# BTH 36201

Bacheloroppgave - Økonomi og administrasjon

Bacheloroppgave

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Økonomi og Administrasjon

Verdsettelse av Lerøy Seafood Group

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Bachelor thesis

# Valuation of Lerøy Seafood Group ASA



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# Summary

This bachelor thesis aims to correctly valuate Lerøy Seafood Group ASA (LSG) based on the free cash flow to the firm. Valuation is done by forecasting and discounting a future cash flow. The discount rate stated in the latest LSG's annual reports was selected and adjusted to ensure a conservative valuation. The forecast is derived from empirical analysis of internal factors such as financial key figures or resources and external factors like trade situation or political developments.

The empirical analysis contains presentation of both quantitative and qualitative factors to determine LSGs future. LSG has changed their accounting from IAS 17 to IFRS 16. This change reduces the transparency of the annual reports but is common in the industry now. One point of concern is a 50% increase in paid salary in the last annual report since there are no major changes in staff or any comments justifying that.

The financial key figures are in general stable and major deviations are easy understandable. The VRIO framework is used for internal analysis without identifying any point of reasonable concern. PEST framework and porters five forces are used for external analyses. There is a sign that LSG may be at a point of having reached a stall point in their growth.

However, the forecast is created to reflect all the findings in the empirical analysis and shows a future growth for the company. The valuation is therafter conducted providing a value of LSGs stock. Lastly before concluding I have ran a Monte Carlo simulation to analyze the sensitivity of the results and mitigating some uncertainty regarding the forecasting.

The conclusion of the thesis is that the market value of LSG's stock should be at NOK 77,74. It is not a viable investing opportunity due to the minor difference compared to the current stock price of NOK 76,02. The Monte Carlo simulation has yielded that the probability for a positive return is only slightly higher than a negative, showing that there is a possibility of experiencing losses of investment.

# Preface

This thesis is the independent finishing work of my bachelor degree in Economics and Administration at Handelshøyskolen BI, and was chosen to help prepare me for a masters degree in accounting.

Early in my study I wanted to write a valuation as I was introduced to it in one of my elective courses. Presenting it to my advisor, ensured me that it was the valuable choice for my thesis. As I have worked with this thesis, I have seen the opportunity to connect theory from different courses I have had. I have also been able to apply knowledge I have gained throughout the entire study.

Selecting the subject for my study was based primarily on my interest in the Norwegian fish industry and especially the farming of salmon and trout. LSG was chosen as they are the second largest farmer of salmon but produces less than half of the leading competitor, which made me want to include them in my study.

The study has given me the opportunity to learn at e deeper level how valuation of companies work, and how to apply theory in practice. I hope that working with this thesis troughout the semester has helped me prepare for future studies.

I want to show my gratitude to my advisor Riana Steen guiding me from the beginning of the work to the end, giving me feedback and assurance.

# 1. Introduction

## *1.1 Background*

Valuation is one of the most important tasks in financial investments. It makes investing based on knowledge possible, mitigating risks tied to speculations. Valuation takes basis in thurough analysis of a firms pasts and present, and combines it with an external view to predict the future developments of a firm. Large investment companies have own departments for conducting valuations and investment analysises to aquire a larger degree of certainty in investing.

## *1.2 Selection of Research Question*

Lerøy Seafood Group (LSG) is the second largest farmer of salmon in the world (Berge, 2020). They are a company with ties more than a hundred years back and is staple of Norwegian quality around the world. As focus in media and politics are ever shifting for a greener source of income for Norway, the fish industry is more attractive than ever. Export of fish is the second largest source of income for the Norwegian economy, valued at BNOK 102 for 2020 (*Fakta Om Fiske*, 2021). The oil industry is however still the largest industry in Norway responsible for export valued at BNOK 325 (*Fakta Om Olje Og Energi*, 2021). The development of the fish industry and the company is something I find very interesting and is the reason I have selected LSG as the subject for my study.

## *1.3 Research question*

A research question can be defines as a question that is asked with a certain purpose and is formulated accurately enough that it is possible to answer with the help of social science (Johannessen et al., 2020, p. 34). The goal of the thesis is to create a useful and accurate valuation and investment-analysis of LSG. The research question has been formulated as:

*What is the real market value of Lerøy Seafood Group ASA? Is the LSG stock a viable investment alternative?*

Furthermore, I will compare the calculated value of the firm to the current stock price, NOK 76,02[1]. The recommendation will be based on this comparison.

### 1.4 Research subject

Lerøy Seafood Group is a world renown company operating in all levels of the value chain. The group mainly farms salmon and trout but also have fisheries for whitefish as well as processing plants. In short LSG follows the fish from the hatchery to the consumer. LSG is an employer of about 4500 people, and aims to provide sustainable and healthy food. LSG has fisheries and farms along the whole of the Norwegian coast, as well as processing and packaging plants across several countries in Europe to retain proximity to the end-user (Lerøy Seafood Group, n.d.)

LSG was purely family owned until 1997 when the company opened for external investors. As a consequence, a  strategy to further develop the groups position in all parts of the value chain was implemented. LSG has been publicly held since 2002, requiring even more attention to effectiveness (*Our History*, n.d.). LSG consists of several daughter companies as they own shares in more than forty companies, most of which a controlling interest. Five years ago the company conducted large investments to gain access to the whitefish market, mainly through the acquisition of two major trawling companies. This has converted LSG from a producer and exporter of seafood to a fully integrated value chain. Investments in product development and sales and marketing aims to increase the demand for seafood (Lerøy Seafood Group, 2020).

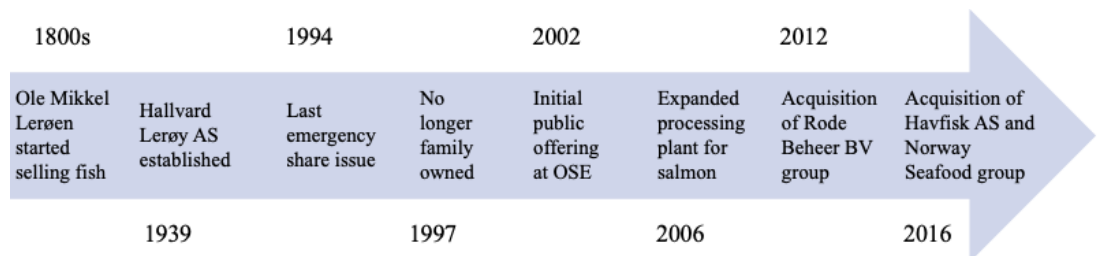| 1800s | | 1994 | | 2002 | | 2012 | |
|---|---|---|---|---|---|---|---|
| Ole Mikkel Lerøen started selling fish | Hallvard Lerøy AS established | Last emergency share issue | No longer family owned | Initial public offering at OSE | Expanded processing plant for salmon | Acquisition of Rode Beheer BV group | Acquisition of Havfisk AS and Norway Seafood group |
| | 1939 | | 1997 | | 2006 | | 2016 |

*Figure 1: Major events in LSG history*

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[1] As of 26th of May 2020, Adjusted closing price, Finance.yahoo.com

### *1.5 Industry*

Norway is a nation with a long history of fishing and have since around the 11<sup>th</sup> centuary utilized fish as a mean of trading and has ever since built its economy and society from it. The industry have been in growth for a long time, and went from a value of around BNOK 7 in 1983 to BNOK 28 in 2004, with almost half coming from export of salmon and trout, reaching BNOK 102 in 2020 (Hallenstvedt & Dørum, 2021). While the number of fishermen in Norway has decreased to a less than tenth of what it was in 1946, one has seen an increase in the number of workers in processing plants and fish farming. The sale of salmon has furthermore increased from 261 thousand tons in 1995 to 1364 thousand tons in 2019, while rainbow trout has increased from 14 to 83 thousand tons in the same period (*Fakta Om Fiske*, 2021).

### *1.6 Demarcation*

This bachelor thesis aims to valuate LSG. The valuation is solely based on publicly available data. As data published during the writing of this thesis has the potential to disrupt the accuracy of it, the empirical data gathering has been limited to 30<sup>th</sup> of April 2021, the publication date of the annual report for 2020. The valuation is of LSG as a sole company and does not take daughter-companies' or associates' operations into account.

# 2.  Theoretical Foundation

In the theoretical foundation I present the most relevant theory applied in the thesis. Firstly, is a walkthrough of what approach has been selected for calculating the value of LSG's stock. Secondly is an overview of different types of cash flow, what impacts them and what they mean for the valuation. Lastly is a presentation of weighted average cost of capital, used for discounting future cash flows.

### 2.1 Valuation Approach

*The value of any asset (or liability for that matter) is calculated as the future income generated by the asset discounted to present value with a discount factor that takes into consideration the time of money and risk associated with the income generated by the asset.* (Petersen et al., 2019, p. 294).

The selection of a valuation approach should be based on four attributes, being precision, realistic assumptions, user friendliness and understandable output. I have chosen the present value approach (PVA) with the discounted cash flow method as it is user friendly, widely used and does not require the extensive work of analyzing competitors at the same level. However, there are three other methods that can be used such as Multiples, Asset-based valuation and the Contingent claim valuation (Petersen et al., 2019, p. 297-299).

The present value approach is based on the expected future cash flow and discounts it to reflect the risk of the investment and the time value of money. As a mean of reflecting risk, the DCF-method requires measures in cost of capital, represented by the weighted average cost of capital ($r_{WACC}$).

FCF, also referred to as the discounted cash flow (DCF) model, consists of two methods. Either yielding an estimation of the enterprise or equity. The enterprise-value approach is based on the value of the future free cash flow to the firm (FFCF) and assumes that the cash surplus is either paid out as dividends or reinvested in projects with a net present value (NPV) of 0. When expecting an infinite cash flow stream, the FCFF-approach can be defined as:

$$Enterprise\ value_0 = \sum_{t=1}^{\infty} \frac{FCFF_t}{(1+WACC)^t}$$

*Equation 1: Enterprise value infinite cash flow*

The model can be modified to return the value of a future cash flow within a defined forecast period:

$$Enterprise\ value_0 = \sum_{t=1}^{n} \frac{FCFF_t}{(1+WACC)^t} + \frac{FCFF_{n+1}}{WACC-g} * \frac{1}{(1+WACC)^t}$$

*Equation 2: Enterprise value defined period*

Net interest-bearing liabilities (NIBL) must be deducted from enterprise value to make it comparable to the market capitalization available publicly. Alternatively one can conduct the valuation through the equity value approach, which yields the market value of equity (MVE) by discounting future free cash flow to the equity (FCFE), not requiring the deduction of NIBL (Petersen et al., 2019, p. 304-306):

$$MVE_0 = \sum_{t=1}^{\infty} \frac{FCFE_t}{(1+r_e)^t}$$

*Equation 3: Market value of equity infinite cash flow*

And

$$MVE_0 = \sum_{t=1}^{n} \frac{FCFE_t}{(1+r_e)^t} + \frac{FCFE_{n+1}}{r_e-g} * \frac{1}{(1+r_e)^t}$$

*Equation 4: Market value of equity defined period*

My analysis is based on enterprise value since the available data is evaluated to be sufficient for a trustworthy result.

### 2.2 Cash flow

A cash flow statement shows us the cash receipts, payments, and net change in cash of a firm, Statement of Cash Flows, IAS 7, dictates that the structure of a firm's cash flow statement should be divided into operating, investing and financial activities. The net cash flow is the sum of these activities and shows us the liquid effects a period has had on a company (Petersen et al., 2019, p. 62).

A company's performance can be evaluated by either accrual or cash flow-based performance measures. The accrual-based performance measures can be found in their income statement and is portrayed by figures such as EBIT or annual profit. Accrual measures is however critiqued as they are historically oriented and are prone to manipulation, meaning that companies can give impression of higher performance than delivered. The manipulation is mainly done through arbitrary cost allocation, accounting estimates and the option to use alternative accounting policies. Cash flow-based performance measures tells us the amount of cash a period has resulted in and is a measure not prone to manipulation as they are seen as an objective figure. The cash flow-based measures are however critiqued as they do not recognize transactions with payments occurring in following period as opposed to accrual methods where an income is recognized at the time of the sale. Also this method is prone to some degree of manipulation (Petersen et al., 2019, p. 83-92).

As there is much controversy about both methods, it can be difficult to select one or another measure for the valuation of a company. Despite accrual methods being historically oriented and prone to manipulations, it is seen as a better mean of measuring value created by a firm. Despite cash flow-based measures being inferior to measuring value created, it is seen as a way of retrieving relevant information about a company, and especially their liquid position, in addition to information available in the accrual methods. It is also a preferred measure for creating a forecast and discounting it to a present value as it represents the future cash value of a project or a firm

### 2.3 Cost of Capital

Cost of capital is a central topic in all financial analyses end especially valuations where it is applied as a discount rate to calculate a present value taking risk of investing into regard. The cost of capital is exactly that, a numerical figure representing the amount of return required by an investor, which is rationally risk averse, to make an inherent risk worthwhile. All companies and investors must accept risk, it is required to take some sort of risk to progress financially. Companies invests money in either product development or purchases with a belief that they will have a yield, knowing that there is possibility of not doing so. LSG recently

made large investments in trawling, believing that they will be able to take part in the established whitefish market. Measuring a cost of capital is difficult, it is comprised of every single investors aversion to risk, as all of them perceive the risk differently and expect different yields (Petersen et al., 2019, p. 339-340).

Weighted average cost of capital is the weighted average of required rate of return, cost of capital, for each type of investor. It is a combined cost of capital for the creditors to a company and the shareholders (Petersen et al., 2019, p. 341). As the model is weighted, it corrects the cost of capital for the capital structure, giving the type of investor with largest stakes a heavier weighted cost of capital:

$$WACC = \frac{NIBL}{NIBL + Equity} * r_d * (1 - t) + \frac{Equity}{NIBL + Equity} * r_e$$

*Equation 5: Weighted Average Cost of Capital*

Where

       NIBL = Market value of net interest bearing liabilities

       Equity = Market value of equity

       $r_d$ = Required rate of return on NIBL

       $r_e$ = Required rate of return on equity

       t = corporate tax

Source: (Petersen et al., 2019, p. 341).

The WACC used in valuation should represent all risks present for a company and dictates at what level of risk it is no longer viable to invest in a company. Risk consists of two variables, systematic and unsystematic risk. The unsystematic risk is present in all industries and is comprised of factors not possible to predict or consider for any company or investor, such risk could be environmental crises or pandemics. Systematic risks are comprised of factors possible to predict to some degree or that can be affected by the company. One can further break systematic risk into operating risks and financial risks (Petersen et al., 2019, p. 345-353).

Operational risks consist of external, strategic, and operational risks. External risks are factors outside of the company affecting them such as commodity prices, currency values, economic fluctuations, or commercial law. Strategic risks are tied

to risks within the industry, such as competition, competitiveness or reliance on suppliers or customers. Operational risks takes factors from within the firm into account, their resources, costs R&D, marketing and more (Petersen et al., 2019, p. 353-354).

Financial risk is dictated by the financial leverage of a company and the way they are financed. The financial leverage tells us the amount of NIBL the company has relative to their equity, directly showing the amount of risk tied to financing. A company with a large amount of debt will have a higher financial risk as they are obliged to make payments to creditors. A company can be financed with different types of loans, short or long term, fixed or variable rates or in foreign currency. All of which impacts the amount of risk tied to the financing (Petersen et al., 2019, p. 356-357).

The present value of a company is heavily dependent on the rate used for discounting. As the discount rate is a compilation of a multitude of variables, it becomes a challenging and complex process to predict it sufficiently accurate. As the cost of capital represents the risk aversion of all individual investors, it is practically impossible to accurately define it. One can at most attempt to estimate it by taking external and internal factors into account, i.e., the possibility for environmental changes or macroeconomic events.

# 3. Methodology

Method is the means of progression in answering questions and curiosities that we have obtained. The research method enables us to get an overview of different methods and the consequences of using them. It allows for exploitation of other researchers results and experiences. This can help prohibit us from utilizing ways of research that in turn produces results with bias (Johannessen et al., 2020, p. 21). Furthermore, one often divides it into two methods, a qualitative and a quantitative research. Whereas qualitative research is often based on surveys or interviews, the quantitative research only takes quantitative variables into account. Qualitative research gives us detailed information and is often used in studies of fields with little or no prior information or studies about human behavior or action. Quantitative research allows for systemic analysis of variables through statistical analysis, simulations and other analyses (Johannessen et al., 2020, p. 23).

## *3.1 Model build*

A study can be designed to answer a research question in several different ways. In this chapter I will showcase the design my thesis is built around and how I have utilized different methods and tools to create a valuation.

### *3.1.1   Preparation*

Initial work for any study is based on a wish to further understand or investigate a subject. In the phase of preparation, one generally attempts to use this curiosity to create a research problem for the study. These problems differ from everyday questions whereas they must be more well thought out, usually requiring a deeper understanding of relevant literature. Initial phases of studies also entail defining a research design and reason for the study to take place (Johannessen et al., 2020, p. 23). The research problem should make the basis for the methods and theory used in the study. It should be formulated to create a precise understanding of the "who, what and why?" of the study for the reader (Johannessen et al., 2020, p. 34-35).

Moving from a subject, the valuation, to a research problem was the initial work for this study. I regard the salmon industry as an exciting topic as there are several sizable companies based in Norway. LSG became the subject for the thesis as they are currently the second biggest company producing fish in Norway and worldwide.

Furthermore, reading relevant literature, such as textbooks regarding valuation and financial theory helped building a theoretical foundation to further build the valuation on.

This study is largely based on the theory of Financial Statement Analysis, the textbook used in the course Financial Analysis and Valuation. The thesis is in general based on economic and financial theory obtained during the courses of the bachelor's degree.

The purpose of this study is to investigate if the market capitalization, the price of LSG's stock multiplied with number of outstanding shares, is appreciated correctly by the stock market. Hereunder, the study aims to predict the future income of LSG and therefrom calculate the actual value of the firm. The result's purpose is to be an indicator of viability in investing in LSG's stock.

The research question in this thesis is: "*What is the real market value of Lerøy Seafood Group ASA? Is the LSG stock a viable investment alternative?*"

The purpose of the design is to assess the how the study can be conducted to best answer the research question. As the valuation of a firm is largely based on the historical figures and probable future figures of a firm, it is most logical to utilize a longitudinal design for the study. The longitudinal designs are based on data gathering over a period, providing possibilities for detecting abnormalities, systemic- or non-systemic variations in the research subject. More specifically, the design most viable is the panel-study design, which is a longitudinal study of one subject. The panel-study lets you collect data at several moments, but only data from one individual (Johannessen et al., 2020, p. 259-263). In this study the panel-design ensures that the data is comparable, as it is collected from one source and only describes LSG. The data is collected longitudinally as it is reported annually from the company, and gives the possibility for analyzing i.e., financial ratios and key figures over time. The same theory applies for the stock prices and indexes for calculating beta.

However, this study is characterized by a mixed method design. Hereunder, a describing design, meaning that the study is primarily dependent on quantitative

data, and utilizes qualitative data only to either help explain the quantitative data or to elaborate them (Johannessen et al., 2020, p. 257). I have used qualitative data in the chapter of empirical analysis to help determine the future trajectory of the quantitative data by analyzing trends, reports and other factors that may weigh in.

### 3.1.2 Data gathering

The second phase of a study is gathering data which reflects the reality surrounding the research problem. Independently from research methods one must define the sample size and discuss what sources of information is relevant or useful to gain the most relevant and reliable data considering the research problem (Johannessen et al., 2020, p. 24).

The data gathered, origins from primary, secondary, and tertiary sources. Accounting numbers has been gathered directly from LSG themselves or from primary sources such as Proff Forvalt. Secondary data has been sourced from research institutions or trade observers. Tertiary data has been used from sources such as Sjømatrådet.

As this thesis is mainly based on a quantitative method, the majority of data analyzed is gathered as numerical values. The quantitative methods make it possible to utilize statistical and econometric tools to further analyze LSG, such as with regression analysis or Monte Carlo simulation. Data for the financial analysis is obtained from LSG's own annual reports. The values presented there gives us accurate quantitative information about the company and enables us to utilize already wide-spread models for analyzing. One prerequisite for the study is that the data provided from LSG is reliable. However, this is usually the case as it is revised by third-party accountants and confirmed in accordance with national and international law.

For calculating beta for LSG I found the month average stock price for the company as well as the OSEBX index. The sample size was set to just shy of 130 observations, as this was the largest sample I could find. The size of the sample is due to the ongoing coronavirus induced conjuncture, resulting in large "outliers", extreme values, in both stock prices and indexes. The large sample size therefor

helps to mitigate the impact of these outliers. This is done to create a more usable beta that will not shift the results of the analyses caused by non-systemic factors in the markets.

The forecast is purely based on publicly available information, whether that is relevant media, government issued reports or LSGs annual report. To aid in creating a viable forecast for LSG, qualitative methods have also been used. The qualitative methods make it possible to gather information of different trends that could either be of harm or opportunity for LSGs operation. Mainly this data has been collected online to make a prediction of where the industry is headed.

### 3.1.3 Data analysis

The data collected in the previous step is analyzed and interpreted. Qualitative data required analysis of textual data and is interpreted to gain understanding of the detailed information. The quantitative data on the other hand, required analysis in the form of statistics, calculation, or simulation. In both cases the key attribute to data analysis is interpreting the outcome to help answer the research problem (Johannessen et al., 2020, p. 24). All calculations and quantitative analysis has been conducted in the attached .xlsx file

When analyzing the financial statements, one often attempts to understand if the profitability of a firm is satisfactory. The profit reported by a firm is important to ensure viable further operation of the firm. However, the financial statements are reformulated to map the profit from operations to create a professional valuation. Interests and payments of net interest-bearing liabilities is deducted from income, giving us a better understanding of how the company is mainly operated. One might also want to disregard the income from non-recurring activities, such as sales of equipment or property. The result of the reformulating results in more accurate valuation as the value is mainly driven by the growth of operating profit (Petersen et al., 2019, p. 139-141).

### 3.1.4 Monte Carlo

To analyze the probability for the NPV to be accurate with fluctuating underlying variables, such as discount rates or growth rates, I have utilized a Monte Carlo

simulation. The simulation returns a distribution of stock prices with the likelihood for each result to occur. It is a valuable tool to mitigate and analyze the uncertainty tied to minor non-systemic fluctuations. The Monte Carlo simulation is similar to a sensitivity analysis, but with the advantage of varying multiple variables simultaneously. While a sensitivity analysis on single variables can shed light on how sensitive the model is to the given variable, Monte Carlo simulation gives a more realistic image of how the outcome of the model can vary. The simulation is conducted using a Python program, shown in appendix 6.2 that draw random values for the variables and insert them in an excel sheet with the valuation model coded as a formula. The program then reads the output from the model and store that as one realization of the model. Iteration amount was set to 10 000 to achieve a high resolution of results. The distribution of random numbers has been set to a uniform distribution. The uniform distribution was selected to not shift the results in any direction. The Monte Carlo simulation could be conducted with any variables affecting the net present value, i.e., by using underlying variables affecting income or costs, to analyze the effect of these variables.
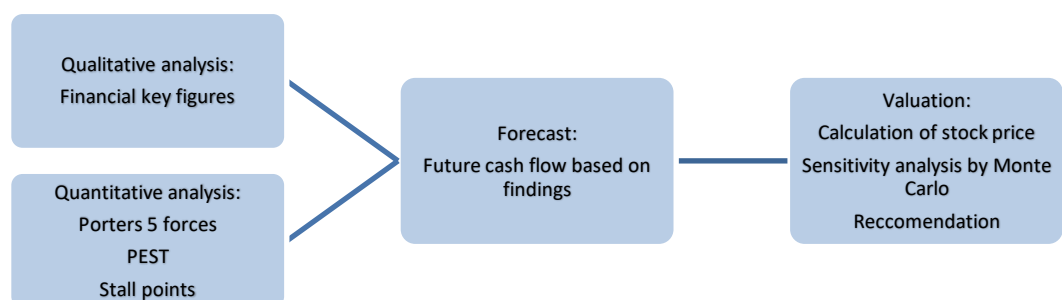


*Figure 2: Model build*

### *3.2 Reliability and validity*

The quality if this paper is determined by different factors, such as the quality of data gathered and what data is included. A large source to inaccuracies in valuation is the accounting quality of the firm in question. Another is the data included in empirical analysis, which should consist of factors directly impacting the research question.

Validity or plausibility ensures that the research measures the value of what is the intention of the study. It results in correlation between our data and the phenomenon

that is investigated (Johannessen et al., 2020, p. 250). In the case of this thesis, one attempts to apply data that is able to explain the future income of LSG. In the Monte Carlo-simulation the variables should have causality on the results.

Reliability is usually not a problem in gathering quantitative data from public sources, however, the accounting quality dictate the reliability of the annual reports. Reliability and validity are often used in quantitative research as criteria for quality. What data is used? Where is the data gathered from? How is the data processed?

Accounting flexibility can be prone to earnings management and fraud. Therefore in an analysis of financial statements assessments of reliability, comparability and usefulness must be made (Petersen et al., 2019, s. 459). As LSG is publicly held, there can be incentives for accounting manipulation. Motives for manipulation can consist of covering up for poor management, competitive issues or to increase performance related pay. The latter is one recurring manipulation of accounting, also known as "Big Bath", where one deliberately delivers poor results a period prior to excellent results to create an illusion of great management. The strategy often results in high bonuses for executives. (Petersen et al., 2019, p.559).

However, poor accounting quality can be subject to other factors than only manipulation. Accounting flexibility in IFRS and local GAAP accounting standards, attempting to mitigate differences between different companies accounting policies, allow for conservative or liberal accounting policies (Petersen et al., 2019, p. 463). Whereas conservative policies are characterized by cautious appraisal of assets and expensed development costs, the liberal policies result in appraisal capitalized development costs. The two accounting policies can result in significant differences in financial ratios.

The amount of non-recurring items, transaction which occur once or seldomly, can be used as an indicator for accounting manipulation. Non-recurring items vary from industry to industry and can be challenging to identify, comprised of an array of variables such as of amortization and depreciation of inventory or restructuring costs which are difficult for authorities to invalidate. The ability to identify non-recurring items are dependent on insight in detailed accounting reports. It is rarely

the case for any company to offer an annual report elaborative enough to investigate the non-recurring items (Petersen et al., 2019, p. 623-625).

# 4. Empirical findings and discussion

The analysis of empirical data aims more accurately predict the future of LSG through the forecast. However, the span of the factors playing a role in LSG's future is far too complicated and sizable to make a strategic analysis with perfect results. It is also impossible to gain perfect insight in several impacting factors. However, the use for the analysis in this thesis will hopefully create a summarized collection of the most significant underlying factors, aiding me in creating a useful forecast. Optimally one would implement a financial analysis of the biggest competitors of LSG to gain perspective on their health from the in regard to the competitive arena. However, this falls out of reach for this thesis and will therefore not be a part of it. The empirical analysis consists of analysis of LSG's financial position today and historically, as well as an internal analysis of LSG compared to the industry and an external analysis of factors impacting their operation and future.

## *4.1 Reformulating financial statement*

The financial statements in the annual reports are meant to provide relevant information, so that the user of the statements can make decisions based on the information. For a valuation the statements need to be reformulated to provide a better image of what factors contribute to the company's value added. When the balance sheet and income statement is reformulated to the net operating assets-format (NOA), we can calculate and analyze key figures better. The reformulation provides us the possibility to generate analyses of liquidity, profitability, and growth. Below is the reformulated balance sheet for the last three years. Small differences or inconsistency occur during the financial analysis due to rounding errors as the data form the annual report is retrieved in NOK1000. Below is the compressed balance sheet, reformulated to the net operating assets (NOA) format.

*Table 1: Balance sheet NOA-format*

|  | 2018 | 2019 | 2020 |
|---|---:|---:|---:|
| **ASSETS** | | | |
| *Net operating non-current assets* | 13 433 957 | 15 322 294 | 16 381 804 |
| *Net operating working capital* | 5 281 286 | 4 952 590 | 4 215 056 |
| *NOA (NONCA+NOWC)* | 18 715 243 | 20 274 884 | 20 596 860 |
| | | | |
| *EQUITY AND LIABILITIES* | | | |
| *Equity* | 17 134 290 | 17 763 306 | 17 632 769 |
| *Net interest bearing debt* | 1 580 953 | 2 511 579 | 2 964 091 |
| *TOTAL E + NIBD* | 18 715 243 | 20 274 885 | 20 596 860 |

### 4.1.1 Challenges Regarding Reformulating: IFRS16

One challenge encountered during the financial statement analysis was LSG's decision to alter their accounting policy in the 2019 report. The alteration is due to an adoption of IFRS 16 accounting policy concerning leases. The policy entails nearly all leases are recognized in the balance sheet, contradictory to the priorly used IAS 17 leases which are classified as finance lease obligations. This results in equity ratios portraying a higher financial risk for LSG in 2019 than in 2018 (Petersen et al., 2019, p.603). As the leases are now reported as financial leases, the lease expenses are categorized as a financial expense and the remaining parts are depreciated. This differs from former years as the leases are charged against EBIT or EBITDA, resulting in poorer results. As mentioned in accounting quality, management could have incentives to report leases as finance leases, as this could result in higher bonuses. LSG's annual reports are not elaborative enough to detect with certainty the number of bonuses given, but there is a 50% increase in salary paid by the firm, including bonuses, despite no comments regarding major changes in staff.

Furthermore, the updated financial statements pose challenges for the valuation as the 2019 reports utilize different posts in both the income statement and balance sheet. To make the new reports comparable, I summed "Lease liabilities to credit institutions", "Lease liabilities to others", "Loans from credit institutions" and "Other long-term loans" to form the post "Long-term interest-bearing debt" as shown in IFRS16 sheet in the .xlsx attachment. This was done by meticulously studying the notes attached to the balance sheet and verifying the result against the

2018 balance sheet in the 2019 report as it contains the former years balance in the 2019-format. This does not alter the outcome of the valuation in any way but makes it easier to compare annual reports with one another. Furthermore, I had to put "Interest rates received" in the financing activities prior to 2019

In an analysis issued by Deloitte, they state that the new leases should not impact the fundamental valuation of a firm. This is due to no direct impact on the economics and cash flow capabilities of the firm. This may change in the future as the enterprise value of a firm increases due to higher free cash flows and EBITDA. The analysis also states that even though IFRS16 should not impact economic valuations, they will to some degree as ratios are affected. This poses a problem especially to valuations by multiples. As more and more businesses adopt the new directive this will even out and create less of a problem in the future (Deloitte, 2016).

### 4.1.2   Challenges Regarding Reformulation: Deferred Tax

Deferred tax assets is a post in the financial statement that is not easily classified as either operating or financial. This is a result of lack of insight into the detailed financials. Furthermore, this is a weakness to the valuation the firm. As deferred tax assets generally occur from tax loss forwards or if assets are recognized at too low of a value, I have made a prerequisite and categorized as operating.

### 4.2 Financial key figures

The financial key figures helps us determine the current position of the company, as well as highlight inconsistencies that might have occurred. The figures showcase some of the decisions made by the company and the results of them.

### 4.2.1   Weighted Average Cost of Capital

Weighted average cost of capital is the representation of investors required rate of return on an investment as a tradeoff for the risk taken. A higher WACC results in a decrease in value due to the rate being utilized in the DCF valuation as the discount rate. WACC has been retrieved from the company's annual reports. One can see that the WACC for LSG has had a slight increase the last few years, which

shows us that they have anticipated a higher risk in investing. As the markets are impacted by the ongoing covid-19 crisis, one can expect the need for an even higher WACC for future years.

### 4.2.2  *Return on Invested Capital*

Return on invested capital (ROIC) shows the profit generated from investments made. Usually, the ratio is utilized to assess the company's ability to allocate capital to return profits. As one can see above, LSG has had large fluctuations in the historical ROIC. Analyzing the annual reports has indicated that this may be due to the acquisition of Havfisk ASA, now Lerøy Havfisk ASA, in the transition from 2016 to 2017. This was a large investment for the company, probably not generating a large profit immediately. However, it does seem like it was a profitable investment as the following year has an increased ROIC. There can also be seen a decline in ROIC in 2019, which may be due to LSG implementing several facilities across the value chain during the year.

### 4.2.3  *Return on Equity*

Return on Equity (ROE) represents the profit generated from both financial and operational activities and assets. One uses the figure to assess the company's ability to generate profit for the shareholders, or the owners of equity. As ROE consists of partly the same figures as the ROIC, one can expect them to behave similarly and can in the case of LSG be seen.
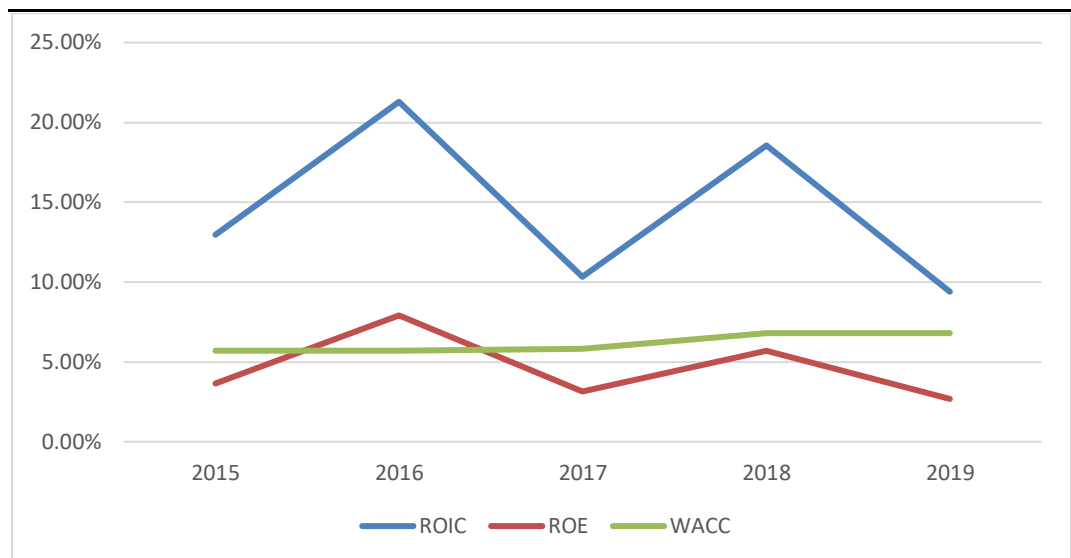
*Figure 3: Financial key figures*

### 4.2.4 Residual Income

Residual income (RI) is a calculation of the difference between actual return on equity and expected return on equity multiplied by the book value of equity (BVE). As ROE is an indicator what actual return is, RI indicates if a return is satisfactory. A positive value indicates a return on investing. Probably due to the same events as described in ROIC, the RI has had a substantial decrease in 2017/2018. Furthermore, one can see a negative RI in 2020, possibly due to the covid-19 crisis. Despite a negative RI one can argue that LSG is a profitable stock as the negative RI mostly can be explained by large investments made by the company or external factors common for the whole industry.

### 4.2.5 Economic Value Added

Economic Value Added (EVA) is a calculation of invested capital multiplied with WACC and thereafter subtracted from NOPAT. EVA is used as an indicator to see if the difference between required and actual return is satisfactory. One can see that LSG has a constantly positive EVA, indicating that the company is generating a residual wealth, indicating it being a beneficial stock for investing in.
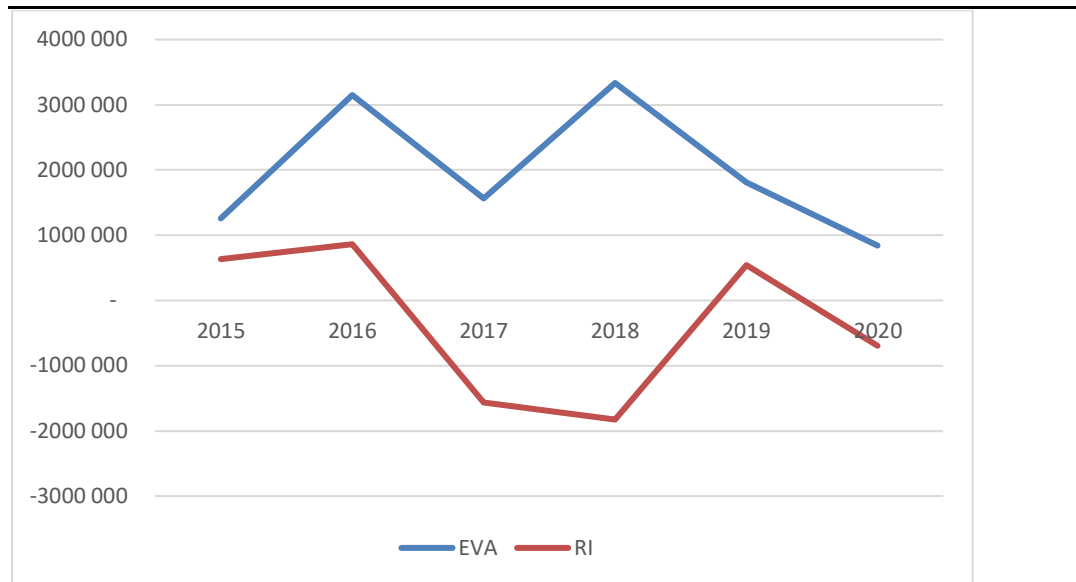
*Figure 4: Financial key figures*

### 4.2.6 Liquidity Analysis

The liquidity analysis aims to show LSG's position regarding their ability to pay suppliers and creditors. Financial position of a company can be shown by the Financial leverage, showing creditors leverage on LSG, and current ratio, displaying LSG's ability to pay the creditors.

### 4.2.6.1 Financial Leverage

The financial leverage tells us how the company finances its operations. A higher financial leverage represents a higher level of debt, giving the company lower taxation as one deducts interest from the profit before tax. Usually, one aims for a ratio lower than 50% (Petersen et al., 2019, p. 216-218). As shown below, the financial leverage of LSG is rather low, ranging from 10% to almost 20%, showing us that they finance their activities largely by liabilities. This will in turn result in a higher activity level and therefor higher earnings per share and a higher ROE. On the other hand, a higher leverage requires larger income from sales to ensure ability to manage the cost of loans.

### 4.2.6.2 Current Ratio

Current ratio consists of the current assets divided by the short term or current liabilities and represents the company's ability to manage said loans. There are differences in determining what is a healthy current ratio, but it is generally said

that it should range above a value of two (Petersen et al., 2019, p. 231). Table 2 shows that the current ratio is satisfactory.

Table 2: Liquidity analysis

|  | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| FINANCIAL LEVERAGE | 14,38% | 18,07% | 10,57% | 9,23% | 14,14% | 16,81% |
| CURRENT RATIO | 2,54 | 2,90 | 2,98 | 2,99 | 2,81 | 2,68 |

## 4.3 Internal analysis

The internal analysis aims to display how the internal aspects of LSG, and their strategy affects the future for the firm. For this thesis I have chosen the VRIO-framework to get an understanding of LSG's resources and how they affect them. The VRIO framework is a tool for analyzing the resources a company possesses and is used to discuss the value, rarity, imitability, and the company's ability to utilize each resource. In this thesis I have looked at the following resources: reputation, competence, market share, capital, and costs.

Table 3: VRIO summary

| RESOURCE | VALUE | RARITY | EASILY IMITABLE | ORGANIZATION |
|---|---|---|---|---|
| REPUTATION | Yes | No | No | Yes |
| COMPETENCE | Yes | No | Yes | Yes |
| MARKET SHARE | Yes | No | No | Yes |
| PP&E | Yes | No | Yes | Yes |
| COSTS | Yes | Yes | No | Yes |

### 4.3.1   Reputation

LSG's origin can be traced all the way back to 1899 and has ever since been a provider of quality fish to the consumer as well as industrial kitchens. The attention to detail and strive for perfection has inevitably resulted in a strong reputation in both consumer markets as well as the industry (Lerøy Seafood Group, 2020). This is assessed as an extremely value resource as it is the main driving resource for their income. Though a thorough reputation has to be created throughout long activity in the markets, it is something achievable by most companies. LSG's reputation is however hard to imitate as it is created by personal interaction with the company

and their products for decades. One can also see that LSG is able to utilize their reputation to further generate value and growth for the company.

### 4.3.2 Competence

LSG's success is largely attributable to their competence in turn a result of their century of experience as well as educated staff, which they claim is their most important resource (Lerøy Seafood Group, 2020, p. 16). The employees and their competence are certainly a very valuable resource as it aids them in developing all parts of the value chain to retain their competitiveness. The competence gained from employees is not very rare, however the vast amount of experience they have obtained is from the employees. This competence is easily imitable but the experience may not be. The organization takes advantage of their knowledge and competence and utilizes it to create innovative solutions across the whole value chain.

### 4.3.3 Market share

LSG has obtained their market share during their years of operations. They are currently the second largest salmon farmer in the world only surpassed by the substantially bigger MOWI[2] (Berge, 2020). This is directly correlated with their income which makes the resource very valuable. However, the closest following companies are close in market share, indicating low rarity. Market share is not easily imitated by competitors as it has to be created over time and with substantial investments. This is a resource that LSG utilizes well to continue improving their operations and products.

### 4.3.4 Property, Plant and Equipment

Property, plant, and equipment (PP&E) is the fixed assets of a company and is for LSG what enables them to produce their products. This consists of fishing vessels, hatcheries, farms, and equipment and is valuable for their operations. The majority of PP&E is not rare and is easily imitated by competitors as it can be purchased.

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[2] Measured in harvesting volume, gutted weight.

However, technology created by LSG may be harder to obtain. PP&E is well applied by LSG as it has created large profitability and growth for the company.

### 4.3.5   Costs

Discussed more in the trade analysis below, the industry of fish production is largely competitive resulting in focus on minimalizing production costs. LSG's position in the industry shows us that they are able to keep their costs low to retain competitiveness. This is valuable as it makes sure they stay profitable. As micro-economic theory suggest that all producers should have similar costs to operate in the same market, one can expect all companies to have similar low production costs. Low costs are therefore not rare but is hard to imitate as all companies would lower them if they could. LSG has shown that they are able of keeping the costs low ensuring profitability even in years of economic decline, such as 2020.

### 4.4 External analysis

In this analysis I aim to discover factors that may affect LSG's future operations from an external perspective. The external factors consist of political decisions or macroeconomic fluctuations and LSG is not in a position to impact them. I have utilized the PEST-framework as it covers several outlying factors, as well as the porters five forces to understand the competitive arena and porters five forces to conduct a trade-analysis (Fjeldstad & Lunnan, 2018, p. 105). The analysis' purpose is to create a more certain basis to develop a forecast from. The quality and outcome of the valuation is largely dependent on the findings in this analysis.

### 4.4.1   Trade-analysis

Porters five forces is a framework that covers several areas that may affect LSG. As red fish comprises roughly 70% of their income, it will be the main focus of the analysis.

#### 4.4.1.1 Substitutes

A substitute is a different product that satisfy a customer in the same manner as the original product. We can find several different substitutes to salmon as we can

consider it as multiple types of products. If we view salmon as specific species of fish, other fishes become substitutes, i.e., cod or pollock, which it seems like LSG might be shielding themselves from by the acquisition of trawler companies. It may also be an action to diversify their income for the future. Considered as a fatty fish with high contents of omega-3 fatty acids, there are substitutional fishes such as halibut or trout. As a source of protein, the substitutional products are either other meats or vegetable-based sources if protein. There is a threat of substitutes present for LSG due to both the different types of fish and proteins. If the markets demand more environmentally friendly proteins in the future one could suspect LSGs position to be weakened, but their new focus on whitefish may aid them in being resilient.

### 4.4.1.2 *Competition*

LSG's competition mainly consists of other fish farmers and fisheries. The fish-farming industry consists of large companies, in which produce large amounts of farmed salmon. The largest opponent to LSG is by far Mowi ASA. It is the largest farmer of Atlantic Salmon in the world and produces more than twice the amount of salmon as LSG. Furthermore, the four other largest opponents to LSG is Cermaq, SalMar, AquaChile and Cooke Aquaculture, all with smaller quantity than LSG (Berge, 2020). As the market contains direct competitors, there is a threat from competition.

Production costs seem to be lower in Norway than in several other countries. In a study conducted by *Aquaculture*, they have found that the production costs of salmon are rather low in Norway compared with other major salmon producing countries. The study defends Norway's large market share by its low production costs (Iversen et al., 2020). This aids us in mitigating the foreign competitors as a threat as long as the production costs of Norwegian salmon farming stay low. This makes Norwegian salmon more competitive compared to i.e., Scottish, Canadian, or Chilean salmon. Conversely this means that Norwegian competitors likely also have these lower costs, giving Lerøy the advantage to a lesser degree.

### 4.4.1.3 *Intruders*

Sea-based salmon farming is by far the preferred method in the industry. However, problems regarding lice infestations, decease outbreaks, escaping fish and pollution

makes producers shift focus towards land-based facilities. The onshore facilities prevent sea lice, escapes, waste mismanagement and makes the farming lice free. New technology has also made the on-shore facilities more profitable (Lekang et al., 2016). This could be a threat to LSG if intruding companies make profitable onshore farms. One can expect LSG's market share to decrease as with all sea-based farming companies. However, this could also be considered as a possibility for them if they manage to implement the new technology themselves. Lerøy has already showed interest in on-shore farming, and states that it very well might be a possibility for their future and may ensure that they keep or evolve their position in the market (Blaalid et al., 2021).

### 4.4.1.4 *Customers leverage*

One can assume that LSG's products are equal to their competitors and does not provide the consumer with any added utility. The salmon price also indicates that the product of different producers is very similar. This means that they are not able to charge their customers with higher prices as the customer simply can purchase from other providers. LSG's customers therefor have leverage over them and demands a low price for the salmon.

### 4.4.1.5 *Supplier's leverage*

LSG has a largely integrated value chain, around of fifty percent of their purchases is from already owned companies[3]. This makes it harder for other suppliers to bargain on prices with LSG due to their option to acquire some products and services by themselves. However, the supply chain is not fully controlled by LSG and some of the suppliers are common for the competitors of LSG. Therefore, some suppliers have leverage over LSG and are able to price their products for themselves.

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[3] 2019 Annual Report

**Threat from substitutes**
- Other fish species
- Other fatty fishes
- Animal-based proteins
- Vegetable-based proteins

**Customers leverage**
- Equal product to competition
- Low bargaining power on customers

**Threat from existing competition:**
- Some large competitors and many small compete over market share
- Subsequently makes production costs important
- Production costs low in Norway

**Suppliers leverage**
- Self-owned suppliers hightens bargaining power
- Third-party vendors lowers bargaining power

**Threat from intruders**
- New technology increases threat from on-shore farms
- Could decrease LSG's market share
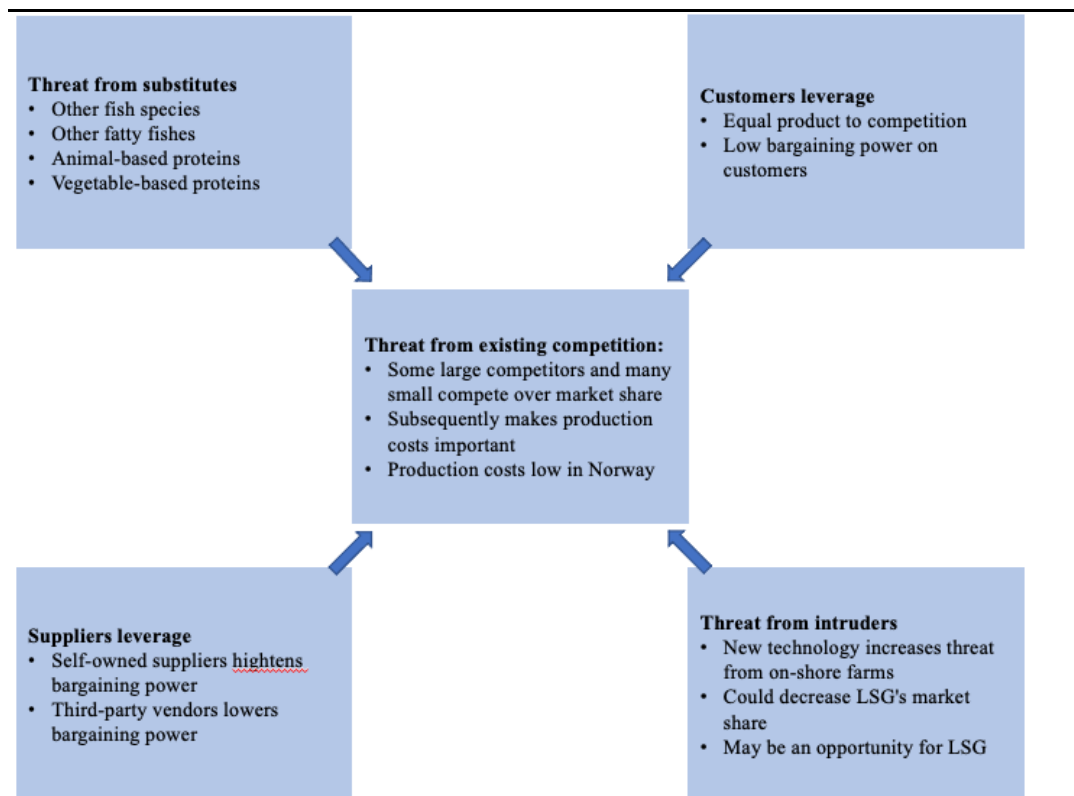- May be an opportunity for LSG

*Figure 5: Porters five forces summary*

### 4.4.2   PEST

A company's future is affected by a multitude of external factors, The PEST framework allow one to categorize them into four different types: Political/legal, economic, sociocultural and technological factors (Petersen et al., 2019, p. 270).

#### 4.4.2.1 Political/Legal

The Norwegian government has previously had a ground rent tax on farming of salmon, trout, and rainbow trout. This has provided the government and municipalities affected with an increased tax income. Last year, the National Budget stated that the government would instead start with a production quantum-based fee. The fee provides farming municipalities with NOK0,40/kg slaughtered salmon which sums up to approx. MNOK 500 (Giæver & Christensen, 2020). The increased tax income inevitably results in higher tax costs for farming companies but affects all competitive companies in Norway. This may give an advantage for the foreign competitors as their costs are not affected.

*4.4.2.2 Economic*

According to Norwegian Seafood council, Norwegian seafood stood for 100 billion NOK in value added for the Norwegian economy, of which 68 billion derived from salmon farming (*Laksens økonomiske bidrag i samfunnet*, n.d.).

Further, SINTEF provides an annual report of the seafood industry's impact on Norwegian economics through direct impact and ripple-effects. I their 2020 report they state that the Norwegian salmon-industry is responsible for creating about 60 thousand full-time equivalents (FTE)[4]. The growth for the two years prior of the report has been around 3 % for core-activities and around 7 % for the ripple-effects. Farming of salmon stands as the 4th most value creating industry in Norway. The historic growth has also been positive in both harvesting and farming (Johansen et al., 2020). The historic growth of the industry indicates a high profitability which in turn can be a good sign for the future of the industry.

As the industry is a sizable use of labor, one can expect the government to be inclined to keep the profitability of the industry high to further retain the FTEs. This might be part of why the industry receive subsidiaries for operations (*Miljøøkonomiske virkemidler*, 2020). This can ensure that the industry is able to keep producing salmon at a rate which would not be profitable originally.

Covid-19 has inevitably resulted in complications for the fish industry. One has seen import bans from big countries like China due to fear of spreading the virus. This has further resulted in lower prices and volumes and in turn lower stock prices. History has showed us that markets recover after such events. Several governments have used expansive fiscal policies to aid individuals and businesses from going bankrupt. This has however increased public debt and will result in lower yields for saving in banks. Stock-markets will therefore be more attractive for the individuals and businesses to make for more profitable saving. In the case of covid-19, most markets were affected as seen in different stock indices. Later we have seen that the markets have somewhat recovered during the pandemics course. The volatility of these markets also seems to have a higher volatility during the pandemic (David et al., 2020).

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[4] Year of 2019

2020 was however the second-best year for salmon export ever, only behind 2019, despite a decline in quantum and prices. The first six weeks of 2021 has had a 58% growth in volume compared with 2020. As more and more restaurants are making recoveries, especially in Japan, one can suspect a future growth for salmon exports (*God Start På Lakseeksporten Til Kina i 2021*, 2021).

As LSG is a company with large foreign exports they are subject to risk due to currency exchange rate fluctuations. LSG state in their 2019 annual report that they utilize forward contract to help mitigate the risk. This ensures predictability in short-term expenses and income. These items consist mainly of sales contracts, foreign deposits, and trade receivables, all in foreign currencies. The risk is however not perfectly mitigated as the currency markets are unpredictable. This does in turn mean that LSG is subject to currency fluctuations, especially in the long term. If the Norwegian krone is weakened against another currency, LSG will have to pay more for foreign services and goods but will be provided with larger income for exported items.

### 4.4.2.3 Sociocultural

Reports indicate that the global market for salmon will keep growing in the coming years. The market is expected to reach a size of about four million tons of salmon in 2023, compared to just over three and a half in 2020 (Shabandeh, 2021). This can further be interpreted as a result of increased focus on healthy food. If the seafood market in general or the salmon market where to grow this could mean possibility for a larger market share for LSG.

### 4.4.2.4 Technological

As stated in the trade analysis, there is emerging technology facilitating onshore farming of salmon which LSG is currently working to take part in. This may be an opportunity for LSG to acquire larger market shares if they are able to lower their costs through the development of the technology.

*Table 4: PEST summary*

| PEST | Findings | Consequence |
|---|---|---|
| *Political* | Norwegian government changed taxation of salmon-farming | Higher tax costs for all. |
| *Economical* | SINTEF reports growth for the industry. | Gives way for increased market share |
| | Government subsidiaries | Decreases need for perfectly efficiency |
| | After a big financial recession one can expect markets to recover | Higher spending can result in better income for industry |
| *Sociocultural* | Forecasted increase in salmon consumption. | Increase in market share |
| *Technological* | Developments of onshore farming | Could create higher competition or be an opportunity |

### 4.4.3   Stall points

Most companies experience a stall in growth for their operations, meaning a point where i.e., their revenue level off or starts to decline. Stalling can occur for any company at any revenue, but typically happen between $1 to $10 billion revenue in the US. Studies also show that 76% of companies reaches a stall at some point, and most importantly never restart growing. Only 11% manages to recover from a stall (Olson & Van Bever, 2008, p. 16-20). The reason for such a stall can be derived from countless factors. Externally factors like market saturation and economic recessions play the largest role. Internal controllable factors like overestimating competitiveness, brand protection or failing innovations are the largest reason for stall points (Olson & Van Bever, 2008, p 34). The historical income of LSG has had a large increase over the years but might show signs of having a decreased growth in the last four years. The seems to be stagnant at around BNOK 20 and might be an indication of a stall point for LSG. The decline in income in 2020 may be explained by the covid-19 crisis, but generally the analyses above have shown an indication of a growing industry and demand for salmon.

### *4.5 Summary of Empirical Findings and Discussion*

Historically, LSG has had fluctuations in financial ratios and figures, indicating a higher risk though the figures have generally been positive. This in turn does not make the stock risky or dangerous to invest in, but rather indicates that a long-term investment may be required. One can see that both historically, currently and for the future LSG is inclined to keep growing as a company and should be able to utilize future opportunities to generate growth and profitability. LSG has on the other hand had a steady income the last three years and might be a sign of having reached a stall point in their growth.

LSG has shown that they are able to take advantage of the power their resources give them and turn them into profitable operations year after year. Developments in the trade shows importance of innovative solutions to retain sustainability and profitability, in which LSG is involved. They show strength in keeping competitiveness and ensuring resilience towards substitutes. Despite economic decline and rising taxes, the company has shown economic profitability and growth, taking advantage of an expanding market and new technological innovations.

As most evidence suggests that LSG has a promising future, the forecast will include a future growth for the company. Though, caution will be exercised in case LSG actually are experiencing a stall in their growth.

### *4.6 Forecasting*

The estimated future events of LSG are based on factors that pose as a threat or opportunity for their operations. The entire basis for the forecast is a personal interpretation and is derived from the empirical findings and discussion. As mentioned, I have concluded that LSG should be able to withstand threats encountered in the next five years and capitalize on emerging markets. In the forecast I have anticipated that LSG is inclined to continue growth throughout the forecast period.

The valuation is comprised of two factors, future income, and a discount rate, reflecting the required rate of return for an investor. The future income is only fully determinable with perfect knowledge historic data. Therefore, one attempts to shift

focus from a historic view to a forward looking one and utilize historic data to create basis for forecasting financial variables (Petersen et al., 2019).

As portrayed in the empirical analysis one can expect a future growth for LSG. In the .xlsx attachment I have calculated a sustainable growth rate for LSG, averaging at 2,75% from 2015 to 2020. In the forecast I have set the annual growth to 1,5% to remain cautious.

### *4.7 Valuation*

WACC for the discounting has been derived from the average of the analysis period, 6,14%, and thereafter adjusted to 7,5% to ensure a realistic and not too optimistic valuation. The growth for the foreseeable future after forecasting period has been set to 5%. As seen below, this has resulted in a market value of equity of BNOK 46,2, divided by outstanding shares giving us a stock value of NOK 77,74. Compared to the price for the first trading day in 2021, NOK 59,76, one can assume that the stock is a viable and lucrative stock to invest in compared to the last trading day within the demarcation of this thesis priced at NOK 76,44 and more recently at NOK 76,02 at 26/05/21 (*Lerøy Seafood Group ASA*, 2021). However, if LSG continues with large investments in PP&E and acquisitions, growth and subsequently stock value would increase. The accuracy of the valuation is sensitive to changes in WACC, forecast period growth and growth for the foreseeable future. Meaning that marginal differences between calculated and actual stock value should be disregarded.

| 04/01/21 | 30/04/21 | 26/05/21 | Estimated value |
|---|---|---|---|
| NOK 59,76 | NOK 76,44 | NOK 76,02 | NOK 77,74 |

*Figure 6: LSG stock price development*

*Table 5: Present value of LSG stock*

| Present value of LSG stock | |
|---|---:|
| Present value of FCFF in forecast period | 9 630 994 |
| Present value of FCFF in continuing period | 39 625 635 |
| estimated enterprise value 01/01/2021 | 49 256 630 |
| NIBD 01/01/2021 | 2 964 091 |
| MV (equity) per 01/01/2021 | 46 292 539 |
| Outstanding shares | 595 476 |
| **Stock value per 01/01/2021** | **77,74** |

### *4.8 Monte Carlo*

As mentioned, the valuation results are sensitive to the variables forecast growth, future growth for the foreseeable future and WACC. These variables are unknown and can at best only be estimated with some uncertainty. I have therefore conducted a Monte Carlo simulation over these variables to showcase a distribution probability of the stock value.

#### *4.8.1 Variables*

I have decided to use the expected growth during the forecast period as one of the variables for simulation. This was selected as it is near impossible to determine the exact rate of which the company will grow. As explained, I have already set the base growth rate for the forecast period to 1,5% to remain on the cautious side of the average sustainable growth rate at 2.75%. I have set the interval range for this variable to 1,5% ± 0,5%, so that it does not exceed the sustainable growth rate.

As the majority of the NPV is comprised of the present value of FCFF in the foreseeable future after the forecasting period, it is highly dependent on the future growth rate. The growth rate has therefore been selected as one of the variables in the simulation and is drawn from the interval 5% ± 1%.

The last variable used in the simulation is the WACC, used as the discount rate in the NPV calculation. WACC was selected as it is difficult to assume future market

fluctuations and risk. A higher WACC will represent a higher risk for investors and therefore a lower market value of the stock. The WACC has been set to $7,5\% \pm 2\%$.

One problem I encountered was that if WACC is lower than the future growth, one would get negative NPV and stock price. If the WACC is similar to the future growth rate, the model becomes unstable due to the division with a number close to 0. This required a condition in the program which never allowed the WACC to be below the future growth rate plus $2\%$.

### 4.8.2   Result

The result of the simulation is shown below. To the left is the distribution of all stock values observed in the simulation and their respective probability of occurring. One can see that the distribution has two concentrations of values above and below the calculated stock price, where the peak around NOK 90 has a higher probability than the one around NOK 50.
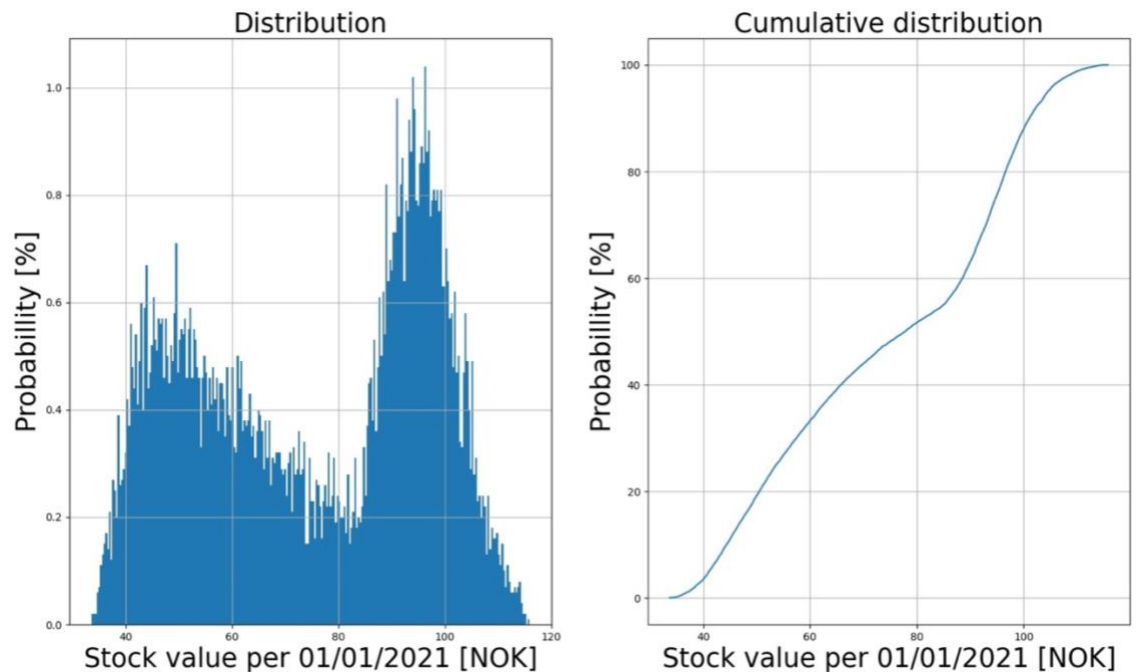


*Figure 7: Distributions from Monte Carlo simulation*

*Table 6: Descriptive statistics*

| Descriptive statistics | |
|---|---:|
| Return 5th percentile | -51,40% |
| Return 95th percentile | 43,66% |
| Weightet Mean | 75,6275 |
| Pr(>7,5%) | 47,60% |
| Pr(<-7,5%) | 44,09% |

The cumulative distribution shows that the probability of the stock value to be smaller than the NOK 77,74 is 50%, meaning that the probability of the actual value being higher is also 50%. The weighted mean of the simulation is NOK 75,63, very close to the median value which is NOK 74,73, both being near equal to the calculated NPV. This may indicate that the caution exercised in the forecast and valuation was sensible. The probability of a return of i.e., 7,5% or higher is 47,6% and a loss of 7.5% or lower is 44,09%. The 5th and 95th percentile shows us that there is a 5 percent chance of either a loss of 51,40% or a yield of 43,66%.

## 5. Conclusion

This thesis has considered internal factors such as LSG's financial history and their resources as well as external factors such as macro-economics and salmon demand forecast. The empirical analysis has given ground for assuming a future characterized by growth if they are not experiencing a stall point. I have been very cautious to not valuate the LSG stock to high. As mentioned the empirical analysis, it is mainly based on salmon and trout as this stands for the majority of income. This means that the acquisition of trawling companies may have an impact greater than what I have included in my forecasting and valuation. In the period after the demarcation there has not been any new developments with LSG that indicate that this valuation is not valid.

The Monte Carlo simulation has furthermore portrayed that the calculated stock price is largely sensitive to different factors, indicating an uncertainty in the valuation. The result of the simulation shows that the close range to the calculated price is less likely to occur than a substantially lower or higher price. Looking at the $5^{th}$ percentile result, one can see a substantial negative return of 51,40%, meaning that if one were to invest in the stock

The stock price of LSG is calculated to be NOK 77,74, which is within a small margin, equal to the current trading price of the stock. Taking this into account, and considering the possibility of a very large loss, discovered in the monte Carlo analysis, my recommendation is therefore to not purchase LSG.

## 6. Appendix

### *6.1 Bibliography*

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## *6.2 Monte Carlo Python-code*

```python
import numpy as np
from openpyxl import load_workbook, Workbook
from shutil import copy as copy_file
from os import remove as delete_file
from pycel.excelcompiler import ExcelCompiler
import matplotlib.pyplot as plt
from tqdm import tqdm
import os




def draw_random_uniform(min, max, workbook, sheet, excel_location, limit=None):
    value = float(np.random.rand() * (max-min) + min)
    if limit is not None:
        value = np.max([limit, value])
    workbook[sheet][excel_location].value = value
    return value


def read_value(tmp_path, excell_location):
    compiler = ExcelCompiler(tmp_path)
    value =  compiler.evaluate(excell_location)
    if value is None:
        raise ValueError('Tried to read empty cell', excell_location)
    return value


def dump_numbers(path, numbers):
    workbook = Workbook()
    for i, value in enumerate(numbers):
        workbook.active['A'+str(int(i+1))].value = value
    workbook.save(path)
if __name__ == '__main__':


    path = '/Users/jorgenueland/Desktop/LSG.xlsx'


    N = 10000



    SUM = []


    for _ in tqdm(range(N),total=N):
```

```python
    copy_file(path, path + '_tmp.xlsx')

    workbook = load_workbook(filename=path )

    #Variabler
    draw_random_uniform(0.01, 0.02, workbook,'Valuation',  'C6') # Forecast growth
    fg = draw_random_uniform(0.04, 0.06, workbook,'Valuation', 'C7')  # Future growth
    draw_random_uniform(0.055, 0.095, workbook, 'Valuation', 'C8', limit=fg+0.02)  # WACC



    workbook.save(path + '_tmp.xlsx')

    SUM.append(read_value(path + '_tmp.xlsx', 'C28'))

    delete_file(path + '_tmp.xlsx')

dump_numbers(os.path.join(os.path.dirname(path), 'montecarlo-results.xlsx'), SUM)



a,b = np.histogram(SUM, bins=250)
bin_size = b[1]-b[0]
a = a/N*100


    dump_numbers(os.path.join(os.path.dirname(path), 'montecarlo-results-histy.xlsx'), a)
    dump_numbers(os.path.join(os.path.dirname(path), 'montecarlo-results-histx.xlsx'), b[:-
1]+bin_size/2)

plt.figure(figsize=[18,10])
plt.subplot(1,2,1)
plt.bar( b[:-1]+bin_size/2,a, width=bin_size)
plt.title('Distribution', fontsize = 25)
plt.grid()
plt.ylabel('Probabillity [%]', fontsize = 25)
plt.xlabel('Stock value per 01/01/2021 [NOK]', fontsize = 25)



plt.subplot(1, 2, 2)
plt.plot(b[:-1]+bin_size/2, np.cumsum(a))
plt.title('Cummulative distribution', fontsize = 25)
plt.grid()
plt.ylabel('Probabillity [%]', fontsize = 25)
```

```python
plt.xlabel('Stock value per 01/01/2021 [NOK]', fontsize = 25)


plt.savefig(os.path.join(os.path.dirname(path), 'montecarlo.png'))
plt.show()
```

### *6.3 .XLSX-file*

The majority of the work done in analysing LSG has been conducted and can be found in the attached .XLSX file.