and gas. The oil and gas prices from the “Current Policy Scenario” indicates an even bigger upside for the share price compared to the share price estimate obtain from the main case. Although, a more interesting observation was found in the lower price path scenario. The discounted cash flows based on the oil and gas prices from the SDS scenario suggests a share price at the same level as the current market price. This implies that there will be a very limited downside for the value of the company if the world manages to reach the objectives of the Paris Agreement.

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Appendix A: Historical and Forecasted Expenses *(in USD million)*

Year	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Revenue	99264	59642	45873	61187	81930	84152	90841	94720	96835	100901	104095	106265	108449	110646
Revenue Growth		*-40 %*	*-23 %*	*33 %*	*34 %*	*2,7 %*	*7,9 %*	*4,3 %*	*2,2 %*	*4,2 %*	*3,2 %*	*2,1 %*	*2,1 %*	*2,0 %*
Purchases	47980	26254	21505	28212	37776	38801	41885	43673	44649	46523	47996	48997	50003	51017
%Δ		-45 %	-18 %	31 %	*34 %*	*2,7 %*	*7,9 %*	*4,3 %*	*2,2 %*	*4,2 %*	*3,2 %*	*2,1 %*	*2,1 %*	*2,0 %*
Operating expenses	11657	10512	9025	8763	8588	8588	8845	9022	9203	9387	9575	9766	9961	10161
%Δ		*-10 %*	*-14 %*	*-3 %*	*-2,0 %*	*0,0 %*	*3,0 %*	*2,0 %*	*2,0 %*	*2,0 %*	*2,0 %*	*2,0 %*	*2,0 %*	*2,0 %*
Exploration expenses	4666	3872	2952	1059	1271	1525	1830	2013	2114	2156	2199	2243	2288	2334
%Δ		*-17 %*	*-24 %*	*-64 %*	*20 %*	*20 %*	*20 %*	*10 %*	*5,0 %*	*2,0 %*	*2,0 %*	*2,0 %*	*2,0 %*	*2,0 %*
Selling, gen. & adm expenses	1159	921	762	738	752,8	767,8	783,2	798,8	814,8	831,1	847,7	864,7	882,0	899,6
%Δ		-21 %	-17 %	-3 %	2,0 %	2,0 %	2,0 %	2,0 %	2,0 %	2,0 %	2,0 %	2,0 %	2,0 %	2,0 %
Depreciation & amortization	15925	16715	11550	8644	8193	8415	9084	9472	9684	10090	10410	10627	10845	11065
%Δ		5 %	-31 %	-25 %	-5,2 %	2,7 %	7,9 %	4,3 %	2,2 %	4,2 %	3,2 %	2,1 %	2,1 %	2,0 %
EBIT	**17877**	**1368**	**79**	**13771**	**25350**	**26055**	**28414**	**29740**	**30372**	**31914**	**33068**	**33768**	**34469**	**35171**
EBIT Margin %	*18 %*	*2,3 %*	*0,2 %*	*23 %*	*31 %*	*31 %*	*31 %*	*31 %*	*31 %*	*32 %*	*32 %*	*32 %*	*32 %*	*32 %*

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Appendix B: Regression Output for Beta Estimations

Regression Statistics	
Multiple R	0,265535748
R Square	0,070509233
Adjusted R Square	0,05448353
Standard Error	0,075672256
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,025194298	0,025194298	4,39975918	0,040312343
Residual	58	0,332124835	0,00572629		
Total	59	0,357319133			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	-0,007410683	0,010542517	-0,702933	0,484909508	-0,028513823	0,013692457	-0,028513823	0,013692457
X Variable 1	0,760017777	0,362334175	2,097560292	0,040312343	0,034727125	1,48530843	0,034727125	1,48530843

Regression output Beta 5yrs (2013-2017) STO vs. S&P500

Regression Statistics	
Multiple R	0,319918202
R Square	0,102347656
Adjusted R Square	0,075946117
Standard Error	0,075603824
Observations	36

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,022158287	0,022158287	3,876579089	0,057158766
Residual	34	0,194341901	0,005715938		
Total	35	0,216500187			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,002478225	0,013352257	0,185603459	0,853858599	-0,024656826	0,029613276	-0,024656826	0,029613276
X Variable 1	0,86913609	0,441431641	1,968903017	0,057158766	-0,027960939	1,766233118	-0,027960939	1,766233118

Regression output Beta 3yrs (2015-2017) STO vs. S&P500

Regression Statistics	
Multiple R	0,134144151
R Square	0,017994653
Adjusted R Square	-0,026641954
Standard Error	0,069081291
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,001923859	0,001923859	0,403136674	0,532022269
Residual	22	0,104988945	0,004772225		
Total	23	0,106912804			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,014360541	0,017148386	0,83742814	0,41135738	-0,021203035	0,049924117	-0,021203035	0,049924117
X Variable 1	0,430784682	0,678475388	0,634930448	0,532022269	-0,976287153	1,837856517	-0,976287153	1,837856517

Regression output Beta 2yrs (2016-2017) STO vs. S&P500

Regression Statistics	
Multiple R	0,282967746
R Square	0,080070745
Adjusted R Square	0,053014003
Standard Error	0,08723518
Observations	36

ANOVA

	df	SS	MS	F	Significance F
Regression	1	0,022520689	0,022520689	2,959363809	0,094472601
Residual	34	0,258739204	0,007609977		
Total	35	0,281259893			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	-0,007799487	0,014822648	-0,526187138	0,602173981	-0,037922733	0,022323759	-0,037922733	0,022323759
X Variable 1	0,829141573	0,481980549	1,720280154	0,094472601	-0,150360751	1,808643898	-0,150360751	1,808643898

Regression output Beta 3yrs (2014-2016) STO vs. S&P500

Regression Statistics	
Multiple R	0,503775907
R Square	0,253790164
Adjusted R Squ	0,240924478
Standard Error	0,067802331
Observations	60

ANOVA

	df	SS	MS	F	Significance F
Regression	1	0,090684082	0,090684	19,7261264	4,07263E-05
Residual	58	0,266635052	0,004597		
Total	59	0,357319133			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	-0,011722645	0,009203223	-1,27375	0,207831323	-0,030144896	0,006699607	-0,030144896	0,006699607
X Variable 1	1,348533738	0,303627365	4,44141	4,07263E-05	0,740757533	1,956309943	0,740757533	1,956309943

Regression output Beta 5yrs (2013-2017) STO vs. OSEBX

Regression Statistics	
Multiple R	0,47182363
R Square	0,222617538
Adjusted R Squ	0,199753347
Standard Error	0,070356957
Observations	36

ANOVA

	df	SS	MS	F	Significance F
Regression	1	0,048196739	0,048197	9,736515347	0,003671284
Residual	34	0,168303449	0,00495		
Total	35	0,216500187			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,000573514	0,012208369	0,046977	0,962806316	-0,024236878	0,025383906	-0,024236878	0,025383906
X Variable 1	1,20850123	0,387298059	3,120339	0,003671284	0,421416876	1,995585584	0,421416876	1,995585584

Regression output Beta 3yrs (2015-2017) STO vs. OSEBX

Regression Statistics								
Multiple R	0,33183057							
R Square	0,110111527							
Adjusted R Squ	0,069662051							
Standard Error	0,066542304							
Observations	24							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0,012053566	0,012054	2,722199099	0,113167926			
Residual	22	0,097413322	0,004428					
Total	23	0,109466888						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,010537208	0,016829022	0,626133	0,537670424	-0,024364047	0,045438463	-0,024364047	0,045438463
X Variable 1	1,073019563	0,650350827	1,649909	0,113167926	-0,275725502	2,421764629	-0,275725502	2,421764629

Regression output Beta 2yrs (2016-2017) STO vs. OSEBX

Regression Statistics								
Multiple R	0,526456297							
R Square	0,277156233							
Adjusted R Squ	0,255896122							
Standard Error	0,07732798							
Observations	36							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0,077952932	0,077953	13,03644347	0,00097291			
Residual	34	0,203306961	0,00598					
Total	35	0,281259893						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	-0,012681628	0,013173279	-0,96268	0,342506223	-0,039452952	0,014089696	-0,039452952	0,014089696
X Variable 1	1,48618246	0,411616304	3,610602	0,00097291	0,649677487	2,322687434	0,649677487	2,322687434

Regression output Beta 3yrs (2014-2016) STO vs. OSEBX

Appendix C: SDS Scenario *(in USD million)*

Year	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Depreciation	**8193**	**8218**	**8735**	**8936**	**8963**	**9169**	**9288**	**9316**	**9317**	**9318**
Revenues	81930	82176	87353	89362	89630	91692	92884	93163	93171	93178
Depr./Revenue	10 %	10 %	10 %	10 %	10 %	10 %	10 %	10 %	10 %	10 %

Forecasted Depreciation and Amortization

Year	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
NWC	6964	7396	8299	8936	8963	9169	9288	9316	9317	9318
%Δ	2 %	6 %	12 %	8 %	0 %	2 %	1 %	0 %	0 %	0 %
Revenues	81930	82176	87353	89362	89630	91692	92884	93163	93171	93178
NWC/Revenues	8,5 %	9,0 %	9,5 %	10 %	10 %	10 %	10 %	10 %	10 %	10 %
Δ NWC	***161***	***432***	***903***	***638***	***27***	***206***	***119***	***28***	***1***	***1***

Forecasted change in Net Working Capital

Year	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Capex	**8603**	**8628**	**9172**	**9383**	**9411**	**9628**	**9753**	**9782**	**9783**	**9784**
Depreciation	8193	8218	8735	8936	8963	9169	9288	9316	9317	9318
Capex/Depreciation	105 %	105 %	105 %	105 %	105 %	105 %	105 %	105 %	105 %	105 %

Forecasted Capital Expenditures

Year	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
EBIT	25350	25188	26882	27389	27210	27872	28148	28017	27764	27504
tax	0,78	0,78	0,78	0,78	0,78	0,78	0,78	0,78	0,78	0,78
EBIT(1-t)	5577	5541	5914	6026	5986	6132	6192	6164	6108	6051
Depreciation	8193	8218	8735	8936	8963	9169	9288	9316	9317	9318
Capex	8603	8628	9172	9383	9411	9628	9753	9782	9783	9784
Δ NWC	161	432	903	638	27	206	119	28	1	1
FCFF	**5006**	**4699**	**4575**	**4941**	**5511**	**5467**	**5609**	**5670**	**5641**	**5584**
Δ FCFF		*-6,1 %*	*-2,6 %*	*8,0 %*	*11,5 %*	*-0,8 %*	*2,6 %*	*1,1 %*	*-0,5 %*	*-1 %*

Forecasted FCFF

Appendix D: Current Policies Scenario *(in USD million)*

Year	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Depreciation	**8193**	**8492**	**9311**	**9836**	**10195**	**10770**	**11270**	**11681**	**11911**	**12145**
Revenues	81930	84916	93108	98361	101951	107704	112704	116815	119107	121447
Depr./Revenue	10 %	10 %	10 %	10 %	10 %	10 %	10 %	10 %	10 %	10 %

Forecasted Depreciation and Amortization

Year	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
NWC	6964	7642	8845	9836	10195	10770	11270	11681	11911	12145
%Δ	2 %	10 %	16 %	11 %	4 %	6 %	5 %	4 %	2 %	2 %
Revenues	81930	84916	93108	98361	101951	107704	112704	116815	119107	121447
NWC/Revenues	8,5 %	9,0 %	9,5 %	10 %	10 %	10 %	10 %	10 %	10 %	10 %
Δ NWC	***161***	***678***	***1203***	***991***	***359***	***575***	***500***	***411***	***229***	***234***

Forecasted change in Net Working Capital

Year	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Capex	**8603**	**8916**	**9776**	**10328**	**10705**	**11309**	**11834**	**12266**	**12506**	**12752**
Depreciation	8193	8492	9311	9836	10195	10770	11270	11681	11911	12145
Capex/Depreciation	105 %	105 %	105 %	105 %	105 %	105 %	105 %	105 %	105 %	105 %

Forecasted Capital Expenditures

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
EBIT	25350	26391	29409	31339	32617	34900	36847	38399	39148	39912
tax	0,78	0,78	0,78	0,78	0,78	0,78	0,78	0,78	0,78	0,78
EBIT(1-t)	5577	5806	6470	6895	7176	7678	8106	8448	8612	8781
Depreciation	8193	8492	9311	9836	10195	10770	11270	11681	11911	12145
Capex	8603	8916	9776	10328	10705	11309	11834	12266	12506	12752
Δ NWC	161	678	1203	991	359	575	500	411	229	234
FCFF	**5006**	**4703**	**4802**	**5412**	**6307**	**6564**	**7043**	**7453**	**7788**	**7939**
Δ FCFF		*-6,1 %*	*2,1 %*	*12,7 %*	*16,5 %*	*4,1 %*	*7,3 %*	*5,8 %*	*4,5 %*	*2 %*

Forecasted FCFF

Appendix E: Peer Group Financials *(in USD million)*

Peer Group financials	Exxon Mobile	Chevron	Conoco Phillips	Total	BP	ENI*
Ticker (NYSE)	XOM	CVX	COP	TOT	BP	E
Share price USD (as of 29.03.18)	73,86	113,05	58,49	57,69	40,02	34,74
# Outstanding shares	4240	1910	1170	2630	3320	1820
Market cap	**313166**	**215926**	**68433**	**151725**	**132866**	**63227**
Cash & cash equivalents	3177	4813	6325	33185	25586	8834
Debt (long term + Short term)	42221	38669	19703	52436	63230	29644
Enterprise Value	**352210**	**249782**	**81811**	**170976**	**170510**	**84036**
Operating Revenue	237162	134674	29106	149099	240208	80293
Shareholder Equity (book value)	187688	148124	30607	111556	98491	57707
EBIT	19275	9528	-1517	12567	8783	6334
Depreciation & amortization	19893	19349	6845	16295	15584	8979
EBITDA	39168	28877	5328	28862	24367	15313
Earnings/Net income 2017	19710	9195	-855	8631	3389	4112
Oil-equivalent production (mboe/d)	4053	2600	1377	2566	3300	1820
Proved reserves (mmboe)	20000	11100	5038	11475	17810	7490
Reserve Replacement Ratio 2017	69% (2015)	95 %	-168 %	95 %	109 %	>150%

Source: Annual Reports. *ENI: Currency EUR/USD as of 31.12.2017: 1.19. Source: https://xe.com/currencycharts/