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Valuation of SalMar ASA

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Abstract

This thesis examines the fair value per share of SalMar ASA, a Norwegian salmon farming company, at 3rd of May 2017. The analysis has been performed using fundamental and relative valuation methods. Future cash flows are forecasted using key value drivers identified and analyzed in a thorough strategic and historical performance analysis. The value per share is derived by discounting future cash flows at a weighted average cost of capital before subtracting debt and non-equity claims. At last the sensitivity of estimates is thoroughly analyzed. Firstly, the macro analysis uncovers how regulations due sustainability challenges limits further organic growth in the industry, despite favorable economic conditions for a continued demand growth for salmon. Secondly, the industry analysis uncovers a threat of increased salmon supply due to new entrants within non-traditional salmon farming methods. Thirdly, the resource based-view analysis uncovers short term competitive advantages in SalMar ASA's optimized value chain, license locations and ocean farming technology. At last, the historical performance analysis reveal how SalMar has a history of stronger operating margin, lower operational cost, and higher return on invested capital compared to peers. The development in non-financial drivers are forecasted based on the results of the strategic and historical performance analysis. Salmon price is expected to stay strong in the short run, but revert to a lower historical average as supply from non-traditional farming methods gradually increase. Cost of goods sold is expected to decrease while fixed assets per license is expected to increase over the explicit forecast period. This is due to larger investments in cost efficient solutions including ocean farming technology, and self-sufficient smolt production. As a result, the forecast exhibits a continued high operating margin while return on invested capital declines compared to historical levels. Based on, these assumptions the fundamental valuation derives a fair value per share of NOK 153, while the relative valuation suggests a value interval of NOK 174-240. The sensitivity analysis uncovers a large value sensitivity to forecasted salmon price and cost of goods sold. The scenario analysis investigates the effect of success and failure of investments in cost improving technologies, ceteris paribus, where the result suggests a fair value per share of NOK 201 in case of success, and 90 in case of failure. At last, a Monte Carlo Simulation based on the historical probability distribution of the salmon price, suggests that the base case fair value per share estimate is less than 40% probable. The thesis concludes that the fair value per share for SalMar ASA is NOK 153 ~30% lower than today's market price.

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Preface

This thesis marks the end of our MSc in Business and Administration from University of Stavanger. Our major is Applied Finance, and this thesis comprise theory from many courses we have undertaken during the past years. The valuation course in the autumn semester of 2016, further triggered our interest in the valuation topic, and finally lead to this in-depth study of a salmon farming company.

We would like to thank our supervising professor, Peter Molnar for valuable inputs and constructive criticism. We also got invaluable counselling from Svein Olav Krakstad, whom we would like to extend our gratitude to. At last, we would like to thank fellow students, friends and family that contributed with valuable input and kept us motivated.

Stavanger, June 14th 2017

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Abbreviations

AH – Arnarlax HF

CAGR – Compounded Annual Growth Rate

COGS – Cost of Goods Sold

EBITA - Earnings Before Interest, Taxes and Amortization

EBITDA – Earnings Before Interest, Taxes, Depreciation and Amortization

EV – Enterprise Value

FPI – Fish Pool Index

HOG – Head-on and Gutted Salmon

IC – Invested Capital

MAB – Maximum Allowed Biomass

MSCI World – Morgan Stanley Capital International World index

NH – Norskott Havbruk AS

NOPLAT – Net Operating Profit Less Adjusted Taxes

OF – Ocean Farming AS

Operating Margin – EBITDA/Revenues

OSE – Oslo Stock Exchange

PP&E – Property, Plant and Equipment

r_e – Cost of Equity

r_f – Risk-Free Rate

R_m – Market Risk Premium

ROIC – Return on Invested Capital

RONIC – Return on Newly Invested Capital

WACC – Weighted Average Cost of Capital

Ton– Metric ton

1 Introduction

Supply growth of animalistic protein is limited due to competition for input factors as fresh water, land, and feed. Consequently, farming in the oceans around the world pose as an incredible opportunity to meet the expected future demand for proteins.

The Atlantic salmon farming industry has grown tremendously to become one of the most important industries in Norwegian value creation. However, the industry's sustainability has been tested over past decade with increasing challenges related to diseases, sea lice, and other environmental challenges. This has caused a growth in costs and increased investment needs due to stricter regulations, in addition to capped volume output as few new licenses are issued. Meanwhile demand for salmon has continued to increase and caused all-time high salmon prices. Thus, despite the challenges, the salmon farming industry's profits have never been larger than in 2016.

26th of February 2016 the Norwegian Directorate of Fisheries (2017b) awarded Ocean Farming AS, a subsidiary of SalMar ASA, with 8 licenses to develop ocean based salmon farming solutions. Traditional salmon farming in Norway takes place in sheltered fjords along the coast. However, technology allowing for utilization of open-water oceans, despite the rough environment, represent an interesting opportunity for expansion.

These developments triggered a motivation to analyse the key drivers of value and the future prospect of SalMar ASA. Thus, the research question of this thesis is:

What is the fair value per share for SalMar ASA as of May 3rd, 2017?

The remainder of this thesis is structured as follows. Section 2 presents the salmon farming industry and SalMar ASA. Section 3 contains a presentation and discussion of theory while chapter 4 elaborates on the research method. Section 5 analyse SalMar ASA's strategic environment, while section 6 analyse the historical performance compared to peers. The result of preceding sections is utilized in defining and forecasting drivers in section 7 and 8. The valuation result is presented section 9, while the sensitivity of the results is thoroughly analysed and elaborated on in section 10. At last, section 11 concludes that the fair value per share estimate indicates that SalMar ASA is overvalued by the market.

2 Presentation of Company and Industry

This chapter will present SalMar ASA and the salmon farming industry to create an understanding and basis for further analysis.

2.1 Industry Presentation

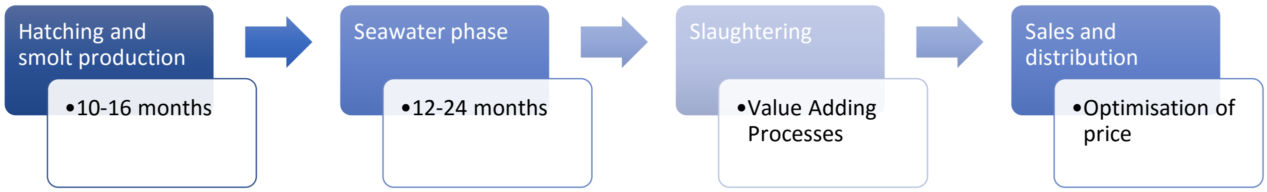
The modern commercial aquaculture of Atlantic salmon in Norway began around the 1970's with a technological breakthrough in constructing floating cages. In addition to being far more successful, salmon production in floating seawater cages proved less risky and entailed lower capital and operating costs than onshore tanks or closed environment earlier tested. As of 1973 a license was required to engage in salmon farming. However, frequent issuance of new licenses accelerated growth and by the late 1980's the market was saturated. Decreasing prices combined with increasing interest rates and banks tightening lending policies led many producers into bankruptcy in the early 1990's (Norsk Fiskeri- og Kysthistorie, 2014).

At the same time laws regarding fish farming were changed, abolishing regulations on local ownership and thereby allowing financing from a larger capital market. This naturally changed the industry's ownership structure, and by 2007 the three largest players produced 50% of all exported salmon (Norsk Fiskeri- og Kysthistorie, 2014). Today, the ten largest companies produce 69% of the total Norwegian export volume. Furthermore, the total Norwegian export make up approximately 60% of the 2 million head on gutted ton (HOG) total supply of farmed salmon (Marine Harvest ASA, 2017b).

2.1.1 Value Chain

The value chain of salmon production is a well-defined process with clear phases. Figure 1 illustrates the value chain of salmon production. The first phase is critical and consist of hatching and smolt production, a process usually lasting for 10-16 months. When the fish reach 100 grams it is classified as smolt, and should be physically strong enough to survive the second phase; sea-water growth. The smolt quality is an essential factor in preventing mortality and determining the quality of the final product (Marine Harvest ASA, 2017b).

Figure 1 - Value Chain of Salmon Production. Source: Marine Harvest ASA (2017b)



The seawater phase make up 12-24 months of the total production time of 24-40 months. During this phase, the production is vulnerable to elements of the external environment including storms leading to escape, but also diseases, and sea lice. The optimal water temperature for salmon is between 8 and 14°C. While sea lice thrives at temperatures above 14°C, the risk of mass mortality rises with temperatures approaching 0°C (2017b). In addition to temperature, factors as light, water oxygen- and salt levels are of importance for the salmon's health and welfare, and consequently; growth (Marine Harvest ASA, 2017b).

Harvesting takes place when the salmon reach appropriate size, between 3 and 6 kg. It is transported to processing facilities to produce the final product. In early times, most salmon were sold as fresh or frozen HOG. However, as the industry has made strategic moves towards increasing the price of produced salmon, value-adding processing (VAP) has become an industry standard. Lerøy Seafood Group, Marine Harvest, and SalMar, three major Norwegian salmon farmers, own facilities for producing a vast amount of secondary processed products.

2.1.2 Demand, Supply, and Price

Salmon, a commodity, contain high quality and easily digestible proteins, omega 3 fatty acids, in addition to several vitamins and minerals, and is consequently considered a healthy product (Marine Harvest ASA, 2017b). National ministries as US Department of Agriculture and the Norwegian Directorate of Health, among others, recommend regular consumption of fish (Helsedirektoratet, 2016; US Department of Agriculture, 2015).

Global supply of farmed Atlantic salmon exceeded 2 million HOG-ton in 2016. Norway and Chile, respectively, produced 52% and 22% of the global supply. The largest global consumer markets are EU (50%), North America (21%), Asia (12%) and South America (6,8%) (Marine Harvest ASA, 2017b).

For Norwegian salmon producers EU is the most important market, accounting for approximately 80% of the volume exported in 2016. The Asian continent is the second largest importer of Norwegian salmon. Table 1 presents the export of salmon by continents.

Table 1 - Norwegian export by continents (Norges Sjømatråd, 2017).

Year	2010	2011	2012	2013	2014	2015	2016
Africa	0,4 %	0,4 %	0,5 %	0,6 %	0,7 %	0,7 %	0,7 %
Europe	81,3 %	82,7 %	83,1 %	83,2 %	81,2 %	80,0 %	79,2 %
North America	4,7 %	2,6 %	1,9 %	2,3 %	3,2 %	4,0 %	4,3 %
Americas	0,2 %	0,1 %	0,0 %	0,0 %	0,0 %	0,0 %	0,0 %
Asia	13,2 %	14,1 %	14,2 %	13,7 %	14,5 %	15,0 %	15,5 %
Oceania	0,2 %	0,2 %	0,2 %	0,2 %	0,4 %	0,3 %	0,3 %

The combination of a long production cycle dependent on natural factors, and a relatively short period in which salmon is classified as fresh (three weeks) creates an inelastic short run supply (Andersen, Roll, & Tveterås, 2008). Hence, observed salmon prices display clear seasonal price-trends. Supply increase during fall as a product of accelerated growth due to warmer water-temperatures during summer (Marine Harvest ASA, 2017b). This consequently causes prices to decline. During the last two months of the year one observes a positive shift in demand, corresponding to an increase in consumption of salmon during Christmas celebrations (Bjørndal, Salvanes, & Gordon, 1994). An inelastic short-run supply combined with seasonal shifts for both demand and supply creates a volatile seasonal price formation.

Consequently, producers generally sell harvested products both in the spot market and on fixed contracts, although companies have different sales strategies. The amount of salmon sold on fixed contracts combined with the amount sold as VAP products determine the average achieved salmon price deviation from spot price. The level of hedging varies largely between salmon farming companies.

2.1.3 Salmon Farming in Norway

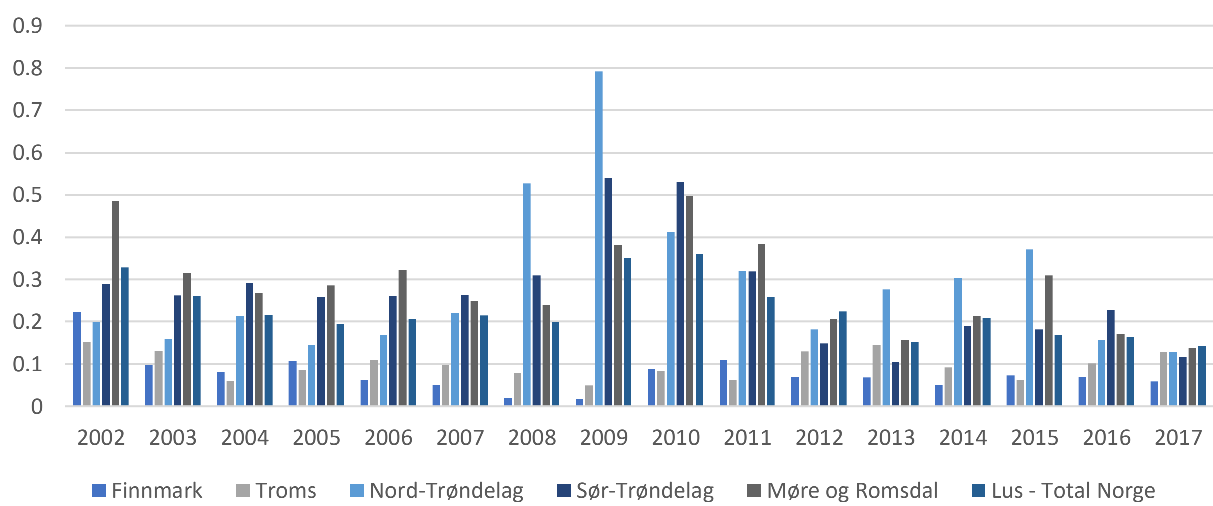
Norway is the largest exporter of farmed salmon in the world. Long and well protected fjords, good sea temperatures, and an ability to control growth has enabled the tremendous development (Marine Harvest ASA, 2017b). The combination of a 7% CAGR in volume output over 20 years and an increased salmon price has made the industry very profitable.

The salmon farming industry in Norway is regulated by the Norwegian government, and the regulations have increased in intensity over the previous years as a reaction to challenges as sea lice, environmental impact, and scale. Salmon farming is a licensed industry. The licenses have been issued with an infinite perspective, but with clear regulations on operations. License holders are imposed constant limitations on maximum allowed biomass (MAB), number of female sea lice per salmon, in addition to other controlling directions. Several new regulations are planned and will take effect as of 2017.

The largest biological challenge in Norwegian salmon farming is sea lice (Iversen, Hermansen, Brandvik, Martiniussen, & Nystøyl, 2016). Sea lice attach to salmon and trout and can cause open wounds which increase the risk of infections. Opposed to regular belief, sea lice do not affect the quality of salmon as food, but increase risk of mortality among farmed fish and wild stock (Lusedata.no, 2017).

Figure 2 illustrate how the historical number of adult female sea lice per fish in Norwegian salmon farms have decrease in the period 2009-2017. This is due to regulations imposed in 2013 limiting the permitted number of female sea lice per fish to 0,2[1].

Figure 2 – Adult Female Sea Lice per Fish Among Norwegian Salmon Farms. (Lusedata.no, 2017)



[1] The regulations impose a maximum allowed number of female sea lice per fish of 0,5 between week 22-15. Only 0,2 female sea lice per fish are allowed between week 16-21.

2.2 Company Presentation

SalMar ASA is a salmon farming company operating in Norway, with headquarter at Frøya, Sør-Trøndelag. The company hold salmon farming facilities in Finnmark, Nordland, Nord- and Sør-Trøndelag, and Møre og Romsdal (SalMar, 2016). SalMar possess a fully integrated value chain with operations including spawn and smolt production, caged sea-water growth, first- and secondary processing, and sales and distribution. The company reports on four segments: roe and smolt production, salmon farming Northern-Norway, salmon farming Central-Norway, and sales and processing.

Table 2 - Financial Summary of SalMar ASA

Year	2012	2013	2014	2015	2016
Revenues	4 205	6 246	7 186	7 326	9 030
EBITDA	511	1 485	2 157	1 725	2 790
Operating margin	12 %	24 %	30 %	24 %	31 %
Market cap					23 655
EV					30 376
NIBD					2 364
Share price May 3rd					207,50
Number of shares					113,999

Table 2 summarises SalMar's recent financial performance. The historical financials exhibit strong operating margins and a low debt to equity ratio. Revenues has more than doubled the previous 5 years, while EBITDA is more than 5x higher in 2016 compared to 2012.

2.2.1 Strategy

SalMar has since the very beginning in 1992 aimed to be most cost-efficient producer of Atlantic salmon. This is still SalMar's main operational focus with a stated operational goal of "*...producing fish at the lowest cost by having the best operational efficiency"* and "*…strive to achieve the best possible price for the salmon and ensure optimal yields"*.

The CEO of SalMar, Trond Williksen, states in his letter to shareholders for 2016 that the previous year's growth in operating costs pose as a threat to the industry's competitiveness. Further, Mr. Williksen points out that future operational efficiency entail developing solutions for efficiency in fighting diseases and sea lice, and increased feeding efficiency (SalMar ASA, 2017a).

SalMar have succeeded in being among the most cost efficient salmon farmers, relative to competitors in the Norwegian salmon farming industry, see Table 8. Currently, SalMar is developing sea farming technology that shall reduce operating costs and new lice fighting techniques that do not involve medicine treatment. However, SalMar struggles to sell salmon at the best possible price as their sales department have performed poorly the last years due to losses on forward contracts, caused by increasing salmon prices (SalMar ASA, 2017a).

2.2.2 Operations

Smolt Production

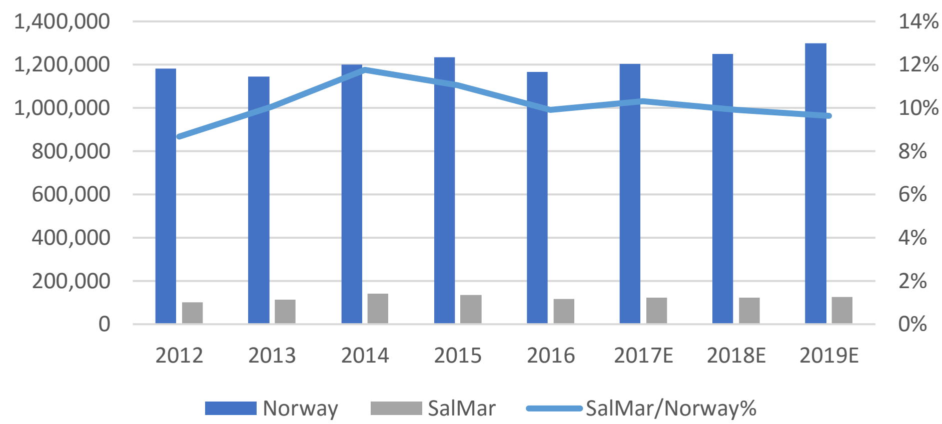
SalMar has 6 facilities for production of smolt. Sizeable investments have been made over previous years, and the completion of Troms Stamfiskstasjon in addition to expansion of Follafoss facilities are expected to increase volume output. SalMar ASA (2017a) has estimated total increase in capacity of 23,5 million smolt, an increase of 91,7% from the current production of smolt. By increasing smolt production SalMar aims to be self-sufficient on high quality smolt, which is of high importance to limiting mortality and increasing production efficiency. The new facilities are also optimized with relation to environmental measures as waste water treatment, and escapes.

SalMar’s focus on operational efficiency has led to many innovative and effective solutions in their production of smolt. Self-sufficiency of smolt enables SalMar to spread smolt release throughout the year. This decrease idiosyncratic risk related smolt generations, in contrast to the industry standard of fall and autumn release. By utilizing alternative energy sources as waste- and cooling water from nearby processing plants, and investing in recycling technologies SalMar have been able to improve their cost efficiency related to smolt production (SalMar ASA, 2017b).

Salmon Farming Facilities

SalMar ASA hold a total 100 salmon farming licenses in Norway. The total number of salmon farming licenses in Norway accumulate to 1.080 in 2016, including development licenses and green licenses (Norwegian Directorate of Fisheries, 2016b). The largest share of SalMar's licenses are in Central-Norway, with a total of 68 licenses. The remaining 32 licenses are in Northern-Norway. SalMar produces approximately 10% of all exported farmed Norwegian salmon. Figure 3 exhibits the total volume output of salmon produced in Norway, compared to SalMar, and SalMar's share of total Norwegian output. The years 2017E-2019E are forecasted estimates from this thesis.

Figure 3 - SalMar's Volume Output and Total Norwegian Volume Output. Source (DNB Markets, 2017b)



According to SalMar the Central-Norway region offer very favourable conditions for salmon farming with stable water temperatures, good water circulation, and favourable access to appropriate sites (SalMar ASA, 2017b). The sub region, Rauma, with 16 marine licenses, focus largely on production of ecological salmon, making SalMar the world's largest producer of ecological salmon. In the annual report for fiscal year 2016, SalMar states that the northern part of Norway is especially well seated for further growth in production of salmon. This is due to fewer challenges related to sea lice and diseases because of the lower sea temperatures.

Processing Facilities and Sales Channels

SalMar's processing facility, Innovamar, was completed in 2011. SalMar states that Innovamar is the world's most innovative and efficient facility for landing, harvesting, and processing salmon with an annual production capacity of 70.000 HOG ton salmon. The facility is located at Frøya, an ideal location considering SalMar's production facilities in the Central-Norway region. Vikenco AS handles processing of salmon produced in the Rauma-area, while an agreement with Lerøy Aurora AS ensures processing of salmon produced in the Northern-Norway region

Most salmon farmers have, over the previous years, increased their focus on value adding processing (VAP), also referred to as secondary processing, as an effort to increase the achieved price per kg produced salmon. Combined, the jointly owned company Vikenco AS (SalMar share of 93,4%) and Innovamar produced slightly less than 36.000 tons of secondary processed salmon in 2016.

Insula AS, a sister company, handles most downstream sales activities. In addition, the company holds own sales offices in Japan, Korea and Vietnam. In total the processing and sales segment has an annual turnover of 130.000 HOG ton salmon and other fish-based products (SalMar ASA, 2017a).

2.2.3 Non-Consolidated Subsidiaries

Norskott Havbruk AS

SalMar ASA owns 50% of the shares in Norskott Havbruk AS (NH). NH owns 100% of the shares in Scottish Seafarms Ltd. (SSL), based in Scotland, Orkney Islands, and Shetland Islands. SSL possess smolt production in Scotland and processing facilities in both Shetland Islands and Scotland (Scottish Seafarms Ltd, 2017). In 2016 SSL produced 28.000 HOG ton of Atlantic salmon, of which 14.000 HOG ton contributed to SalMar's total output.

Arnalax Hf

Arnarlax Hf (AH) operates in the western fjords of Iceland. AH is considerably smaller than NH as AH just began their production, and harvested their first salmon in 2016. The total output for 2016 was 4.000 HOG ton salmon. However, AH expect a total output of 10.000 HOG ton salmon in 2017, and project a total production capacity of 14.500 HOG ton for existing facilities (Arnarlax Hf, 2017).

3 Theory

The previous sections provide insight to both SalMar and the salmon farming industry, information that is essential in choosing an appropriate valuation model. The following chapter will discuss different approaches to valuation from relevant literature.

3.1 Fundamental Valuation

Fundamental valuation, also referred to as the Discounted Cash Flow-based valuation (DCF), is the theory on forecasting and discounting future cash flows available to equity- and debt holders of the company. Hence, the value of a company stems from its ability to generate cash from the return on invested capital and growth (Koller, Goedhart, & Wessels, 2015).

Fundamental valuation aims to value a firm's assets and allocate this value to the rightful claimholders. The operating assets are valued through a thorough cash flow analysis consisting of clear steps. Financial statements are reorganised to separate operating, non-operating, and financing items. The company's ROIC and growth are analysed to create an understanding of the business and its historical performance. By combining this insight with a careful analysis of the company's environment and strategy, one can project future cash flows in an explicit forecasting period based on firm specific drivers. The value of operations is the sum of the present value of free cash flow in the explicit forecast period, and the present value of continuing value. Even though there are several methods to estimate continuing value, which all should yield the same result in theory, Koller et al. (2015) argues that the value driver formula is best in order to avoid conceptual errors in the steady state. The continuing value is then calculated as in Equation 1.

$$Continuing\ value = \frac{NOPLAT_{t+1}(1 - \frac{g}{RONIC})}{Cost\ of\ Capital - g}$$

Equation 1 - Value Driver Formula (Koller et al., 2015)

Non-operating assets have value but are not a part of operations and thus it must be valued separately. These assets can be non-consolidated subsidiaries, excess cash, tradable securities, and customer-financing business units. The non-operating assets must be valued with an appropriate valuation method given the amount of available information (Koller et al., 2015).

At last, debt and other non-equity claims are valued. If the debt is traded, the market value can be applied. If the debt is not traded, book value is an appropriate proxy if default risk has not changed significantly since the debt issuance (Koller et al., 2015). Other non-equity claims such as operating leases, preferred stock, employee options, and non-controlling interest must be carefully analysed to identify potential claims on cash flow.

Equity value is determined by subtracting debt and all non-equity claims from the value of operating-, and non-operating assets. To determine value per share the equity value is divided by the non-diluted number of shares.

Koller et al. (2015) presents several frameworks in approaching a fundamental valuation. The frameworks differ in cash flow estimation techniques, and discount rates. An important assumption in fundamental valuation is that the choice of framework should not impact the value estimate (Koller et al., 2015). However, choosing the right framework is essential to minimize potential errors, mainly with respect to capital structure. The following section presents different frameworks for estimating the value of operations.

3.1.1 Enterprise Discounted Cash Flow Model

The enterprise discounted cash flow framework project the future free cash flow to a firm and discounts these at the weighted average cost of capital (WACC). This framework is the most popular among academics and practitioners due to its categorical focus on cash in and out of the firm. The free cash flow to firm consists of operating profit plus depreciation net change in working capital and gross capital expenditures. The EDCF approach works best with companies that manage their capital structure to a target level, because it discounts the cash flows at a blended cost of capital rate (Koller et al., 2015).

3.1.2 Economic-Profit-Based Model

While the EDCF focus solely on cash flow in and out of the firm, the economic-profit-based model highlights when a company creates value. Value creation occurs when a company generate returns that exceed the cost of capital (Koller et al., 2015), as illustrated by Equation 2.

$$Economic\ Profit = Invested\ capital \times (ROIC - WACC)$$

Equation 2 - Economic Profit

The value of operations is derived by explicitly modelling ROIC as the main driver for operating economic profit, and discounting this with the WACC.

$$Value_0 = Invested\ Capital_0 + \sum_{t=1}^{\infty} \frac{Economic\ Profit_t}{(1 + WACC)^t}$$

Equation 3 - Economic Profit Value

3.1.3 Adjusted Present Value Model

The previous two frameworks of fundamental valuation discount future cash flows at constant average cost of capital. However, in companies where the capital structure changes this might be an implausible assumption due to the impact of tax shields related to cost of debt in the WACC calculations. The adjusted present value framework deals with this issue by dividing the value of operations into two components: the value of operations as if the company was fully equity financed and the value of tax shield related to debt financing. Future cash flows are consequently discounted at unlevered cost of equity (Koller et al., 2015).

3.1.4 Cash-Flow-to-Equity Model

To avoid the potential issues related to discounting cash flows at blended cost of capital, the cash-flow-to-equity model values the equity directly. By forecasting cash flow to equity and discounting by levered cost of equity the model embeds capital structure into the cash flows. However, this can make the model hard to implement, as a changing capital structure affect risk imposed to equity holders, and thereby the levered cost of equity. The model is often applied for companies whose operations are related to financing, such as financial institutions (Koller et al., 2015).

3.2 Relative Valuation

Relative valuation is based on valuing a company by comparing multiples of comparable firms. The rationale behind multiple analysis is that similar assets should sell for similar prices. To derive a value the price of a company's assets is standardized by a multiple of a common variable. However, the multiple must be compared to firms with similar risk, growth potential, and cash flows (Damodaran, 2012).

Two assumptions must be made before applying this valuation method. Firstly, the market must be assumed to make individual pricing errors, but on average prices assets precisely. Secondly, relative valuation must be efficient in identifying these errors (Damodaran, 2012).

Unfortunately, the simplicity of the model has its shortcomings. The bundle of assets held by companies is rarely standardized or identical, and the question of how similar assets must be to derive a precise valuation arises. The answer is mainly a subject of subjective assessment, allowing for different interpretations. Consequently, the model is not robust with respect to manipulation and misuse.

3.3 Contingent Valuation

In some situations, the value is uncertain due to potential effects of future decisions based on occurrence or non-occurrence of an event. The future decision is often referred to as managerial flexibility that allow for more than one scenario. Based on the level of uncertainty, there are several ways to value assets contingent on more than one scenario due to managerial flexibility and occurrence of events (Koller et al., 2015).

Decision tree analysis is a useful approach when there is limited information about the distribution of future cash flows and the possible decisions faced by managers. The analysis combines outcome probabilities of potential events or decisions with related DCF values to derive the total value of the scenarios (Koller et al., 2015).

Real option valuation is more applicable when there exists reliable information about the underlying probability distribution of future cash flows, e.g. assets whose value depend on a traded commodity. Contrary to the NPV invest-now-or-never approach, real option valuation maximizes the value of an investment opportunity by allowing for a time dimension with potential value (McDonald & Siegel, 1986).

4 Method

4.1 Design and Sample

This thesis aims to find a fair value per share for SalMar ASA and thus information on historical share prices, financial statements, and other information that impact the value drivers are needed.

Finding a fair value per share for SalMar ASA is a case study of the forecasted performance of a publicly traded firm. To compare the performance of SalMar, a peer group will be identified in the thesis and includes similar competing companies with a similar business portfolio.

4.2 Data Collection

All data utilized in this thesis is secondary data, publicly available or provided by third parties. Financial data was retrieved from EIKON Thompson Reuters, a database of financial data. Data on Norwegian salmon export was retrieved from Norges Sjømatråd (2017). Data on fish feed costs with respect to regions was retrieved from Norwegian Directorate of Fisheries (2016a). In addition, journal articles, books and other publications have provided useful insight to methods, previous findings and data. Marine Harvest ASA, the largest salmon farming company in the world, publishes an annual *"Salmon Industry Handbook"* which is widely utilized as a source of information about salmon farming.

4.3 Reliability and Evaluation of Sources

The reliability of information gathered is essential when conducting an analysis. The reliability of the sources used is considered good; Annual reports are audited and hence reliability is guaranteed by a third party. Journal articles are in most cases thoroughly investigated before publication and are considered very reliable. Information gathered from companies' web pages, the "*Salmon Industry Handbook*", analyst reports, and newspaper articles are handled with caution due to possible biases degrading the reliability. To avoid bias from false information, unreliable sources have been cross-examined with reliable information whenever possible.

4.4 Data Analysis

The Enterprise Discounted Cash Flow framework is a generally accepted method in deriving company values among academics and practitioners due to its categorical focus on cash flow in and out of the firm (Koller et al., 2015). In addition, SalMar ASA is a publicly traded company with quite stable capital structure, making the EDCF framework applicable. The estimation of future cash flows will be based on a strategic qualitative analysis and quantitative historical performance analysis. Generally accepted strategic frameworks, PESTEL, Porter's five forces and Resource Based View, will be applied when analysing SalMar's macro environment, competitive environment and basis for competitive advantage, respectively. To derive a discount rate, simple regression analysis of stock and market returns have been performed. The EDCF analysis will be accompanied by a relative valuation based on a selection of comparable companies.

In the following analysis, all financial numbers in tables, figures, and discussions are in NOK million unless stated otherwise.

4.5 Assumptions

In thesis, there are made some overall assumptions to allow for estimation of fair value per share for SalMar ASA. Companies report annual harvested volumes, and it is assumed that all harvested salmon is sold. This is a reasonable assumption as salmon is fresh good and cannot be stored for long without decreasing quality. Further, the word salmon refers to Atlantic salmon, as this is by far the most common species within salmon farming.

5 Strategic Analysis

This section will analyse the macro environment, the competitive environment, and the basis for competitive advantage for SalMar. The results of these analyses will be utilized to identify and forecast key value drivers to estimate future cash flows.

5.1 Analysing the Macro Environment

To analyse SalMar ASA's macro-environment the PESTEL-framework is used as a basis. There are a lot of details in any company's environment, but the most vital part of a PESTEL analysis is to identify key drivers in the environment that have a significant impact on the company's future performance (Johnson, Whittington, Regner, Scholes, & Angwin, 2016). The PESTEL analysis will enlighten the risks and opportunities for specific drivers of SalMar ASA's future performance as described by Johnson et al. (2016).

5.1.1 Political Factors

Licence Politics in Norway

As of 2016, the number of commercial licences is limited to a fixed amount throughout Norway due to environmental considerations (Norwegian Directorate of Fisheries, 2016c, 2016e). The lack of issuance of new licenses naturally cap the potential for salmon farmers to increase production. Simultaneously, the Norwegian government has decided to issue development licenses with a limited lifetime. Granting of development licenses are dependent on detailed plans describing solutions to tackling the industry's challenges. In addition, companies must state desired duration and volume needed to achieve positive project NPV. Development licenses can be converted to normal licenses for a fee of NOK 10 million, with standard conditions of infinite duration and normal MBA regulation, if specific goals are met. Hence, development licences are attractive as they provide an opportunity to increase production (Norwegian Directorate of Fisheries, 2016d).

Recently the Norwegian Directorate of Fisheries launched a model, referred to as the "Bremnes"-model, allowing for greater flexibility in MAB regulations. The model allows for increased MAB through the autumn and winter, when the water is cooler, but restricts the licence-owner to a smaller MAB through March until August. The aim is to increase the productivity of current licences. The trial period began in August 2016 and ends in December 2019. A 1,5 million NOK fee is charged per license to participate in trial period (Norwegian Directorate of Fisheries, 2017a). The "Bremnes"-model aims to increase the total output per year, although the effect of the flexible model is yet uncertain.

The Norwegian government launches a new regulation on the Norwegian salmon farming industry in the fall of 2017 called the "Traffic Light System" (TLS). The authorities have divided license localities in to geographic areas administrated based on the level of lice in the specific area. If the level of lice is moderate, the current MAB level will be unchanged. However, unacceptable levels of sea lice can cause a reduction in MAB for 6 months. Acceptable levels of sea lice may lead to an offer of increased MAB capacity, in exchange for a fee determined by the Ministry of Industry and Fisheries. Any counter decision to reduce MAB, on a location where an increase in MAB has previously been paid for, will not induce a refund (Fiskeridepartementet, 2017). In total, the TLS system is supposed to reduce the amount of sea ice, thus reducing the mortality and increasing the total output. However, in the short run the system could have negative effects on the total output by reducing the MAB.

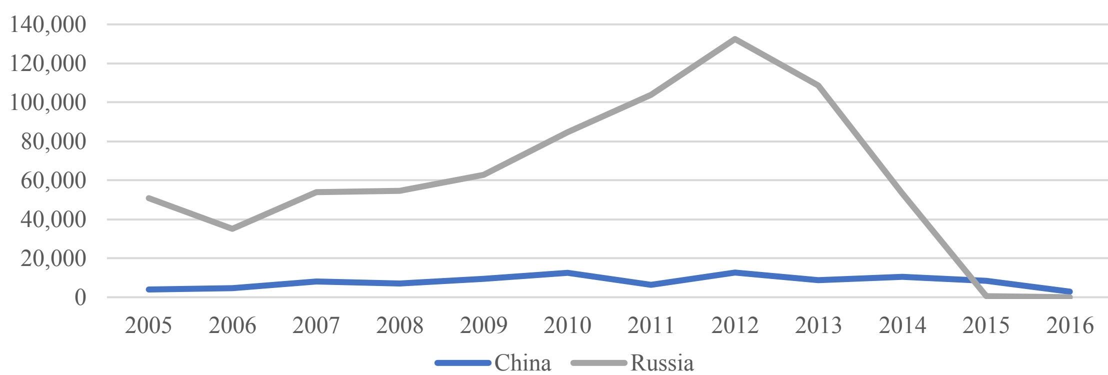
Trade Politics

Europe is the most important market for salmon farmers as almost 80% of the total salmon exported in 2016 was sent within the EU (Norges Sjømatråd, 2017). The EU trade agreement, which Norway is a part of through the EEA (European Economic Area), permits free trade among EU countries, but with an exception for salmon. Salmon is subject to the WTO trade agreement yielding equal toll rates as any WTO country trading with EU. However, the toll rates are quite low, currently at 2% for fresh or frozen filets, while there are higher toll rates for cured salmon and other processed products (Kvistad, 2014). Despite the complex trade agreements, Europe has been a stable market for salmon historically and currently there are no indications that this situation will change.

In 2010 Liu Xiaobo received the Nobel peace prize, which eventually caused a trade embargo of Norwegian goods in China (Chen & Garcia, 2015). The embargo was a setback for the Norwegian fish farming industry as an increasing middle class in China has caused an increase in demand for Atlantic salmon (Ytreberg, 2017). However, the Chinese government has recently indicated a softening of sanctions towards Norwegian products. Norwegian salmon allegedly still has a strong trademark in China and it is expected that once sanctions are lifted, Norwegian salmon will gain market shares quickly (Berglihn, 2017).

The Russian involvement in the Ukrainian conflict at Crimea in 2014 caused trade sanctions from western governments, quickly countered by Russia. This led to a Russian sanction on, among other goods, Norwegian salmon (Johansen & Lysvold, 2015; Lysvold, Sørgård, & Insteviken, 2014). Figure 4 clearly illustrates how export of salmon to Russia drops from 108.476 HOG ton in 2014 to 426 HOG ton in 2015. A normalization of the Norwegian trade relationship to Russia could increase demand for Norwegian salmon.

Figure 4 – Historical Export (HOG ton) to China and Russia Source: Norges Sjømatråd (2017)



5.1.2 Economic Factors

Business Cycle Sensitivity

Business cycles follow a trend, but the trend has temporary deviations going up and down in cycles (Gottfries, 2013). Norwegian salmon can be considered a luxury good judging by an estimated income elasticity greater than one, shown in a study on the Spanish and Italian market (Bjørndal et al., 1994). In a case where Norwegian salmon is considered a luxury good, business cycles will affect the demand for Norwegian salmon as real income changes. Future fluctuations in the world economy and the real income will therefore affect the demand for salmon.

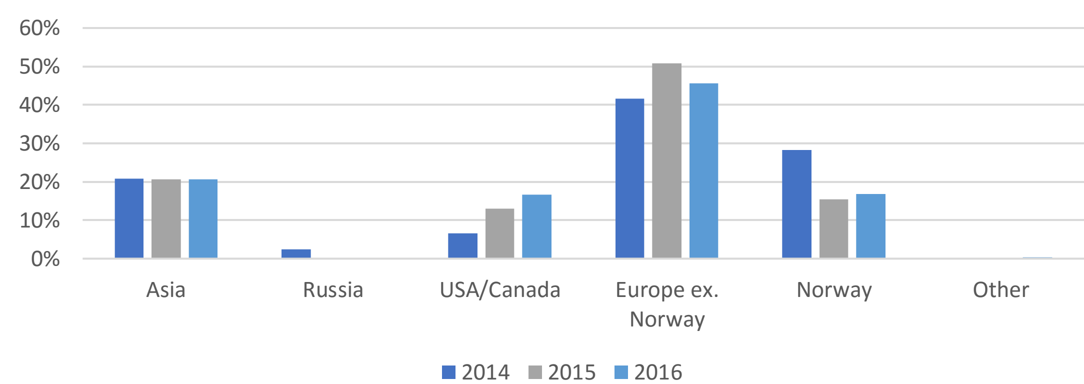
Long Term Debt Interest Rates

The portfolio of loans is carried at a floating rate, which implies that SalMar ASA is affected by changes in the interest rate, more specifically the Norwegian money market rate (SalMar ASA, 2017a). The Norwegian money market rate are highly correlated with the Norwegian key rate (although other factors also impact the money market rate), determined by Norges Bank six times a year (Norges Bank, 2017a). The Norwegian money market rate, NIBOR (Norwegian Inter Bank Offered Rate), is normally slightly higher than the key rate, and are set by a council of Norwegian Banks (Finans Norge, 2017). Covenants for SalMar's long-term financing states that the company's equity share must be above 35% at any time. Furthermore, the NIBD/EBITDA ratio cannot exceed an annual average of 4,5, but can exceed 6,0 three quarters in a row if annual average is below target. Interest bearing debt is raised in NOK and is not subject currency risk (SalMar ASA, 2017a). Currently, the risk of a rise in debt interest is unlikely because Norges Bank (2017a) predict a stable development in key interest rate and SalMar has shown no sign of breaking the covenants.

Sales and Currency

SalMar ASA sell salmon internationally, causing exposure to currencies as EUR, USD, GBP and JPY. Figure 5 illustrates SalMar's currency exposure with respect to sales. Europe and consequently. EUR, represents SalMar's largest currency exposure, while sales in USD and CAD has increased in the period 2014-2016. The exposure to Asian currencies have remained stable over the past three years. Although, SalMar does not specify the distribution of exposure to Asian currencies other than revealing Japan as the major market.

Figure 5 – Revenues of SalMar ASA per Geographical Markets. Source: SalMar ASA (2015, 2016); (SalMar ASA, 2017a)



5.1.3 Social Factors

The fact that 70% of Earth is covered with water and only 6,5% of human protein consumption originates from fish, illustrates the potential demand for seafood (Marine Harvest ASA, 2017b). Bjørndal et al. (1994) finds that Norwegian salmon is a luxury good in Spain and Italy, implying that an increase in income will increase demand. Table 3 show how OECD expects the Asian middle class to account for 2/3 of the world middle class population by 2030. Assuming equal income demand elasticity in Asia, this suggests a growth potential in absolute numbers overt the next ten years. This estimate relies on a continued strong performance in Chinese and Indian economy, and it is sensitive to changes in such trends (Kharas, 2010). In conclusion, there is certainly a potential for a gradual increase in demand for Norwegian salmon due to a growing middle class.

Table 3 - World Middle Class by Region (population in millions) Source: (Kharas, 2010)

Year	2009		2020		2030	
North America	338	18 %	333	10 %	322	7 %
Europe	664	36 %	703	22 %	680	14 %
Central and South America	181	10 %	251	8 %	313	6 %
Asia	525	28 %	1740	54 %	3228	66 %
Africa	32	2 %	57	2 %	107	2 %
Middle east and North Africa	105	6 %	165	5 %	234	5 %
World	1845	100 %	3249	100 %	4884	100 %

5.1.4 Technological Factors

Due to the biological challenges the industry is facing potential future growth is capped by an intensification in the regulatory regime. This has forced salmon farmers into R&D projects in search for innovative technological solutions to allow for further growth potential.

Innovations

From 2012 until 2016 SalMar ASA has invested in Ocean Farming AS (OF), a subsidiary of SalMar, which has developed a solution for salmon farming in offshore cages. In 2016, OF received 8 development licences to try-out the new solution. The licenses can, if the criteria of the development projects are met, be converted into ordinary infinite licences within 7 years (SalMar ASA, 2017a).

Only two other development projects have currently been awarded licenses (3rd of May 2017), none of which the controlling companies are publicly traded. The Norwegian Directorate of Fisheries are as of 3th of May 2017 treating 37 applications for development licenses, 3 have been approved, while a total of 11 have been rejected (Norwegian Directorate of Fisheries, 2017b). Hence, the development licenses are very attractive as they represent potential increase of production, but project authorisation has been proven difficult to achieve.

The terms related to issuance of development licenses clearly states that all technological advances must be shared with the industry as whole to enhance industry-wide learning, hence, limiting possibilities for secrecy and patenting (Norwegian Directorate of Fisheries, 2016e). The fact that the whole industry is investing in innovative technological solutions hoping to increase growth potential, while governments allow for no secrecy, is posing as an opportunity for a collective improvement in profitability and sustainability.

5.1.5 Ecological Factors

Asche, Guttormsen, and Tveterås (1999) points out three main negative environmental effects of salmon farming. Emission of feed waste and faeces through the sea cage can cause algal blooming, and consequently imbalance in the near marine environment. Contagious fish diseases originating from production facilities spread and affect the wild salmon stock in addition to other species. Thirdly, genetic contamination of wild stock salmon due to escapes can cause a decline in the wild salmon stock due to lower reproductive ability.

SalMar ASA focuses on preventing escapes and disease outbreaks that can result in extraordinary slaughtering of salmon. The past two years SalMar has not experienced any incidents classified as “extraordinary biological events”, meaning escapes or disease outbreaks causing a cut in stock. Trond Williksen, CEO in SalMar, points out in his letter to shareholders that part of the increased operating costs in 2016 are due to experiments with non-medical treatment[2] of sea lice (SalMar ASA, 2017a).

Traditional salmon farmers around the world have historically struggled with salmon health and disease challenges. Asche, Hansen, Tveteras, and Tveteras (2009) points out there has been limited knowledge sharing in the industry and across borders. In addition, the strictness of government regulations has varied across countries, which has caused different development in the sustainability of production (Asche et al., 2009). More recently the salmon supply from Chile, the second largest salmon producing country, has recovered with increased production costs (DNB Markets & Multiexport Foods, 2016). Iversen et al. (2016) points to additional growth opportunities in global supply, especially from Chile, Canada, and Faroe Islands. In sum, further improvements and additional utilization of natural production locations can cause a gradual increase in supply.

5.1.6 Legal Factors

Due to the potential negative environmental effects of salmon farming, mentioned in the earlier section, authorities have imposed strict regulations on the salmon farming industry. Generally, salmon farming facilities should be operated and established biologically sound (Norges Lover, 2017).

Specific requirements on maximum allowed biomass per licence is a particularly important regulation affecting salmon farmers, as it limits the output per licence. Maximum allowed biomass (MAB) restricts the maximum weight of living fish per licence and per company, measured in kilos or tons. A standard farming licence in Norway has MAB of 780 ton of live fish, except for locations in Finnmark and Troms where MAB is 945 ton live fish. Regulations comprise specific restrictions to MAB based on the locality's sustainability to host farmed salmon. Further, specific companies are imposed individual restrictions with regards to MAB affected by the number and type of licences held (Norwegian Directorate of Fisheries, 2016c).

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[2] Non-medical treatment of sea lice treat infected salmon without the use of antibiotics and other medicines.

According to Norwegian law (Norges Lover, 2017), companies can be imposed a variety of reactions, if the terms and agreement has been violated (Norwegian Directorate of Fisheries, 2014):

- Action order (at the expense of the respective company)
- Fines
- Measures taken on behalf, but at the expense of, the respective company
- Payback of profits originating from the excess MAB kept
- Penalty

The reactions to violation of license terms and agreement will in many cases cause an economic penalty, in addition to a loss in biological assets. Thus, a proper biologically operated facility is in the interest of both the authorities and the salmon farmers.

5.2 Analysing the Industry

To forecast the prospects for SalMar ASA it is important to understand the competitive environment of the industry. Porter (1985) suggests that competition in all industries can be embodied within five competitive forces being: the entry of new competitors, the threat of substitutes, the bargaining power of buyers, the bargaining power of suppliers, and the rivalry among the existing competitors. In the following section these five competitive forces will be analysed to determine the competitive environment of SalMar and the industry's prospect for profitability.

5.2.1 New Entrants

The barriers of entry in traditional salmon farming is high. The macro analysis points out that the Norwegian government does not issue new commercial licenses and thus cap potential growth, making it virtually impossible for new entrants to attain traditional licenses. In addition, the salmon farming industry is highly capital-intensive with clear economies of scale benefits for large producers. Growth has been limited over the previous years' and existing producers have channelled capital expenditure towards value chain optimisation. Marine Harvest's acquisition of Morpol, a fish feed producer, and SalMars investments in smolt production capacity are examples of this. Consequently, entry barriers within traditional salmon farming increase further.

Iversen et al. (2016) points out that governments of other countries with natural suitable locations also have imposed barriers of entry. In Scotland, laws regulate the access of production localities and allowed production volumes. In Canada, the west coast has experienced large resistance within the public opinion, making it politically difficult to allow for increased production. Thus, entrance of new players is limited in these areas.

High entrance barriers within traditional salmon farming, in addition to technological advances, has made onshore salmon farming a highly relevant production method. A special report from DNB Markets (2017a) suggests the market capitalization of salmon farming companies indicate that the implicit price of acquiring traditional licenses exceeds the average capital expenditure for land-based facilities. The increasing challenges related to sustainability in traditional salmon farming has caused a convergence of production costs in onshore- and traditional salmon farming according to DNB Markets (2017a). Onshore salmon farming has essentially no geographical limitations, which potentially entail far lower transportation costs. Although, onshore locations entail large capital expenditures the entrance barriers are lower compared to traditional farming and new entrants are expected over the upcoming years.

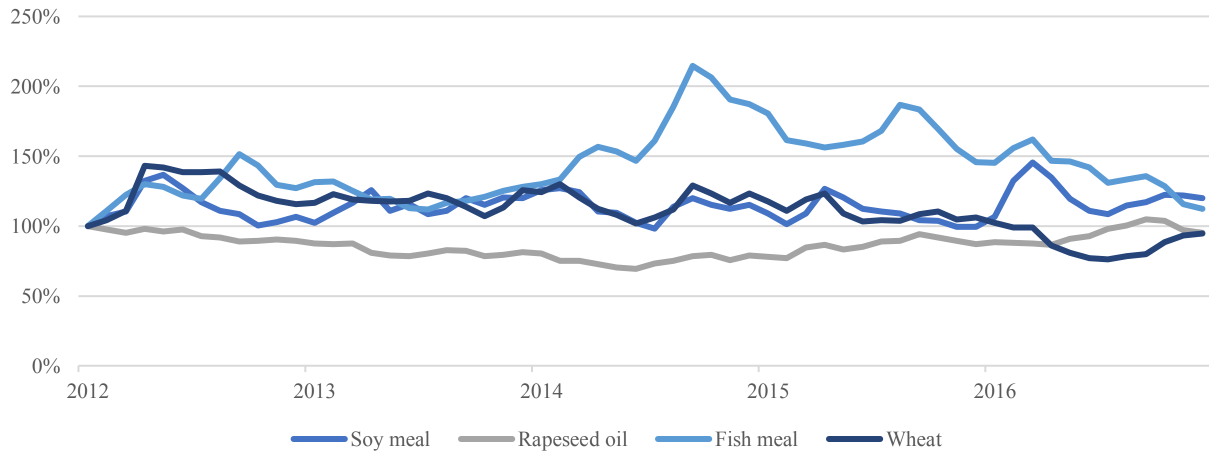
5.2.2 Suppliers

Fish feed accounts for approximately 50% of salmon production costs (DNB Markets, 2017b). Consequently, salmon producers are largely dependent on suppliers of fish feed as few possess own production of this input.

Fish feed inputs are mainly soy meal, fish oil, veg oil, avian meal, and fish meal, where soy meal is the main ingredient making up 49% (Marine Harvest ASA, 2017b). At the end of 2014 and the start of 2015 fish meal prices rose dramatically, causing an increase in fish feed costs. Soy meal, which stayed cheaper than fish meal during 2015, consequently became the preferred basis for fish feed amongst Norwegian salmon farmers. Despite the change in inputs, data from the Norwegian Directorate of Fisheries (2016a) indicates that fish feed costs among Norwegian salmon producers marked an all-time high in 2015. This indicates, a low presence of input substitution possibilities and high dependence on cost of fish feed inputs.

Figure 6 exhibits the price development of the main fish feed ingredients in NOK. The ingredients are mainly traded in USD. The recent year’s appreciation of USD to NOK has counter-weighted a large depreciation in feed cost measured in USD, thus, only causing convergence to 2012 levels in NOK.

Figure 6 – Normalized Cost of Fish Feed Inputs Adjusted to NOK from USD. Source: Indexmundi (2017b, 2017e, 2017f, 2017h)



This indicates large dependence on fish feed suppliers. However, as prices of fish historically have changed correspondingly to prices of input factors it can be argued that there is competition among fish feed suppliers indicating low switching cost for salmon producers. Thus, it is expected that future fish feed cost will follow the cost of inputs.

SalMar has previously been partly dependent on smolt suppliers. However, as pointed out, SalMar expects to increase own production with the completion of a new smolt facility at Senja and the expansion of the existing smolt-production in Follafoss. The new facilities serve the purpose of self-sufficiency in high-quality smolt which will reduce dependency of external suppliers, and eventually reduce costs.

5.2.3 Consumers

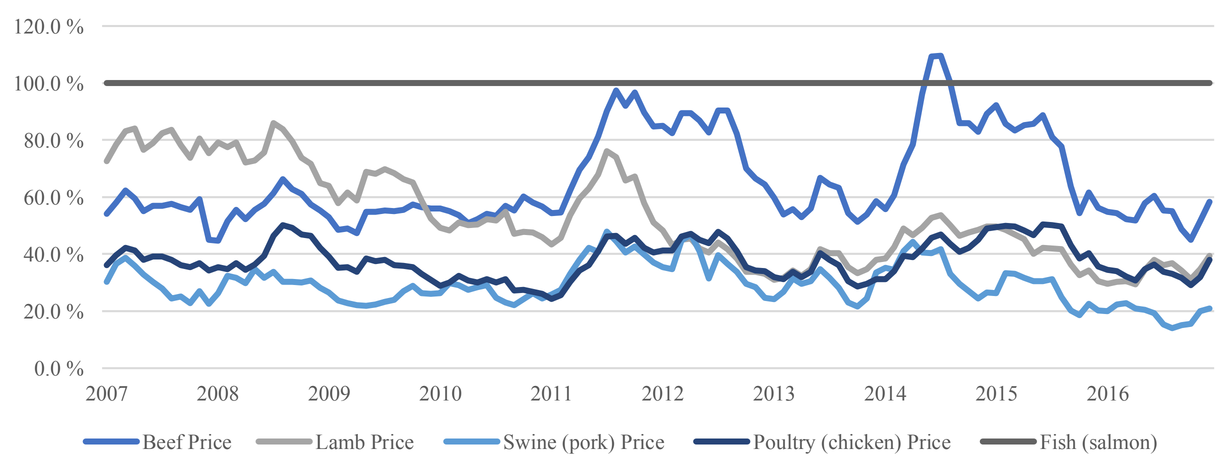
The homogeneous characteristics of salmon entail a low switching cost for consumers. Additionally, salmon is a fresh good and must be consumed within a short time after harvesting for producers to achieve maximum price. Salmon is traded in transparent markets i.e. Nasdaq and Fish Pool, which entail easily accessible information about the current market price. Consequently, salmon suppliers are price takers and have low bargaining power over buyers and consumers.

To increase switching costs and create brand awareness salmon farming companies have increased efforts in producing VAP products. Through these efforts companies aim to reduce buyer and consumer bargaining power allowing for a higher sales price. Lerøy Seafood, Marine Harvest, and SalMar all possess secondary processing facilities and supply value-added products as sushi, fillets, marinated products etc. Despite these efforts, VAP products are still an early face initiative, and are easily imitable thus it is assumed to have low impact on consumer bargaining power. In conclusion, buyer and consumer bargaining power is expected to be high also in the future.

5.2.4 Substitutes

Salmon is first and foremost considered to be a source of proteins. This makes for substitutes as chicken, beef, pork, lamb, and other species of fish. In Figure 7 it is illustrated that salmon, historically, has been a relatively expensive product compared to substitutes. Lamb is the only substitute with an observed higher price than of salmon within the last ten years. Microeconomic theory suggests that the presence of suitable substitutes should increase demand elasticity. However, Xie, Kinnucan, and Myrland (2009) find that demand for farmed salmon is becoming less elastic, which can be interpreted as a decreasing substitution effect implying a declining sensitivity to changes in price of substitutes.

Figure 7 - Relative Price per Kilogram Scaled by Price of Salmon to Substitutes. Source: Indexmundi (2017a); (2017c, 2017d, 2017g)



As pointed out in the industry presentation, salmon is a healthy product (Helsedirektoratet, 2016). Thus, consumer propensity to substitute salmon for other sources of protein is assumed to be lower, because of its healthy characteristics. Consequently, a moderate substitution effect for salmon is assumed.

5.2.5 Rivalry

The salmon market is characterized by the low switching cost for consumers which should entail high rivalry. Although VAP products have become a method of differentiating salmon products, there is still low brand awareness. On the other hand, many consolidations in the last decades have caused fewer but larger players in Norway, which should cause lower rivalry. The observed increase in salmon price over the past years is, as earlier noted, due to the limitations of supply and strong demand. As consequence, salmon producers should not have problems in locating buyers, which should entail lower rivalry. In conclusion, the industry rivalry is assumed to be medium high.

5.3 Analysing Competitive Advantage

To analyse whether SalMar have a competitive advantage compared to other industry players a resource-based view of the firm will be applied.

The resource-based view of firms (RBV) assume that resources, and capabilities, both are heterogeneously distributed among firms and imperfectly mobile (Newbert, 2007). In the context of strategic assets, resources can be defined as accumulated factors that the firm control or own, while capabilities entail the firm's capacity to employ these resources (Amit & Schoemaker, 1993). Newbert (2007) elegantly summarises RBV in 'that (1) if a firm possesses and exploits resources and capabilities that are both valuable and rare, it will attain a competitive advantage, (2) if these resources and capabilities are also both inimitable and non-substitutable, the firm will sustain this advantage, and (3) the attainment of such advantages will enable the firm to improve its short-term and long term performance.

Capabilities and resources are identified through key success factors as in line with framework by Grant (2010). The value and rareness of these resources and capabilities will be analysed to potentially identify competitive advantages. At last, the basis for sustainability of identified competitive advantages are examined.

5.3.1 Cost Control

The salmon farming industry is exposed to a cyclical commodity price. In addition, Marine Harvest ASA (2017b) states that the production cycle of salmon is 24-40 months, while the final product is considered fresh for only three weeks after harvesting. This underpins findings of inelastic supply of salmon in the short run (Andersen et al., 2008), and emphasize the importance of cost control to achieve long term profitability. Consequently, cost control is presumed to be a key success factors in the salmon farming industry.

Table 4 - Identification and analysis of key success factors, capabilities, and resources

Key success factors	Resources	Capabilities	Valuable	Rare	Imperfectly imitable	Non-substitutable	Implication
Cost control	Smolt production	Integrated value chain	Yes	No	-	-	Competitive parity
	Primary processing		Yes	No	-	-	Competitive parity
	Sales and distribution		Yes	No	-	-	Competitive parity
	License location		Yes	Yes	Yes	No	Competitive advantage
	100 licenses	Economies of scale	Yes	No	-	-	Competitive parity
	License location		Yes	No	-	-	Competitive parity
	PP&E	Continued improvement and innovative solutions	Yes	No	-	-	Competitive parity
	Innovamar AS		Yes	No	-	-	Competitive parity
	R&D		Yes	No	-	-	Competitive parity
	Ocean Farming AS		Yes	Yes	No	No	Competitive advantage

SalMar has a fully integrated value chain with resources within all phases of salmon production, which enables strict cost control focus within every subsection. SalMar has invested greatly in smolt production, and are still increasing capacity. The goal is to be fully self-sufficient with high quality smolt, resulting in lower mortality rates during the seawater growth phase (SalMar ASA, 2017a). Additionally, SalMar possesses resources within primary and secondary processing. Most primary processing is executed at the company's facilities, while small amounts of salmon produced in the northern regions are processed at Lerøy Auroras facilities.

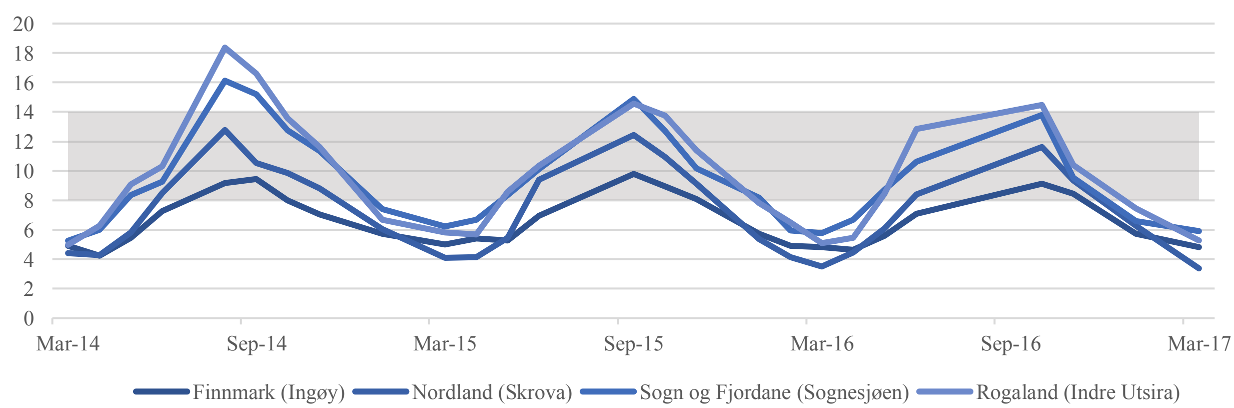
The three locations in which SalMar hold licenses allow for optimal usage and economies of scale through closeness to other value chain resources. Geographical location of processing- and smolt facilities as well as infrastructure assets are important in gaining economies of scale in the production. SalMar possess smolt production and processing facilities close to both licenses held in Mid-Norway and Rauma (SalMar ASA, 2017a). SalMar hold most of its licenses in Mid-

Norway close to smolt production and processing facilities as well as administration located at Kverva (SalMar ASA, 2017a).

The optimized value chain and identified economies of scale is not regarded as a competitive advantage. The industry has, through substantial M&A activity, evolved from being composed of many small players to larger corporations. Consequently, the industry has become more professional and profitable, with fully adequate and optimized value chains. The past years increased regulations have also contributed in shifting focus from growth to optimization, making well-functioning and integrated value chains an industry standard. Thus, these assets entail competitive parity.

Fish farming takes place all over the Norwegian west coast all the way from Rogaland in south to Finnmark in north. These areas differ, amongst other things, in seawater temperature. Since salmon is a coldblooded animal, temperature plays an important role in its the well-being and thus growth. The ideal temperature for Atlantic salmon according to Marine Harvest ASA (2017b) is between 8-14°C, where higher temperatures increase risk of diseases while temperatures approaching 0°C cause mass mortality. On the other hand, Atlantic salmon grows faster in warmer water.

Figure 8 - Seawater Temperatures in Norway. Celsius Degrees. Source: Havforskningsinstituttet (2017)



Out of the 149.900 HOG-ton that SalMar produced in 2015, 55% were produced in Mid Norway while 26% were produced in Northern Norway. Figure 8 shows that regions where SalMar produce most of their salmon exhibit lower maximum temperatures, which makes for a more optimal production environment.

Consequently, the allocation of licenses SalMar possess, combined with the integrated and optimized value chain, are sources of competitive advantage over peers. Due to the strict policies initiated by the Norwegian government this competitive advantage can further be classified as non-imitable. However, as pointed out in the macro- and industry analysis there is a high R&D spending in the search for new solutions in addition to the potential of onshore salmon farming. Due to this threat, it is not enough logical proof to claim non-substitutability of these resources and capabilities in the long run, despite the strong historical performance of SalMar. According to the RBV-framework, this suggests a short term competitive advantage due to SalMar's allocation of licenses and integrated value chain

In 2016, SalMar was awarded the first eight development licenses in a government issued program seeking to enable sustainable growth in the salmon farming industry. The licenses have a total MAB of 6.240 ton salmon (Norwegian Directorate of Fisheries, 2017b). SalMar's historical average output per license of 1.240 HOG ton (see Table 10) equals an estimated additional annual production of 9.920 thousand HOG ton. Furthermore, the licenses are valid for seven years with the possibility of conversion to traditional infinite licenses, if the production meets certain goals corresponding to license terms.

This additional growth opportunity is valuable if sales price of additional salmon is above production cost. Obviously, Ocean Farm 1 has no proven track record, however estimations indicate lower production cost compared to traditional farming (Kongsberg Maritime, 2015). Without forecasting future salmon prices in this section, the facility is assumed to be valuable.

The Ocean Farm 1 was the first facility in the world to be approved for ocean farming of salmon (SalMar ASA, 2017a). After SalMar was granted eight licenses, Nordlaks Oppdrett AS' application for ten licenses, a project also aiming to farm salmon in an open ocean environment, have been approved (Norwegian Directorate of Fisheries, 2017b). As of 3rd of May 2017, 37 applications with a goal of improving the sustainability of the industry are still pending. Thus, Ocean Farming AS's technology and licenses are considered rare.

However, the guidelines concerning the issuance of development licenses clearly states that all technological advances must be shared with the industry as a whole to enhance industry-wide learning, hence limiting possibilities for patenting (Norwegian Directorate of Fisheries, 2016e). Furthermore, there are other projects with different solutions essentially serving the same purpose; enabling further growth in production volumes, entailing substitutability. This limits the long-term competitive advantage that this technology and these licenses entail making them both imitable and substitutable.

To conclude, Ocean Farming AS has developed an interesting technology that so far serve the purpose of enabling additional production volume. The technology and the licenses are currently both valuable and rare, but will be both substitutable and imitable in the long run. This suggests that Ocean Farming AS represents a short term competitive advantage for SalMar.

5.3.2 Achieved Salmon Price

Maximizing price on produced salmon is the second key success factor. Despite the homogenous characteristics of salmon, well-performing sales and distribution channels are important to sell salmon at an optimal price within the natural limits of freshness. The industry has increased focus and allocated capital towards making salmon sold in the retail market less of a homogenous product through VAP products. By creating brands and producing value added products, both Lerøy and Marine Harvest sell their salmon at a higher price compared to peers according to revenues per HOG kg ratio presented in Table 8.

Table 5 – Identification and Analysis of Key Success Factors, Capabilities, and Resources

Key success factors	Resources	Capabilities	Valuable	Rare	Imperfectly imitable	Non-substitutable	Implication
Achieved salmon price	Innovamar AS	Product development and brand building	Yes	No	-	-	Competitive parity
	Brand		Yes	No	-	-	Competitive parity
	Sales office South Korea	Effective sales and distribution	Yes	No	-	-	Competitive parity
	Sales office Japan		Yes	No	-	-	Competitive parity
	Sales office Vietnam		Yes	No	-	-	Competitive parity
	In-house distribution		Yes	No	-	-	Competitive parity

Through Innovamar AS, a processing company with facilities in Kverva, SalMar produces value-added processing (VAP) products. In 2016, this facility produced 36.000 ton of VAP products, making up only 27% of total sold quantity. The production of VAP and brand creation is considered valuable, however, as it has become an industry standard it should only entail competitive parity.

SalMar holds several sales offices in Asia including South Korea, Vietnam and Japan, in addition to in-house distribution. The sales offices sell and distribute salmon to a total of 40 countries. For comparison, Lerøy and Marine Harvest both each sell and distribute salmon to a total of 70 markets (Lerøy Seafood Group ASA, 2017; Marine Harvest ASA, 2017a). Sales and distribution is an important part of the value chain ensuring continuous sale of produced salmon. Despite its importance, this part of SalMar's value chain is assumed to only entail competitive parity.

6 Historical Operating Performance Analysis

To forecast the future, it is essential understand the company's past. The historical operating performance analysis aims to analyse the historical return on invested capital and growth of SalMar ASA compared to peers, and on an individual basis.

6.1 Defining Peer Group

A peer group is defined to analyse and compare SalMar's historical operating performance. The companies in the peer group must be similar in terms of business portfolio for precise comparison.

Table 6 - Publicly Traded Norwegian Salmon Farming Companies

	Production			Processing		Related Businesses
Value Chain Assets	Smolt Production	Farming	Primary Processing	Secondary Processing	Sales and Distribution	Fish Feed Production
Salmar ASA	x	x	x		x	
Grieg Seafood ASA	x	x	x		x	
Marine Harvest Group ASA	x	x	x	x	x	x
Lerøy Seafood Group ASA	x	x	x	x	x	
Norway Royal Salmon ASA		x	x		x	

Table 6 describe the possession of value chain assets for publicly traded Norwegian salmon farming companies. The companies have similar possession of value chain assets. Thus, revenues and costs are related to the same purpose; to produce salmon. However, originally Norway Royal Salmon ASA focused its business on sales and distribution of bought salmon. A large part of sales still originates from this business segment although production is increasing due to 10 green licenses awarded in 2014. Further, the company produce less than 30.000 HOG ton salmon annually, significantly lower than the other companies. Consequently, Norway Royal Salmon is excluded from the peer group.

The peer group consists of Grieg Seafood ASA, Marine Harvest ASA, and Lerøy Seafood Group ASA. Grieg Seafood is the least comparable company in the peer group due to its lack of secondary processing assets. However, the business focuses on production and sales of salmon and is for that reason considered comparable.

6.2 Reorganizing Financial Statements

Financial statements mix operating performance, non-operating performance and financial performance to display all activities in a company. To analyse historical operating performance, a reorganisation of the reported financial statements is necessary. Historical NOPLAT and invested capital are calculated for SalMar and the peer group to derive the historical the return on invested capital. The reorganisation follow the guidelines of Koller et al. (2015).

6.2.1 Invested Capital Calculation

Salmar ASA

shows how the balance sheet is reorganized to find invested capital, while Table 7 illustrates the process of reorganising a reported balance sheet to calculate invested capital.

Table 7 - Framework for Calculation of Invested Capital

Traditional Balance Sheet		Invested Capital Calculation	
Current Assets	Current Liabilities	Operating current assets	Debt & Debt Equivalents
+	+	-	+
Non-Current Assets	Non-Current Liabilities	Operating current liabilities	Equity & Equity Equivalents
=	+	=	=
Total Assets	Equity	Net working capital	Total Funds Invested
	=	+	
	Total liabilities and equity	Fixed asset	
		+	
		Goodwill and accumulated amort.	
		=	
		Invested capital incl. goodwill	
		+	
		Non-operating assets	
		=	
		Total Funds Invested	

The reorganisation is performed with the following adjustments.

- Cash serves several purposes in a company. Some cash is needed to meet short term obligations related to operations, and while the rest serve other purposes e.g. acquisitions of companies, dividends, buybacks, or investment in fixed assets. As companies do not deem the amount of cash needed in operation, operating cash is calculated as 2% of revenue, if cash and cash equivalents exceed 2% of revenue in accordance with recommendations of Koller et al. (2015). The remaining amount are classified as non-operating and excluded in the invested capital calculation.

- R&D is expensed in a company's income statement. However, it can be argued that R&D represent an investment which should be included in the invested capital calculation (Koller et al., 2015). Hence, historical R&D expenditure is capitalized and calculated using Equation 4, assuming an asset life 10 years and cost of debt 4,39%[3], and listed under fixed assets. The capitalized R&D is assumed equity financed and an equal amount is added to equity and equity equivalents in accordance with Koller et al. (2015).

Equation 4 - Capitalizing Expenses

$$Asset\ Value_{t-1} = \frac{Expense_t}{(k_d + \frac{1}{Asset\ Life})}$$

- Goodwill and intangibles do not wear out over time (Koller et al., 2015). Accountants test the value of goodwill and intangibles and write down book value if impairments are identified. Thus, for invested capital to represent the cash paid, accumulated amortization and impairments of intangibles are added back. To ensure balance in total funds invested, accumulated amortization is assumed to be equity financed
- Non-current financial assets are classified as non-operating and consequently excluded in the invested capital calculations. Non-current financial assets are mainly investments in the non-consolidated subsidiaries Arnalax Hf, an Icelandic salmon farming company, and Norskott Havbruk AS, a company with 100% ownership of a Scottish salmon farmer. The non-operating assets will be valued separately in a subsequent section.

See Appendix A for historical invested capital calculation for SalMar ASA and peers.

[3] See chapter 8.8.2 for cost of debt calculation.

Peer Group

The historical balance sheet of the peer group is reorganized in a similar fashion as for SalMar ASA to calculate invested capital. The following additional adjustments are performed:

- Companies with operating leases charge a rental expense in the income statements, and need not record either assets or liabilities. Thus, a company with many operating leases may appear "asset light", and make peer comparison inefficient. Marine Harvest ASA and Grieg Seafood ASA possess operating leases. These are capitalized using Equation 4 with an asset life of 10 years and cost of debt 4,39%[4]

6.2.2 NOPLAT Calculation

SalMar ASA

Net operating profit less adjusted taxes is the cash flow generated from operating assets. It is estimated as EBITA less adjusted taxes with the following adjustments:

- SalMar and the peer group use the IFRS accounting standard, which state that all assets must be booked at fair value. Consequently, salmon in cages must be valued at fair price, making fair value adjustments of biological assets appear in the income statement. Fair value adjustments, gains and losses on assets, and impairments are non-cash adjustments, and thereby excluded from the NOPLAT calculation
- Amortization of intangible assets are excluded to avoid double counting due to the add-back of accumulated amortization and impairments in invested capital calculation
- Capitalized R&D expenses are amortised over five years and charged in NOPLAT calculation[5].
- Operating tax rate is calculated by multiplying marginal tax rate and operating EBITA. Marginal tax rate equals the Norwegian statutory rate in the corresponding year. The

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[4] See chapter 8.8.2 for cost of debt calculation.

[5] Note that capitalized R&D expenses are only for comparison purposes. These are excluded in the free cash flow calculation, and will not affect the value of operating assets.

difference between operating tax and provision for income tax are defined as non-operating tax

- NOPLAT should represent cash flow from operations only, and taxes are no exception. However, provision for income tax include changes in deferred taxes which are non-cash adjustment. Thus, for operating taxes to equal actual taxes paid, the corresponding year's increase in net deferred tax liabilities (ΔDTL-ΔDTA) is subtracted from operating taxes to calculate operating *cash* taxes

See Appendix B for historical NOPLAT calculation for SalMar ASA and peer group.

Peer Group

The historical NOPLAT for peers are calculated with the same adjustments as for SalMar ASA. There are no additional adjustments to NOPLAT calculation for peer companies.

6.3 Analysing ROIC

It is assumed that all companies in the peer group are in the business of maximizing the number of ton salmon produced, while minimizing costs and maximizing the price at which it is sold. Table 8 presents key numbers related to core operations per HOG kg produced salmon from the past three years. Scaling allows for analysis of relative performance which is presented in the following sections.

Table 8 - ROIC Items per HOG kg Salmon Produced. Period 2012-2016

	Salmar ASA			Grieg Seafood ASA			Marine Harvest ASA			Lerøy Seafood Group ASA[6]		
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
Produced salmon (HOG t-ton)	141,0	136,4	115,7	64,7	65,4	64,7	418,9	420,1	380,6	158,4	157,7	164,2
Revenue/HOG kg	51,0	53,7	78,0	40,4	42,7	70,2	61,0	66,3	85,7	79,4	85,3	105,2
Operating costs/HOG kg	35,3	40,7	53,4	43,3	54,2	66,1	48,6	56,2	65,8	66,5	74,0	84,7
Cost of Goods Sold/HOG kg	22,5	26,1	34,6	12,7	17,1	22,2	33,5	37,7	43,5	50,5	55,9	62,5
Labour & Related Expense/HOG kg	5,0	5,6	7,4	14,7	18,2	21,3	7,9	9,1	10,7	8,0	8,9	10,9
Other Operating Expense/HOG[7] kg	7,7	9,0	11,4	15,9	18,9	22,5	7,2	9,4	11,5	8,0	9,2	11,4
Dep &Amort/HOG[8] kg	2,3	3,0	4,6	2,1	2,5	2,7	2,3	3,0	3,5	2,3	2,7	3,1
Operating EBITA/HOG kg	13,4	9,9	20,0	-5,0	-14,0	1,4	10,1	7,1	16,4	10,6	8,6	17,3
Operating Margin	26,3 %	18,5 %	25,7 %	-12,5 %	-32,8 %	2,0 %	16,6 %	10,7 %	19,2 %	13,3 %	10,0 %	16,5 %
Operating Working Capital/HOG kg	24,2	24,4	30,2	30,3	30,9	36,5	28,2	30,5	38,0	27,3	30,6	37,8
Fixed assets/HOG kg	32,1	38,7	52,6	36,4	39,4	40,5	38,3	42,5	52,0	29,3	31,9	47,2
Invested Capital excl. GW/HOG kg	56,2	63,1	82,8	66,7	70,3	77,0	66,5	73,0	90,1	56,5	62,5	85,0
Pre-tax ROIC excl. GW	23,8 %	15,8 %	24,2 %	-7,6 %	-19,9 %	1,8 %	15,2 %	9,7 %	18,2 %	18,2 %	12,9 %	16,3 %
Operating cash tax rate	23,6 %	27,3 %	10,9 %	27,2 %	23,8 %	-125,9 %	21,4 %	19,3 %	17,9 %	26,2 %	24,3 %	-18,8 %
ROIC excl. GW	18,2 %	11,4 %	21,6 %	-5,5 %	-15,2 %	4,2 %	11,9 %	7,8 %	15,0 %	13,8 %	10,4 %	24,2 %
GW and Amort. in % of capital invested	6,1 %	5,9 %	5,3 %	5,4 %	5,2 %	4,9 %	20,3 %	18,5 %	16,8 %	23,1 %	21,7 %	15,5 %
ROIC incl. GW	17,1 %	10,8 %	20,5 %	-5,2 %	-14,4 %	4,0 %	9,9 %	6,6 %	12,8 %	11,2 %	8,5 %	20,9 %

[6] Lerøy Seafood Group ASA farm other species of fish. However, 80% of revenue are from sale of salmon, while 12,5% stems from sale of trout a similar product. Lerøy's HOG volume include all species.

[7] Other operating expenses include sales, administration, maintenance, delivery cost, operating equipment and other operating expenses

[8] Amortization equals capitalized R&D expenses. Amortization and impairments of goodwill and intangibles are deemed non-operating, and are not included in NOPLAT calculation

6.3.1 Revenues

Salmon is essentially a fairly homogeneous product (Brækkan, 2014). As an effort to increase price of produced salmon both Marine Harvest, Lerøy Seafood Group and SalMar are doing VAP. Focusing on VAP should result in higher prices achieved per kg of produced salmon, but also additional cost and investments. The achieved revenue per HOG kg are also affected by the performance of sales and distribution centres.

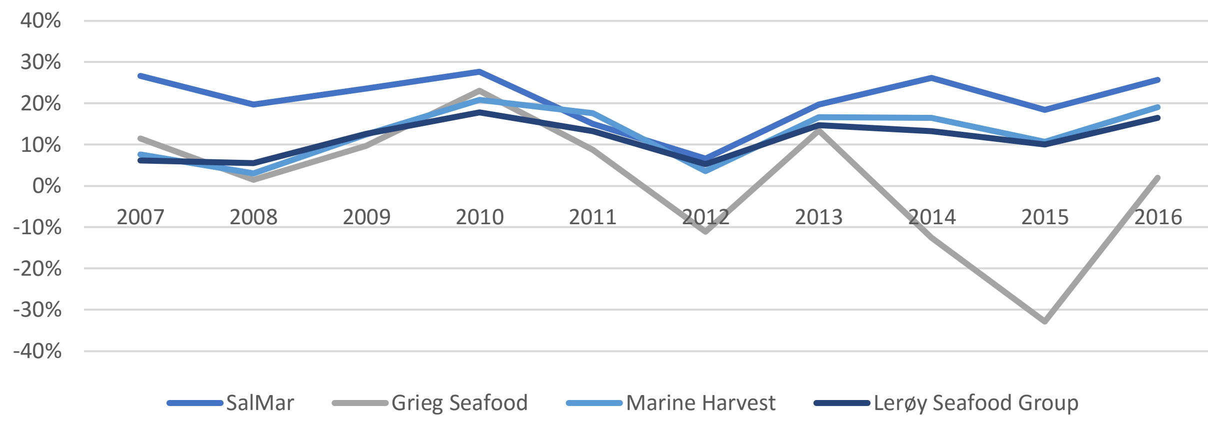
Lerøy are focusing largely on VAP and have achieved the highest revenue per HOG kg, however they subsequently have the highest operating cost per HOG kg. SalMar owns Innovamar, a secondary processing facility, with a capacity of handling 70.000 ton salmon per year. In 2016, Innovamar processed about 36.000 HOG ton salmon equalling about 31% of the company's harvested HOG ton. However, the company has not been able to achieve the same prices as Lerøy or Marine Harvest.

Moreover, SalMar sell produced salmon to 40 countries around the world. Well-functioning sales and distribution channels are of high importance to maximize price on produced salmon. However, the historical revenue/HOG kg indicates that SalMar performs worse than the peer group in this part of operations.

6.3.2 Operating Margin

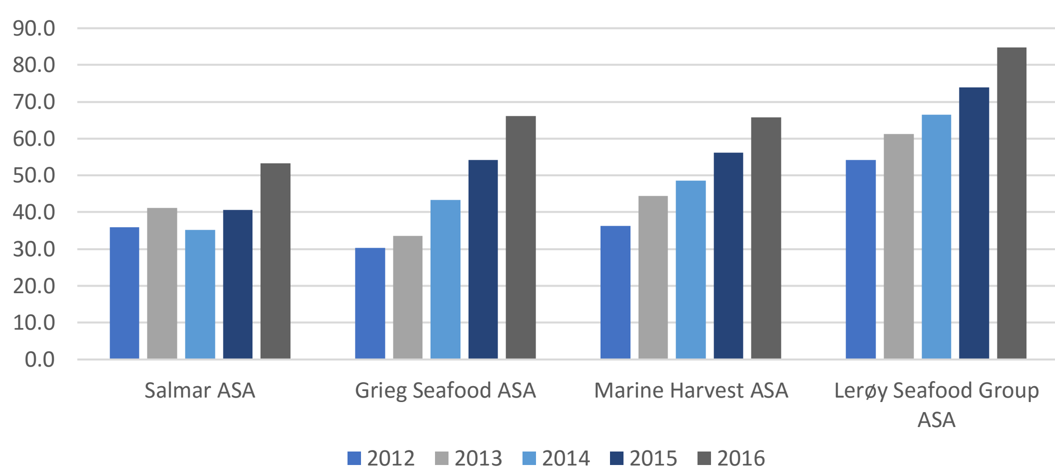
SalMar have historically been known as the most cost efficient publicly traded salmon farming company (SalMar ASA, 2016), a reputation reflected in the historical numbers. Figure 9 illustrate how SalMar have had highest and most stable operating margin among the peer group. A 10-year average of 20,9% in operating margin is far above peers, with Marine Harvest being closest at 12,8%. On the other hand, Grieg Seafood exemplify the complexity of salmon farming with a 10-year average operating margin of 1,4%. Furthermore, SalMar perform best among peers in average operating EBITA/HOG kg, a common used ratio in analysing the salmon farming industry.

Figure 9 - Historical Operating Margin for Peer Group



Lately, the industry has experienced a large growth in operating costs mainly related to increased price on fish feed, and increasing challenges with sea lice and diseases. Figure 10 illustrate how all the companies in the peer group have experienced an increase in operating costs per HOG kg and how SalMar still are the cost-leader in 2016.

Figure 10 - Operating Cost Excl. Depreciation per HOG kg



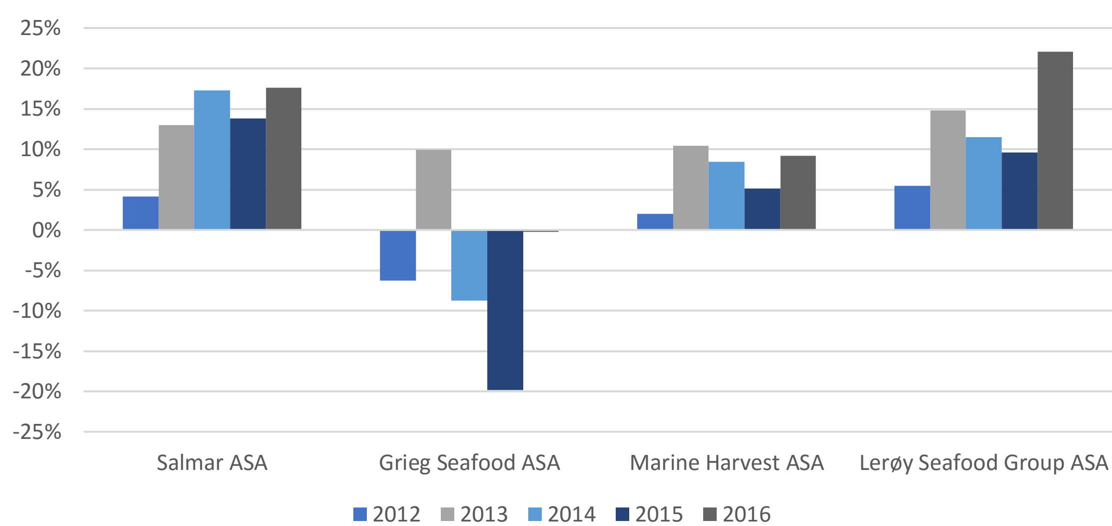
6.3.3 Invested Capital

Table 8 illustrate how all companies have experience increased invested capital per HOG kg of output over the past three years. This developed is due to investments related to sustainability challenges. SalMar has invested in smolt facilities, green licenses, biological technologies, and ocean farming technology (SalMar ASA, 2015, 2016, 2017a). As of year-end 2016 the average invested capital in fixed assets/HOG kg in the industry is NOK 47,3 with SalMar at NOK 49,5.

6.3.4 ROIC

Figure 11 illustrate the differences in ROIC performance and consistency among the companies. Lerøy and SalMar both have had a consistent and high ROIC above 10% except for 2012 where PD outbreaks and escapes influenced the whole industry negatively. Despite SalMar's increased investments and higher production costs per HOG kg output, increased revenue per HOG kg due to higher salmon prices has resulted in a high operating margin and satisfying ROIC. The historical ROIC differs largely among the companies where SalMar and Lerøy exhibits the best performance while Grieg Seafood has experience negative ROIC three out of the past five years. This reflects a complex and challenging industry where strategic choices and execution are extremely important.

Figure 11 – Historical ROIC Incl. Goodwill



6.4 Analysing Growth

To analyse revenue growth, it is assumed that revenue grow either by increasing volume harvested or by achieving higher price on sold volumes. Volume growth is calculated as annual percentage change in HOG ton harvested. To analyse and compare the companies, the change in implicit salmon price is assumed to be the difference between revenue growth and the growth in volume harvested. Table 9 shows the annual geometric average decomposition of revenue growth for the past five years.

Table 9 - Decomposition of Revenue Growth. Geometric Average. Period 2012-2016

Company	Marine Harvest ASA	Lerøy Seafood Group ASA	SalMar ASA	Grieg Seafood ASA
Revenue growth	15,8 %	13,5 %	19,7 %	17,3 %
Volume growth	3,0 %	3,7 %	5,3 %	1,5 %
Δ Implicit price	12,9 %	9,7 %	14,4 %	15,8 %

6.4.1 Implicit Salmon Price

The past five years have been very profitable for salmon farming companies. The average annual salmon price has increased 40% since 2012 (Fish Pool, 2017b). Consequently, average growth in revenues due change in salmon prices has been tremendous. SalMar's average growth of 14,4% in implicit salmon price is the largest among the peer group, and all companies except Lerøy have experienced double digit growth.

6.4.2 Volume Growth

There is a large difference in efficiency per license within the industry. The MAB system distinguishes between the geographical location of licenses, where Finnmark and Nord-Troms are imposed a MAB of 940 ton while, and all other locations have a MAB of 780 ton. This difference is due to slower salmon growth in colder water in the northernmost regions. The disparate regulations might explain some of the variations in efficiency among the peer companies. However, SINTEF (2011) points out that, even with a greater MAB, the average production per license in Finnmark and Northern-Troms is significantly lower.

Table 10 illustrates how SalMar have a high efficiency compared to peers with an average of 1.240 HOG ton per license. In contrast, Grieg Seafood have achieved an average of 635 HOG ton per license making them the least efficient company in the peer group. There has been a flat development in efficiency per license over the past five years.

Table 10 - Production Efficiency per License (Consolidated Level). Company per Year.

Production efficiency	2010	2011	2012	2013	2014	2015	2016	Average
SalMar ASA	985	1 310	1 267	1 186	1 410	1 364	1 157	1 240
Marine Harvest Group ASA[9]	N/A	N/A	N/A	N/A	N/A	717	684	700
Grieg Seafood ASA	636	583	700	581	647	654	647	635
Lerøy Seafood Group ASA	899	1 051	1 180	1 049	1 123	1 080	1 125	1 072

The challenges affecting the industry has trigged a stricter regulatory regime, hence there has been a limited number of new licenses issued. The last allocation of new licenses was completed in 2013, where SalMar acquired 8 "green licenses", issued to companies with innovative solutions to handle sea lice or other environmental issues. Consequently, the industry has relied on M&A activity to grow production capacity. SalMar have bought a total of 18 licenses through M&A since 2011. Furthermore, Table 11 illustrates how none of the companies have been awarded new licenses over the past two years.

Table 11 - Number of Licenses Held (Consolidated Level). Company per Year.

Licenses	2010	2011	2012	2013	2014	2015	2016
SalMar ASA	66	71	81	97	100	100	100
Marine Harvest Group ASA[10]	N/A	N/A	N/A	N/A	N/A	586	556
Grieg Seafood ASA	101	103	100	100	100	100	100
Lerøy Seafood Group ASA	130	130	130	138	141	146	146

To conclude, the growth analysis uncovers how the increase in salmon price plays a major role in determining revenue growth. However, the most notable development is the lack of growth in volume output due to low efficiency improvement and a status quo number of licenses in Norway.

[9] Marine Harvest Group ASA started reporting its number of licenses in 2015

[10] Marine Harvest Group ASA started reporting its number of licenses in 2015

7 Driver Analysis

To precisely forecast a company's future performance, it is essential to develop a clear understanding of trends in the underlying drivers of value. Thus, this chapter will define drivers of value, and analyse the potential impact of key findings from the strategic- and historical performance analysis. The information is analysed in a SWOT framework to clearly illustrate whether the potential impact of key findings represent a strength, weakness, opportunity, or threat for SalMar.

7.1 Financial Drivers

In this analysis, drivers are separated in two groups; non-financial-, and financial drivers. The two groups are related so that non-financial drivers drive the development in the financial drivers which further drives other income statement-, and balance sheet line items. The financial drivers are revenues, cost of goods sold, and property, plant and equipment. All non-financial drivers will be forecasted separately.

Revenues

Revenues are calculated as the product of volume harvested (HOG), and achieved salmon price. Volume (HOG ton) is the product of the number of licenses SalMar possess, and the license efficiency. Salmon price is measured as the sum of expected salmon price and an additional achieved premium due to sale of VAP products.

Equation 5

$$Revenue = Volume\ (HOG) \times Salmon\ Price$$

where

Equation 6

$$Volume\ (HOG) = Efficiency \times Licenses_{t-2}$$ [11]

[11] See section 8.1.1

Equation 7

$$Salmon\ Price = Future\ spot\ price + Premium$$

Cost of Goods Sold

Cost of goods sold (COGS) are defined as COGS per HOG kg multiplied by the harvested volume. This allows for separate forecasting of volume, and COGS per HOG kg.

Equation 8

$$COGS = \frac{COGS}{Volume} \times Volume$$

Property, Plant, and Equipment

Property, plant, and equipment (PPE) are assumed to be driven by licenses, and are estimated as the ratio PP&E/licenses multiplied by licenses. This allows for separate forecasting of licenses and PP&E per license.

Equation 9

$$PP\&E = \frac{PP\&E}{License} \times Licenses$$

7.2 Non-Financial Drivers

The non-financial drivers needed to calculate financial drivers are volume, future salmon price, premium, COGS/HOG kg, PP&E/license and license cost. The key findings from previous chapters represent either a strength, weakness, opportunity, or threat for SalMar. Their impact on non-financial are illustrated in Table 12, Table 13, Table 14 and Table 15 and discussed in the remainder of this section.

7.2.1 Strengths

Table 12 – SalMar's Strengths Impact on Non-Financial Drivers

	Volume		Achieved salmon price				
	Efficiency	Licenses	Salmon price	Premium	Cost of Goods Sold/HOG	PP&E/Licences	License cost
Cost efficiency	-	-	-	-	➡/⬇	-	-
License efficiency	➡	-	-	-	-	-	-
License locations	➡	-	-	-	⬇	-	-
Ocean Farming	⬆	⬆	-	-	⬇	⬆	-
Smolt self-sufficiency	➡	-	-	-	⬇	⬆	-

Table 12 exhibits an overview of SalMar's identified internal strengths and how these impact forecasting of non-financial drivers.

The historical performance analysis illustrates how SalMar have been the cost leader among peers. Furthermore, the strategic analysis identifies how the license location and optimized value chain together entail a short term competitive advantage within the key success factor, cost efficiency. In addition, Ocean Farming AS pose as short term competitive advantages due to its expected improvement on operating costs, and added growth potential through awarded licenses. Moreover, if Ocean Farming AS succeed in decreasing issues related to sea lice and diseases, one might see higher efficiency per license due to lower mortality and less premature harvesting. The previous year's investments in smolt production facilities allows for larger degree of self-sufficiency. High quality smolt is an important factor in achieving high quality salmon, low mortality rates, and thus cost efficiency. It is also important to note, that there are no trend substantiating a change in SalMar's high license efficiency.

7.2.2 Weaknesses

Table 13 - SalMar's Weaknesses Impact on Non-Financial Drivers

	Volume		Achieved Salmon price				
	Efficiency	Licenses	Spot price	Premium	Cost of Goods Sold/HOG	PP&E/Licences	License cost
Increasing capital expenditure	-	-	-	-	-	↑	-
Increasing biology cost	-	-	-	-	↑	↑	-
Stable feed cost	-	-	-	-	➡	-	-

Table 13 exhibit an overview of SalMar's internal weaknesses and how these impact forecasting of non-financial drivers.

Despite positive effects on operating costs, upcoming investment needs related to both Ocean Farming AS and smolt facilities have increased, and will continue to increase PP&E per license. The issues regarding biology are yet not resolved, and will require further investments in search for a sustainable solution. All in all, these weaknesses pose a threat to ROIC performance through increased capital expenditure.

Costs related to feed, the largest operating cost in salmon farming, have increased largely the previous years. This is due to increasing costs of inputs as fish oil and fish meal, combined with unfavourable changes in foreign exchange rates. The cost of fish feed in USD has stabilized and assuming USD/NOK will remain stable in the future, the cost of fish feed is expected to remain at current levels.

7.2.3 Opportunities

Table 14 - SalMar's Opportunities Impact on Non-Financial Drivers

	Volume		Achieved salmon price				
	Efficiency	Licenses	Salmon price	Premium	Cost of Goods Sold/HOG	PP&E/Licences	License cost
Ease of trade sanctions	-	-	↑	-	-	-	-
Increasing middle class in Asia	-	-	↑	-	-	-	-
Increased R&D spending in industry	↑	↑	-	-	↓	-	-

Table 14 exhibits an overview of SalMar's external opportunities and how they impact the non-financial drivers, and thus SalMar's valuation.

Ease of trade sanctions towards Norway, imposed by Russia and China, can increase the demand for Norwegian salmon and have a positive effect for SalMar. However, these situations are not yet resolved and will only remain as an opportunity for increased demand.

An increasing middle class in Asia can contribute to increased demand as a higher percentage of the Asian population can afford salmon. The rational explanation is that salmon can be considered a luxury good and the demand increases if the real income increases generally in the population (Bjørndal et al., 1994). An increased demand will positively affect salmon prices.

The goal of increasing R&D spending in the industry are development of solutions that allow for increased production in Norway. Ocean and land-based salmon farming can possibly meet the requirements set by authorities with respect to environmental sustainability and induce issuance of new licenses. Moreover, cost efficient solutions, e.g. non-medical treatment of salmon and fish feed optimization, will be essential for the future profitability of the industry.

7.2.4 Threats

Table 15 - SalMar's Threats Impact on Non-Financial Drivers

	Volume		Achieved Salmon price				
	Efficiency	Licenses	Spot price	Premium	Cost of Goods Sold/HOG	PP&E/Licences	License cost
Increased regulation	↓	-	-	-	↑	-	-
Onshore salmon farming	-	-	↓	-	-	-	-
Feed prices	-	-	-	-	↑	-	-
Increased global supply	-	-	↓	-	-	-	-

Table 15 exhibit an overview of SalMar's external threats and how they impact the non-financial drivers.

The planned "traffic light system" will change the way salmon farmers operate and plan their operations. It is not yet certain what consequences the system will have on the salmon farming companies with respect to volume output. However, poor lice handling entails a risk of lower output in years where MAB is reduced on their location. Trond Williksen, CEO of SalMar, fears the TLS is unpredictable and doubts the environmental effects of the system (SalMar ASA, 2017a). An order from authorities to reduce biomass will reduce the efficiency per licence, and thus volume output.

Onshore salmon pose a threat to SalMar as DNB Markets (2017a) predict a potential output of 150.000 HOG ton from onshore salmon farming by 2020 and hence reduce salmon prices. These estimates are highly uncertain, but is still a proxy for the potential of this kind of production. Thus, this thesis assumes that onshore salmon farming will increase the total global supply and be a tipping factor when determining long term future salmon price.

As pointed out in the industry analysis, the potential to improve sustainability in production and possibilities to utilize existing natural production locations indicate a gradual increase in global supply. The development in Chilean salmon production will be important in determining future supply and consequently salmon price.

8 Forecasting Performance

In this chapter, SalMar's future performance is forecasted, by utilising the key findings in the previous sections. The forecasting of non-financial drivers is presented, followed by the calculation of financial drivers.

8.1 Forecasting Non-Financial Drivers

8.1.1 Volume

Table 16 - Volume Production Forecast

	2016	2017E	2018E	2019E	2020E	2021E	2022E	2023E
Licenses	100	101	106	108	108	108	108	108
Efficiency (HOG ton)	1 157	1 240	1 240	1 240	1 240	1 240	1 240	1 240
Volume (HOG t-ton)	115,7	124,0	124,0	125,2	131,4	133,9	133,9	133,9
% change	-15,2 %	7,1 %	0,0 %	1,0 %	5,0 %	1,9 %	0,0 %	0,0 %

Efficiency

SalMar has historically had a high and stable efficiency per license compared to peers. SalMar's new technology and 8 new licenses within Ocean Farming can have a positive impact on efficiency due to lower mortality, and premature harvesting. On the other hand, the new traffic light system regarding MAB may pose a threat to efficiency in situations of reduced MAB. All in all, efficiency is expected to continue along the historical average, and is forecasted as 7-year historical average.

Licenses

The awarding of 8 development licenses in 2016 are the only signs of increased capacity for SalMar. The authorities do not express any sign to change policies regarding license politics. Hence, Table 16 illustrate how it is not expected any issuance of new licenses in the forecasting period. Regarding the development licenses, it is expected that 1 license will be operational by 2017, 5 by 2018, and remaining 2 by 2019.

HOG Volume

HOG volume is a product of efficiency and the number of licences 2 years ago. The 2-year time-lag equals the production time of 14-26 months to achieve fish at marketable size, as displayed in Equation 6 (Marine Harvest ASA, 2017b). Consequently, there are no immediate output by acquiring a new license unless its already in operation. The forecast illustrates an increase in volume over the forecasting period due to development licenses, see Table 16.

8.1.2 Salmon Price

Table 17 - Salmon Price Forecast. Forward price source: (Fish Pool, 2017a)

	2016	2017E	2018E	2019E	2020E	2021E	2022E	2023E
Forward prices	63,1	62,6	59,4	57,7	48,1	46,4	43,9	43,9
Premium	14,9	13,3	13,3	13,3	13,3	13,3	13,3	13,3
Forecasted price	78,0	76,0	72,7	71,0	61,4	59,7	57,2	57,2
% change	45,3 %	-2,7 %	-4,3 %	-2,3 %	-13,6 %	-2,8 %	-4,2 %	0,0 %

Spot Price

In the short run, it is expected that demand will continue to gradually increase due to an increasing Asian middle-class, and a continuance of the trend of healthy protein consumption. The supply side is expected to remain somewhat stable, with a slight increase in traditional farming from Norway and Chile. In addition, non-traditional methods are expected to contribute with smaller volumes. These expectations are reflected in the forward prices, which are utilized to forecast salmon price until 2021E.

In the long run, increasing volumes from traditional and non-traditional methods due to new technology will offset the demand growth and cause a reversion in salmon price. This is substantiated by economic theory, which suggests that an industry experiencing high profits will be subject to increased competition. Hence, it is reasonable to assume salmon price will revert towards a historical average in the long run.

Table 17 show how forward prices are estimate to decrease in the until 2021. From 2021 and onward this analysis expects the salmon price to return to the 5-year historical average of NOK

43,9 in the long run. The future salmon price is highly uncertain. Therefore, the sensitivity analysis in section 10 will uncover the effect of different assumptions on long term salmon price.

Premium

VAP products are sold at a premium over the spot price of salmon, see Table 17. Preceding the completion of Innovamar in 2010, SalMar experienced an increase in their VAP premium, after which the premium stabilized. Considering SalMar's historical cost focus, there is no indication of increased efforts to VAP products. Subsequently, the premium is forecasted as the 5-year average of historical premium.

8.1.3 Cost of Goods Sold/HOG kg

Table 18 - Cost of Goods Sold/HOG kg

	2016	2017E	2018E	2019E	2020E	2021E	2022E	2023E
COGS/HOG kg	34,6	33,6	32,6	31,6	30,7	29,7	28,7	27,7
% change	32,4 %	-2,8 %	-2,9 %	-3,0 %	-3,1 %	-3,2 %	-3,3 %	-3,4 %

The combination of SalMar's proven ability to focus on cost efficiency, stable trend in NOK price of fish feed, greater efficiency in ocean farming facilities, and smolt self-sufficiency by 2017 will entail a reversion of COGS/HOG kg in the forecast period. However, costs related to biological challenges are still a major threat to profitability, and will be a critical success factor in the upcoming years. Assuming the large investments lead to lower operating costs, COGS/HOG kg is forecasted to decrease towards the average of 2014-2016 in the terminal year, see Table 18.

8.1.4 PP&E/License

Table 19 - PP&E/License

	2016	2017E	2018E	2019E	2020E	2021E	2022E	2023E
Gross PP&E/License	47,8	54,0	60,2	66,4	72,6	75,6	78,6	81,6
Change	10,4	6,2	6,2	6,2	6,2	3,0	3,0	3,0
Depreciation/License	3,6	2,3	2,5	2,9	3,3	3,5	3,5	1,8
Net PP&E/License	31,4	35,4	40,0	43,6	46,6	46,1	45,6	46,8

The expected reversion in COGS/HOG kg is a result of increased investments. The industry will not be able to tackle the biological challenges without substantial investments. SalMar is investing in sustainable lice fighting technologies, effective disease handling, self-sufficiency in smolt, and new production methods. Table 19 illustrates the effect of increased investments on gross PP&E per license. The 3-year average historical increase in gross PP&E is assumed to continue until 2020. After 2020, the company approach stable state and gross investments is limited to the annual reinvestment need in line with historical observations.

8.1.5 License Cost

The Norwegian Directorate of fisheries states that the cost of development licenses is NOK 10 million upon approved conversion of to commercial licenses (Norwegian Ministry of Trade Industry and Fisheries, 2015). SalMar predicts conversion of development licenses in 2018 (SalMar ASA, 2017a). However, this is quite optimistic, and this thesis assumes conversion in 2019. This entails that the 8 development licenses will be fully paid in 2019 with a price of NOK 84,5 million adjusted for expected inflation.

8.2 Forecasting Financial Drivers

The financial drivers are a product of the non-financial drivers forecasted in section 8.1. The forecasted income statement- and balance sheet items that determine the value of operating assets will be presented in this section.

8.2.1 Revenue

Table 20 - Revenue Forecast

	2016	2017E	2018E	2019E	2020E	2021E	2022E	2023E
Volume (HOG t-ton)	115,7	124,0	124,0	125,2	131,4	133,9	133,9	133,9
Price per kg HOG	78,0	76,0	72,7	71,0	61,4	59,7	57,2	57,2
Revenue (MNOK)	9 030	9 417	9 010	8 894	8 069	7 994	7 656	7 656
% change	23,3 %	4,3 %	-4,3 %	-1,3 %	-9,3 %	-0,9 %	-4,2 %	0,0 %

Revenues are forecasted according to definitions of section 7.1. The forecasted volume output is multiplied with the salmon price, see Table 20. The expected decrease in salmon price upset the expected growth in volume, and thus revenues are forecasted to decrease in the forecasting period.

8.2.2 Cost of Goods Sold

Table 21 - Cost of Goods Sold Forecast

	2016	2017E	2018E	2019E	2020E	2021E	2022E	2023E
Volume (HOG t-ton)	115,7	124,0	124,0	125,2	131,4	133,9	133,9	133,9
COGS/HOG kg	34,6	33,6	32,6	31,6	30,7	29,7	28,7	27,7
COGS (MNOK)	4 000,8	4 165,7	4 044,6	3 962,7	4 030,4	3 975,7	3 844,9	3 714,0
% change	12,3 %	4,1 %	-2,9 %	-2,0 %	1,7 %	-1,4 %	-3,3 %	-3,4 %

COGS are calculated as the product of COGS/HOG kg and the estimated volume output according to definitions of chapter 7.1. The combination of slightly increased volume and decrease in the COGS/HOG kg ratio causes COGS to slightly decline from 2016 to 2023, see Table 21.

8.2.3 PP&E

Table 22 - PP&E Forecast

	2016	2017E	2018E	2019E	2020E	2021E	2022E	2023E
Licenses	100	101	106	108	108	108	108	108
Gross PP&E/License	47,8	54,0	60,2	66,4	72,6	75,6	78,6	81,6
Gross PP&E (MNOK)	4 776	5 452	6 382	7 174	7 846	8 170	8 494	8 818
% change	27,9 %	14,2 %	17,0 %	12,4 %	9,4 %	4,1 %	4,0 %	3,8 %
Depreciation (MNOK)	358	235	268	318	354	377	373	197
Net PP&E (MNOK)	3 137	3 578	4 239	4 714	5 032	4 979	4 929	5 056

Gross PP&E is driven by the number of licenses and the gross PP&E/License ratio. Both licenses and PP&E/license are increasing throughout the forecast period, causing an increase in gross PP&E. Net PP&E grow with investments in ocean farming facilities until 2020, before it stabilizes only driven by reinvestment.

8.3 Forecasting Other Income Statement and Balance Sheet Items

Table 23 - Forecasting Other Income Statement Items

	Line item	Forecast driver	Calculation	Historical Ratio
	Payroll expense	Cost of Goods Sold	5 year average	21,3 %
	R&D	Revenue	3 year average	0,70 %
Operating	Other operating expenses	Cost of Goods Sold	5 year average	34,9 %
	Depreciation	Net PP&E t-1	Constant	7,5 %[12]
	Amortization	Intangible assets	5 year average	0,1 %
	Income from investment in associates	Investment in associates	9 year average	17,67 %
Non-Operating	Interest income	Cash and Cash Equivalents t-1	5 year average	2,99 %
	Financial cost	Long term debt t-1	5 year average	5,81 %

To forecast a complete income statement, it is necessary to define drivers for all line items. Table 23 illustrates definitions of line items' forecast drivers, and the historical ratio applied in forecasting. All ratios have line item in the numerator and forecast driver in the denominator. Furthermore, most ratios are calculated based on a 5-year historical average. R&D and income from investments deviate in historical time horizon to avoid extreme value bias.

Payroll expense and other operating expenses are driven by COGS to avoid a connection to salmon price which is represented in revenues. Forecasting costs with connection to salmon price would assume an ability to cut cost when the salmon price declines, and thus operating margin would not fluctuate. Due to the long production cycle this would be an unrealistic assumption. Other line items are driven by its appropriate asset in the balance sheet.

[12] Depreciation is set to 4% in terminal year.

Table 24 - Forecasting Other Balance Sheet Items

	Line item	Forecast driver	Calculation	Historical Ratio
	Inventories	Cost of Goods Sold	5 year average	52,27 %
	Receivables	Revenue	5 year average	15,41 %
	Payables to suppliers	Cost of Goods Sold	5 year average	22,16 %
	Tax liabilities	Revenue	3 year average	4,40 %
Operating	Government duties	Revenue	5 year average	1,75 %
	Other current liabilities	Revenue	5 year average	5,48 %
	Capital Lease	Revenue	5 year average	5,14 %
	Deferred Tax	Revenue	5 year average	18,26 %
	Minority interest	Revenue	3 year average	0,95 %
	Next year's instalment	Revenue	5 year average	3,03 %
	Other Intangibles	Revenue	5 year average	1,46 %
Non-operating	Non-current financial assets	-	Constant	-

Other balance sheet items are forecasted with revenue and cost of goods sold as driver. Inventories and payables to suppliers should be driven by the cost related to production, and thereby not be affected by the development in salmon price. Receivables are linked to goods sold, making revenue an adequate driver.

8.4 Forecasting Income Statement and Balance Sheet

It is essential to forecast complete income statements and balance sheet items to get a clear understanding of the company's future capital structure. The income statement and balance sheet are forecasted based on the drivers defined above, and are listed in Appendix C and D.

To create a realistic forecasted balance sheet, relationships regarding allocation of retained earnings and newly issued debt are defined. The difference between assets excluding excess cash and equity and liabilities less newly issued debt, are either allocated to excess cash or newly issued debt. This is reasonable because investments will be either financed by retained earnings or issuance of debt. Equally, retained earnings that are not spent on new investments are allocated to excess cash. Thus, accumulated excess cash are available for either additional dividend pay-out or further future investments.

SalMar has a history of large dividend pay-outs in years with great results. The company states that dividend is not regulated to a fixed ratio of earnings, but paid out handsomely whenever earnings are not needed for additional investments (SalMar ASA, 2017a). The earnings-outlook in the forecast period are positive, while there are few growth opportunities preceding the investment in development licenses. Thus, dividend pay-out ratio is assumed to be 100% in the forecast period to uphold the current capital structure.

8.5 Forecasted NOPLAT

Table 25 - Forecasted NOPLAT

		2017E	2018E	2019E	2020E	2021E	2022E	2023E
	Revenue	9 417,3	9 010,0	8 894,0	8 069,2	7 994,4	7 655,7	7 655,7
-	Cost of Goods Sold	4 165,7	4 044,6	3 962,7	4 030,4	3 975,7	3 844,9	3 714,0
-	Operating Costs	2 408,2	2 337,3	2 290,4	2 322,8	2 291,4	2 215,5	2 142,0
=	EBITDA	2 843,3	2 628,2	2 640,9	1 716,0	1 727,3	1 595,3	1 799,7
-	Depreciation	235,3	268,3	317,9	353,5	377,4	373,4	197,2
=	Operating EBITA	2 608,1	2 359,8	2 323,0	1 362,5	1 349,9	1 221,9	1 602,5
	Operating Margin	27,7 %	26,2 %	26,1 %	16,9 %	16,9 %	16,0 %	20,9 %
-	Operating cash taxes	463,1	696,5	633,6	509,8	369,5	384,0	422,5
=	NOPLAT	2 145,0	1 663,4	1 689,4	852,7	980,4	837,9	1 180,0
	ROIC incl. Goodwill	20,0 %	14,8 %	14,4 %	7,1 %	8,2 %	7,1 %	10,0 %

The forecasted income statement is reorganized in the same way as for historical data to find NOPLAT. Table 25 illustrates how the forecasted salmon price reversion causes revenue to decline despite increased volume output. The gradually decreasing COGS per HOG kg are not great enough to offset the impact of lower salmon price. Depreciation increase due to higher investment needs per license, but decrease towards steady state in 2023E. Operating cash tax varies largely with changes in salmon price causing lower revenues and a reduction in deferred tax liabilities. In the terminal year, operating margin is 20,9 %, which is just above the 5-year historical average of 19,4%. The increased investment needs are reflected in a poorer ROIC incl. goodwill at 10,0% in the terminal year compared to the historical 5-year average of 14,5%.

8.6 Forecasted Working Capital and Capital Expenditure

Table 26 - Forecasted Operating Working Capital

	2017E	2018E	2019E	2020E	2021E	2022E	2023E
Total operating current assets	6 156	5 954	5 845	5 775	5 702	5 501	5 360
Inventories	4 517	4 385	4 297	4 370	4 311	4 169	4 027
Receivables	1 451	1 388	1 370	1 243	1 232	1 179	1 179
Cash and cash equivalents	188	180	178	161	160	153	153
Total operating current liabilities	2 019	1 945	1 913	1 832	1 812	1 743	1 714
Payables to Suppliers	923	896	878	893	881	852	823
Tax Liabilities	415	397	392	355	352	337	337
Government Duties	165	158	156	141	140	134	134
Other current liabilities	516	494	488	443	438	420	420
Operating Working Capital	4 137	4 009	3 931	3 942	3 891	3 758	3 645

The operating working capital decrease over period with decreasing salmon price and COGS/HOG kg. Inventories and payables to suppliers decrease slightly throughout the explicit forecast period as the volume increase is offset by the decreasing COGS/HOG kg. The receivables are driven by revenue and therefore affected by the decreasing salmon price.

Table 27 - Forecasted Capital Expenditure

	2017E	2018E	2019E	2020E	2021E	2022E	2023E
PP&E	676	929	792	672	324	324	324
Intangible assets	58	(6)	83	(12)	(1)	(5)	0
Gross Goodwill	(0)	(1)	(0)	(2)	(0)	(1)	0
Capital expenditure	734	923	875	658	323	318	324

Capital expenditure is high the first years of the explicit forecast period related to investments in ocean farming facilities visible in PP&E. The changes in intangible asset are mainly related to other intangible assets which are driven by revenue. Cost of converting developing licenses into traditional licenses of NOK 80 million are expensed in 2019E.

8.7 Forecasted Free Cash Flow

Table 28 - Forecasted Free Cash Flow

		2017E	2018E	2019E	2020E	2021E	2022E	2023E
	NOPLAT	2 145,0	1 663,4	1 689,4	852,7	980,4	837,9	1 180,0
+	Depreciation charge	235,3	268,3	317,9	353,5	377,4	373,4	197,2
=	Gross cash flow	2 380,3	1 931,7	2 007,3	1 206,3	1 357,8	1 211,3	1 377,2
	Δ Operating Working capital	423,4	(128,0)	(77,3)	10,9	(51,6)	(132,4)	(112,9)
+	Operating Capital Expenditure	733,7	922,7	875,0	658,2	322,7	318,3	324,0
=	Gross investment	1 157,1	794,7	797,7	669,1	271,2	185,9	211,1
	Free cash flow	1 223,1	1 137,0	1 209,7	537,1	1 086,6	1 025,4	1 166,1

The free cash flow in the forecasting period is largely affected by the decreasing investment need in lack of growth opportunities after 2020. Operating working capital is expected to decrease due to decreased cost of inventory as COGS/HOG kg decrease. NOPLAT is affected by the decrease in salmon prices but slightly counterbalanced by a decrease in COGS/HOG kg. In conclusion, free cash flow remains somewhat stable, except from 2020, and positive for the entire forecast period.

8.8 Cost of Capital

Cost of capital is the discount rate of which forecasted free cash flows to firm will be discounted. Cost of capital is estimated as the weighted average cost of capital (WACC) according to the EDCF framework. The WACC consists of equity and debt at market values and the respective cost of financing. In addition, the model adjusts cost of debt for tax deductions making WACC an after-tax cost of capital. The calculation of WACC is performed with the following equation:

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

Equation 10 - Weighted average cost of capital (Koller et al., 2015)

The identification and calculation of necessary inputs are described in the following section.

Table 29 - WACC Calculation

WACC	6,20 %
Cost of equity	6,52 %
Market Cap/(MV Debt + Market Cap)	89,91 %
Cost of debt	4,39 %
Debt/(MV Debt + Market Cap)	10,09 %
Tax	24,00 %

8.8.1 Cost of Equity

Cost of equity is calculated using the capital asset pricing model (CAPM). The calculation of necessary inputs is described in the following section.

Table 30 - Cost of Equity Calculation

Cost of Equity	6,52 %
Risk Free Rate	1,63 %
Risk Premium	5,69 %
Beta	0,86
Equity Risk Premium	5,69 %

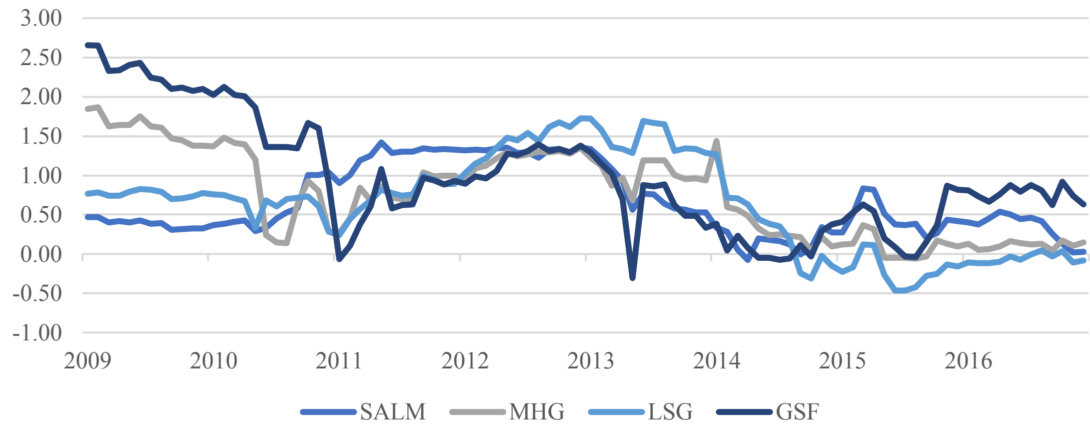
Beta Estimation

An industry beta estimate based on the peer group is used in the CAPM model to estimate cost of equity. The advantage of estimating an industry beta compared to a company beta is a more precise estimate which is less affected by idiosyncratic shocks (Koller et al., 2015). The analysed data ranges 10 years back in time and is based on monthly data. All stocks are regressed on the MSCI World index.

10 years of historical data is considered a long estimation period for historical beta. This can result in an inconsistency in the beta estimation due to biases related to historical events and/or changes in the business portfolio, and hence the exposure to market risk (Damodaran, 2012). However, salmon farming companies have experienced abnormal returns compared to the market in the recent years. As Figure 12 illustrates, this has resulted in a low market correlation compared to earlier years, yielding a lower beta. The peer group's business portfolio has

remained somewhat unchanged throughout the past 10-years. This substantiates the application of a long beta estimation period.

Figure 12 - Historical Development in 2-year Beta



Monthly data on stock prices reduce the non-trading bias compared to the use of weekly or daily data. Long time-intervals causes fewer observations, and results in lower significance in the regression results (Damodaran, 2012). In this case, the use of 10 years of monthly data, equivalent to 120 observations, yields significance at a 1% level in all regressions. The regression outputs are listed in Appendix F.

MSCI World index, an index consisting of large and mid-cap equities from all over the world in developed markets, is used as the market index. Following the assumptions made in the CAPM, the marginal investor in this analysis invests world-wide (Damodaran, 2012).

Table 31 – Industry Beta Estimation

Company	Beta	D/E	Tax	Unlevered beta
SalMar ASA	0,64	27%	24 %	
Marine Harvest Group ASA	1,08	64%	24 %	
Lerøy Seafood Group ASA	0,70	47%	24 %	
Grieg Seafood Group ASA	1,43	45%	24 %	
Average	0,96	46%	24 %	0,71
Industry Beta	0,86			

Table 31 illustrate the calculation of industry beta. The unlevered beta is calculated as an average of all companies. Further, to calculate the industry beta the unlevered beta is adjusted for

SalMar's capital structure and tax. The unlevered beta is derived from the average beta as in Equation 11:

$$\beta_{unlevered} = \frac{\beta_{average}}{(1 + \frac{D}{E}(1 - tax))}$$

Equation 11 - Unlevering Industry Beta (Damodaran, 2012)

Equity Risk Premium

There are essentially two ways to calculate the equity risk premium. Firstly, one can look at the historical market return and apply this in the future forecast. This method adjusts for corresponding historical interest rates containing the implied inflation to calculate a historical equity risk premium. (Koller et al., 2015). However, Damodaran (2012) argues that this method assumes that investors' risk aversion does not change over time, which is highly speculative. Secondly, one can calculate the current implied equity risk premium by the investigating the relationship between current share prices, and the expected growth and performance. This method is criticized because it relies largely on assumptions about growth and future cash flows (Damodaran, 2012).

Despite the criticism, the implied equity risk premium is more forward looking than historical risk premiums, and therefore applied to uncover the equity risk premium in this thesis. Damodaran (2017a) has estimated an implied equity risk premium of 5,69% for the Norwegian market, which will be used in calculating cost of equity. Damodaran's estimate is based on analyst estimates for dividend yield and growth on the S&P500 and adjusted for country risk.

Risk Free Rate

The risk-free rate is an input in both cost of equity, and cost of debt calculations. A risk-free asset can have no default risk and there can be no risk for reinvestment. Reinvestment risk involves the risk of reinvesting at a lower rate if the time-period of the risk-free asset is shorter than the asset being valued. Thus, an asset with a long time to maturity is the best estimate available as companies are assumed to have infinite lives (Damodaran, 2012). The best estimate available is the 10-year Norwegian government bond because it is the risk-free asset with the longest time to maturity in Norway. The 10-year government bond is also the most frequently used risk-free rate by practitioners (PWC, 2016). May 3rd the bond was traded with a risk-free rate of 1,63%, which will be applied as the risk free rate in this thesis (Norges Bank, 2017b).

Cost of Equity

Using an industry beta of 0,86, a risk-free rate of 1,63% and an equity risk premium of 5,69%. The cost of equity is estimated to be 6,52% using CAPM.

8.8.2 Cost of Debt

SalMar does not have any outstanding long-term bonds, where the market implicit default spread can be observed. Hence, cost of debt must be calculated using historical data. One can estimate the historical cost of debt in several ways. Firstly, the implicit historical cost of debt can be found by looking at historical interest payments over interest bearing debt and leases. The historical interest payments adjusted for the corresponding risk free rate yields the implicit historical default spread. Consequently, this method allows an isolated evaluation of the actual historical default spread. To estimate cost of debt, historical default spread is added to the current risk free rate (Damodaran, 2012). This model can be criticized for the assumption that historical default spread is representative for today's risk.

Another method of estimating cost of debt is through a synthetic rating. By analysing and rating credit health ratios one can arrive at an appropriate cost of debt. Damodaran (2012) argues that the best synthetic rating estimator is the interest coverage ratio.

Table 32 - Cost of Debt Calculation

	Year	2011	2012	2013	2014	2015	2016	Average
Implicit Historical Method	Implicit Cost of Debt	4,56 %	6,29 %	5,97 %	5,07 %	3,61 %	4,30 %	4,97 %
	10-year Gov. Bond	3,12 %	2,10 %	2,58 %	2,52 %	1,57 %	1,33 %	2,20 %
	Implicit Default spread	1,44 %	4,19 %	3,39 %	2,55 %	2,04 %	2,97 %	2,76 %
	Current Risk Free Rate							1,63 %
	Cost of Debt							4,39 %
Synthetic Rating Method[13]	Interest Coverage Ratio	1,8	3,8	11,6	13,3	14,6	29,0	12,3
	Implied Rating	B-	BB+	AA	AAA	AAA	AAA	AA
	Default Spread	5,50 %	2,50 %	0,80 %	0,60 %	0,60 %	0,60 %	0,80 %
	Current Risk Free Rate							1,63 %
	Cost of Debt							2,43 %

The interest coverage ratio in the period 2014-2016 are highly inflated by the corresponding extraordinary results due to high salmon prices. Contrary, SalMar's interest coverage ratios in 2011 and 2012 are extremely low because of poor performance related to biological challenges. Despite, the large variation, the 6-year historical average of interest coverage ratio implies AA rating and a 0,8% default spread (Damodaran, 2017b). As illustrated in Table 32, the synthetic rating yields a low cost of debt estimate compared to the company's historical implicit equivalent. Thus, the implicit historical method yields a more likely cost of debt estimate of 4,39% which will be applied in the cost of capital calculation.

[13] The implied rating and default spread is calculated based on Damodaran (2017b) table.

9 Valuation

This section aims to apply the derived information from previous chapters to identify the equity value for SalMar. Enterprise discounted cash flow model and relative multiple valuation are applied to uncover the fair value per share.

9.1 Enterprise Discounted Cash Flow Value

In the following section the Enterprise Discounted Cash Flow model is applied to derive the equity value of SalMar.

9.1.1 Value of Operating Assets

The value of operations in SalMar is derived as present value of free cash flow, and present value of continuous value. Continuous value is estimated using the value driver formula presented in chapter 3.1.1.

Economic theory suggests that competition will eventually eliminate abnormal returns, meaning return on investment moves towards WACC overtime. This would be false only in the existence of sustainable competitive advantage (Koller et al., 2015). The analysis of competitive advantage does not uncover a sustainable advantage in SalMar's capabilities and resources. Thus, the return on new invested capital (RONIC) is set equal to WACC, meaning new invested capital will not generate abnormal returns.

The terminal growth rate is normally a highly ambiguous number with large implications for a DCF valuation. By calculating continuous value using the value driver formula, and assuming no excess returns on new invested capital, the valuation becomes less sensitive to terminal growth. Damodaran (2012) states that the risk-free rate is a good proxy for terminal growth. The thesis has assumed a growth rate of 1% in the continuous value, just shy of the risk-free rate of 1,63%. However, due to the use of the key value driver formula in estimating continuous value the risk of making conceptual errors in the continuous value is lower. To elaborate; using terminal NOPLAT eliminates challenges with reinvestment, depreciation and changes in operating working capital. The reason is that changes in these are assumed to sum up to zero. Thus, steady state is assured in the terminal year cash flow.

It is common to discount by the year-end discount rate. However, as cash flows are generated continuously throughout the year it is more precise to adjust discount factor to reflect a mid-year discounting. The exponential time term in the discount factors in Table 33 are adjusted with -0,5.

Table 33 - DCF Valuation of SalMar's Operations

Year	2017E	2018E	2019E	2020E	2021E	2022E	2023E	Terminal
Free cash flow	1 223	1 137	1 210	537	1 087	1 025	1 166	
Discount factor	1,03	1,09	1,16	1,23	1,31	1,39	1,48	
Present value of free cash flow	1 187	1 039	1 041	435	829	736	789	
Terminal NOPLAT x (1+g)								1 192
Perpetuity growth rate								1,00 %
RONIC								6,20 %
WACC								6,20 %
Continuous value								19 218
Present Value of Free Cash Flow Explicit Period	6 056							
Present Value Continuous Value	12 997							
Present Value of Operations	19 052							

Table 33 exhibits forecasted cash flows, discount factors and the present value of free cash flows and continuous value generated by operating assets.

9.1.2 Value of Non-Operating Assets

SalMar has equity claims in several companies that are not consolidated, and hence regarded as non-operating assets. None of the associated companies are listed and thus there are less information to be found on these. Norskott AS is a Norwegian limited corporation, thus the financial information is publicly available. The company has a significant value and has been valued using the economic-profit-based framework. Arnarlax Hf has been valued at book value as there is little public information available except for earnings and dividend payments reported by SalMar.

Norskott Havbruk AS

Table 34 - Norskott Havbruk AS - Historical Performance

Year	2012	2013	2014	2015	2016
ROIC	3,14 %	5,70 %	4,74 %	1,86 %	19,48 %
Revenue growth	18,39 %	27,53 %	14,44 %	7,38 %	16,38 %
HOG	27 000	26 700	27 400	27 000	28 000

Historically, NH has experienced biological difficulties causing higher costs and a low ROIC as illustrated in Table 34. In 2016, NH managed their biological challenges well, resulting in a spike in ROIC. New farming locations has been acquired throughout 2016, and is expected to increase output volume by 2.000 HOG ton in 2017 (SalMar ASA, 2017a). Revenues have grown steadily from 2012 to 2016, despite stable volumes, which is clearly caused by higher salmon prices in the most recent years.

The cost of capital in the economic profit model should be WACC. Cost of debt in NH equals the average historical implicit cost of debt based on past years' payments to creditors. The cost of equity for SalMar is applied in calculating the cost of capital for NH. Continuing value is calculated as shown in Equation 12:

$$CV(Economic\ profit) = \frac{IC_t(ROIC_t - WACC)}{WACC} + PV(Future\ economic\ profit)$$

Equation 12 - Continuing value of economic profit (Koller et al., 2015)

The present value of future economic profit is calculated as shown in Equation 13:

$$PV(Future\ economic\ profit) = \frac{NOPLAT_t(\frac{g}{RONIC_T})(RONIC_T - WACC)}{WACC - g}$$

Equation 13 - Present value of future economic profit (Koller et al., 2015)

Table 35 - Estimated Economic Profit of Norskott Havbruk AS

Year	2017E	2018E	2019E	2020E	2021E	2022E	2023E	Terminal
NOPLAT	265	226	207	146	114	66	102	
Invested Capital	1707	1745	1786	1727	1706	1675	1675	
ROIC	15,51 %	12,93 %	11,58 %	8,44 %	6,69 %	3,92 %	6,08 %	
WACC	6,08 %	6,08 %	6,08 %	6,08 %	6,08 %	6,08 %	6,08 %	
Economic profit%	9,44 %	6,85 %	5,51 %	2,36 %	0,61 %	-2,16 %	0,00 %	
Economic profit	143	117	96	42	11	-37	0	
Discount factor	1,03	1,09	1,16	1,23	1,30	1,38	1,47	
Discounted Economic profit	138	107	83	34	8	-27	0	
Terminal NOPLAT x (1+g)								69
Growth								1,00 %
RONIC								6,08 %
WACC								6,08 %
Present Value Future Economic Profit								0
Continuous value								0
Invested capital in 2016	1 511							
Present Value of Economic profit	344							
Discounted continuous value	0							
Value of operations	1 857							

Table 35 exhibits the forecasted performance for NH in the period 2017 to 2023, and value of operations. ROIC decreases through the estimated forecast period due to decrease in salmon price as shown in Table 17, and remained high production costs. SalMar ASA (2017a) expects NH to produce 30.000 HOG ton in 2017. The forecast assumes production equivalent to the expectations for 2017 in the whole explicit period. Economic profit is calculated as the excess return over the cost of capital multiplied by the estimated invested capital in the corresponding year. It is assumed that NH does not possess a sustainable competitive advantage. Thus, the RONIC is set equal to WACC in the terminal year. Value of operating assets in NH is the sum of present value of economic profit in the forecast period, IC in 2016, present value of future economic profit, and the continuous value in 2023.

Table 36 - Equity Value of Norskott Havbruk AS

Value of operations	1 857
Non-operating assets	59
EV	1 916
Debt	394
Equity value	1 522
SalMar's share	50 %
SalMar's equity claim	761

Table 36 shows the calculation of NH's enterprise value, and SalMar's equity claim. Non-operating assets in NH consist of goodwill at book value. Debt subtracted from EV is valued at book value.

Arnarlax Hf

There is little public information on AH's historical performance as they recently started their operations. Further, SalMar bought their share of AH in 2015 through their non-consolidated subsidiary Salmus AS. SalMar's indirect equity claim on Arnalax HF accumulates to 34,4%. Hence, in lack of extensive financial information the book value of equity is considered an adequate estimate of equity value for AH.

The book value of SalMus AS for 2016 is NOK 291 million (SalMar ASA, 2017a), which is considered the value of Arnalax Hf in this analysis.

Other Associated Companies

The rest of the associated companies are valued at book value of NOK 8 million in 2016 (SalMar ASA, 2017a).

9.1.3 Equity Value

Table 37 - DCF Value of SalMar

		Value	Value per share
	Value of Operating Assets	19 052	168,2
+	Value of Non-Operating Assets	1 051	9,3
=	Enterprise Value	20 103	177,4
+	Value of Excess Cash	93	0,8
+	Value of Non-Controlling Interests	(82)	(0,7)
+	Value of Restricted Share Unit Plan	(116)	(1,0)
+	Value of Debt	(2 639)	(23,3)
=	Fair Value	17 360	153,2

To derive equity value, the value of debt and other non-equity claims must be subtracted.

Firstly, the value of excess cash is added to EV. Excess cash is calculated as the book value of cash & cash-equivalents for 2016 less operating cash equalling 2% of revenue.

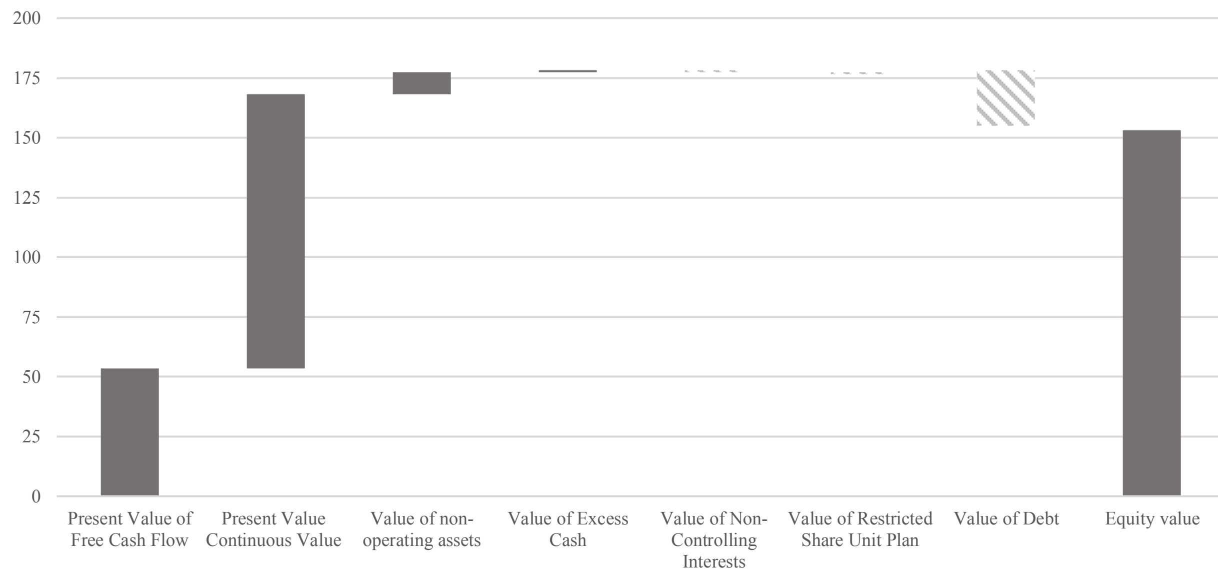
Secondly, the value of non-controlling interest is subtracted. In lack of extensive financial information about non-controlling interests, the book value is used as an approximation for estimating of non-controlling interests' claim on equity.

Thirdly, to incentivise high efforts of key employees SalMar has issued a restricted share unit plan (RSU). The RSU consists of annually allocated shares with a 3-year earning period. 1/3 is awarded annually contingent on the achievement of key performance objectives. SalMar estimates the fair value of outstanding RSU's based on the share price at vesting date. This value is considered best estimate and subtracted from EV to determine equity value for SalMar.

At last, the value of debt is subtracted from EV. SalMar does not possess traded bonds, making book value a proxy for value of debt contingent that default risk has not changed since the issuance of the debt (Koller et al., 2015). SalMar's 4-year loan agreement was issued in 2014. Since then, the implicit cost of debt has not changed significantly. Thus, the value of debt is set equal to book value of interest bearing debt including long term debt to credit institutions, next year's instalment on long term, and capital leases.

The DCF analysis results in an equity value of NOK 17.360 million for SalMar, equalling NOK 153 in value per share.

Figure 13 - Breakdown of Value per Share



9.2 Relative Valuation

The relative valuation focus on reasonable multiples to analyse salmon farming companies. The analysis is based on 2017 estimates of EBITA and earnings retrieved from EIKON Datastream, which are the consensus estimates of recent analyses. Forward looking multiples have been empirically proved more accurate, in relative valuation, rather than historical multiples (Liu, Nissim, & Thomas, 2002). EV is calculated as the market capitalization at May 3rd less book value of debt including operating leases per 31.12.16. The current share price for SalMar, at the valuation date, was NOK 207,50. The result of relative valuation is summarized in Table 38.

Table 38 - Relative Valuation

	Market cap	Earnings$_{2017E}$	EBITA$_{2017E}$	Volume	EV	P/E	EV/EBITA	EV/Volume
SalMar	23 510	2 348	3 083	131	30 230	10,0x	9,8x	247,5x
Average	31 897	3 299	4 165	203	47 203	8,4x	9,7x	207,3x
Median	25 827	2 835	3 914	164	38 498	9,1x	9,8x	241,6x
Marine Harvest	64 860	6 154	7 163	381	94 489	10,5x	13,2x	241,6x
Lerøy Seafood Group	25 827	2 835	3 914	164	38 498	9,1x	9,8x	247,3x
Grieg Seafood Group	5 005	909	1 418	65	8 621	5,5x	6,1x	133,2x
Enterprise Value							29 913	27 183
Excess cash							93	93
Equity claims							-198	-198
Value of Debt							-2 639	-2 639
Equity Value						19 689	27 169	24 439
#shares						113	113	113
Relative value per share						173,78	239,80	215,70

Capital structure is not accounted for in the PE ratio. SalMar is less leveraged than the peer group as illustrated in Table 31. Thus, the relative overpricing indicated by the P/E multiple, might be explained by differences in leverage. The effects of capital structure are better accounted for in the EV/EBITA, which suggests SalMar is undervalued. The EV/EBITA ratio is preferred to EV/EBITDA as EBITA incorporates the cost of replacing fixed assets in the future, an important element in the salmon industry. The EV/HOG ratio compares the companies with respect to the output produced, and consequently fails to incorporate the operating margin and cost efficiency. However, the ratio portrays valuable information about enterprise value scaled by an important industry value driver. The relative value EV/HOG multiple suggest SalMar is undervalued.

10 Scenario and Sensitivity Analysis

A valuation is largely impacted by the assumptions of development in key value drivers. Overconfidence is a well-known behavioural bias indicating that people have a tendency of overestimating their knowledge, ability, and precision of information (Ackert & Deaves, 2009). Thus, it is important to test the identified value for possible changes in value drivers. This chapter aims to identify which value drivers that have the largest impact on SalMar's share value in the EDCF model. Firstly, the sensitivity of non-financial drivers is identified, before scenarios are created based on logical alternative outcomes. At last, a Monte Carlo simulation based on the historical probability distribution of the salmon price is performed to analyse the corresponding probabilities related to fair value per share.

10.1 Sensitivity of Value per Share with Respect to Value Drivers

Figure 14 - Sensitivity of Share Value by Changing Value Drivers

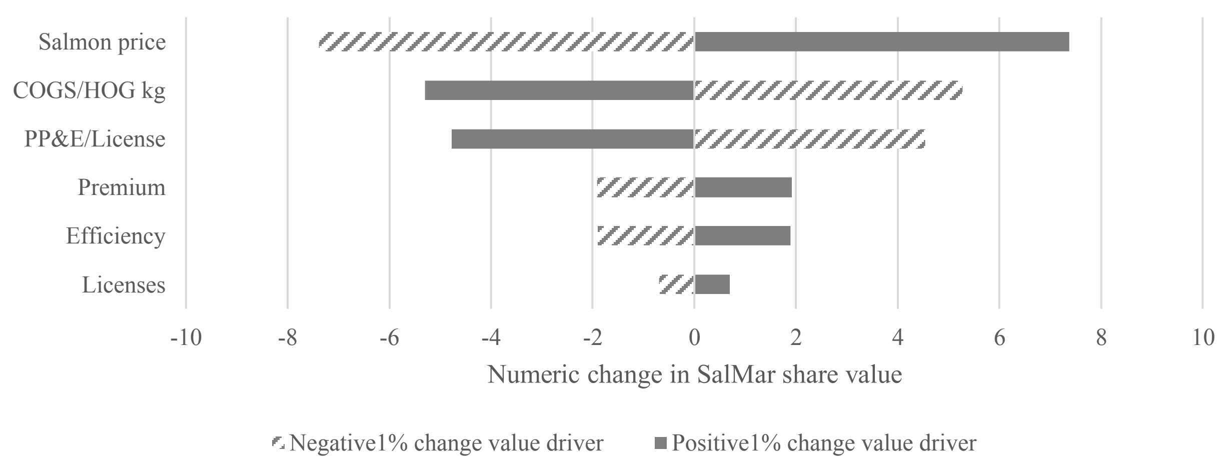


Figure 14 exhibits the absolute change in fair value per share given a 1% change, positive or negative, in non-financial value drivers. SalMar's share value is most sensitive to changes in salmon price, while gross COGS/HOG kg has the second largest impact on SalMar's share value. Future investments are driven by gross PP&E, and thus an increase in PP&E/license will increase capital expenditures and reduce the future cash flows. Interestingly, the two drivers, efficiency and licenses, are not as sensitive compared to salmon price and COGS/HOG kg. Licenses and efficiency drive the volume output. Thus, the result suggests that price and cost, drivers of operating margins, affect share value more than the volume output.

Table 39 – Terminal Salmon Price and COGS/HOG kg Effect on Fair Value per Share

Terminal Salmon Price	Terminal COGS/HOG kg 24	25	26	27,7	29	31	33	34,6
35	107	87	67	33	8	(32)	(72)	(103)
38	141	121	101	67	42	2	(38)	(69)
40	175	155	135	101	76	36	(4)	(35)
43	209	189	169	135	110	70	30	(1)
43,9	228	208	188	153	128	88	49	17
48	277	257	237	203	178	138	98	67
50	311	291	271	237	212	172	132	101
53	345	325	305	271	246	206	166	135
55	379	359	339	305	279	240	200	168
58	413	393	373	338	313	274	234	202
60	447	427	407	372	347	307	268	236
62,9	487	467	447	412	387	347	308	276
65	514	495	475	440	415	375	336	304
68	548	528	509	474	449	409	369	338

Table 39 exhibits the change in fair value per share when terminal values of salmon price and/or COGS/HOG kg change. The shaded cross marks the model inputs of the EDCF valuation. This exemplifies how sensitive the EDCF model's estimate is to assumptions on future salmon price and COGS/HOG kg. The shaded area in the lower rightmost part of the table indicates a share value of NOK 276 if the current situation, with respect to salmon price and COGS/HOG kg, continues in the terminal year.

10.2 Scenarios

This thesis assumes that individual companies have no impact on salmon price, and that the development in salmon price and other non-financial drivers are uncorrelated. If operating costs could vary with salmon price one assumes elastic operating cost in short term, which is considered unlikely due to long production cycle and strict regulations related to biology. Therefore, these factors were forecasted separately in the cash flow analysis, and are analysed separately in the scenario analysis.

To analyse the impact of different outcomes in non-financial drivers compared to the base case value of chapter 9.1, two additional scenarios are created.

10.2.1 Positive Scenario

Table 40 - Value per Share in Positive Scenario

Positive scenario	2016	2017E	2018E	2019E	2020E	2021E	2022E	2023E
Licenses	100	101	106	108	110	112	112	112
Produced volume HOG ton	115 700	123 971	123 971	125 210	131 409	133 888	136 368	138 847
COGS/HOG kg	34,58	33,30	32,02	30,74	29,46	28,17	26,89	25,61
Operating Margin	31,6 %	30,8 %	30,5 %	31,7 %	24,3 %	25,6 %	25,8 %	29,3 %
ROIC incl. goodwill	19,1 %	20,5 %	15,7 %	15,7 %	8,6 %	10,0 %	9,7 %	13,3 %
Present Value of Free Cash Flow	6 951							
Present Value Continuous Value	17 478							
Value of Non-Operating Assets	1 051							
Value of Excess Cash	93							
Value of Non-Controlling Interests	(82)							
Value of Restricted Share Unit Plan	(116)							
Value of Debt	(2 639)							
Equity value	22 737							
Fair Value per Share	201							

In the positive scenario SalMar's investments in Ocean Farming and other technology prove effective and meet governments targets regarding biological and environmental effects. This causes issuance of two new licenses per year from 2020 till 2021, while the efficiency per license remains at the same level. Consequently, the new licenses cause increased output volume. Less biological challenges entail lower mortality rate and treatment needs. This cause a decrease in COGS/HOG kg which revert to the average of 2012-2016. Lower costs are reflected in a higher operating margin, close to 2016 levels. The positive scenario indicates a higher fair value per share of NOK 201. This scenario is assumed to be less likely as there are scarce information on whether the success of Ocean Farming, will entail new licenses in addition to conversion of the existing development licenses. There is also a chance that other solutions may be more efficient than SalMar's Ocean Farming.

10.2.2 Negative Scenario

Table 41 - Value per Share in Negative Scenario

Negative Scenario	2016	2017E	2018E	2019E	2020E	2021E	2022E	2023E
Licenses	100	101	106	108	108	108	108	100
Produced volume HOG ton	115 700	123 971	123 971	125 210	131 409	133 888	133 888	123 971
COGS/HOG kg	34,58	33,98	33,37	32,77	32,16	31,56	30,95	30,35
Operating margin	31,6 %	29,4 %	27,6 %	27,2 %	17,5 %	16,7 %	14,7 %	16,4 %
ROIC incl. goodwill	19,1 %	19,5 %	13,8 %	13,0 %	5,2 %	5,8 %	4,1 %	5,5 %
Present Value of Free Cash Flow	5 201							
Present Value Continuous Value	6 676							
Value of Non-Operating Assets	1 051							
Value of Excess Cash	93							
Value of Non-Controlling Interests	(82)							
Value of Restricted Share Unit Plan	(116)							
Value of Debt	(2 639)							
Equity value	10 183							
Fair Value per Share	90							

In the negative scenario SalMar's investments in technology do not payoff. Ocean Farming does not perform in accordance to government targets, and SalMar fail to convert the development licenses into normal licenses after the 7-year trial period. This causes a loss of 8 licenses in the terminal year and consequently a decrease in volume output. The lack of technological solutions to biological and environmental issues are reflected in a lower COGS/HOG kg reversion, causing a lower operating margin and ROIC under cost of capital in terminal year. The negative scenario indicates lower fair value per share, but is assumed to be a less likely outcome. The negative scenario is less likely because rejection of conversion, which implies a total failure of Ocean Farming, seems unlikely as the application process has been very strict.

10.3 Monte Carlo Simulation

Salmon price, the most important value driver in this valuation model, has historically been very volatile. An analysis of fair value per share based on the historical probability distribution and volatility of salmon price will provide insights to the sensitivity of the EDCF. Monte Carlo simulations has been performed on the terminal year salmon price in the valuation model of all scenarios.

The historical probability distribution of salmon prices is estimated based on a 5-year historical dataset with 278 weekly observations from Fish Pool (Fish Pool, 2017b). Increased regulations and increasing costs is a result of unsustainable operations in the past. Consequently, for this analysis a shift in marginal cost is assumed to have occurred the past 5-years as the industry is pushed towards more sustainable production of salmon. Thus, production of salmon is no longer profitable at the historical long term average salmon price making the 5-year average appropriate in this analysis[14]. This assumes that no other solutions, e.g. land based salmon farming, can produce salmon at lower marginal cost than traditional farming.

The @Risk software was applied to define a distribution on historical salmon price with the following constraints:

- Salmon price cannot be negative
- Salmon price has an infinite upside
- Data on salmon price is continuous data

The Inverse Gaussian distribution was identified to be appropriate in describing the dataset. Three simulations with 10.000 iterations were run on terminal salmon price in all scenarios. The output results can be found in Appendix G.

[14] Data from FishPool ranging back to 2006

Table 42 – Summarized Results Monte Carlo Simulation of Value per Share

	Value per Share (NOK)		
P(V>x)	Negative	Base	Positive
80,0 %	(59)	(6)	36
70,0 %	(37)	17	60
65,0 %	(16)	39	83
60,0 %	3	60	105
55,0 %	23	82	127
50,0 %	43	103	149
45,0 %	63	125	171
40,0 %	85	148	195
35,0 %	107	172	220
30,0 %	131	198	247
25,0 %	158	226	276
20,0 %	188	258	309
Mean	223	296	348
St.dev	90	153	201

The results of the Monte Carlo simulations are presented in Table 42. The simulations indicate, as expected, that the value of SalMar in all scenarios is largely dependent on the terminal year salmon price. The results suggest that it is an approximately 40% probability that the value of SalMar is above the scenario estimates, based on historical salmon prices. The standard deviations of the three simulations are between 95-197% of mean value, while the historical annual stock volatility of SalMar exceeds 100%. This further illustrates the value's dependence on the terminal salmon price.

11 Conclusion

The objective of this thesis has been to determine a fair value per share for SalMar ASA. The value estimated was derived using two different valuation methods, Enterprise Discounted Cash Flow valuation and relative valuation.

To arrive at a reliable result using the EDCF framework, a comprehensive analysis of the strategic environment, the basis for competitive advantage, and historical performance of SalMar and peers have been conducted. Key drivers of value in SalMar are derived and forecasted following the results of these analyses. These also form the platform in projecting future cash flows to firm. An estimated weighted average cost of capital is applied in discounting the projected future cash flows, in line with relevant theory and best practices. At last, the sensitivity to the assumptions of the final EDCF value are tested through a careful sensitivity analysis.

In the macro analysis, global economic conditions are found favorable that causes an expectation of a continued gradual increase in demand for salmon. Sustainability challenges have caused increased regulation and limited potential in further organic growth for traditional salmon farming in Norway. Biological challenges have been even larger in Chile, but improved sustainability and yet unused natural suitable locations are expected to cause an increased supply. In addition, the industry analysis uncovers a threat of increased supply due to new entrants within non-traditional salmon farming methods. At last, the resource based-view analysis uncovers short term competitive advantages in SalMar ASA's optimized value chain, license locations, and ocean farming technology.

The historical analysis uncovers a significant growth in cost of producing salmon, in line with observed regulatory requirements concerning sustainability, and increased feed prices. To allow for additional production volume and to decrease costs the industry is forced to invest in new technology. At the same time, the industry is largely dependent on the salmon price, which in the short run is expected to stay strong, while in the long run will revert to an historically lower average as supply increases. This is supported by the forward price curve.

The combination of increased capital expenditure requirements to reduce costs, and expected price reversion compresses SalMar's future ROIC. This leads to a fair value per share estimate in the EDCF valuation of NOK 153. The relative valuation indicates a value interval of NOK 174-

240, above the EDCF estimate. However, the sensitivity analysis perfectly illustrates how the estimated EDCF value is largely dependent on assumptions regarding salmon price and COGS/HOG kg. Consequently, it may seem speculative to value a company on multiples of all-time high earnings and EBITA, when a significant reversion in long term future salmon price is expected.

The scenario analysis investigates the results of the EDCF model given success or failure in the Ocean Farming project. The scenario analysis yields values of NOK 201 and NOK 90 for the positive and the negative scenario, respectively. The Monte Carlo simulation on value per share based on the historical probability distribution of salmon price suggests a higher probability of fair value being below than above the value interval derived in relative valuation. This substantiates the EDCF value estimate.

At May 3rd, 2017 SalMar share price closed at NOK 207,5. This indicates that the market either believes in higher future salmon price, lower future production costs, or lower future capital expenditure needs, compared to the results of this valuation. The estimated fair value per share of NOK 153 indicates an overpricing of ~30% in the market.

"Irrespective of its cause, the growth in costs represents a threat to the industry's competitiveness"

Trond Williksen, CEO SalMar ASA

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Appendices

Appendix A – Historical Invested Capital Calculations for all Companies

Appendix A.1 - SalMar ASA

Invested capital calculation	2012	2013	2014	2015	2016
Inventories	2 290	3 249	3 322	3 634	5 222
Receivables	907	880	1 181	1 074	897
Cash and cash equivalents	55	125	144	147	181
Total operating current assets	3 252	4 254	4 647	4 855	6 300
Payables to Suppliers	763	516	409	649	1 199
Tax Liabilities	7	26	322	292	423
Government Duties	43	94	144	153	189
Other current liabilities	154	192	381	488	775
Total operating current liabilities	967	828	1 256	1 582	2 586
Operating working capital	2 285	3 426	3 391	3 272	3 713
Net PP&E	1 269	1 860	2 017	2 411	3 137
Intangible assets	1 702	2 030	2 451	2 466	2 465
Accumulated Amortization of Intangibles	(11)	(19)	(23)	(38)	(41)
Capitalized R&D inc amort	62	105	288	412	564
Invested capital ex goodwill and impairments	5 318	7 421	8 147	8 561	9 879
Goodwill	452	452	466	466	466
Accumulated amortization of intangibles	11	19	23	38	41
Invested capital	5 781	7 892	8 635	9 065	10 386
Non-current financial assets	971	408	540	636	959
Excess cash	0	946	23	127	93
Total funds invested	6 752	9 246	9 199	9 829	11 439
Long term debt	2 223	2 447	2 191	2 761	2 440
Debt to credit institutions	596	397	277	140	199
Deferred tax	872	1 200	1 263	1 231	1 495
Operating deffered tax	872	1 199	1 262	1 231	1 495
Non-operating deferred taxes	0	0	0	0	0
Other Liabilities	0	0	0	0	0
Pension liabilities	1	0	0	0	0
Debt and debt equivalents	3 692	4 044	3 731	4 132	4 134
Paid in Equity	493	476	478	501	529
Distributable reserve	2 338	4 247	4 599	4 646	6 069
Minority interests	136	338	61	80	82
Capitalized R&D inc amort *	62	105	288	412	564
Accumulated amortization of intangibles **	11	19	23	38	41
Accumulated Goodwill Amortization **	18	18	18	18	18
Equity and equity equivalents	3 059	5 203	5 467	5 695	7 303
Rounding adjustments	2	(1)	1	1	2
Total funds invested	6 752	9 246	9 199	9 829	11 439

Appendix A.2 - Grieg Seafood ASA

Invested Capital Calculation	2012	2013	2014	2015	2016
Accounts Receivable - Trade, Net	124,7	441,6	504,1	581,9	826,9
Receivables - Other	29,3	98,2	60,9	115,3	136,6
Total Inventory	1 375,8	1 841,3	1 935,1	2 020,0	2 548,8
Prepaid Expenses	22,0	0,0	32,5	30,5	0,0
Other Current Assets, Total	12,7	2,8	8,5	9,8	43,2
Cash & Equivalents	41,0	48,1	82,0	92,2	130,9
Total Operating Current Assets	1 605,5	2 432,0	2 623,1	2 849,7	3 686,4
Accounts Payable	246,1	418,2	360,4	653,1	500,9
Accrued Expenses	71,9	22,8	96,3	119,8	0,0
Other Current liabilities, Total	15,6	98,1	135,3	68,0	464,2
Total Operating Current Liabilities	333,6	539,1	592,0	840,9	965,1
Operating Working Capital	1 271,9	1 892,9	2 031,1	2 008,8	2 721,3
Property/Plant/Equipment, Total - Net	1 141,3	1 204,6	1 425,0	1 534,8	1 510,4
Intangibles, Net	980,5	998,6	1 077,7	1 110,3	1 078,2
Note Receivable - Long Term	1,1	1,3	1,6	2,7	5,6
Invested Capital excl. GW	3 394,8	4 097,4	4 535,4	4 656,6	5 315,5
Goodwill, Net	105,1	107,3	108,7	110,6	108,6
Accumulated Intangible Amortization	123,4	126,0	124,8	130,0	134,9
Invested Capital incl. GW	3 623,3	4 330,7	4 768,9	4 897,2	5 559,0
LT Investment - Affiliate Companies	49,2	28,1	22,4	25,9	0,0
LT Investments - Other	1,3	1,4	0,0	1,4	0,0
Defered Income Tax - Long Term Asset	0,0	0,0	2,2	10,3	1,6
Excess Cash	186,2	134,2	91,0	290,0	372,7
Total Funds Invested	3 860,0	4 494,4	4 884,5	5 224,8	5 933,3
Notes Payable/Short Term Debt	500,0	606,3	195,6	338,2	668,0
Current Port. of LT Debt/Capital Leases	154,3	157,2	540,9	162,9	0,0
Total Long Term Debt	1 107,2	1 020,9	1 218,9	1 791,2	1 246,3
Deferred Income Tax - LT Liability	426,8	557,5	560,3	539,0	669,1
Minority Interest	0,0	13,8	19,4	30,3	56,2
Other Liabilities, Total	35,2	24,7	2,5	25,9	11,4
Debt and debt equivalents	2 223,5	2 380,4	2 537,6	2 887,5	2 651,0
Common Stock, Total	446,6	446,6	446,6	446,6	446,6
Additional Paid-In Capital	0,0	0,0	0,0	0,0	0,0
Retained Earnings (Accumulated Deficit)	1 118,1	1 548,5	1 780,4	1 625,5	2 705,9
Treasury Stock - Common	(5,0)	(5,0)	(5,0)	(5,0)	(5,0)
Other Equity, Total	(46,5)	(2,2)	0,0	140,0	0,0
Accumulated Intangible Amortization	123,4	126,0	124,8	130,0	134,9
Equity and equity equivalents	1 636,6	2 113,9	2 346,8	2 337,1	3 282,4
Adjustments	(0,1)	0,1	0,1	0,2	(0,1)
Total Funds Invested	3 860,0	4 494,4	4 884,5	5 224,8	5 933,3

Appendix A.3 - Marine Harvest ASA

Invested Capital Calculation	2012	2013	2014	2015	2016
Accounts Receivable - Trade, Net	1 782	3 191	3 360	5 470	5 676
Receivables - Other	497	942	938	0	0
Total Inventory	7 028	11 288	12 415	13 612	16 544
Prepaid Expenses	95	115	133	0	0
Other Current Assets, Total	89	197	253	(1)	0
Operating Cash	246	384	511	557	652
Total operating current assets	9 737	16 117	17 610	19 638	22 872
Accounts Payable	1 453	2 233	2 039	0	0
Accrued Expenses	386	672	1 392	0	0
Other Current liabilities, Total	1 116	1 548	2 246	5 911	7 655
Total operating current liabilities	2 955	4 453	5 677	5 911	7 655
Working capital	6 782	11 664	11 933	13 727	15 217
Capitalized operating leases	1 100	1 938	2 569	3 304	4 731
Property/Plant/Equipment, Total - Net	4 112	6 677	8 257	9 252	9 154
Intangibles, Net	5 550	6 225	6 681	7 432	7 234
Invested capital ex goodwill and impairments	17 544	26 504	29 440	33 715	36 336
Goodwill - Gross	2 116	2 375	2 417	2 486	2 433
Accumulated Intangible Amortization	3 090	3 195	3 392	3 392	3 453
Invested capital inc goodwill and impairments	22 750	32 074	35 249	39 593	42 222
LT Investment - Affiliate Companies	647	900	978	1 189	1 526
LT Investments - Other	1009	132	166	24	49
Other Long Term Assets, Total	147	1 247	181	129	56
Excess Cash	0	55	684	132	291
Total funds invested	24 553	34 408	37 258	41 067	44 144
Capitalized operating leases	1 100	1 938	2 569	3 304	4 731
Notes Payable/Short Term Debt	143	160	1	0	0
Current Port. of LT Debt	235	527	6	2	1
Total Long Term Debt	5 339	7 710	10 669	10 285	9 020
Deferred Income Tax	2 544	3 365	3 569	3 761	4 118
Minority Interest	69	28	16	9	8
Other Liabilities, Total	415	1 167	2 334	2 125	4 096
Debt and debt equivalents	9 845	14 895	19 164	19 486	21 974
Common Stock, Total	2 811	3 078	3 078	3 377	0
Additional Paid-In Capital	779	2 955	9 268	10 329	0
ESOP Debt Guarantee	0	8	31	59	0
Other Equity, Total	8 029	10 278	2 326	4 425	18 719
Accumulated Intangible Amortization	3 090	3 195	3 392	3 392	3 453
Equity and equity equivalents	14 709	19 514	18 095	21 582	22 172
Adjustments	(1)	(1)	(1)	(1)	(2)
Total funds invested	24 553	34 408	37 258	41 067	44 144

Appendix A.4 - Lerøy Seafood ASA

Invested Capital Calculation	2012	2013	2014	2015	2016
Accounts Receivable - Trade, Net	995	1 486	1 428	1 569	2 209
Receivables - Other	164	248	195	192	252
Total Inventory	3 051	4 086	4 207	4 873	7 140
Prepaid Expenses	25	59	34	41	56
Other Current Assets, Total	10	10	73	75	113
Operating cash	182	215	252	269	345
Total Operating Current Assets	4 427	6 104	6 189	7 019	10 116
Accounts Payable	827	1 059	1 054	916	1 367
Accrued Expenses	220	274	338	329	264
Other Current liabilities, Total	166	455	480	434	1 408
Total Operating Current Liabilities	1 213	1 788	1 872	1 679	3 038
Operating Working Capital	3 214	4 316	4 317	5 340	7 077
Capitalized operating leases			37	34	134
Property/Plant/Equipment, Total - Net	2 095	2 377	2 677	2 900	4 209
Intangibles, Net	1 979	1 979	2 152	2 217	5 900
Note Receivable - Long Term	9	26	32	17	77
Invested Capital ex goodwill	7 297	8 698	9 215	10 508	17 397
Goodwill, Net	1 993	2 008	2 083	2 133	2 119
Accumulated Intangible Amortization	11	23	28	33	47
Invested Capital inc goodwill	9 301	10 729	11 326	12 674	19 562
LT Investment - Affiliate Companies	349	741	575	678	739
Excess Cash	901	658	1 108	979	1 889
LT Investments - Other	0	0	0	0	0
Other Long Term Assets, Total	22	12	42	42	31
Total Funds Invested	10 573	12 140	13 051	14 373	22 221
Capitalized operating leases			37	34	134
Total Long Term Debt	2403	2357	2767	2377	4541
Deferred Income Tax	1230	1487	1531	1568	2802,2
Minority Interest	649	794	817	878	935
Other Liabilities, Total	52	40	139	130	127
Current Port. of LT Debt/Capital Leases	912	683	469	1465	1094
Debt and debt equivalents	5246	5361	5 760	6 452	9 633
Accumulated Intangible Amortization	11	23	28	33	47
Common Stock, Total	55	55	55	55	60
Additional Paid-In Capital	2732	2732	2732	2732	4778,3
Retained Earnings (Accumulated Deficit)	2529	0	0	0	7702
Treasury Stock - Common	0	0	0	0	0
Other Equity, Total	0	3969	4476	5100	0
Equity and equity equivalents	5 327	6 779	7 291	7 920	12 587
Adjustments	0	0	0	1	1
Total Funds Invested	10 573	12 140	13 051	14 373	22 221

Appendix B – Historical NOPLAT Calculations for all Companies

Appendix B.1 - SalMar ASA

NOPLAT Calculation – SalMar ASA	2012	2013	2014	2015	2016
Revenue	4 205	6 246	7 186	7 326	9 030
COGS	2 325	3 051	3 175	3 563	4 001
Cost of Goods Sold	2 715	3 376	3 337	3 810	4 397
Change in stocks of goods in progress and finished goods	(390)	(325)	(162)	(247)	(396)
Operating Costs	1 366	1 692	1 800	1 991	2 176
Payroll expenses	483	623	710	766	862
Other Operating Expenses	883	1 069	1 090	1 225	1 314
Maintenance	134	136	202	209	238
Operating equipment	40	49	69	72	76
Direct inputs	59	200	210	210	229
Delivery cost	323	423	445	560	551
Other operating expenses	328	260	164	176	220
EBITDA	514	1 503	2 210	1 773	2 853
Depreciation	166	218	272	303	358
Amortzation	65	46	49	108	171
Amortzation capitalized R&D	65	46	49	108	171
Operating EBITA	282	1 239	1 889	1 361	2 324
Operating cash taxes	(55)	7	447	372	293
Operating tax	79	335	510	340	558
Provision for income tax	127	419	413	255	691
Non-operating deductibles	(48)	(84)	97	85	(133)
Net DTA (DTA-DTL) Increase (Decrease)	135	327	63	(32)	264
NOPLAT	338	1 232	1 442	989	2 031

Appendix B.2 - Grieg Seafood ASA

NOPLAT Calculation	2012	2013	2014	2015	2016
Revenue	2 050	2 404	2 613	2 792	4 545
Cost of Goods Sold	1 202	969	823	1 119	1 439
Gross Profit	848	1 435	1 790	1 673	3 106
Labour & Related Expense	276	302	953	1 191	1 382
Other Operating Expense	642	675	1 028	1 236	1 457
EBITDA	(71)	458	(191)	(754)	267
Depreciation	157	134	135	162	175
EBITA	(228)	324	(326)	(916)	92
Operating cash tax	(4)	(43)	(89)	(218)	(116)
Operating tax	(64)	88	(88)	(247)	23
Provision for Income Taxes	(55)	114	28	(14)	343
Tax shield	9	26	116	234	320
Δ Deffered tax liabilities	(60)	131	1	(29)	139

NOPLAT	(224)	367	(238)	(698)	208

Appendix B.3 - Marine Harvest ASA

NOPLAT Calculation	2012	2013	2014	2015	2016
Revenue	15 464	19 199	25 531	27 839	32 603
Cost of Goods Sold	9 847	10 239	14 022	15 835	16 553
Gross Profit	5 617	8 960	11 509	12 004	16 050
Labor & Related Expense	2 419	2 674	3 321	3 820	4 087
Other Operating Expense	1 983	2 342	3 005	3 964	4 389
EBITDA	1 215	3 944	5 183	4 220	7 574
Depreciation	666	751	955	1 250	1 324
EBITA	549	3 193	4 228	2 970	6 250
Operating cash tax	(124)	146	906	573	1 120
Operating tax	154	862	1 142	802	1 563
Provision for Income Taxes	377	1 027	752	819	2 042
Tax shield	223	165	(390)	17	480
Δ Deffered tax liabilities	278	716	236	229	443
NOPLAT	673	3 047	3 322	2 397	5 131

Appendix B.4 - Lerøy Seafood Group ASA

NOPLAT Calculation	2012	2013	2014	2015	2016
Revenue	9 103	10 765	12 579	13 451	17 269
Cost of Revenue	6 442	6 781	8 003	8 812	10 265
Gross Profit	2661	3984	4576	4639	7004
Labor & Related Expense	1032	1094	1271	1411	1786
Other Operating Expense	854	1 004	1 263	1 448	1 864
EBITDA	775	1 886	2 042	1 780	3 354
Depreciation	292	305	364	429	512
EBITA	483	1581	1678	1351	2842
Operating cash tax	4	160	439	328	(535)
Operating tax	135	427	453	365	711
Provision for Income Taxes	183	594	329	268	927
Tax shield	48	167	(124)	(97)	217
Δ Deffered tax liabilities	131	267	14	37	1 245
NOPLAT	479	1 421	1 239	1 023	3 377

Appendix C – Forecasted Income Statement for SalMar ASA

	Income Statement	2017E	2018E	2019E	2020E	2021E	2022E	2023E
	Revenues	9 417,3	9 010,0	8 894,0	8 069,2	7 994,4	7 655,7	7 655,7
-	Cost of Goods Sold	4 165,7	4 044,6	3 962,7	4 030,4	3 975,7	3 844,9	3 714,0
=	Gross profit	5 251,6	4 965,5	4 931,3	4 038,8	4 018,7	3 810,8	3 941,6
-	Operating Costs	2 408,2	2 337,3	2 290,4	2 322,8	2 291,4	2 215,5	2 142,0
=	EBITDA	2 843,3	2 628,2	2 640,9	1 716,0	1 727,3	1 595,3	1 799,7
-	Depreciations	235,3	268,3	317,9	353,5	377,4	373,4	197,2
=	EBITA	2 608,1	2 359,8	2 323,0	1 362,5	1 349,9	1 221,9	1 602,5
-	Amotization and impairments	4,1	4,1	4,2	4,2	4,2	4,2	4,2
=	Net operating profit (EBIT)	2 603,9	2 355,7	2 318,7	1 358,3	1 345,7	1 217,7	1 598,3
+	Net financials	350,7	326,7	362,7	392,1	421,3	416,1	409,7
=	Profit before tax	2 954,6	2 682,4	2 681,4	1 750,4	1 766,9	1 633,8	2 007,9
-	Provision for Income Taxes	770,7	699,5	698,4	452,3	456,0	421,0	519,8
=	Net profit before non-controlling interests	2 183,9	1 982,9	1 983,0	1 298,1	1 311,0	1 212,8	1 488,2
-	Non-controlling interests share of result	14,6	14,0	13,8	12,5	12,4	11,9	11,9
=	Net profit	2 169,3	1 968,9	1 969,2	1 285,6	1 298,6	1 200,9	1 476,3

Appendix D – Forecasted Balance Sheet for SalMar ASA

Balance sheet	2017E	2018E	2019E	2020E	2021E	2022E	2023E
Inventories	4 517	4 385	4 297	4 370	4 311	4 169	4 027
Receivables	1 451	1 388	1 370	1 243	1 232	1 179	1 179
Cash and cash equivalents	188	180	178	161	160	153	153
Current assets	6 156	5 954	5 845	5 775	5 702	5 501	5 360
Net PPE	3 578	4 239	4 714	5 032	4 979	4 929	5 056
Net intangible assets	2 930	2 925	3 008	2 997	2 996	2 992	2 992
Non-current financial assets	908	908	908	908	908	908	908
Non-current assets	7 416	8 072	8 629	8 938	8 883	8 830	8 956
Total assets	13 572	14 025	14 474	14 712	14 585	14 331	14 316
Next years instalment	285	273	269	244	242	232	232
Payables to Suppliers	923	896	878	893	881	852	823
Tax Liabilities	415	397	392	355	352	337	337
Government Duties	165	158	156	141	140	134	134
Other current liabilities	516	494	488	443	438	420	420
Current liabilities	2 304	2 218	2 183	2 077	2 054	1 975	1 946
Long term debt to credit instituions	1 880	1 595	1 322	1 052	808	566	334
Newly issued long term debt	497	1 421	2 206	3 021	3 179	3 328	3 574
Lease	484	463	457	414	411	393	393
Deferred tax	1 719	1 645	1 624	1 473	1 460	1 398	1 398
Total Liabilities	6 884	7 342	7 792	8 037	7 911	7 660	7 645
Non current liabilities	4 580	5 124	5 609	5 961	5 858	5 685	5 699
Paid in Equity	529	529	529	529	529	529	529
Distributable reserves	6 069	6 069	6 069	6 069	6 069	6 069	6 069
Minority interests	89	86	84	77	76	73	73
Total equity	6 687	6 684	6 682	6 675	6 674	6 671	6 671
Total Liabilities & Shareholders' Equity	13 572	14 025	14 474	14 712	14 585	14 331	14 316

Appendix E – Forecasted Invested Capital Calculation for SalMar ASA

	2017E	2018E	2019E	2020E	2021E	2022E	2023E
Inventories	4 517	4 385	4 297	4 370	4 311	4 169	4 027
Receivables	1 451	1 388	1 370	1 243	1 232	1 206	1 179
Cash and cash equivalents	188	180	178	161	160	157	153
Total operating current assets	6 156	5 954	5 845	5 775	5 702	5 531	5 360
Payables to Suppliers	923	896	878	893	881	852	823
Tax Liabilities	415	397	392	355	352	345	337
Government Duties	165	158	156	141	140	137	134
Other current liabilities	516	494	488	443	438	429	420
Total operating current liabilities	2 019	1 945	1 913	1 832	1 812	1 763	1 714
Operating working capital	4 137	4 009	3 931	3 942	3 891	3 768	3 645
Net PP&E	3 184	3 463	3 560	3 528	3 097	2 732	2 423
Intangible assets	2 523	2 517	2 599	2 587	2 586	2 584	2 581
Accumulated Amortization of Intangibles	(41)	(40)	(40)	(38)	(38)	(37)	(37)
Invested capital ex goodwill and impairments	9 803	9 948	10 051	10 020	9 536	9 046	8 612
Net Goodwill	448	448	448	448	448	448	448
Accumulated amortization of intangibles	59	58	58	56	56	55	55
Invested capital	10 310	10 454	10 557	10 524	10 040	9 550	9 115
Non-current financial assets	908	908	908	908	908	908	908
Excess cash	0	0	0	0	0	0	0
Total funds invested	11 218	11 362	11 465	11 432	10 948	10 458	10 023

Appendix F – Regression Outputs

	SalMar		Marine Harvest		Lerøy Seafood		Grieg Seafood	
	Intercept	β	Intercept	β	Intercept	β	Intercept	β
MSCI World Index	0,02	0,64	0,01	1,08	0,01	0,70	0,02	1,43
SE	0,01	0,16	0,01	0,24	0,01	0,19	0,01	0,29
t-stat	2,14	3,93	1,22	4,58	1,54	3,68	1,34	4,88
p value	0,03	0,00	0,23	0,00	0,13	0,00	0,18	0,00
R-squared	0,12		0,15		0,10		0,17	

Appendix G - Monte Carlo Simulation Statistics and Percentiles

Statistics	Negative Scenario	Base Case Scenario	Positive Scenario
Minimum	(313)	(320)	(242)
Maximum	1 236	1 311	1 503
Mean	90	153	201
Std Dev	176	189	195
Variance	30926,4399	35 625	38144,58546
Skewness	0,944049629	1	0,947411724
Kurtosis	4,474244563	4	4,499129595
Median	63	125	171
Mode	2	71	111
Left X	(147)	(101)	(63)
Left P	5 %	0	5 %
Right X	416	503	563
Right P	95 %	1	95 %
Diff X	563	605	625
Diff P	90 %	1	90 %
#Errors	0	0	0
Filter Min	Off	Off	Off
Filter Max	Off	Off	Off
#Filtered	0	0	0

Percentile	Negative Scenario	Base Case Scenario	Positive Scenario
5 %	(147)	(101)	(63)
10 %	(110)	(62)	(21)
15 %	(82)	(32)	9
20 %	(59)	(6)	36
25 %	(37)	17	60
30 %	(16)	39	83
35 %	3	60	105
40 %	23	82	127
45 %	43	103	149
50 %	63	125	171
55 %	85	148	195
60 %	107	172	220
65 %	131	198	247
70 %	158	226	276
75 %	188	258	309
80 %	223	296	348
85 %	266	342	396
90 %	323	404	460
95 %	416	503	563