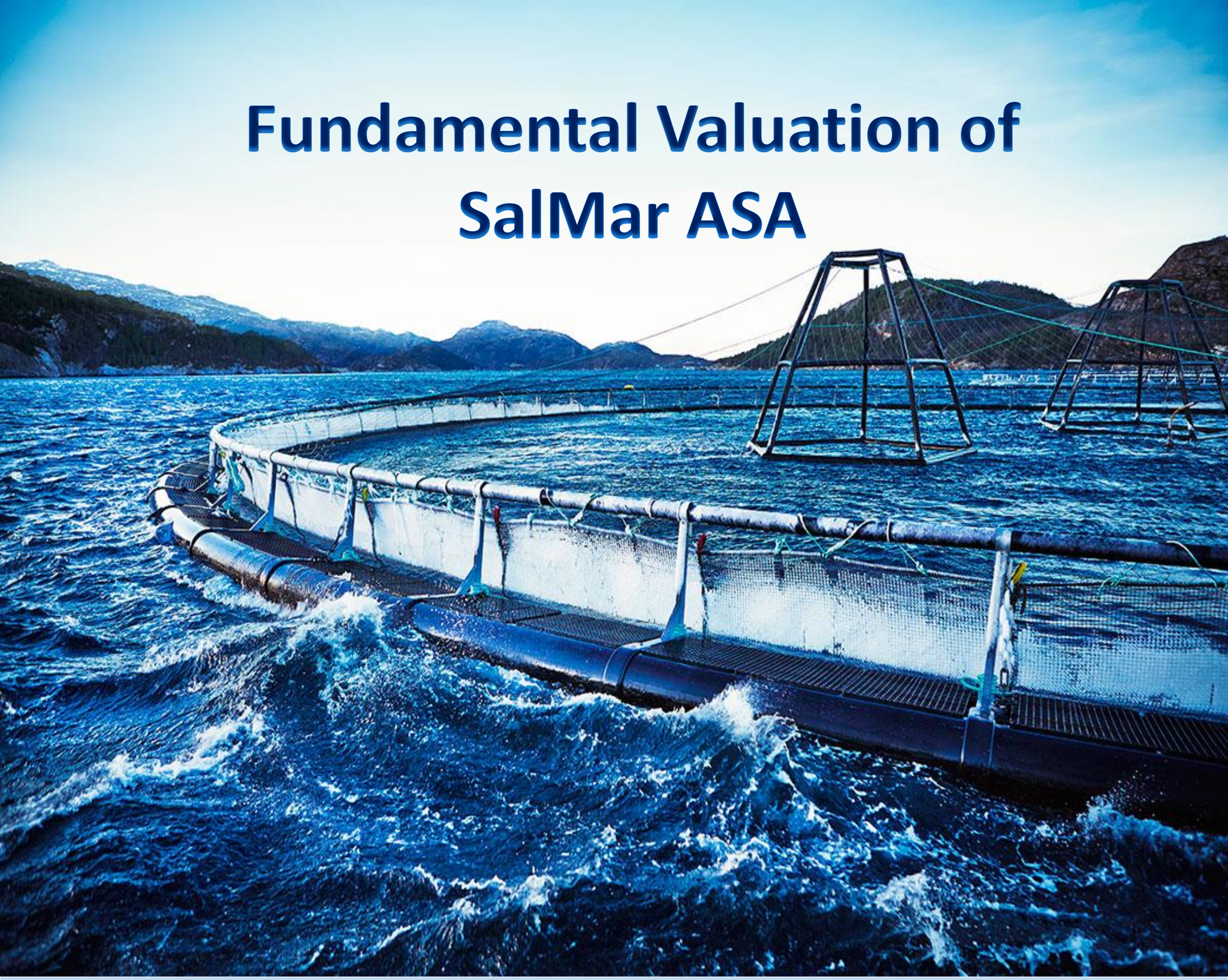
Fundamental Valuation of SalMar ASA



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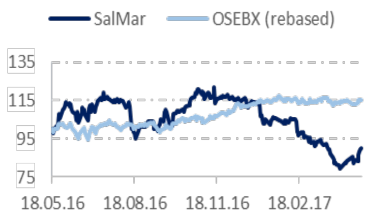
SalMar ASA- Executive Summary

Buy HOLD Sell

Key Data 1/05/2017	
Target Price (NOK)	182.33
Share Price (NOK)	203.7
Downside	10.50%

Key Info	
Country	Norway
Ticker	SALM
Market.Cap (NOK bn)	23.08
Enterprise Value (NOK bn)	25.54
Shares Outstanding (m)	113,300
Company Webiste	www.salmar.no

Multiples		
Year	16	17E
P/E	10.98	10.73
EV/EBIT	11.66	9.20
EV/EBITDA	10.20	7.87
EV/kg	274.18	215.00



Salmon prices at an all-time high

Salmon prices surged to an all-time high of NOK 78.75 per kilo in the last year. Plummeting supply and a weak Norwegian krone led to a record-year for salmon farmers, despite low harvest volumes. Looking forward, prices are expected to trend down but remain high, breaking the traditional cyclicality.

Pressured short-term supply and demand, future looking brighter

Norwegian supply is approaching maximum capacity. Prevailing biological challenges and a strict regulatory regime curtails future growth. However, new technology for land-based and open-ocean farming is showing potential. Short-term demand is falling due to unsustainable price-levels increasing the threat of substitutes. Long-term prospects are brighter, with demand set to grow on the back of population and economic growth in low- to middle-income countries especially. Further increase is expected from newly opened markets and a growing VAP-segment.

Biological threats and foreign exchange rates driving costs

Sea-lice remain the largest risk-factor for Norwegian salmon farmers, with no recovery in sight till 2019. Feed costs are similarly high due to a weak NOK and increased input commodity prices. As the sea-lice situation improves and the NOK strengthens, costs are expected to come down in the medium-term.

Full-year results and estimates					
NOKm	2015	2016	2017E	2018E	2019E
Revenue	7,366	9,317	8,477	8,548	9,421
EBITDA (adj)	1,771	3,106	2,206	2,231	3,109
margin	*24.0 %*	*33.3 %*	*26.0 %*	*26.1 %*	*33.0 %*
EBIT(adj)	1,444	2,719	1,768	1,789	2,647
margin	*19.6 %*	*29.2 %*	*20.9 %*	*20.9 %*	*28.1 %*
Pre-tax profit (adj)	1,054	2,039	1,344	1,360	2,011
ROIC after tax	13.8 %	24.0 %	15.3 %	15.9 %	22.8 %
ROE after tax	21.0 %	33.5 %	21.2 %	24.2 %	35.3 %

SalMar – Profitable, but not without challenges

SalMar stands out as the industry cost leader, which will be increasingly important as the industry matures and margin competition increases. However, SalMar's heavy exposure to sea-lice in Central Norway is driving costs up and keeping harvest volumes low. Meanwhile, there is potential in the form of SalMar's Ocean Farm 1 project and smolt technology. Furthermore, SalMar retains a competitive advantage in organic salmon. SalMar is forecasted to remain highly profitable; however, we find a slight downside in the share price on the back of a delayed sea-lice recovery profile.

Projections				
Year	2016	2017E	2018E	2019E
Salmon price (NOK)	63.13	59.63	56.76	58.08
Harvest volume (Tonnes)	115,600	118,957	124,818	135,887

Contents

1. Introduction

Today, Norway is the worlds leading producer of farmed Atlantic salmon, accounting for almost half of the global volume[1]. The long Norwegian coastline is ideally suited to the production of farmed salmon, with well-suited sea-temperatures and plenty of shelter. Norwegian aquaculture has exploded in the last decades, as a result of technological innovations and industry-consolidation enabling economies of scale. This has led to farmed volumes increasing with a compound annual growth-rate of 7% in the last ten years[2].

As the world's population continues to grow at an exponential rate, finding new ways to feed the growing population is one of the world's greatest challenges. Production of other protein-sources such as beef and pork is neither environmentally sustainable nor feasible given the lack of available agriculture space. Meanwhile, fish compromises only 6.5% of the worlds protein consumption, though 70% of the world is covered in oceans[3]. Increased production and consumption of fish, and here-under salmon, seems inevitable, with the UN projecting an 80% increase in demand by 2050. At the same time, catch from the worlds fisheries are stagnating due to dwindling stocks, paving the way for the aquaculture industry.

While the prospects of Norwegian farmed salmon may seem bright, there are significant elements of risk. The industry is plagued by biological challenges, the largest of which is the prevalence of sea-lice. In 2016, biological incidents in Norway and Chile led to a fall in global supply of more than 9%, which resulted in record-high salmon prices in excess of NOK 78 per kilo[4]. Growth is now heavily regulated by the government, and contingent on biological indicators, curtailing supply as producers approach maximum current capacity. This raises the question whether salmon farming is sustainable, and capable of meeting the growth in demand.

In response, the industry is continuing their focus on technological innovation, investing massively in R&D. This investment is close to yielding dividends through the enabling of salmon farming in the open-ocean, and on land[5]. The industry hopes that this will alleviate the biological challenges, enabling sustainable growth once again.

It is therefore our belief that Norwegian salmon farming represents a nuanced industry, with great potential, but similarly great challenges. There are many exciting things happening in the industry, especially in light of new technological innovations. As Norwegian students we are naturally particularly interested in investigating the industry, and the potential it represents for Norway as a whole. Especially now, as salmon farming is becoming increasingly important for

[1]FAO, *Global Aquaculture Production.*
[2]Marine Harvest Group, *Salmon Farming Industry Handbook*, p.17,28.
[3]Marine Harvest Group, *Salmon Farming Industry Handbook*, p.6.
[4]Fishpool, *Spot Price History.*
[5]Aadland, *Vil bruke over 9 milliarder på nye typer lakseoppdrett.*

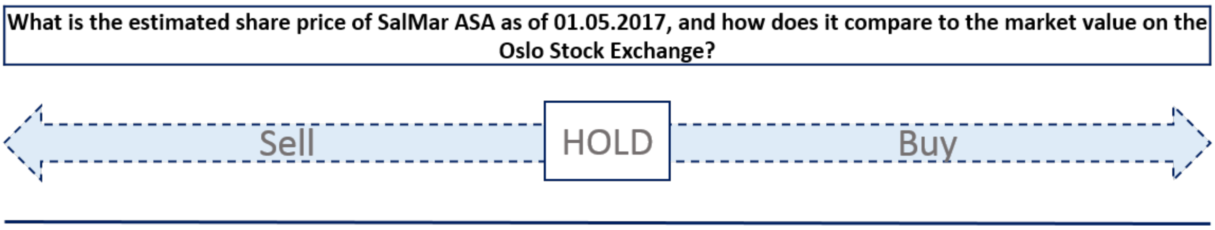
the Norwegian economy, in light of the declining oil industry.

We choose to do our examination through a valuation of SalMar. This allows us to build an in-depth understanding of the industry through our strategic analyses, while also yielding insight into what drives company value in the industry. SalMar emerges as a company of particular interest for us, being the worlds third largest producer of salmon, while simultaneously having operations concentrated almost wholly in Norway. SalMar is furthermore one of the most cost-efficient producers, consistently outperforming others in industry profitability measures such as EBIT/Kg, which piques our interest in SalMar's inner workings.

1.1 Research Questions

The ultimate goal of the thesis is to determine the fundamental value of SalMar ASA by analyzing SalMar and the industry through a variety of strategical frameworks, and then applying conventional valuation techniques on the gathered information. The thesis takes an investor point of view, which leads to the following research question:

Figure 1.1: Research question - Investment guide



As the final valuation will rest upon on a litany of assumptions, we recognize that the estimated fair value is exactly that; an estimate. We therefore supplement the research question with a supporting sub-question:

How confident can we be in our estimated share price?

The research question requires insight into a range of topics in order to be answered accurately. The topics will be explored through well-established theoretical frameworks, in order to achieve a coherent and comprehensive structure in the analyses. The frameworks are guided by overarching sub-questions, in order to gain actionable insight from the analyses and build a solid foundation for the valuation. The following subsections presents each section of the thesis, and the sub-questions associated with each section.

Salmon industry

The salmon industry chapter precedes the analyses, and the goal of the chapter is to introduce the concepts and characteristics specific to the salmon farming industry and SalMar in particular. In essence the chapter lays the factual groundwork of the following analyses.

The introductory chapter is guided by the questions:

- What characterizes SalMar?
- What characterizes the industry and how has it developed?
- Who are SalMar's peers

External analyses

The two first analyses are outwards-looking and concern external factors. Initially, we begin by utilizing Porter's framework to analyze the competitive environment of the salmon industry. Porter's Five Forces provides insight into how value is shared across industry participants, in addition to investigating whether the industry is in danger of value-destruction by profits being competed away. The framework is well-established, and a premier choice of analysts when looking at an industry.

The second framework applied is the PESTEL-framework. PESTEL is an extension of the original PEST-framework. Both frameworks cover the macro-environmental factors which affect an industry by looking at; political, economic, socio-cultural, technological, environmental, and legal factors. As will become apparent in the thesis, salmon farming is highly regulated and faces significant environmental challenges. Therefore, the thesis applies the extended version of the framework where these factors are included. When viewed in conjunction, Porter's Five Forces and the PESTEL-framework create a complete picture of the external forces affecting the industry.

The external analyses are guided by the questions:

- What are the most important environmental factors affecting industry value?
- How does industry competition affect profitability?

Price and cost analysis

Industry profitability is naturally highly dependent on the salmon prices achieved. Historically, prices have been fluctuating and volatile, which has become especially evident in the last year. We therefore dedicate a section to analyze salmon prices specifically. The analysis does not utilize any specific theoretical framework, but builds upon basic economic theory of supply-demand-price dynamics. In addition, the analysis contains an in-depth look at developments in production costs and the relevant factors affecting costs. The analysis allows for an educated forecast on global supply, demand, and price levels, and thereby SalMar's revenues and cost levels.

The price and cost analysis is guided by the question:

- What determines prices?
- What determines supply and demand?
- What determines costs?

Internal analysis

The internal analysis utilizes the VRIO-framework developed by J.Barney. The analysis addresses SalMar's internal capabilities, and is thereby introspective. By investigating SalMar's internal capabilities through the framework, sources of competitive advantage or disadvantage become apparent. The internal analysis provides explanatory power to SalMar's financial situation in relation to their peers, and provides expectations for the forward-looking statements.

The internal analysis is guided by the question:

- Does any of SalMar's resources translate into a competitive advantage or disadvantage?

Forecast and valuation

The forecast builds upon the findings of the strategic and financial analyses. The primary models used are the fundamental valuation models DCF and EVA, which are supported by a relative valuation based on multiples. The forecast section is based upon a base-case scenario, which uses the most likely and realistic assumptions gathered from the analyses.

- How will SalMar's key value drivers develop in the future?
- What is the estimated share price of SalMar?

Sensitivity analysis

The sensitivity analysis tests the sensitivity of the estimated share price to changes in the key value-drivers.

The sensitivity analysis is guided by the question:

- How sensitive is the share price to changes in value-drivers?

Scenario analysis

The scenario analyses are similar in function to the sensitivity analysis, in that it performs a valuation based on changes in the value-drivers. However, in the scenario analyses, the drivers are changed to reflect a given scenario, while still keeping the most likely assumptions given that scenario. The scenario analyses are basically "what-if" forecasts, where the "what-if"'s are selected events that have a realistic chance of occurring and a significant effect on SalMar and the industry.

The scenario analysis is guided by the question:

- What happens to the share price if we change fundamental forecast assumptions?

Monte Carlo

The Monte Carlo simulation functions as an extension of the sensitivity analysis. By defining maximum and minimum-values for our forecast parameters, Monte Carlo analysis allows us to run thousands of iterations of our model, giving a distribution for our share price. The maximum- and minimum-values are based on the findings of the sensitivity- and scenario- analyses, and supported by the findings of the strategic analyses.

The Monte Carlo analysis is guided by the main sub-question:

- How confident can we be in our estimated share price?

1.2 Methodology

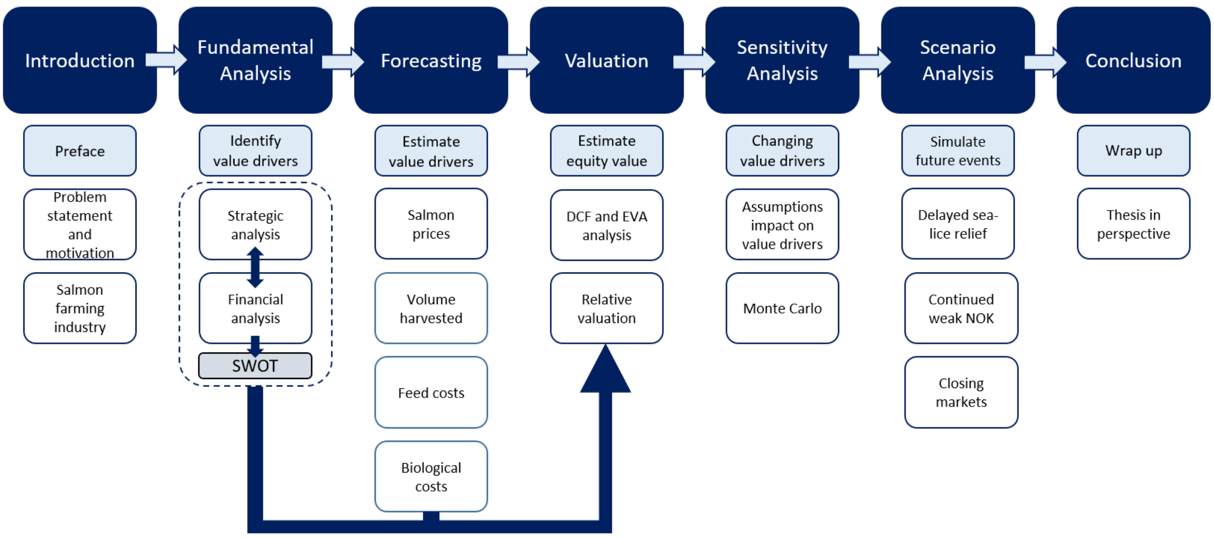
Data collection and validity

The thesis is based solely upon publicly available information from reputable sources. The quantitative accounting data gathered from annual reports has been audited by independent agencies. Other sources used in the thesis include sector reports and analysis from leading investment banks, peer-reviewed journals, and reputable news agencies. Frameworks and theoretical approaches are sourced from original sources or well-established academic literature. Wherever possible, the thesis has sought to only use information from unbiased and verifiable sources. Overall, we assess the risk of any data-manipulation or bias in the sources to be low.

Thesis Structure

In order to achieve a coherent structure in the analyses, we utilize well-established theoretical frameworks. The goal of the analyses is to identify SalMar's value drivers and risks, and develop an understanding of the various factors affecting them, in order to attain a solid valuation framework. The thesis is structured in such a way as to promote clarity and a logical build-up and dissemination of information. Figure 1.2 shows the chronological structure of the thesis, and highlights how the sections interact.

Figure 1.2: Thesis structure



Authors creation

1.3 Delimitations

Given the scope of the thesis, and seeing as how valuation is ultimately an imperfect science, some assumptions have been made when constructing the thesis.

- The thesis presumes that the reader has a basic understanding of economics, finance, and valuation theory.
- As the thesis takes the point-of-view of an investor, data is gathered solely from publicly available sources.
- As new information becomes available every day, the thesis only considers available information up until the cut-off date, which is set to equal the date of the valuation, 01.05.2017.
- Unless explicitly specified otherwise, any mention of "salmon" refers to the species Atlantic Salmon (Salmo Salar).

2. SalMar and the Salmon Industry

A successful valuation requires a fundamental understanding of the company and the industry in which it operates. The first section therefore performs an introductory role, with the aim of introducing SalMar and the salmon farming industry as a whole. The primary focus will be on Norwegian aquaculture, however salmon farming is a global industry, with salmon being traded as a commodity, so a global perspective is also utilized.

2.1 SalMar

SalMar is a Norwegian salmon farming company established in 1991 by Gustav Witzøe. The groups headquarters are located in Frøya in Sør-Trøndelag, where it was first founded. SalMar's first foray into salmon farming was made possible through the acquisition of a harvesting plant and a licence from a company in liquidation. The 90's was one of the most turbulent times in the history of Norwegian aquaculture, resulting in a number of bankruptcies in the industry. The bankruptcy of Fiskeoppdretternes Salgslag AL, the fish-farmers own sales organization, was of particular interest to SalMar. This bankruptcy formed the foundation for SalMar's entry into the market for secondary processing operations. Ultimately, the turbulent times ushered in an era of major restructuring for the Norwegian aquaculture sector, leading to significantly increased industrialization.[6]

From 2005, SalMar's core business activities have been the farming, harvesting, and processing of salmon, with vertical integration throughout the entire value chain; from breeding to the sale of finished products. Throughout the years, SalMar has gradually increased their farming capacity from the one original license, to the 100 licenses they have today. They have also transformed into an international corporation employing over 1,200 people by acquiring considerable holdings through sustained M&A activities. Growth through acquisition is typical in the industry, as organic growth is limited by regulations. SalMar remains active on the acquisition front, the latest undertaking being in 2016, where they increased their holdings in the Icelandic farming company Arnarlax HF to 34%[7].

SalMar was listed on the Oslo stock exchange (OSEBX) in May 2007. Today, SalMar is one of the largest and most efficient producers of farmed Atlantic salmon. SalMar is the third largest producer of Atlantic Salmon in the world, with a market cap of approximately NOK 29.2 billion.[8] With a harvest volume of 115,700 tonnes salmon in 2016, SalMar accounted for 9.88% of the Norwegian salmon supply, and 5.33% of the total global supply. In addition, SalMar controls 50% of Norskott Havbruk AS, who in turn control 100% of Scottish Sea Farms Ltd who harvested 28,000 tonnes in 2016. Furthermore, it controls 34% of Arnarlax HF, who harvested

[6]SalMar, *History.*
[7]SalMar, *History.*
[8]Oslo Børs, *SalmMr.*

4,000 tonnes in 2016.[9]

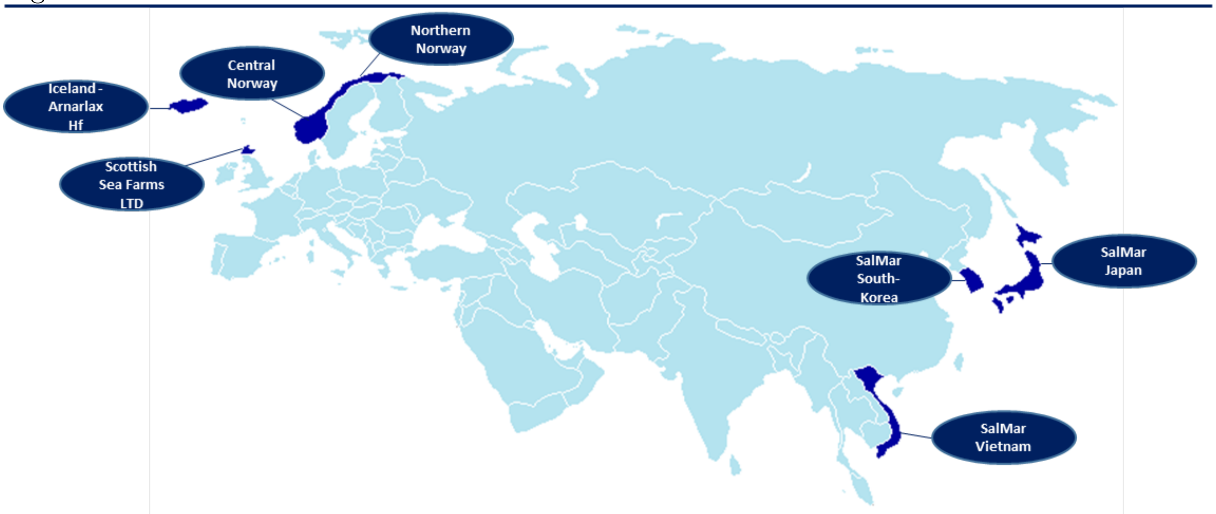
Business strategy and objectives

SalMar's vision is "Passion for Salmon", and has an ambition of becoming "the world's best fish farming company". SalMar aims to achieve this through two clear sub-goals; on the farming side, they will produce fish at the lowest cost by having the best operational efficiency, on the sales side, they will strive to achieve the best possible price for their salmon.[10]

2.1.1 Organizational Structure

SalMar has offices around the world, typically divided into three segments; roe and smolt production, farming, and sales & distribution. The Asian offices operate exclusively with sales & distribution, while the sales & distribution offices in Norway also handle processing. The farming and production operations are located in Norway, with joint-ventures and affiliates in Europe.

Figure 2.1: SalMar's locations



Author composed, Source: SalMar annual reports

2.1.2 Roe and Smolt Production

SalMar has six hatcheries, plus two which are under construction, for smolt production, one lumpfish production unit, and one on-shore facility for the production of roe. The facilities are located in Central and Northern Norway, and produced over 25 million smolt, 24 million roe, and 1.5 million lumpfish in 2016. Two of the facilities are geared toward organic smolt-production, which is more stringently regulated by environmental standards. The two facilities under construction have a total capacity of 23 million smolt, and play an important role in SalMar's bid to become fully self-sufficient in smolt-production.[11]

[9]SalMar, *SalMar Annual Report 2016*, p.6.
[10]SalMar, *SalMar Annual Report 2016*, p.11.
[11]SalMar, *SalMar Annual Report 2016*, p.21.

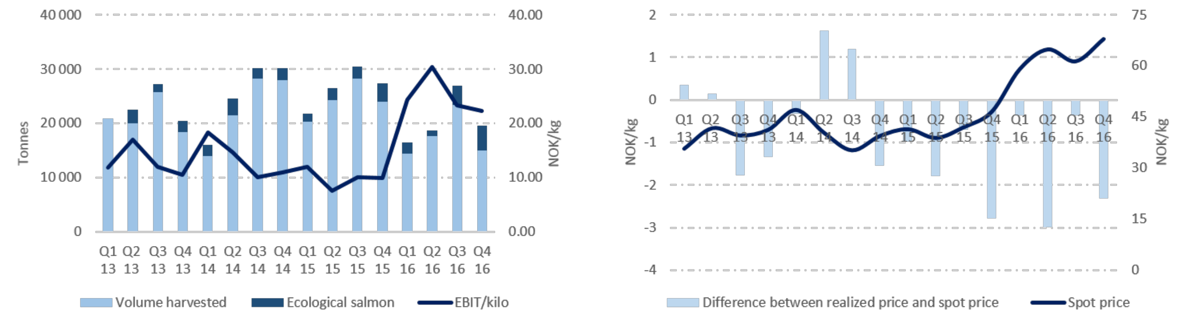
2.1.3 Fish Farming

SalMar's salmon farming operations are split into two geographical segments: SalMar Central Norway and SalMar Northern Norway. The development of harvested volumes and licenses in the respective regions can be found in the appendix[12].

SalMar Central Norway

The majority of SalMar's fish-farming takes place in Central Norway and is organized through SalMar Farming AS. Central Norway has several advantageous environmental conditions for salmon farming; good temperatures all year round thanks to the Gulf Stream and good circulation of seawater. The region was plagued by significant biological challenges impacting volumes in 2016, however overall performance significantly improved due to extraordinarily high salmon prices.

Figure 2.2: Performance in SalMar Central Norway



Author composed, Source: SalMar annual reports

As illustrated in figure 2.2, profitability, as measured in EBIT/Kg, increased by approximately 87% from 2015 to 2016[13]. Though as mentioned, 2016 was a challenging year biologically, with production costs increasing by 5.6 NOK/Kg, attributable to a difficult sea-lice situation. The region also accounts for SalMar's organic salmon production, with 30% of the volumes being farmed organically. In recent years, much of the organic volume was sold at the lower price-point of conventional salmon, as the Norwegian authorities failed to implement the EU's organic production regulations[14].

SalMar Northern Norway

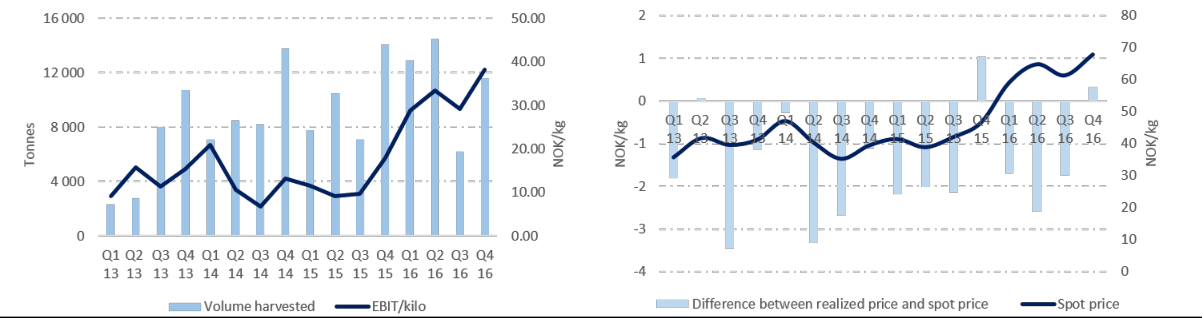
SalMar is present in Northern Norway through SalMar Nord AS, which is fully integrated. It consists of operations in ten districts, from southern Troms to Finnmark. SalMar has increased their holdings in the region, acquiring 18 licenses through a takeover of Villa Organic. The segment now holds 32 licenses and harvested a volume of 45,200 tonnes in 2016, an increase of approximately 14% from 2015. Like the operations in Central Norway, SalMar's Northern

[12]See appendix A.2
[13]SalMar, *SalMar Annual Report 2016*, p.49.
[14]SalMar, *SalMar Annual Report 2016*, p.49.

Norway activities are characterized by a focus on larger units. The region utilizes larger net-pens allowing increased smolt-transfers, which is expected to increase throughput and volume harvested.[15]

The segment had an extremely good year in 2016, illustrated in figure 2.3. The profitability increased by around 192% from 2015 to 2016, with an obtained EBIT/Kg of NOK 32.8. In contrast to Central Norway, the segment was relatively unaffected by sea-lice, and as a result production costs were relatively unchanged year-over-year. Due to a beneficial biological situation, the region represents a strong potential for future growth.

Figure 2.3: Performance in SalMar Northern Norway



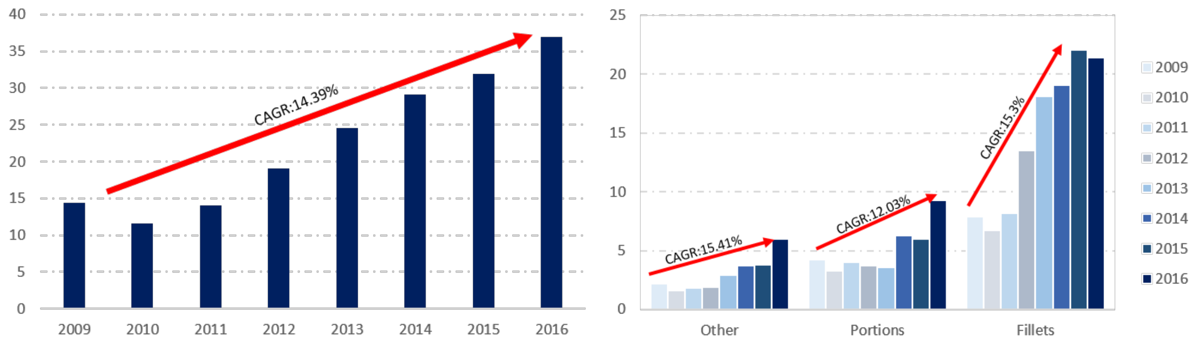
Compiled by authors, Source: SalMar annual reports

2.1.4 Processing, Sales and Distribution

SalMar's sales activities and onshore processing facilities are managed by the Sales and Processing segment. In 2016, the sales department handled sales of almost 130,000 tonnes of salmon and other fish-based products[16]. The department focuses on the markets in Europe, Asia and USA, and distribute salmon to more than 40 different markets[17]. SalMar's main processing facility and salmon harvesting is InnovaMar, which is located in Frøya. InnovaMar is a modern facility, containing advanced equipment for cost-effective harvesting and filleting. The facility has a capacity of 70,000 tonnes of salmon a year in one shift, a substantial percentage of which goes to further processing before the products are shipped to customers worldwide. SalMar processes volumes from the southern part of Central Norway through Vikenco, another processing facility. In 2016, Vikenco and InnovaMar together produced approximately 36,000 tonnes of processed salmon (VAP) measured by product weight. SalMar has an industrial cooperation agreement with Leroy Aurora AS who process the majority of the fish farmed in Northern Norway.

[15] SalMar, *Business Areas.*
[16] See appendix A.1 for a breakdown of SalMar's sales
[17] SalMar, *SalMar Annual Report 2016*, p.21.

Figure 2.4: Value added products in 1000 tonnes

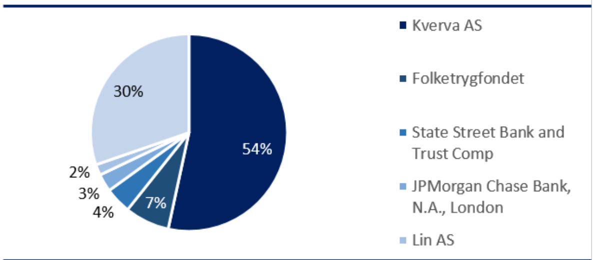


Compiled by authors, Source: SalMar annual reports

2.1.5 Ownership

At the end of 2016 SalMar had 113.3 million outstanding shares distributed between 3,828 shareholders[18]. Kverva AS, which is a holding company focusing on the marine sector, is the largest shareholder in SalMar with a majority stake of 53.4%. SalMar's co-founder Gustav Witzøe owns over 90% of the shares in Kverva AS and is also the director of Kverva AS. Folketrygdfondet, which is a long-term financial investment institution responsible for investing Norway's pension fund on behalf of Norwegian Ministry of Finance, is the second largest shareholder with 7.33% of the shares[19]. The rest of the shareholders in SalMar are mainly institutional investors who hold a lower portion of shares.

Figure 2.5: Ownership Structure



Compiled by authors, Source: SalMar annual report

2.1.6 Financial Performance

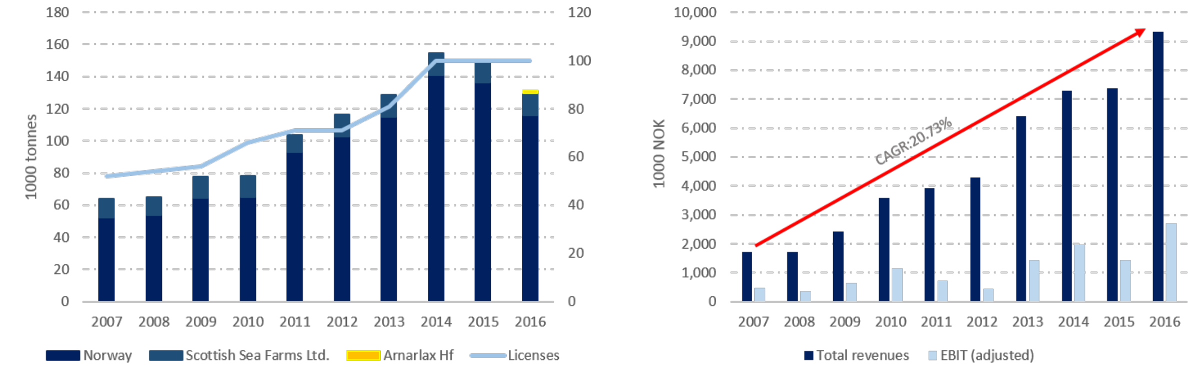
As the figure below illustrates, SalMar has experienced significant revenue growth since the listening of the company in 2007, achieving an average annual growth of 20.73% from 2007 to 2016. Unsurprisingly, the figure indicates a strong correlation between revenues and harvest volumes; SalMar's jumps in revenues correspond to periods where new licenses were acquired and harvest volumes grew. 2013 and 2016 were exceptional years, where revenues were amplified by high salmon prices.

EBIT has had a similar growth; 22.35% annually for the period, which is influenced heavily by the last three years[20]. Biological challenges is the prevalent risk-factor for SalMar, as evidenced by falling operating profits, despite growing revenues, in 2011, 2012, and 2015. As mentioned, 2016 was a spectacular year as a result of record-high salmon prices, despite depressed harvest

[18]SalMar, *SalMar Annual Report 2016.*
[19]Folketrygdfondet, *About folketrygdfondet.*
[20]See chapter 4

volumes owing to the biological challenges currently facing the Norwegian industry and SalMar Central Norway in particular. Excepting 2016, SalMar's volumes has seen steady growth.

Figure 2.6: Harvest volumes and financial performance



Compiled by authors, Source: SalMar annual reports

SalMar's revenues for the different segments; Fish farming Central Norway, Fish farming Northern Norway and Sales & Processing has experienced a CAGR of 51.5%, 26%, and 18% respectively between 2010 and 2015. Central Norway has experienced the largest growth, as it has historically been SalMar's main focus area.

2.2 Industry Structure and Development

The supply side of farmed Atlantic salmon has traditionally been concentrated to a few regions - Norway, Chile, Canada, and Scotland, where Norway is the largest producer by far. With Norway contributing to roughly 54% of the global supply of roughly two million tonnes in 2016. Norway produced twice as much Atlantic salmon compared to its biggest competitor, Chile, and the growth of the Norwegian supply is illustrated in figure 2.7. The second largest supplier by region is Chile, with a production of 27% of the total supply. Chile's position has strengthened, experiencing a significant growth pace the last years. As shown in figure 2.7, their share of global supply has increased from 10% in 2012 to 27% in 2016. Atlantic salmon is today also farmed in Australia, Faeroe Islands, Iceland, Ireland and New Zealand[21].

Figure 2.7: Growth in different markets

		CAGR	
Countries	1996-2016E	2005-2016E	2010-2016E
Norway	7%	7%	4%
Chile	9%	2%	24%
UK	4%	3%	3%
North America	5%	3%	2%
Others	7%	10%	9%
Total global supply	6%	5%	8%

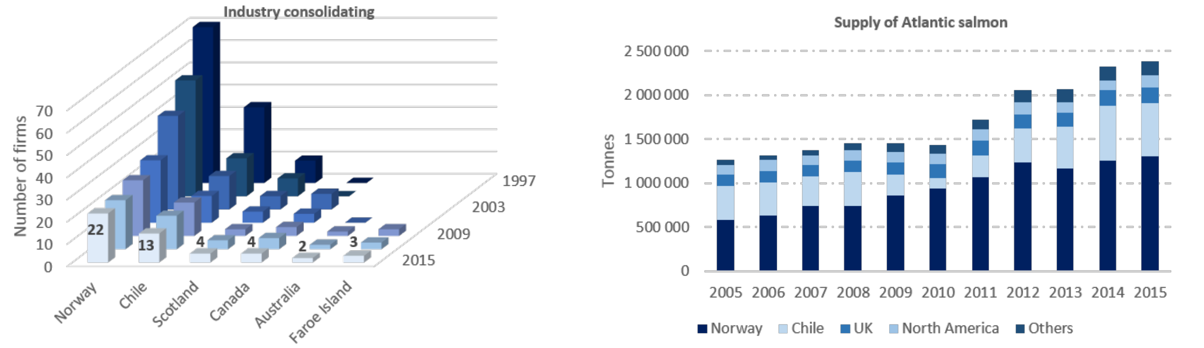
Compiled by authors, Source: MHG industry handbook

The supply side of salmon farming is dominated by a few regions due to the limited suitable coastal areas for salmon farming. There are several prerequisites for an area to be viable for salmon farming. The key prerequisite is temperature; the optimal temperature for salmon is in the range of 8-14 degrees Celsius. Another important requirement is that the coastline is sheltered, and that it has a certain current in order to exchange the water while still allowing

[21]Global Salmon Initiative, *About Farmed Salmon and Salmon Farming.*

the salmon to move freely[22]. Certain biological parameters and a degree of political willingness is also required in order for salmon farming to be commercially viable.

Figure 2.8: Salmon industry development



Compiled by authors, Source: Marine Harvest industry handbook 2016, Norwegian Seafood Council

As illustrated by the figure, the industry has gone through several structural changes; from being a fragmented industry to a more consolidated one. This trend is expected to continue[23]. Norway is more fragmented than Chile due to different government priorities. The Norwegian government prioritizes decentralized structures and local ownership, while the Chilean government prioritizes fast industry growth and therefore has fewer regulations on ownership structure.

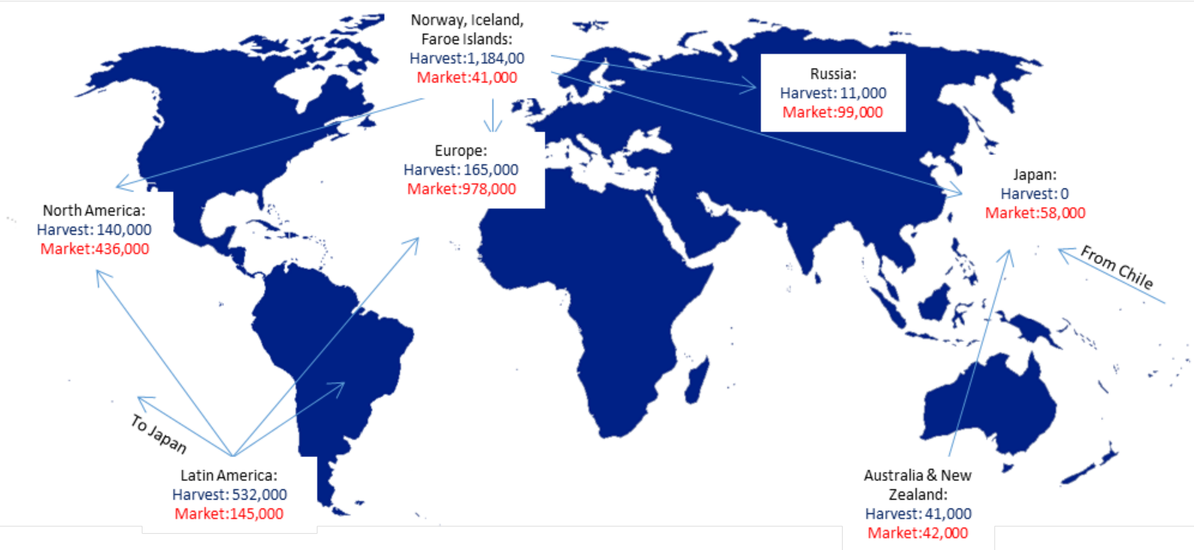
2.3 Salmon Market

The different regions producing salmon have historically exported to different main markets due to several factors. Since salmon is generally marked as a fresh product, the time and cost of transportation is significant. Other factors include the political landscape and trade barriers.

Norway has traditionally exported to the EU, Russia and Asia, Chile has served the US, South America and Asia, Canada has exported to the US West-Coast, and Scotland's main market was primarily domestic and within the UK. The transportation of frozen fish to distant markets requires the cost of airfreight, which is only justified when there is a significant price differential and volumes involved. High salmon prices are therefore helping to transform the industry from the historical set-up into a more globalized market. This has increased the competition for Norwegian fresh salmon by frozen Chilean salmon in the European market, even though the category of frozen salmon overall is decreasing. Similarly, Norway and Scotland increased their export of salmon to US when Chile faced reduced supply in 2009-2010. The market in Japan has experienced increased competition between Norway and Chile due to similar transportation costs.[24]

[22]Marine Harvest Group, *Salmon Farming Industry Handbook*, p.19.
[23]Marine Harvest Group, *Salmon Farming Industry Handbook*, p.28.
[24]Marine Harvest Group, *Salmon Farming Industry Handbook*, p.20-21.

Figure 2.9: Global trade flow of farmed Atlantic salmon in tonnes



Compiled by authors, Source: MHG industry handbook 2016

The EU is the biggest market for Atlantic salmon by far, with approximately one million tonnes imported in 2016. Europe's salmon imports in general has experienced a CAGR of 5% in the last ten years, indicating a continued strong demand for salmon. After that follows the US, with around 370,000 tonnes imported in 2016, and a yearly salmon import growth of 3%. The emerging markets are smaller by volume imported, but they have experienced a significantly higher growth rate than traditional markets. The import growth of Atlantic salmon in Brazil for example has been tremendous; with an annual growth of 19% in the last ten years. An interesting note is that Russia has experienced a demising import of Atlantic salmon, which is due to Russian sanctions that harmed the Norwegian salmon producers in particular. On average, the market for Atlantic salmon increased by 6.2% in all markets during the ten last years.[25]

2.4 Licenses and MAB

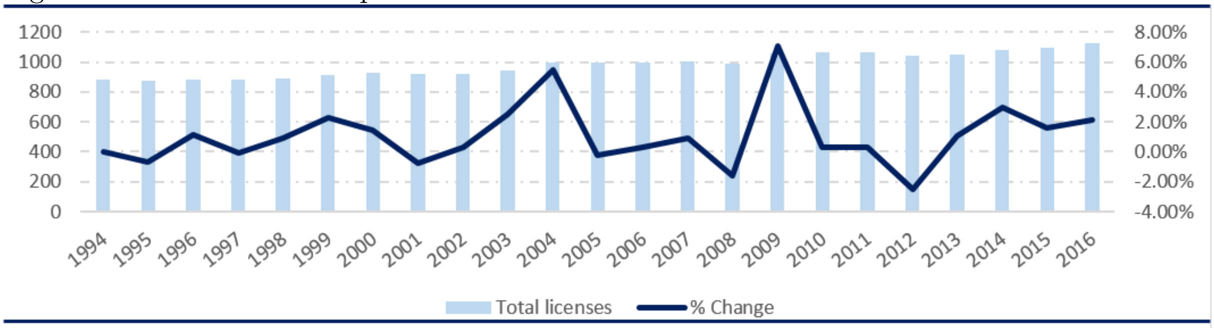
Salmon farming companies are dependent on licenses in order to operate, and these can either be acquired through new government issuings or in the second-hand market. New licenses are granted irregularly, but last in perpetuity once granted. They can however be withdrawn, if companies are in breach of conditions set out in the license or in aquaculture- or environmental-legislature. In sea water, farming licenses can be connected to up to four farming sites to increase capacity and efficiency.[26]

As the figure 2.10 illustrates, the total number of licenses in Norway in 2016 was 1067 and have been held relatively stable, with some exceptions. In 2013, the Norwegian Government announced 45 new licenses for salmon farming; green licenses, which have strict environmental

[25] Marine Harvest Group, *Salmon Farming Industry Handbook*, p.19.
[26] Marine Harvest Group, *Salmon Farming Industry Handbook*, p.57.

covenants attached to criteria such sea lice, escape risk and other environmental factors[27]. In November 2015, the Norwegian Government announced a new category of licenses; development licenses. Development licenses are issued to encourage increased investment into new technology. The licenses can be converted into commercial licenses for NOK 10 million if the development projects are successful.[28]

Figure 2.10: Licenses development



Compiled by authors, Norwegian Seafood Council

In Norway, production is further limited by regulations capping the "maximum allowed biomass" (MAB) per license. MAB denotes the maximum volume of fish each company can have in the water at all times. Each license has a MAB of 780 tonnes in Central, Southern, and Western Norway, but in Northern Norway the MAB is set to 945 tonnes. Around 1,200 tonnes gutted weight equivalent (GWE) is harvested annually per license in Norway, and larger companies are more capable of maximizing the output per license. Therefore, industry utilization on average is lower than the utilization of the largest companies. Furthermore, no company is allowed to control more than 50 % of the total biomass in any given region, as mandated by the Directorate of Fisheries. Even though each company has a limited maximum production volume based on a total MAB, total production will vary due to productivity, fish health, mortality, sea temperature and other factors.[29]

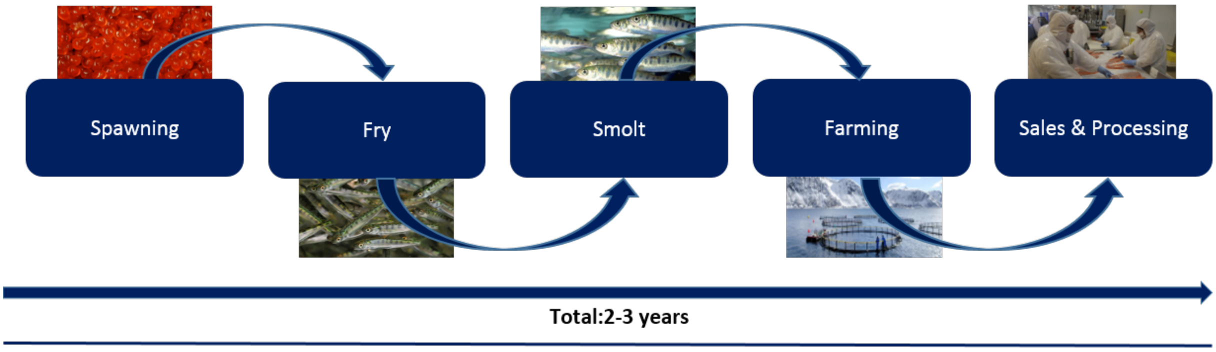
2.5 Production Life Cycle

The production chain of farmed salmon is an extensive process comprised of several stages, mirroring that of wild salmon. From egg to harvest, the total production cycle lasts about three years. The production life cycle is divided into a freshwater and a seawater stage, which take approximately 10-16 months and 14-24 months respectively. The life cycle is slightly shorter for Chilean farmed salmon due to more optimal water temperatures. In Chile, the temperature is quite stable around 10-14°C, while also having the highest average temperature of 12°C. The temperature plays an important role for salmon growth rates, since salmon is a cold-blooded animal which thrives in waters between 8-14°C. This gives Chile a natural competitive advantage compared to other regions.[30]

[27] Furuset, *Understanding Norway's Green Production Licenses.*
[28] Marine Harvest Group, *Salmon Farming Industry Handbook*, p.61.
[29] Marine Harvest Group, *Salmon Farming Industry Handbook*, p.58-59.
[30] Marine Harvest Group, *Salmon Farming Industry Handbook*, p.31-32.

The life cycle of farmed salmon starts with the broodstock; parents of the next generations, which are selected based on health, color, disease-resistance, and growth characteristics. The harvested eggs and milts from the broodstock are mixed during autumn to fertilize the eggs.

Figure 2.11: Life cycle



Authors creation

After roughly three months the eggs hatch into tiny fishes called alevins. They get nutrition from a yolk sac attached to their bellies. The yolk sac provides nutrition for the alevins for 7-8 weeks[31]. After this phase ends, the fish are large enough to feed themselves. At this stage the fish are called fry and are fed with dry pellets in order to improve the growth phase. The fry is moved into larger freshwater tanks or open net cage in a lake with a temperature around 12-14°C when the weight is around six grams. Feed requirements are increased significantly, since at this stage the growth rates are the most dramatic. At this stage vaccination is important to ensure robustness and resistance to common diseases. The fry are ready to enter saltwater once the weight is around 60-100 grams, which is the optimal weight and the fish are now called smolts. It is extremely important that the smolts are of optimal weight, since it influences survival and growth rates, and the occurrence of diseases[32].

After entering the seawater, they are referred to as salmon. It will take around 14-24 months, depending on the water temperature, before the salmon has grown to a size of 4.5-5.5 kg. This is the optimal harvest size where the salmon is ready to be transported to a processing plant where it will be slain, gutted and packaged. The harvest volume of farmed salmon is spread relatively evenly during the year, though it is highest in the last quarter due to better growth opportunities. Slaughtering and gutting are the primary processing, and most of the salmon will be packed whole and frozen into boxes with ice. Secondary processing is fillet, smoking and ready-meal or packing with modified atmosphere (MAP), and these products are called value-added products (VAP).[33]

[31] ISFA, *The cycle of salmon*.
[32] Asche and Bjordal, *The economics of salmon aquaculture*, p.49.
[33] Marine Harvest Group, *Salmon Farming Industry Handbook*, p.71-73.

2.5.1 Production Output

The production output from the value chain is primarily sold as fresh or frozen in commodity markets, but also as consumer-ready fillets or steaks[34]. The consumption of VAP products has increased during the last decade, and enjoys a price premium relative to frozen and fresh salmon. The value of the European VAP industry is now over EUR 25 billion, and is extremely fragmented, consisting of more than 4,000 companies[35].

Salmon contains high quality proteins, and is considered a healthy product compared to other animal protein sources. Atlantic salmon also has a high content of Omega-3 fatty-acids, several vitamins and minerals, making it an important part of a varied and healthy diet. The production of salmon is also more resource efficient and has arguably less of an environmental impact compared to other animal production.[36]

2.6 Profitability Cycle

Salmon is generally marketed as a fresh product, and therefore consumed in the same period as it is produced. Since farmed salmon has a production cycle of three years, adjustments in production levels is difficult and expensive in the short-term, making the short-term supply inelastic. Furthermore, both supply and demand experiences seasonal variations, which leads to significant price volatility in the market[37]. This results in a cyclical industry.

High prices and margins signals to suppliers to increase their production. However, due to the long production time, the underlying market situation may be substantially different when the increased production hits the market. This often leads to oversupply, with reduced prices and tighter margins. In turn, pressured margins signal decreased production. However, producers often similarly overestimate the required decrease, leading to a tight supply situation with higher prices and margins. And so the cycle continues.

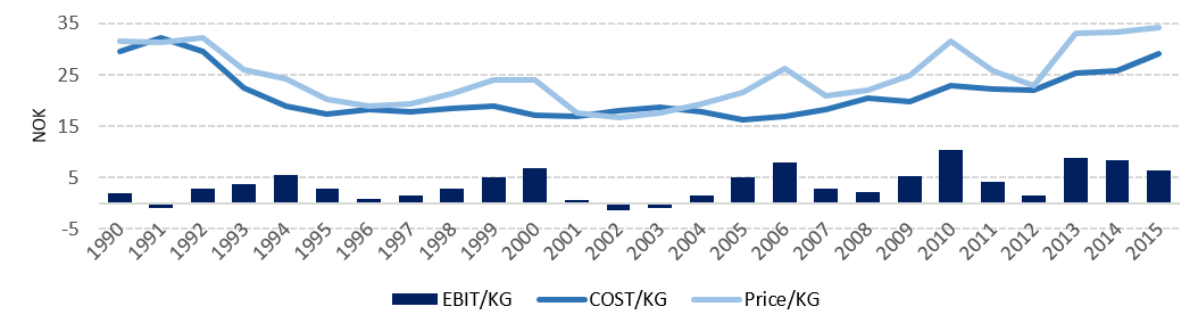
The figure 2.12 below clearly illustrates a cyclical industry. Years with higher margins are followed by years with pressured margins, and vice versa, in a roughly three-year long cycle. The years leading up to 2004 were characterized by steadily increasing industry-industrialization. This meant downward-trending costs due to economies-of-scale, consolidation, productivity growth, and improved fish health. The period also saw supply outperforming demand, pushing prices down[38]. From 1980 to 2007, the productivity increase led to a 75% fall in prices and production costs for Norwegian salmon[39]. In the last decade, costs are trending up again due

[34]Sea Food Health Facts, *About Farmed Salmon and Salmon Farming.*
[35]Marine Harvest Group, *Salmon Farming Industry Handbook*, p.74.
[36]Marine Harvest Group, *Salmon Farming Industry Handbook*, p.13-15.
[37]Marine Harvest Group, *Salmon Farming Industry Handbook*, p.24.
[38]Marine Harvest Group, *Salmon Farming Industry Handbook*, p.54.
[39]Waite *et al.*, *Improving Productivity and Environmental Performance of Aquaculture*, p.46.

to increased feed costs, biological costs and more stringent regulatory compliance procedures[40]. Finally, the years with the highest profitability evidently correspond to periods with higher prices.

Due to the industry cyclicality, the industry norm is to use fixed-price contracts to partly hedge against unfavorable price-movements. The degree to which industry participants utilizes hedging forward-contracts depends on their targeted risk-profile, and is ultimately a strategical consideration. Though fixed-price contracts protect against unfavorable price-movements, in times where prices significantly over-perform, a high-contract coverage ratio can be detrimental. For example in late 2016 and early 2017, when spot prices reached an all-time high, contracts were typically locked in at a much lower price, meaning firms were unable to take full advantage of the price-levels[41].

Figure 2.12: Profitability Cycle



Authors creation, Source: FishPool, Directorate of Fisheries

2.7 Cost Structure

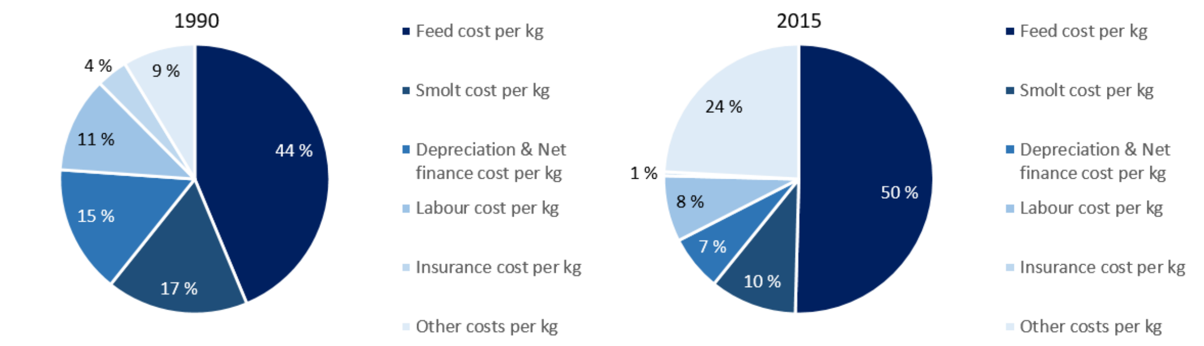
Production costs per kilo has increased dramatically; growing almost 90% in Norway since 2005[42]. This is primarily due to higher feed and medicinal treatment costs[43]. Feed is the most important input factor, accounting for circa 50% of the operating costs of the Norwegian aquaculture industry in 2015, compared to 43.7% in 1990. Feed costs are dependent on both the efficiency of feed utilization[44], the feed composition used, and feed commodity prices[45]. The two most important ingredients in fish feed has historically been fish-meal and fish-oil, which are made primarily from non-edible fish[46]. The supply of these two ingredients is constrained, and therefore partly replaced by agricultural commodities like soy, wheat, corn, sunflower, and rapeseed oil[47].

Costs related to smolt-production has a lower portion of total production cost than in 1990,

[40]Marine Harvest Group, *Salmon Farming Industry Handbook*, p.54.
[41]SalMar, *SalMar Annual Report 2016*, p.44.
[42]Iversen, *Almost twice the cost to produce farmed salmon.*
[43]Iversen *et al.*, *Kostnadsdrivere i lakseoppdrett*, p.1.
[44]Amount feed used to produce one kilo of salmon
[45]Iversen *et al.*, *Kostnader for lakseoppdrett i konkurrentland*, p.53.
[46]Laksefakta, *Hva er i foret til laksen?*
[47]Marine Harvest Group, *Salmon Farming Industry Handbook*, p.83.

due to a higher survival rate as a result of better disease-prevention and improved farming practices[48]. Other costs, which are mainly related to biological costs, increased its share from 8.68% to 24.13% due to problems regarding sea-lice, as illustrated in figure 2.13.

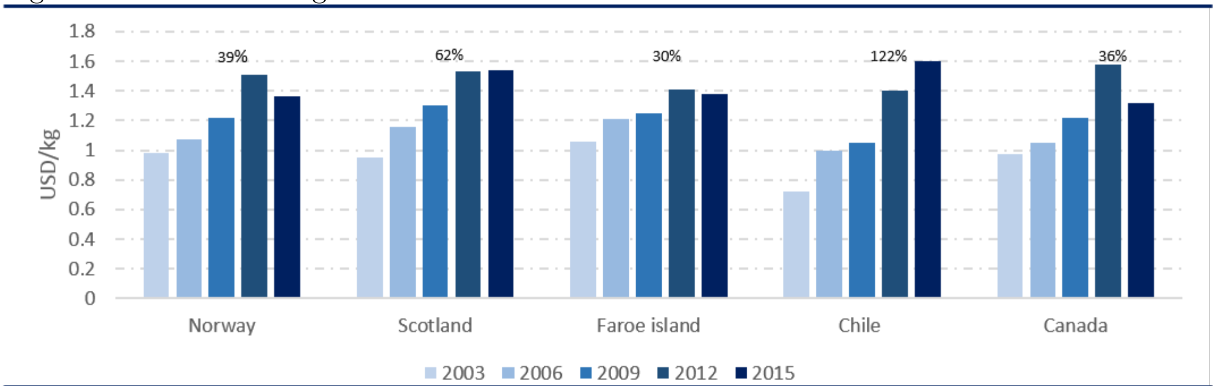
Figure 2.13: Cost structure development



Author Composed, Source: MHG industry handbook 2016

The feed cost for other competing countries is illustrated below, and their total production costs in the appendix[49]. Canada, Scotland, and the Faroe Islands are included solely for illustration purposes. While costs increased by 39% in Norway, Chile's cost-levels grew by 122%. Norway has the lowest production costs per kilo, while Chile has moved from cost-leader to cost-laggard. In 2015, Chile had a cost-level about 10 NOK/kg higher than the Norwegian production costs.[50]

Figure 2.14: Different regions feed cost



Author Composed, Source: Nofima

2.8 Peer Group

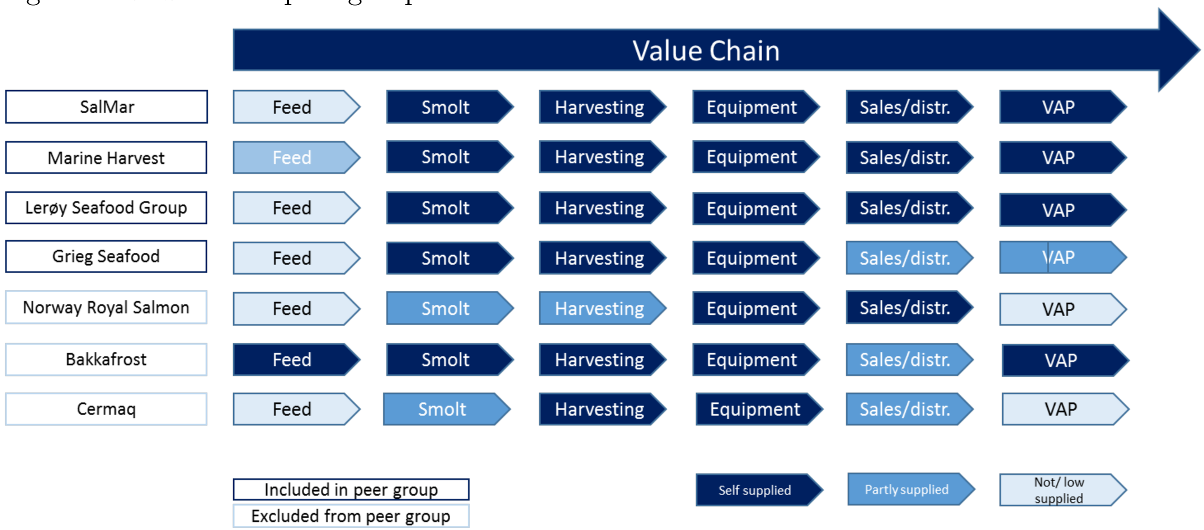
In order to create a benchmark for the coming analyses, we need to define a peer group for SalMar. Because the peer group acts as the benchmark in the financial and strategic analysis, it is important that the companies chosen for the peer group are as similar to SalMar as possible. Similarity entails that the companies are comparable to SalMar in; size, in which markets they operate, and in how integrated they are. Furthermore, it is imperative that the companies

[48] Asche and Bjordal, *The economics of salmon aquaculture*, p.49.
[49] See appendix A.3
[50] Iversen *et al.*, *Kostnader for lakseoppdrett i konkurrentland*, p.10.

operate with a similar risk-profile as SalMar. Apart from acting as a benchmark in the strategical and financial analyses, the peer group is also used in the valuation based on multiples.

In order to determine SalMar's peer group we compared companies listed on the Oslo Seafood Index. The main characteristics we have looked at for determining the peer group is production location, production volume, the degree of integration, and main business area. Norway Royal Salmon is excluded because of their lack of integration, and because they have operated with a different business model during most of historical period, functioning more as a sales than a farming company. Cermaq is excluded since it is not listed on the OSEBX anymore, and because it is not fully integrated in the value chain. Bakkafrost on the other hand is excluded since it is not of Norwegian origin and operates primarily in the Faroe Islands.

Figure 2.15: SalMar's peer group



Compiled by authors, Source: Annual reports

The chosen companies: Marine Harvest, Grieg Seafood and Lerøy are introduced in greater detail in the following subsections. Harvest volumes and market capitalization is gathered from the respective annual reports and the Oslo stock exchange.

Marine Harvest ASA

Marine Harvest ASA is one of the largest seafood companies in the world, and the world's largest producer of Atlantic salmon. The company was listed on the Oslo stock exchange (OSEBX) in July 1997 and has a market cap of approximately NOK 70bn. In 2016, Marine Harvest had a market share of 22.94% of the Norwegian market and a share of 17.59% of the total global salmon production. In 2016 Marine harvest harvested a volume of 380,600 tonnes (GWE), while their total production capacity was between 487,000-552,000 tonnes. Their headquarters are located in Bergen, Norway, with operations in more than 70 markets worldwide. In an effort to become fully self-sufficient, Marine Harvest have started production of their own fish feed.

Lerøy Seafood Group ASA

Lerøy Seafood Group is a Norwegian leading seafood exporter and the world's second largest producer of Atlantic Salmon by harvest volume. The company was listed on the OSEBX in June 2002, and has the third largest market cap at roughly NOK 26bn. In 2016, Lerøy had a market share of 12.15% of the total supply of farmed salmon in Norway, and 8.2% of the global market. Lerøy is fully integrated, with the exception of feed production. Their headquarters are located in Bergen, and they have a global sales network which includes daughter companies and sales offices in several countries, along with 14 processing facilities located in different European countries. In 2016 Lerøy produced 157,700 tonnes of salmon. Lerøy also have a joint venture with SalMar for farming in Scotland.

Grieg Seafood ASA

Grieg Seafood ASA is one of the world's leading fish farming companies, listed on the OSEBX in 2007, and have a market cap of approximately NOK 9bn. In 2016, Grieg had a market share of 2.85% of the production in the Norwegian market and 3.38% of the global market. Grieg Seafood's headquarters are located in Bergen, Norway, and they are also present in Canada and in Shetland. In 2016, Grieg Seafood harvested 64,272 tonnes (GWE), while they had a capacity of roughly 99,000 tonnes.

3. Strategic Analysis

The strategic analysis consists of both external- and internal-analyses. The external-analyses are further divided into three distinct analyses. First, the PESTEL-framework is applied to investigate the macro-environmental factors affecting the Norwegian salmon farming industry. In the second, Porter's framework is used to analyze the level of competition within the industry, to determine the attractiveness of the industry. The third external analysis concerns salmon prices and what affects them. Following this, is an internal analysis which covers SalMar's internal capabilities through Barney's framework, to determine whether any of the capabilities represent a competitive advantage or disadvantage for SalMar.

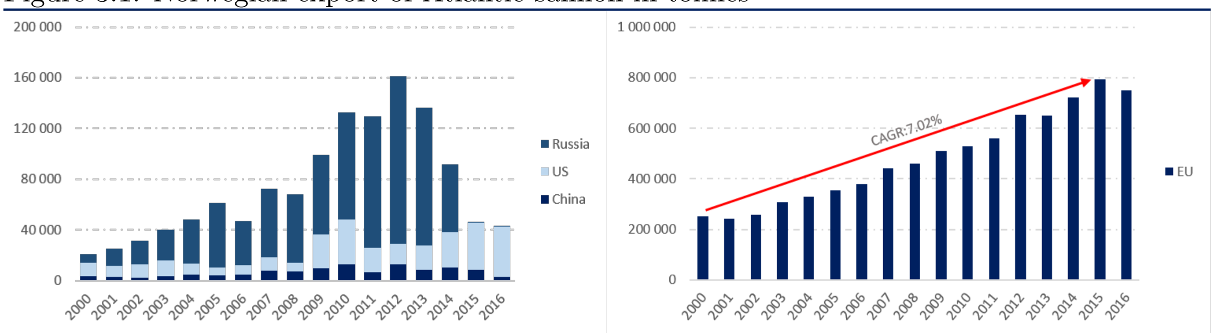
3.1 Macro-Environmental Analysis

The goal of the PESTEL-analysis is to identify key factors in SalMar's macro-environment which affect their strategic outlook. An analysis on the external influences on SalMar allows a better understanding of the industry as a whole, allowing for a more nuanced scenario building, and consequently a more robust valuation. In the following subsections, the political (P), economical (E), socio-cultural (S), technological (T), environmental (E), and legal (L) influences will be analyzed as per the model.[51]

3.1.1 Political

In section 2.2 we outlined how certain regions, therein Norway, are ideally suited for salmon production. This has led to a few global supply regions which export to the rest of the international market. SalMar, who have almost the entirety of their operations situated in Norway, are therefore largely affected by the geopolitical climate in Norway. Trade agreements or restrictions, embargoes and import taxes all play a large role in which markets SalMar are able to service profitably. Note that the following is not an exhaustive list of all SalMar's markets, but rather a highlight of areas where trade has become largely politicized.

Figure 3.1: Norwegian export of Atlantic salmon in tonnes



Complied by authors, Source: Norwegian Seafood Council

[51]PestleAnalysis, *What is Pestle Analysis?*

The EU

Norway is not a member of the EU. They are however a part of the European Economic Area (EEA), and members of the World Trade Organization (WTO), and the European Free Trade Association (EFTA). The EEA-agreement article 9, allows for duty-free trade of several whitefish products, but does not include salmon. Instead, salmon has associated import-duties ranging from two to twelve percent, depending on the degree of processing. In addition there is a duty-free quota of 450 tonnes of Norwegian smoked salmon, the product with the highest import duty. Article 9 also protects against excessive protective tariffs and quantitative import limits. The exclusion of salmon from article 9 and the protection offered has had a profound effect on the salmon farming industry historically, as the EU has enacted temporary punitive measures against the industry several times in the past 20-years. In 2008 though, Norway won their WTO case against the EU, forcing a restoration of trade conditions.[52]

Russia

Russia represents a large market, and has the additional upside of being geographically close to the Norwegian salmon production facilities; an important factor when exporting fresh goods. Traditionally Russia has been Norway's largest market, and SalMar's third largest market, however in 2015 Russia instituted a retaliatory ban on all import of Norwegian salmon as a response to sanctions on Russia[53]. This closed the door for SalMar, and opened up an opportunity for Chilean aquaculture to fill the gap. Noticeably though, SalMar's exports to Russias neighbouring countries increased drastically, offsetting part of loss associated with the ban[54]. With a new administration in place in the US, which seemingly looks to repair relations with the Kremlin, the probability of eased sanctions increases, and correspondingly a lift on the Russian retaliatory sanctions. It seems unlikely though that the EU will follow suit and align themselves more with Russia.

China

In Asia, the primary challenge for SalMar has been Norway's strained relationship with China following the political fallout of awarding the Nobel Peace Prize to Chinese dissident Liu Xiaobo in 2010. Before the souring, when Chinese consumption was around 20,000 tonnes, Norway had a market share of 94 % of imported fresh salmon[55]. In late December last year, political relations were finally normalized following extensive diplomatic efforts[56]. This has allowed trade-talks to resume, however it will take time before any trade-agreements are finalized and Norwegian salmon can flow freely to China again[57]. At the time of normalization, the Norwegian market share had fallen to approximately 3 %, of a market which has grown to consume 70,000 tonnes.

[52] Norwegian Government, *Fisk og EU - Informasjon om Norges fiskerisamarbeid med EU.*
[53] Galouchko, *Norway Salmon, Anyone?*
[54] MySalmon, *Putin Neighbours Boost Salmon Imports 40%.*
[55] Berglihn, *Spår 20-doblet lakseeksport etter Kina avtale.*
[56] Milne, *Norway and China resume diplomatic ties after Nobel rift.*
[57] NTB, *Sandberg til Kina i mai.*

Depending on the level of competition, analysts indicate that Norwegian salmon exports to China could quickly increase twenty-fold, measured by tonnage[58].

North-America

The US decided to remove the 24% anti-dumping duty on whole fresh farmed Norwegian salmon in 2012, 20 years after it was introduced. The import duty wiped out Norwegian exports to the US almost overnight; but the removal has steered growth into positive territory again[59]. Norwegian exports to the US has more than doubled in just three years, due to Americans preferring salmon from Norwegian farmers who use less antibiotics than Chilean farmers[60].

American consumers are partly shielded from the high salmon prices by a strong dollar, and their consumption of seafood increased with 5% from 2014 to 2015. Imports of Norwegian salmon are up by 2% in 2016, a year where other main markets dropped due to high salmon prices[61]. This points towards the US as an attractive market in growth. However, the current administration has proposed a protectionist Border Adjustment Tax (BAT) plan, which could harm salmon imports dramatically, and Norwegian salmon in particular[62]. Nordea Markets project that the proposed tax could impact more than 400,000 tonnes of imported farmed salmon[63]. Since the US domestic supply is less than 2% of the global supply, the tax would have a huge negative effect on the world's largest single salmon market.

As mentioned, the old anti-dumping import duty wiped out almost all imports of Norwegian salmon. However, things look a little different today, due to a low domestic supply, and therefore no US companies able to take over. Hence, Nordea assumes the tax will put considerable downwards-pressure on salmon prices, due to a huge proportion of salmon sold to US being moved to other markets, oversaturing supply.[64]

3.1.2 Economic Factors

Economic factors are determinants of an economy's performance that directly impacts a company and have resonating long term effects[65]. The highlighted economical factors affecting SalMar include interest rate risks, currency risks, and global economic growth; there-under consumer purchasing power.

[58] Berglihn, *Spår 20-doblet lakseeksport etter Kina avtale.*
[59] Schjetne, *USA fjerner straffetoll på laks.*
[60] Mikalsen, *Antibiotika-fri norsk laks er blitt en slager i USA.*
[61] Norges Sjømatråd, *Sjømateksport for 91,6 milliarder i 2016.*
[62] Egeness, *Hva betyr Trump for sjømateksporten til USA?.*
[63] Nordea Markets, *Equity Research - Seafood*, p.5-6.
[64] Nordea Markets, *Equity Research - Seafood*, p.5-6.
[65] PestleAnalysis, *What is Pestle Analysis?*

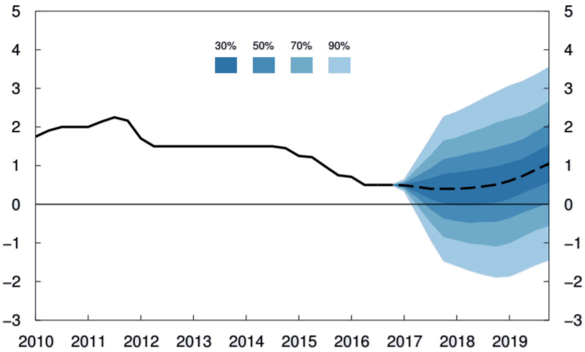
Interest Rate Risk

The salmon farming industry is, as most all other industries, partly debt financed. This exposes SalMar, who have their borrowing portfolio at floating interest rates, to interest rate risk. For SalMar, all their debts are in NOK and financed by Norwegian banks. SalMar state that they pay interest based on the NIBOR plus a credit spread[66]. More information on their interest debt payments can be found in section 5.1.4 about cost of debt. Consequently, changes in NIBOR will have an effect on SalMar's financial performance.

NIBOR can be decomposed into the expected key interest rate as determined by the central bank, and a risk premium. From late 2014 to mid 2016, the risk premium has increased by about 35 basis points, which is mainly attributed to increased liquidity in the euro area and banks adaptation to the new liquidity regulations imposed by BASEL III[67].

During the financial crisis, where the key interest rate was slashed from 5,75% to sub-3%, the 6-month NIBOR nonetheless reached between 5 and 7 %, owing largely to a large risk premium in EURIBOR and a scarcity premium on USD compared to EUR. A similar but smaller situation arose in the European government securities market crisis in 2011-2012, also owing to a scarcity premium on USD. Following the crisis, the NIBOR has held low, ranging from 2.5% to an all-time low of 1.05%. This is largely due to the historical low key interest rate being held at 0.5%. Prognosis' expect the key interest rate to see a slight dip before stabilizing at 1% in the coming years[68], as shown in figure 3.2. Consequently, NIBOR is expected to remain low in the upcoming years.

Figure 3.2: Key Policy Rate



Source: Norwegian Central Bank

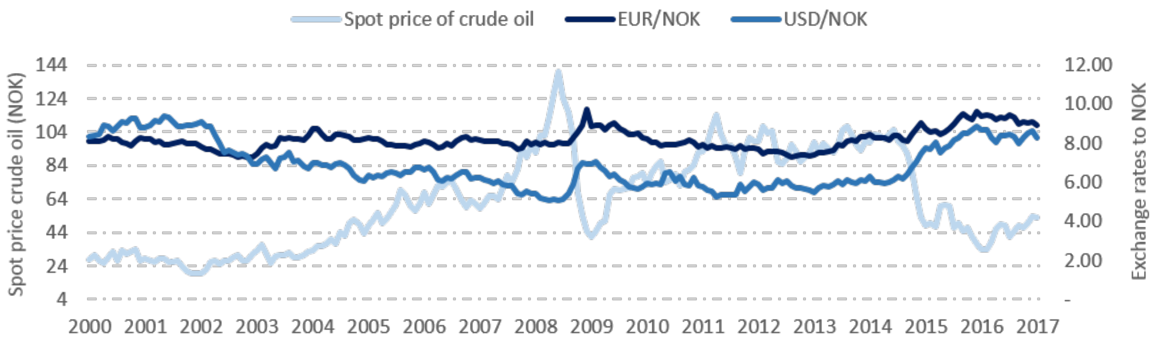
Foreign Exchange Risk

The majority of SalMar's salmon is sold internationally, primarily in EUR, USD, GBP and JPY. Changes in exchange rates therefore represent a significant risk for SalMar, and are partly hedged using forward contracts and currency accounts. Sales in foreign currencies are hedged on the transaction date, while contract sales are hedged when the contract is entered into[69]. The cost-side is less exposed to currency risk, given that most input factors and salaries are paid largely in NOK[70]. Despite the various hedging strategies employed, SalMar ultimately

[66]SalMar, *SalMar Annual Report 2015*, p.45.
[67]Lund, Tafjord, and Øwre-Johnsen, "Hva driver Nibor-påslaget", p.2-3.
[68]Lund, Tafjord, and Øwre-Johnsen, "Hva driver Nibor-påslaget", p.7-10.
[69]SalMar, *SalMar Annual Report 2015*, p.66.
[70]SalMar, *SalMar Annual Report 2015*, p.44.

benefit from a weak NOK relative to other currencies. The NOK is commonly referred to as a commodity currency, due to it's dependency on oil prices. Much of Norwegian salmon exporters revenues can therefore be seen in part as a result of the low oil-price of recent years.

Figure 3.3: Exchange rates vs oil price



Source: Investing.com - Exchange rates and World Bank - World Development Indicators

Feed prices act as a counterweight to the revenue benefits of a weak NOK. Salmonid feed is composed of globally traded commodities; vegetable oils and fats, and fish-feed and -meal. These commodities are primarily quoted in USD[71]. As a result, the NOK to EUR exchange rates is the largest risk influence for revenues, while the NOK to USD exchange rates is the largest risk influence for costs. Worth noting is that the American market is growing, meaning some of the associated cost-risks are in the future expected to be offset by revenue gains. For a further discussion on feed prices, see the corresponding section 3.3.4.

The Norwegian krone was strong comparatively in the years following the financial crisis. From 2011 to 2013, NOK was at record highs against the EUR; the most important market for SalMar. Since then though, the NOK has weakened comparatively against most all major relevant currencies. Forecasts from the Norwegian statistical institute point to a small strengthening of NOK to EUR, as a result of higher oil prices and equalized inflation rates between the EU and Norway. In 2019 and forwards, the trend is expected to turn, with a weaker NOK due to reduced differences in interest rates[72]. More specifically, the EUR/NOK rate is expected to depreciate in the coming year to around 8.6. According to SEB, the NOK is currently undervalued, and most market participants are anticipating a slightly stronger NOK. Nordea and Danske Bank expect EUR/NOK to be at 8.5 and 8.7 respectively in April next year[73].

NOK is furthermore expected to appreciate relatively to USD in the short- and long-term. SEB predicts the USD/NOK to depreciate to a level of 7.78 in the beginning of January[74]. Handelsbanken are predicting an even lower USD/NOK; 7.61 at the end of 2018, and 6.88 at the end of 2019[75]. This will as mentioned influence SalMar's feed costs positively, given the

[71]Marine Harvest Group, *Salmon Farming Industry Handbook*, p.53.
[72]Statistics Norway, *Økonomiske Analyser*, p.20-22.
[73]Danske Bank, *FX Forecast Update*, p.4-6.
[74]SEB, *Currency Strategy*.
[75]Handelsbanken, *SHB Forecast*.

propensity for feed to be quoted in USD.

Economic growth

In general, per capita fish consumption is expected to grow fast in regions with the highest projected income growth: China, India, South and South-East Asia[76]. Coincidentally, these regions are also the most populous, which indicates a projected rise in world per-capita fish consumption; despite some areas which are projected with regressive consumption, such as Sub-Saharan Africa. Indeed, several studies have shown a causal relationship between income and fish consumption. Jang and Chang provide clear support for the positive long-term co-integrated relationship between GDP and fishery consumption[77]. Trondsen et al. show that those with the highest income had significantly lower likelihood of perceiving price as a barrier to consumption of fish[78]. Given the high price of salmon, it seems reasonable to posit that increased income, as measured by GDP, will increase salmon consumption.

World bank estimates put global GDP growth at 2.7 % per annum. However, growth attributed to advanced economies, as defined by the World Bank, is forecasted to 1.8 % per annum. The majority of GDP growth is therefore concentrated in emerging markets and low-income countries, with an expected GDP growth of 4.4 and 5.6 % respectively in the next three years. Economic growth prospects therefore point towards an increase in global demand for salmon, and hereunder farmed salmon.[79]

3.1.3 Socio-Cultural

Socio-cultural aspects are the areas that involve the shared belief and attitudes of the population, and can play a large role in driving consumer demand. The factors deemed most pertinent for SalMar is the general population growth, and the degree of health consciousness present in the population.

Health benefits

What constitutes health, a healthy lifestyle, and a healthy diet are hotly contested topics; though fish consumption is generally accepted to be healthy by the scientific community. Atlantic salmon is rich in long-chain omega-3, which is linked with reduced risk of cardiovascular disease. In addition, salmon is rich in macro-nutrients, and contains both vitamin A and D, on top of being a high-quality protein source[80]. On the other hand, Norwegian farmed salmon has been repeatedly criticized for having dangerously high toxicity levels, containing trace mercury amounts and dioxin molecules[81]. This concern was among the arguments provided by Chinese and Russian governments when limiting imports.

[76]FAO, *The State of World Fisheries and Aquaculture*, p.65.
[77]Jang and Chang, "National income and fishery consumption: a global investigation", Abstract.
[78]Myrland and Trondsen, "Determinants of Seafood Consumption in Norway", Abstract.
[79]World Bank, *Global Economic Prospects.*
[80]Marine Harvest Group, *Salmon Farming Industry Handbook*, p.5.
[81]Landau, *Farmed or wild fish: which is healthier?*

In more recent years, the reputation of Norwegian aquaculture has improved, owing mainly to better compliance to sustainability standards, a better technology base, and changing fish feed makeup. A majority of SalMar's farms are ASC-certified, the most stringent standard, and SalMar has another farm up for review in 2017[82]. The importance of bettering salmon quality is underpinned by the Norwegian government, as evidenced by the issuing of green licenses. It is important to emphasize that, as a whole, the health benefits of eating fish and farmed salmon surpass the possible risks. Especially given that cardiovascular disease is the leading cause of death in developed nations. It is expected that as technology improves and standards are upheld, farmed fish will become increasingly culturally accepted and demand increase.

Population growth and consumption trends

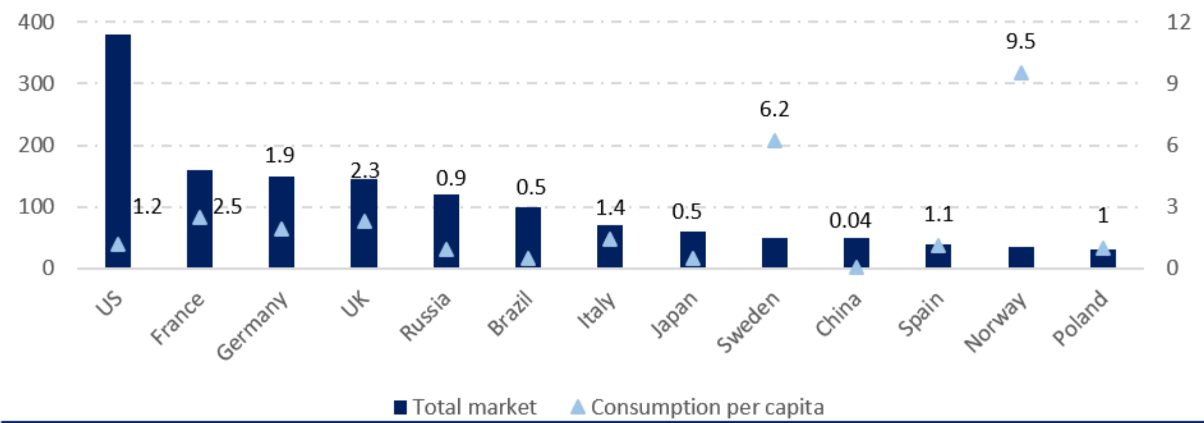
By 2050, the worlds population is expected to reach approximately 9.7 billion people. The growth is primarily driven by less developed regions and low- to middle-income nations[83]. Consistent with estimated population growth, estimated world demand for protein to increase by 40% in 2050, if consumption stays the same. The UN however expects actual demand to be double that in 2050[84].

Simultaneously, most of the world's areas have apparently reached their maximum potential for fisheries production, with total production remaining relatively static since the late 1980s. Other classical animal protein sources are also approaching their maximum potential output, mostly constrained by available space. Seeing as animal protein growth is constrained, the aquaculture sectors share of protein production is expected to increase. In 2014, aquaculture reached an important milestone; accounting for half of the fish destined for human consumption.[85]

In the last five decades, growth in fish consumption has outpaced population growth; roughly 3.2 % growth versus 1.8 % growth respectively. The increase in fish consumption is largely accredited to growth in per-capita consumption in developing nations where fish consumption is traditionally determined by local supply[86]. The population growth, economic prospects, and increasing fish consumption in developing countries indicates many new emerging markets and supports a continued rise in demand for farmed salmon, especially when viewed in conjunction. Furthermore, the US represents a large potential market, with significantly lower consumption than their European counterparts. As availability of other protein decreases in the future, we expect American per-capita consumption to increase.

[82] SalMar, *ASC-Certified Salmon.*
[83] FAO, *The State of World Fisheries and Aquaculture*, p.ii.
[84] Marine Harvest Group, *Salmon Farming Industry Handbook*, p.6.
[85] FAO, *The State of World Fisheries and Aquaculture*, p.ii.
[86] FAO, *The State of World Fisheries and Aquaculture*, p.2.

Figure 3.4: Market size (1,000kt) & consumption/capita (kg)



Compiled by authors, Source: Beringer Finance Aquaculture Sector 2016

3.1.4 Technological

Technological advances in the last 30 years are credited with enabling expansion of commercially viable aquaculture. Specifically, progress in breeding technology, system design, and feed technology take much of the credit. Salmon farming is recognized as a capital intensive industry, characterized by a strong degree of industrialization; a trend which is expected to continue. This is evidenced by a growth in patent intensity over the last two decades; and as heavy R&D requires significant capital, the patent growth-rate is expected to continue with continued industry consolidation[87]. Though advancements have already brought cost-levels down for the industry, environmental challenges and rising fish feed costs mandate increased R&D focus for industry participants, which is illustrated in figure 3.5.

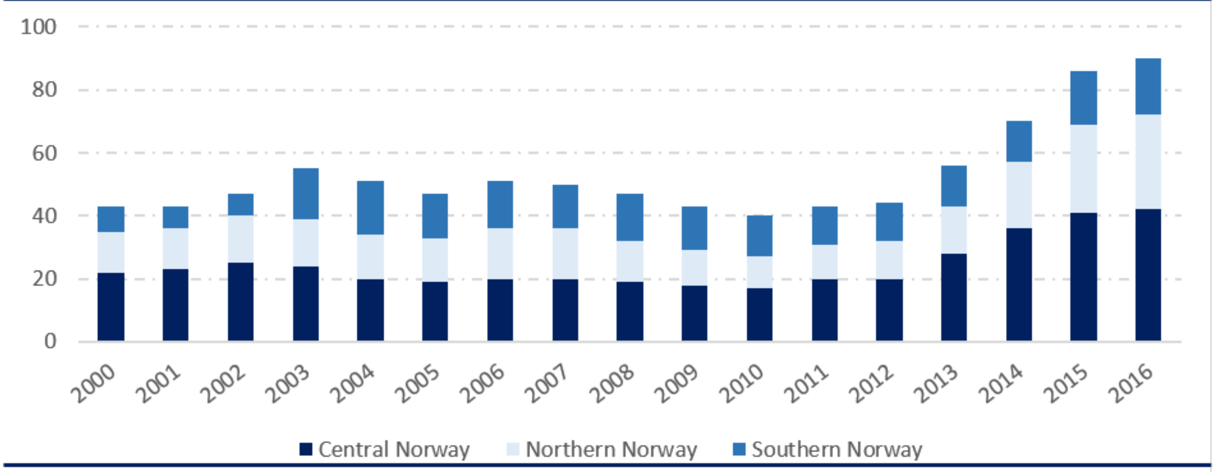
Not all focus areas have been successful though. Strict regulation regarding maximum sea lice levels and amount of medicinal treatments per production period is an ever present challenge for the industry. New technology for both treatment and preventive measures against sea lice has, despite extensive effort, not been able to solve the problems, only to a certain extent mediated them.

The Norwegian government actively supports and requires technological progress. Through the issuing of development licenses, which are earmarked for technological pilot-solutions, the government incentivizes innovation and promotes sustainable growth for an industry close to capacity[88]. Development licenses effectively subsidizes R&D by representing an alternative growth avenue to the one offered from purchasing standard licenses in the market. Ocean-based and land-based solutions are among the projects which have been awarded development licenses. Land-based farming for example, has long been dismissed as being prohibitively expensive, but rising production costs and development subsidization is evidently close to balancing the equation[89]. It is the governments and industries hope that technological innovations will yield

[87]Marine Harvest Group, *Salmon Farming Industry Handbook*, p.69.
[88]Fiskeridirektoratet, *Utviklingstillatelser*.
[89]Milde, *Future growth in salmon farming*.

solutions to the biological challenges plaguing the industry within a few years, enabling new growth again.

Figure 3.5: Development in R&D licenses by region



Author composed, Source: Directorate of Fisheries

This focus is evidenced by, among other things, SalMar's Ocean Farming 1 project. Ocean Farming 1 is an innovative ocean-farming platform developed by a subsidiary of SalMar, and the first of its kind. The project envisions placing the salmon at a depth of 100-300 meters, thereby eliminating many of the biological challenges inherent in traditional farms[90]. The project is the result of interdisciplinary cooperation between the aquaculture and offshore industry, with much of the technology base originating from semi-submerged offshore platforms[91]. Given the Norwegian propensity for offshore technology, it is possible that this represents a competitive advantage for Norwegian salmon farmers against other international industry participants.

3.1.5 Environmental

Environmental factors are the primary concern of industry participants. Global supply is heavily constrained by the prevalence of diseases, parasites and other biological challenges. Other, more long-term factors, include sea-temperature changes.

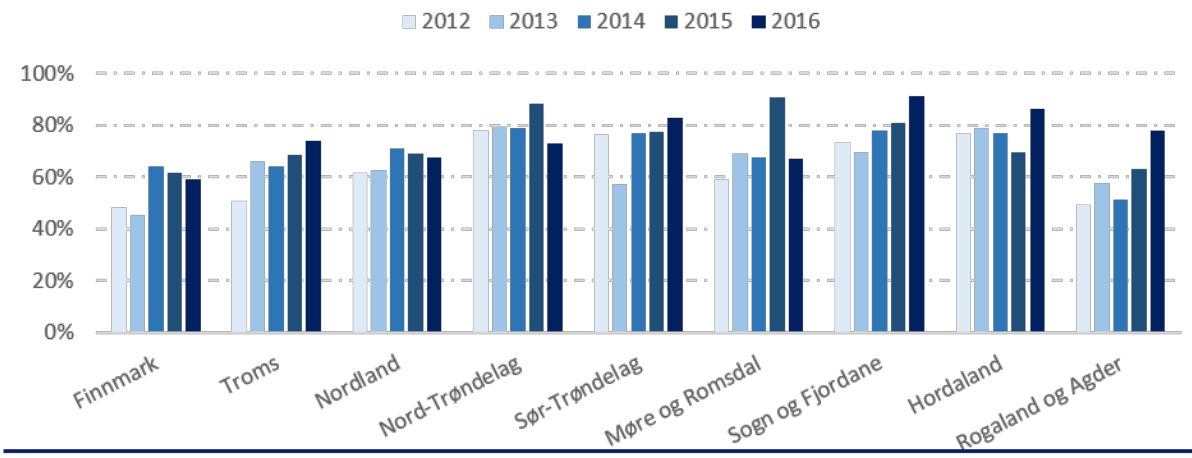
Disease and parasites

Despite a strong focus on good husbandry and health management practices, disease remains a problem. Recent years has seen the emergence of viable vaccines for bacterial infections, thereby almost eliminating the use of antibiotics in Norwegian salmon production. However viral disease outbreaks remain an industry threat, such as pancreatic disease (PD) and infectious salmon anemia (ISA), which have no current countermeasures. Outbreaks are especially problematic given the high density of salmon in the pens, making infections spread extraordinarily fast. PD is the most common virus, affecting fish appetite, and creating lesions and lethargy, and ultimately elevated mortality.[92]

[90] Stensvold, *Her kommer verdens første digitalt styrte fiskefarm.*
[91] SalMar, *Offshore fish farming- a new era!*
[92] Marine Harvest Group, *Salmon Farming Industry Handbook*, p.67.

The largest current concern though is the prevalence of salmon lice, a parasite that can cause lesions and secondary infection and is threatening to grow out of control. Current regulation sets a ceiling for maximum allowed lice per fish. In order to avoid breaching regulations, many farmers are forced to harvest early, before optimal weight is reached. Current treatment plans represent a significant portion of costs, and include the use of cleaner-fish that eat the lice, mechanical removal, and medicinal products[93]. In Norway, the government has stopped all calls for new production licenses until the sea lice situation is under control. Existing growth potential comes with strict regulations - maximum 6% growth semi-annually, and with a maximum 0,2 mature female salmon lice per fish.[94].

Figure 3.6: Percentage of sites treating for salmon lice



Compiled by authors, Source: Lusedata

The severity of the environmental challenges can be seen by looking at last-years supply levels. In 2016 the Norwegian sea-lice situation, coupled with an algal bloom in Chile, led to a massive supply side shock. The shock reduced the global supply of farmed salmon by 9%, and gave rise to record-high prices. Tying into the health challenges of disease is the cost, both financial and environmental, of escaping salmon. Dwindling stocks of wild salmon makes escaping farmed salmon, typically more troubled by sea lice and other diseases, a significant threat. Furthermore farmed and wild salmon can vary in their genetic makeup, as such interbreeding between stocks can cause genetic contamination of wild salmon, further straining stock levels[95]. In sum though, mortality due to disease and parasites represents the largest loss factor in production by far. Nordea emphasize that they still see sea lice as the key risk on the biological side. Senior seafood analysts expect costs related to sea lice to rise in 2017; underscoring that costs have increased by NOK 5 per kilogram for the industry in the last two years[96].

[93]Marine Harvest Group, *Salmon Farming Industry Handbook*, p.67.
[94]Norwegian Government, *Nye regler for lusegrenser om våren.*
[95]Norwegian Environmental Agency, *Escaped Farmed Fish.*
[96]UndercurrentNews, *Nordea maintains SalMar - Marine Harvest sell ratings on sea lice threat.*

Temperature

The ideal temperature for salmon is between 8 and 14 degrees Celsius. More ideal temperature yields higher growth rates, larger harvesting volume, and allows for year-round smolt release. Temperatures in the higher echelons of the range yield lower risk of disease, while temperatures closer to freezing leads to mass mortality. Excessively high temperatures increases the biological risks. The sea temperature in Norwegian farm areas average around 10 degrees°C, with a range from 6-16°C. Recent years has seen slightly increased sea temperatures in Norwegian waters. In the semi-long run this could prove beneficial for Norwegian salmon production; putting Norwegian sea temperature levels closer to the Chilean temperatures of today. In the long-run the reverse is possible warns the OECD; sea-water temperatures could rise above the critical threshold required for salmon farming[97].

3.1.6 Legal

Salmon farming in Norway is regulated by licences which each have a corresponding maximum allowed biomass. New licences issued by the directorate of fisheries have primarily been green licences and development licenses, with additional covenants designed to combat the environmental challenges outlined in the previous section. Licence covenants include, inter alia, a limit on the amount of sea-lice allowed per salmon.

The Norwegian parliament are in talks about a new model where the coast will be divided into a series of production zones, where the licensed production volume is regulated up or down depending on the extent of salmon lice. Industry participants are concerned that the new "traffic model" will result in greater bureaucracy and unpredictability. There are also doubts whether the model will actually help alleviate the lice problem and result in the environmentally sustainable growth that it is aimed at. In regions assigned a "green light", i.e where sea-lice levels are low, growth is restricted to 6% every other year. Regions assigned a "yellow light" are not permitted to grow, while "red-light" zones must reduce production or otherwise deal with the sea lice.[98]

New directives aimed to placate industry concerns highlight that the flexibility the industry enjoys today through the inter-regional biomass ceiling must be maintained. Other directives issued state that the Institute of Marine Research should not be a dominant premise-giver for the new model, but that other centres of expertise must participate in the evaluation before any new regulatory model is introduced[99].

[97]OECD, *Norway - climate change impacts on water systems*, p.189.
[98]Norwegian Government, *Bærekraftig og forutsigbar vekst for laks.*
[99]SalMar, *SalMar Annual Report 2015*, p.9.

3.1.7 Summarized

Overall the PESTEL analysis paints a positive picture for the salmon industry. The opening of Chinese borders to Norwegian salmon represents a huge potential, and until now, untapped market. Similarly, increased consumption in the large US market could represent a big upside for Norwegian exporters, however tighter US regulations could make servicing problematic. The Norwegian victory in the WTO should keep the European market open and stable for the foreseeable future. There are concerns about continued political tensions with Russia, restricting trade, however most salmon producers have adapted by selling via neighbouring markets.

Economical and Social considerations are positive. Global growth in GDP and population is expected to positively impact demand, especially in emerging economies. Demand is further amplified by an increasingly health-aware population. Norwegian exporters have benefited from favorable foreign exchange rates, however the gains are expected to taper off in the next couple of years as the NOK strengthens.

The largest detractor on the macro-prospects of the industry is the prevalence of sea lice. Tight regulations tie into the regional biological situations, limiting growth. However, some possible relief is in sight through heavy technological investments, opening the way for farming on land and in the open ocean.

3.2 Competitive Environment

The competitive environment in the industry is assessed through Porter's Five Forces framework. The framework defines five "forces", which impact the degree of competition in the industry[100]. In the following sub-sections, each force is analyzed in turn, before the effects are summed up in the conclusion. A high degree of competition entails smaller margins as competition erodes profits, while the reverse is true if there is little competition.

3.2.1 Threat of new entrants

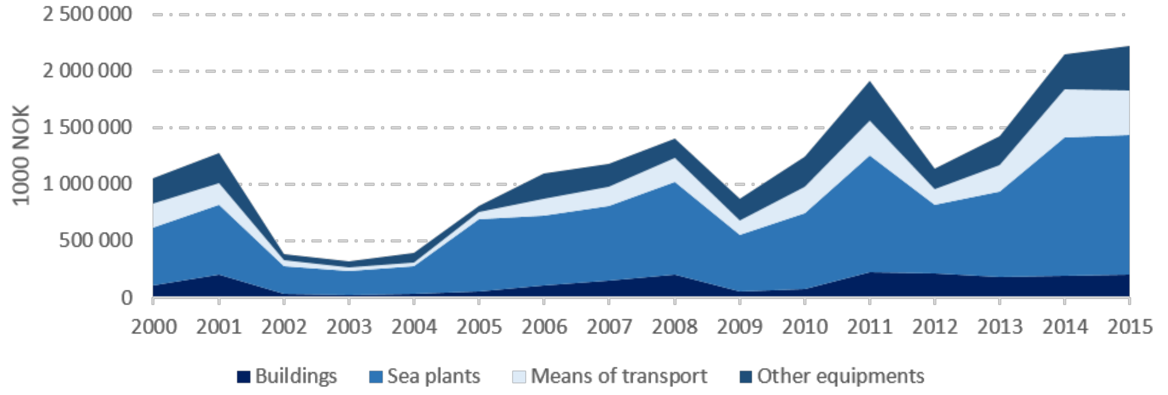
As previously discussed in the salmon industry section 2.2; the industry has gone through a period of consolidation, and is expected to do so in the future as well. In 2015, the top five suppliers in Norway accounted for roughly 56%, and the top ten for approximately 70%, of the total production of farmed salmon[101]. The high concentration is due to the governments reluctance in granting new licenses, which restricts organic growth. Therefore, larger salmon farming companies have turned towards mergers and acquisition activities to grow further. The industry is also characterized by its vertical integration, which allows for reduced biological risk and a higher quality product, reducing the threat of new entrants.

The salmon farming industry is furthermore characterized by long production cycles and high

[100] Harvard Business School, *The Five Forces*.
[101] Marine Harvest Group, *Salmon Farming Industry Handbook*, p.27.

associated working capital considerations. Given the production cycle, the typical time from capital is tied up in various farming activities till it is freed up, is three years. Economies of scale is therefore important in order to minimize the cost in working capital, and succeed as a salmon farming company. Producers often operate several adjacent sites simultaneously, which enables economies of scale, making the production less costly and more flexible. As economies of scale is prevalent in the industry, new entrants will typically experience higher than average production costs, which reduces the threat they represent.[102]

Figure 3.7: Norwegian aquaculture investments in equipment



Compiled by authors, Source: Directorate of fisheries

Furthermore, the industry is considered as a capital intensive industry, in the sense that equipment and sites requires high capital expenditures. In Norway, the investment costs related to start or increase production with 5,000 tonnes farmed salmon was somewhere between NOK 325-470 millions in 2015[103]. A production site, which consists of four standard licenses, valued to NOK 40-62 million in the second-hand market, requires equipment investments estimated to between NOK 30-40 mill. Based on a variety of input variables, Marine Harvest estimates the historical payback time of an initial investment to be roughly seven years[104]. This further reduces the threat of new entrants.

The Norwegian salmon farming industry is also subject to strict regulations. Salmon farmers are required by the regulations to obtain both farming licenses and farming sites in order to operate, which are, as discussed, both difficult and expensive to acquire. The licenses are allocated to applicants in rounds by the Norwegian Ministry of Trade, Industry and Fisheries, but can also be traded in the second-hand market[105]. The different regulations will limit the threat of new entrants. As mentioned in section 2.4, the Norwegian Government announced an allocation of new development licenses in 2015. If choosing to enter the market through the announced development licenses, new entrants will be forced to invest significantly into new technology and investments in order to be eligible. This can be difficult in the face of an industry which is

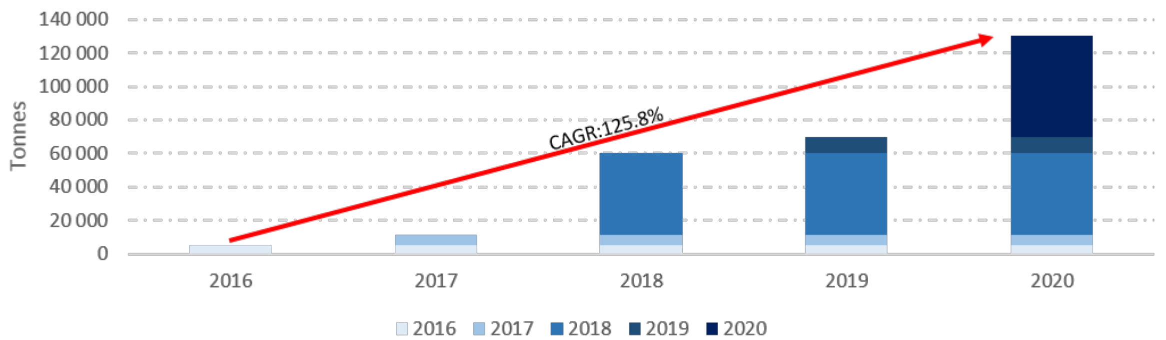
[102]Marine Harvest Group, *Salmon Farming Industry Handbook*, p.49-50.
[103]Gjendemsjø, *Oppdrett på land kan bli ny industrisuksess.*
[104]Marine Harvest Group, *Salmon Farming Industry Handbook*, p.51.
[105]The Norwegian Ministry of Trade, Industry and Fisheries, *Licence requirements in aquaculture.*

planning to invested over NOK 9 billion in new technology[106].

Finally, since only certain areas are suitable for salmon farming, ref. section 2.2, available space for new farms is limited. This has led to increased interest in alternative solutions, such as land-based salmon farming. The Norwegian government is supportive, and has decided that land-based aquaculture could be granted licenses continuously and at no cost[107]. This increases the threat of new entrants, since land-based salmon farmers are not exposed to the biological risks of traditional farms, and can be located anywhere in the world.

DNB Markets is optimistic about land-based salmon farming, and believe it is closer than ever before to being a viable alternative to the traditional net-pens. The analysts; Alexander Aukner and Tone Bjornstad Hanstad, argue that dwindling supply growth, and converging production costs due to increased biological costs for sea-based farming, is paving the way for land-based farming[108]. They predict a global land-based salmon production of 130,000 tonnes in 2020[109]. Their volume estimates are reproduced in figure 3.8. While the estimates point to significant growth, the volumes are not recognized as a legitimate threat in the immediate future, however the impact will start to be felt in the medium-term.

Figure 3.8: Land-based salmon farming



Compiled by authors, Source: DNB - The Fat Trout Weekly

To summarize, the high capital requirements, both in terms of working capital and in terms of capital expenditure, keeps the threat of new entrants low. The strict regulations imposed by the Norwegian government has the same effect by keeping license prices high and limits the organic growth in the industry. Further, the lack of available and viable space puts a cap on the possibility of new entrants. While land-based farming could provide an alternative ingress and increase the threat-level, the uncertain cost-levels and low volumes means it is not relevant for the situation today, but is considered to have an impact on a medium-term. Overall, the threat of new entrants is considered to be low.

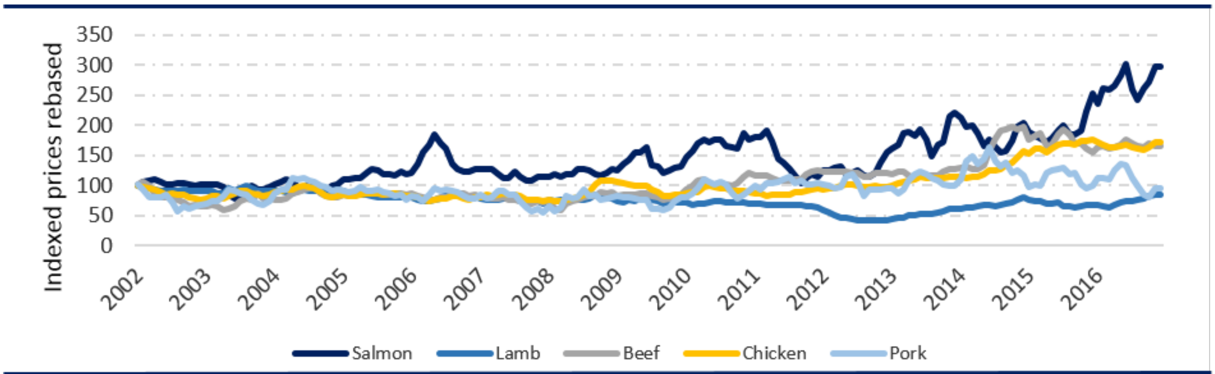
[106] Aadland, *Vil bruke over 9 milliarder på nye typer lakseoppdrett.*
[107] Ilaks, *Nå kan tillatelser til landbasert oppdrett tildeles løpende.*
[108] Ramsden, *Land-based salmon farming: the numbers now make sense.*
[109] Aukner and Hanstad, *Farmed salmon market update*, p.15.

3.2.2 Threat of substitutes

The profitability of the industry is affected by the threat of substitutes. The degree of threat posed by substitutes is impacted by factors such as the cost of switching product, the price of substitutes, and the quality of the substitutes[110].

In order to evaluate the threat of substitutes, the potential substitutes must first be identified. A substitute is defined as a product that consumers perceives as the same or similar, and which covers the same needs as farmed Atlantic salmon[111]. Farmed salmon is a rich source of protein, so substitute products will therefore also include other products than fish like other animal protein sources as chicken, beef, lamb and pork. This implies that relative price changes between salmon and the aforementioned substitutes will affect consumer demand. If salmon prices increase relatively more, demand for the substitutes will increase at the expense of salmon, and vice versa if salmon becomes relatively cheaper[112].

Figure 3.9: Indexed protein prices



Compiled by authors, Source: Indexmundi

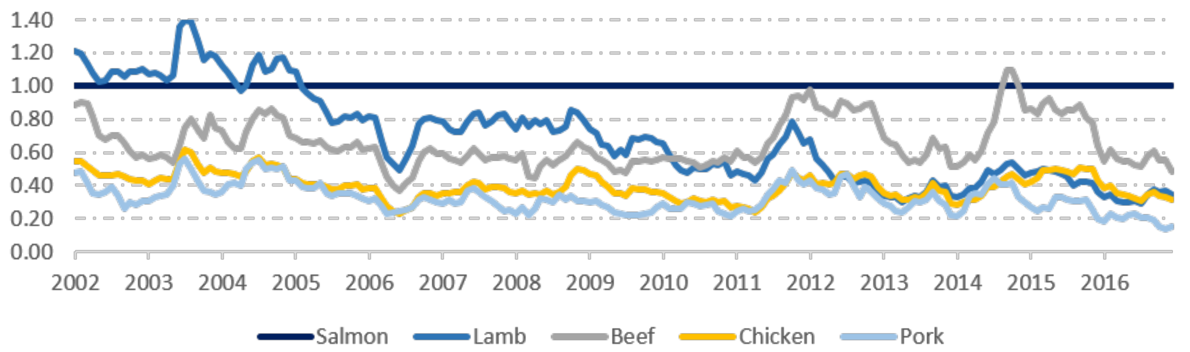
Figure 3.9 above, illustrates the indexed prices of salmon compared to other animalistic proteins. Salmon prices rose drastically in 2016, which has made it relatively more expensive than other animal proteins. Overall, salmon has seen the greatest price-increase from the index-year of 2002, which points towards an increased threat of substitutes. The following figure 3.10, which shows the relative price difference indexed to salmon, tells the same story. Lamb and beef are the only other protein sources which have experienced higher prices than salmon in the last 15 years. Though land-based protein sources are an imperfect substitute, the high salmon prices are expected to increase the threat of substitutes.

[110]Wilkinson, *Threat of Substitutes.*

[111]Investopedia, *Definition of substitute.*

[112]Stead and Laird, *The Handbook of Salmon Farming.*

Figure 3.10: Relative price difference indexed to salmon



Compiled by authors, Source: Indexmundi

Whitefish such as cod is excluded from the figure due to a lack of accurate data, though whitefish is also a relevant substitute. Salmon prices have surged 70% during the last 18 months, while cod prices grew by 16% and meat prices fell 4%. According to Nordea, salmon is getting too expensive and can't compete at the moment in the protein market. Consumers are replacing salmon with other protein foods, including whitefish.[113]

This is evidenced by the whitefish industries record year, with higher prices and increased exports[114][115]. This is partly due increased demand on the back of rising salmon prices[116]. Cod enjoys a much lower price-point than salmon, and is also defrosted, filleted and sold as a convenience product. The whitefish segment experiences competitive pricing due to 50% lower raw material price for refreshed cod than for salmon, making it more attractive. Therefore, Nordea expects that based on this the whitefish industry will experience a wave of fresh and refreshed whitefish to flow into Europe the next few years. This is reflected in the retail price, cod fillets prices grew from 2015 to 2016 with 5%, while the price of salmon fillets increased by 20% in the same period.[117]

We consider the threat of substitutes at moderate to high based on an upward trend in salmon prices compared to other protein products. Additionally, cod has already experienced an increase in demand due to relatively higher salmon prices. If the gap between the prices on different products decreases in the future, the threat of substitutes may reverse.

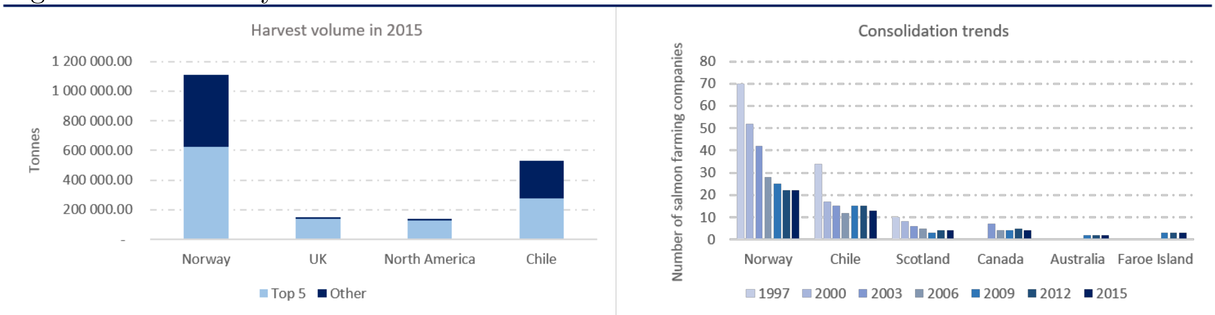
3.2.3 Rivalry among competitors

The attractiveness of the industry is affected by the rivalry among the existing competitors, and the profitability for the whole industry may be negatively impacted by aggressive competition. The threat that rivalry represents for the industry is determined by the producer concentration, the diversity of competitors, the product differentiation, and the exit-barriers.

[113] Nordea Markets, *Seafood Sector report*, p.3-4.
[114] Larsen, *Norsk sjømateksport*.
[115] Norges Sjømatråd, *Rekordår for hvitfisk for tredje året på rad*.
[116] Financial Times, *Higher cod prices hit Europe's fish consumers*.
[117] Nordea Markets, *Seafood Sector report*, p.4.

The industry consolidation previously discussed also impacts the rivalry among competitors. The following figure reiterates the degree, by showing the amount harvested by the top five producers, and the trend in consolidation. In general, higher consolidation reduces the degree of rivalry in Porters framework.

Figure 3.11: Industry structure

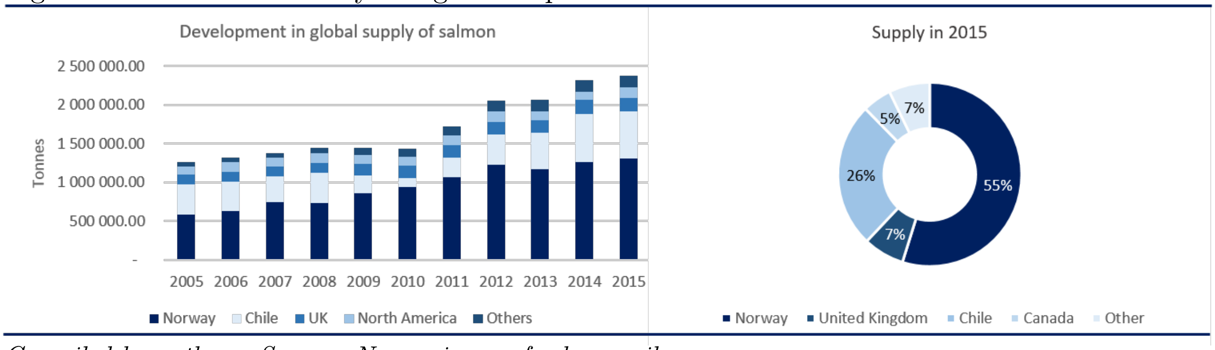


Compiled by authors, Source: MHG industry handbook 2016, Norwegian seafood council

Salmon is traded as a commodity, which in theory makes diversification have little to no effect. Therefore, the industry participants are effectively offering similar products, making switching costs low for consumers and increasing rivalry among competitors. However, recent years has seen a rise in value added products, which could impact switching costs.

As salmon farming is a global industry, the Norwegian industry also faces international competition, the largest of which is from Chile. Chile has experienced a significant growth in supply in the last years, but this is expected to taper of as production is pushing the biological boundaries. International competition sets a global price for salmon, increasing rivalry.

Figure 3.12: Chile is Norway's largest competitor



Compiled by authors, Source: Norwegian seafood council

Contrary to the high barriers to entry, the industry has relatively low barriers to exit. In order to exit, firms will want to liquidate their production sites and sell the belonging licenses. As licenses are highly sought after and a second-hand market exists, exiting the industry should not pose a problem. Similarly, the actual production sites that use the licenses should be possible to sell, although the equipment is specialized and can only be used for farming. The exit-barriers are therefore regarded as low, at least as long as salmon farming remains profitable, which reduces the rivalry among competitors. Should the second-hand market become illiquid, exit-barriers increase along with competition and industry rivalry.

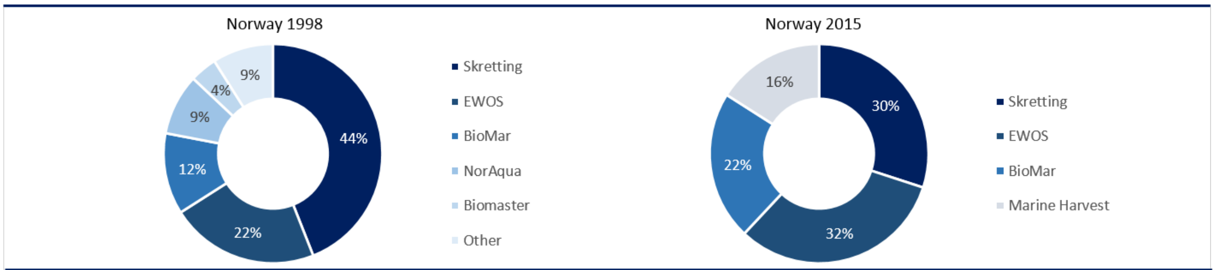
The industry is characterized to have low rivalry among the competitors due to low exit barriers, high market growth and a consolidated industry. However, diversification and low switching costs makes the rivalry intensity higher. In sum, the industry is considered to have a moderate rivalry among the competitors.

3.2.4 Bargaining power of suppliers

The profitability potential in the sector may be affected by the suppliers bargaining power, and the suppliers can increase the competition within an industry by increasing prices, and tightening margins. The bargaining power of suppliers is determined by the concentration of suppliers, if switching costs are significant, the dependency of the industry, and the forward integration of the suppliers.

Feed is an important input factor in the salmon farming industry, and accounts for roughly 40-50% of the total production costs. The salmon feed industry has seen significant consolidation during the last decade, even more than the salmon farming industry. At this point, there are basically only three suppliers who control the majority of the salmon feed output; EWOS, BioMar and Skretting. The low level of supplies increases their bargaining power.[118]

Figure 3.13: Consolidation in feed suppliers



Compiled by authors, Source: MHG industry handbook 2016

Nevertheless, as indicated before, salmon farming is characterized by partly or full vertical integration. The dependency on the feed suppliers differs between firms, because some are partly or fully independent when it comes to feed input as well. Marine Harvest started their own production of feed from its feed plant in 2014, and doubled its market share of total produced feed from 2014 to 2015. The development in the respective market shares from 1998 to 2015 are illustrated in figure 3.13.

The feed suppliers major cost elements are raw materials and production costs. Feed is typically sold on cost-plus contracts though, meaning aquaculture companies are left with the risk-exposure of raw material prices[119]. During the last period prices have increased for raw

[118] Marine Harvest Group, *Salmon Farming Industry Handbook*, p.43.
[119] Marine Harvest Group, *Salmon Farming Industry Handbook*, p.43.

materials due to the exposure to exchange rates, which has led to increased production costs for aquaculture companies[120]. This leads to increased supplier bargaining power.

Feed suppliers produce products which is slightly different, but they have in general limited opportunities to differentiate. Therefore, the switching cost is considered to be low. Additionally, the feed suppliers experience a limited market, which means that they are dependent on the salmon farming industry; reducing the feed suppliers bargaining power.

Overall, feed suppliers are the only real relevant suppliers for much of the salmon farming industry. With the industries being mutually dependent on each other. There are few suppliers, who in turn are able to dictate cost-plus contracts, indicating strong supplier bargaining power. However, as the trend seems to point towards self-sufficiency in feed as well, we deem the bargaining power of the suppliers to be moderate.

3.2.5 Bargaining power of buyers

The buyers of salmon can affect the competition in the industry by forcing down the price, or by requiring improved quality or better service. This will have an impact on the profitability in the industry. The factors which determine the degree of buyer bargaining power are; the concentration of buyers, the switching costs, the price sensitivity of buyers, availability of substitutes, product differentiation, and the portion the buyers have of the seller's sales.

Historically, salmon demand has been high, due to its status as a healthy protein source and its good taste, which indicates low bargaining power of buyers[121]. On the other hand, salmon is relatively standardized and considered a fairly homogeneous product, thus increasing buyers bargaining power. However, Atlantic salmon is recognized as an exclusive product which reduces the customers bargaining power[122]. Though, as the price of salmon significantly increases compared to other proteins, the viability of the alternatives increases, and the bargaining power of buyers rises.

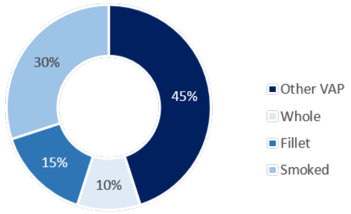
The secondary processing industry differs from that of primary processed, as mentioned in section 2.5. The consumers of VAP products are willing to pay for the quality and value added. According to MHG, it is expected that the demand for convenience products such as ready-to-cook fish, together with a packaging trend towards MAP, will increase. However, there are over 4,000 different players in the processing industry in Europe. This increases the bargaining power of buyers.

Salmon buyers of varying purchasing power are found around the world. Apart from the largest retail chains in Europe, customers in general have a little power to influence prices. Furthermore,

[120]SalMar, *SalMar Annual Report 2015*, p.42.
[121]Stangeland, *Laksen puster kyllingen i nakken.*
[122]Engø, *Norwegian Seafood Enjoyed Worldwide.*

most of the large salmon farming companies are vertically integrated and hold their own export firms. Therefore, many of the salmon farming firms are not dependent on external companies in order to sell to the global market.

Figure 3.14: Different salmon VAP products

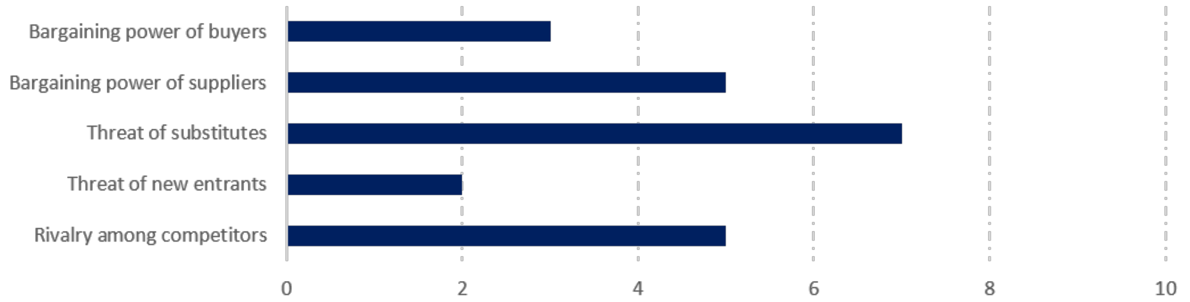


Compiled by authors, Source: SalMar

The bargaining power of buyers are considered to be moderate to low on the evidence provided and the high demand after farmed salmon. In the future bargaining power may fall further as general demand for protein increases.

3.2.6 Summary

Figure 3.15: Summary of the competitiveness in the industry



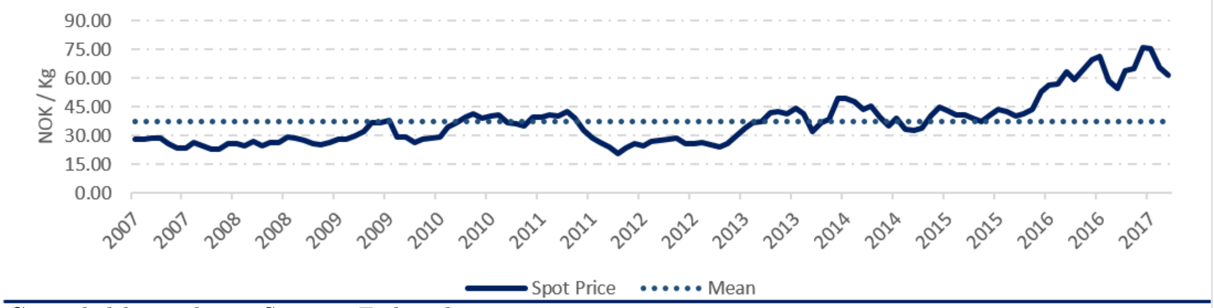
Compiled by authors

3.3 Salmon Price

SalMar is a salmon farming company, meaning their revenues are highly dependent on salmon prices. For the purpose of the forecast, it is therefore important to understand the underlying factors that drive salmon prices. This allows us to identify why prices have developed as they have, and most importantly, how they are expected to develop in the forecasting horizon.

Figure 3.16 shows the development of spot prices for Atlantic salmon in the last 10 years. As evidenced by figure 3.16, prices can be quite volatile. This is primarily caused by a mismatch between supply and demand, and exacerbated by seasonal demand variations and an inelastic supply curve.

Figure 3.16: Atlantic Salmon spot prices



Compiled by authors, Source: Fishpool

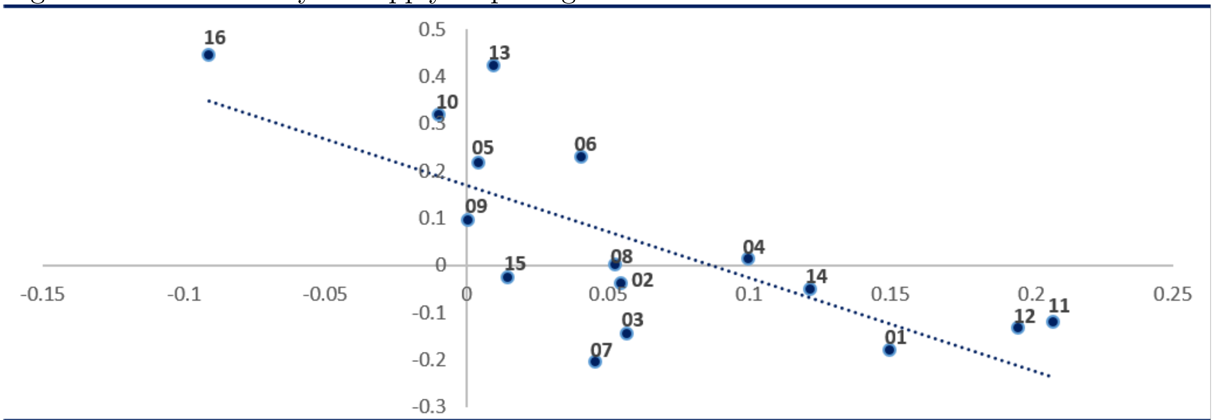
In December 2016, spot prices reached an all-time high, at approximately 78 NOK/kg; an increase of 43 % compared to December 2015. High spot prices meant the five largest Norwegian farmers posted NOK 7 billion higher earnings in 2016 compared to 2015, despite harvesting 7,000 tonnes less[123].

To investigate the price-drivers, we apply one of the most fundamental concepts of economics; the relationship between price, supply, and demand. This is followed by an analysis on production costs, which in the long-term decides the minimum price-levels for commercially viable salmon farming.

3.3.1 Supply

Historically the supply side has been the driving force for price changes, as evidenced by the following figure showing the relationship between year-over-year supply growth and year-over-year price change.

Figure 3.17: Year-over-year supply vs price growth



Authors creation, Source: Fishpool, FAO

Figure 3.17 gives a linear correlation between change in global supply and change in the Fish Pool Index price. The relationship had an explanatory power of approximately 55% for the annual price development from 2001 to 2016. The following sections will first present an overview of the current supply situation, before discussing the indicators for future supply-levels.

[123] Nilsen, *Inntjeningstoppen er slett ikke nådd.*

Overview

Much of today's high salmon price is attributed to the supply side shock in 2016, where global supply dipped over 9%; the result of an algal bloom in Chile and the Norwegian sea lice situation. Supply has been slowing for some time now though. In the years 1990-2010 the supply of Atlantic salmon experienced a compound annual growth rate of 10 %. In the last six years, this has fallen to 2 %[124]. Henning Lund, an analyst at Pareto Securities, argues that there has been no real supply-growth in the last five years[125].

Long production cycles make supply inelastic in the short-run. To elaborate on the previous point; higher prices due to higher demand incentives salmon farmers to increase production. However, as it takes roughly three years for salmon to grow to optimal harvest size, changes in production has a time-lag before it affects the market. This time-lag results in a cyclical industry, where supply is constantly adjusting to demand.

However, as Norwegian suppliers approach max MAB-utilization, analysts are talking about a "new normal" and an end to the traditional cyclicality[126]. Full capacity utilization, as constrained by regulation and biological boundaries, means supply can no longer increase in response to higher salmon demand. The new traffic-light system being implemented halts growth in regions heavily affected by sea lice. Sea lice in itself leads to increased mortality and sub-optimal harvest weights; the main reason for the Norwegian supply-drop in 2016. A restricted supply-side and strong demand has several analysts pointing towards a future with slower and more stable growth, with better margins and lower volatility.[127][128]

Whether supply has plateaued permanently, or if salmon-farming is currently experiencing a super-cycle, depends on the future. One deciding factor is how well the industry manages to face the sea-lice challenge. DNB Markets estimate that the situation will be contained within 2-3 years, allowing growth from regular licenses in Norway to continue. Further, they point to green and development licenses taking effect in late 2017, bringing growth back into positive territory. In Chile, new vaccines and regulations should alleviate uncertainty, and bring positive volume growth from 2018/2019[129]. This sentiment is mirrored by Beringer, who forecast a global supply growth of 2 and 2.6% in 2017 and 2018 respectively[130]. If DNB Markets' assumptions hold, the current up-cycle should last until 2021, whereby they expect new technology such as ocean and land farming to have added enough production capacity to influence prices. This would put the current up-cycle at eight years, as opposed to the traditional three years[131].

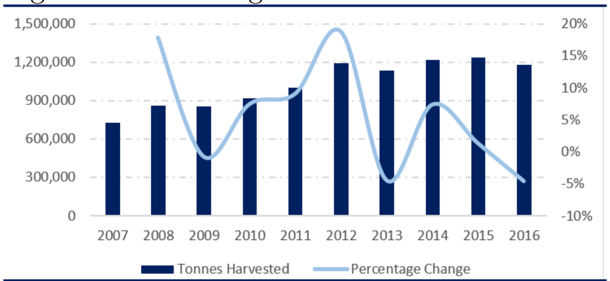
[124] Sletmo, *The new normal in salmon farming*, p.10.
[125] Terazono, *Norway turns to radical salmon farming methods.*
[126] Sletmo, *The new normal in salmon farming*, p.11.
[127] Sletmo, *The new normal in salmon farming*, p.41.
[128] Sletmo, *World market for salmon: pricing and currencies*, p.29.
[129] Aukner, *Extended super-cycle*, p.29.
[130] Beringer Finance, *Aquaculture Sector Preview 4Q2016*, p.1.
[131] Aukner, *Extended super-cycle*, p.35.

However, if the sea-lice situation is not contained, and other growth opportunities remain absent, we could see a persistent supply plateau. With the consequence of high prices but stagnating profits as production costs rise and demand shifts.

3.3.2 Future Supply Indicators

Looking at supply with less broad strokes, we can identify several important indicators for forecasting future short-term supply levels using the production cycle of farmed salmon. In the immediate short-term, the prime indicator for harvest quantities is the standing biomass. Further indicators in the short- to medium-term include smolt release and seawater temperatures[132]. We investigate the applicability of the indicators by comparing Norwegian supply levels to the mentioned indicators before extrapolating the information to a global scale.

Figure 3.18: Norwegian harvest volumes



Authors creation, Source: Norwegian Directorate of Fisheries

Salmon, being a fresh product, is generally sold in the same period as it is harvested. We therefore view harvested volumes as equivalent to Norwegian supply levels. Norwegian harvest volumes are reproduced in figure 3.18.

Initially, we note that our proxy agrees with Henning Lund's statement of zero supply-growth in the last five years. In fact, supply in 2016 was slightly below 2012 levels. Our proxy is also in congruence with supply-dip of 2016. As a final aside, we note that supply was steadily increasing until 2012, a level which is close the Norwegian maximum MAB capacity, explaining in part why supply has been slowing since then.

Biomass

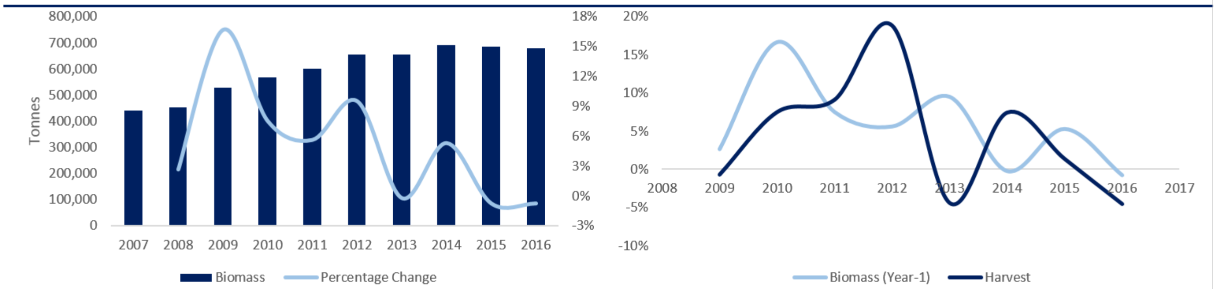
Biomass is roughly defined as the current standing weight of live fish, measured in kilos or tonnes. This encompasses all salmon past the smolt-phase, and given the production life-cycle of farmed salmon, standing biomass levels therefore functions as an indicator for harvest volumes in the following one to eighteen months. The one-year lagged biomass to harvest volumes and Norwegian standing biomass levels are shown in figure 3.19.

Historically, biomass levels have developed much the same as harvest volumes, with a slight outlier in 2013. Biomass levels were up in 2012, while harvested volume fell in 2013. This is mostly due to an outbreak of pancreas disease, which forced early harvest and higher than normal mortality. Biomass levels has held relatively steady in the last few years, which is congruent with the unchanged supply levels. Looking forward, the percent change in biomass in 2016 compared to 2015 is effectively zero. As such, when looking exclusively at the biomass indicator, we should

[132] Marine Harvest Group, *Salmon Farming Industry Handbook*, p.70.

expect Norwegian supply to remain unchanged in 2017 compared to 2016. For Chile, biomass levels are down 20% in 2016, which should indicate lower harvest volumes in 2017[133]. However, reduced mortality due to the resolution of the algal bloom is expected to more than compensate the lower biomass levels, making analysts point towards slightly increased Chilean supply levels in 2017 and 2018[134].

Figure 3.19: Norwegian biomass levels and change in lagged biomass to harvest

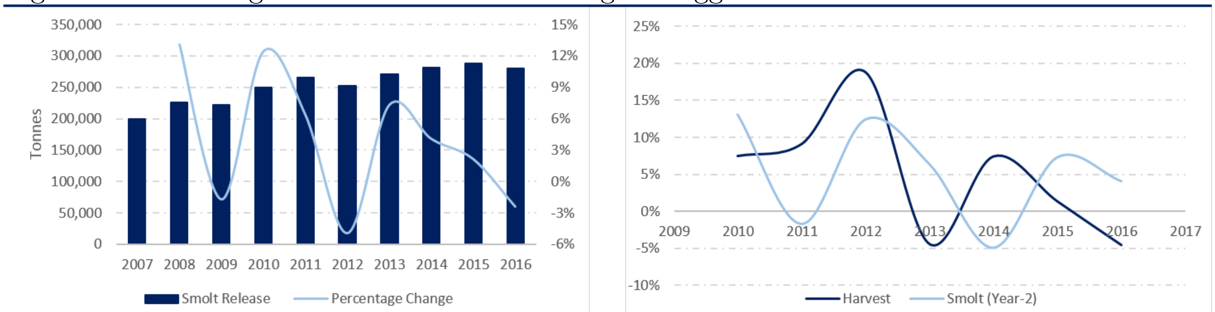


Author composed, Source: Norwegian Directorate of Fisheries

Smolt release

In the standard production cycle, average time from smolt release to harvest is approximately 20 months. However, this is subject to fall, given the large investments in smolt-improvement by the industry. The improved smolt-production yields larger smolt, which shortens the production cycle, but also reduces mortality which should improve the precision of the indicator. For the purpose of the forecast, we use smolt release as an indicator for harvest volumes one- to two-years forwards. The two-year lagged release of smolt to harvest volumes, and annual smolt release and yearly percentage change are shown in figure 3.20.

Figure 3.20: Norwegian smolt release and change in lagged smolt to harvest



Author composed, Source: Norwegian Directorate of Fisheries

Overall, changes in smolt release seem to follow the trend of harvest volume two-years forward, ref figure 3.20. The main outlier is once again the low harvest volumes of 2013, skewing the graph somewhat. Another thing to note is that in the last two years, 2015 and 2016, percentage change in lagged smolt release has been higher than the percentage change in harvest volumes. This indicates a lower utilization of the smolt released in 2013 and 2014, presumably due to the prevalence of sea-lice in recent years.

[133]Beringer Finance, *Aquaculture Sector Preview 4Q2016*, p.3.
[134]Strat, *Stronger for Longer*, p.21.

From figure 3.20, smolt-release is effectively unchanged in 2015 year-over-year, and decreasing in 2016 year-over-year. Using smolt-release as an indicator therefore implies unchanged supply levels in 2017, given unchanged smolt-release levels in 2015. This is congruent with the biomass indicator, which also predicted unchanged supply-levels in 2017. Applying the smolt-release indicator to predict 2018 levels, supply is expected to dip, given lower smolt-release in 2016.

Other factors

As mentioned in section 3.1.5, sea temperature plays an important role on the growth of salmon. Within the ideal temperature range, higher temperatures typically means faster growth-rates, but also carries higher risk of disease. In Norway, farmers experience the most seasonality in harvest volumes due to sea-temperatures, and biomass levels will be similarly effected[135]. Norwegian sea-temperatures in 2016 are slightly down compared to 2015, which may indicate that current biomass levels are underestimated[136]. This could ultimately imply that harvest volumes can see a slight rise in 2017, despite the biomass indicator suggesting zero growth.

Furthermore, the aforementioned lack of viable farming-space constricts Norwegian supply growth in particular. Regulations instituted by the Norwegian government to tackle the biological challenges, such as the traffic-light regime, is limiting growth. Chile is looking to institute similar regulations, which will set a maximum to allowed capacity and capacity-growth in each region[137]. Supply is therefore theoretically close to plateauing, until new farming solutions yield dividends, or until the biological challenges are tackled adequately and new licenses are issued. Furthermore, this restrictions are assumed to limit the likelihood for short-term spikes in the volume harvested in Chile[138].

3.3.3 Demand

The balance between supply and demand decides the market equilibrium. As discussed in the previous section, supply has been the prevailing price-driver, while demand has been latent. In reality, the current price levels are helped significantly by growing demand.

Long-term demand is primarily a function of population and economic growth in emerging markets and increased health awareness. In the short-term, demand is contingent on the international political landscape and the price differential on alternative protein sources. The opening of the Chinese market specifically could have a large impact on global demand for salmon.

Short-term demand is heavily influenced by the recent record-high prices, as discussed in section 3.2.2. The prices put salmon at double the price of beef, more than three times the price of swine and poultry, and significantly above that of whitefish. Even though salmon is typically

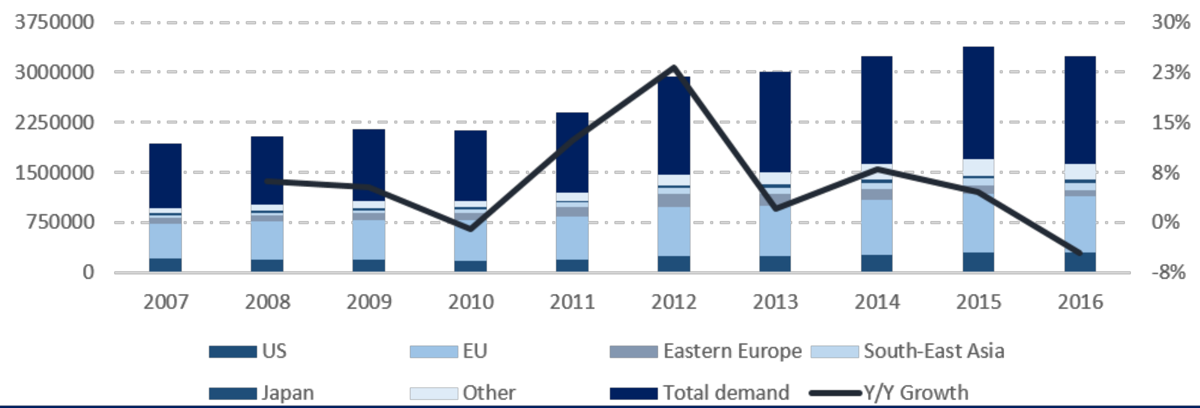
[135] Marine Harvest Group, *Salmon Farming Industry Handbook*, p.72.
[136] Beringer Finance, *Aquaculture Sector Preview 4Q2016*, p.4.
[137] Valor Econômico, *Chile decides to restrict supply of salmon.*
[138] Aukner and Hanstad, *Farmed salmon market update*, p.7.

recognized as being a more "high-class" product, current price levels could prove unsustainable for demand in developed markets, as well as delaying demand growth in developing markets, depending on consumer price-sensitivity. Due to the time-lag in retail prices reflecting the wholesale price, the impact of the record high prices on demand has not been seen yet, according to Kolbjorn Giskeodegard, an analyst at Nordea[139]. Similarly, Kontali expect zero growth in salmon consumption in 2017, due to the high prices[140].

Factors which help mitigate the declining short-term demand is the increased focus on product innovation, which despite being in its infancy, has seen an upswing in recent years. The introduction of processed fillet packages and other easy-to-prepare products is making salmon more accessible for the average consumer, spurring demand and allows for further price differentiation[141]. However, some of the revenue increases is offset by a cannibalization of sales of smoked and frozen salmon. Other consumer trends, such as sushi, which has trended from gourmet food to volume production, has also helped push demand for salmon.

The effect of population- and economic growth has largely been covered in section 3.1.2. In sum, long-term growth in demand is expected to outpace general population growth due to a growing global middle-class. On the health side, obesity and heart-related issues are a growing problem, especially endemic to developed nations, which could translate into increased salmon demand. The US market shows significant potential in increasing consumption, as they are currently well-below their European counterparts. FAO point to fish consumption fish consumption rising from 14.4 kg per capita in the 1990's, to consumption surpassing 20 kg in 2015[142].

Figure 3.21: Development in demand



Author composed, Source: Norwegian seafood council

Figure 3.21 shows the development in global demand, with data from the Norwegian Seafood Council, which in turn corresponds to the demand data used by Beringer[143]. The exact nature

[139]Terazono, *Norway turns to radical salmon farming methods.*
[140]Terazono, *Norway turns to radical salmon farming methods.*
[141]Stangeland, *Laksen puster kyllingen i nakken.*
[142]FAO, *The State of World Fisheries and Aquaculture*, p.71.
[143]Beringer Finance, *Aquaculture Sector Preview 4Q2016.*

of the data is not explicitly known, however often incorporated elements include the global trade of salmon, and salmon consumption. Consequently, the gathered demand is largely a function of supply, and can therefore not be viewed in isolation. The World Bank highlights the problems in measuring demand, noting that no single source or database exists for world fish production, consumption, and trade, which could lead to inconsistency in the gathered data[144].

Overall, demand is expected to fall slightly in the short-term due to the high salmon prices relative to other protein sources, pressuring prices downwards. However, demand in the long-term is expected to grow steadily, thanks to the growth in emerging markets.

3.3.4 Production Costs

Regardless of the supply and demand equilibrium, to remain commercially viable, salmon prices also need to reflect the costs of production. Recent years have seen production costs trending upwards, contrary to the historical trend.

This is largely attributed to rising feed costs, biological costs, and more stringent regulatory compliance procedures. In line with other animal production, feed costs represents the largest share of total costs by far. For the salmon farming industry, feed costs are roughly 50 % of total costs, with some regional variation due to differing input factors, logistics and feed conversion ratios[145].

Feed costs is also the cost element which has seen the largest increase in the last years in absolute numbers[146]. Breaking down feed costs, we can talk about both the raw material feed costs, the actual feed composition used, and currency effects.

Feed costs

As mentioned in section 2.7, feed composition has moved towards including more vegetable matter. A strengthened technology base has also allowed for the inclusion of more fats[147]. As feed producers typically operate on cost-plus contracts, aquaculture companies are the ones exposed to raw-material price risks[148].

Even though the price of marine ingredients has seen the largest price hike, the price for vegetable ingredients has still more than doubled since 2005. Much of the price increase was observed leading up to the financial crisis. However in the case of vegetable ingredients, costs have stabilized post-crisis, slowing down feed price growth rates[149]. Other considerations in analyzing the cost of fish-feed is the amount of specialized feed used to combat diseases, increase growth

[144] The World Bank, *Fish to 2030: Prospects for Fisheries and Aquaculture*, p.31.
[145] Marine Harvest Group, *Salmon Farming Industry Handbook*, p.39.
[146] Iversen *et al.*, *Kostnader for lakseoppdrett i konkurrentland*, p.8.
[147] Iversen *et al.*, *Kostnader for lakseoppdrett i konkurrentland*, p.14.
[148] Marine Harvest Group, *Salmon Farming Industry Handbook*, p.43.
[149] Iversen *et al.*, *Kostnader for lakseoppdrett i konkurrentland*, p.14.

rates, and treat sea-lice. Specialized growth-feed typically carries a premium of 15-20 % to normal feed, while sea-lice treating feed is typically twice that of normal feed. The use of growth-feed is a strategical consideration, where increased use may be due to high salmon prices and limited growth opportunities elsewhere[150].

Salmonid feed is composed of globally traded commodities; around 70 % of the raw material volume is quoted in USD, the remaining 30 % in EUR[151]. This naturally exposes operators to significant currency risks, which is also discussed in section 3.1.2. As it relates to feed costs though, Norwegian aquaculture has in recent years been facing higher costs from a weak NOK to USD, while Chile, the worlds second largest producer, has had it even worse through CLP to USD[152]. Some of Chile's movement from cost-leader to cost-laggard can be attributed to currency movements. However, Chile has also faced low production in their pelagic fisheries and therefore low fish-meal production, while also transitioning into a feed composition more closely following the European fisheries[153].

According to a Nordea analyst, feed costs are expected to come down from the current inflated levels. He expects that the pelagic fisheries in Peru will increase production, giving lower fish-meal and fish-oil prices. Paired with a decrease in soybean prices, feed costs are expected to fall NOK 1 per kg in the next two years[154]. Although, the specialized growth-feed, which is used to combat diseases, is offsetting the positive outlook for feed cost in the short-term since sea-lice is projected to be a problem for a couple more years. Overall, projections point towards a small decrease in short-term feed costs due to a depreciation of USD/NOK and falling raw material prices.

Other cost-factors

Other production cost elements include the cost of medicinal treatment to combat sea-lice, viral infections, algae blooms, and more. While the exact costs are hard to pinpoint exactly, due to the costs often being lumped together. Analysts at Nofima and Kontali have nonetheless attempted, and found that almost 40 % of the increased production costs in the last three years has been due to increases in the miscellaneous post other expenses; of which medicinal costs represent the large majority[155].

As mentioned in section 3.1.5, the sea-lice level is projected to remain relatively high and stable in the short-term. Therefore, it is expected that other operating costs will increase slightly on a short-term basis. This is backed by senior seafood analysts who anticipate an increase in costs related to sea-lice in 2017 and 2018. In 2019-2020 we project the cost to decline due to better

[150] Iversen *et al.*, *Kostnader for lakseoppdrett i konkurrentland*, p.15.
[151] Marine Harvest Group, *Salmon Farming Industry Handbook*, p.53.
[152] Sletmo, *World market for salmon: pricing and currencies*, p.14-15.
[153] Iversen *et al.*, *Kostnadsdrivere i lakseoppdrett*, p53.
[154] Seaman, *Nordea: Norway salmon farming costs moving toward Chile levels.*
[155] Iversen *et al.*, *Kostnader for lakseoppdrett i konkurrentland*, p. 36.

sea-lice situation.

Worth keeping in mind is that production costs are denoted as costs per kg. This entails that costs per kg will increase when supply is held constant, due to naturally increasing expense items such as salaries. Furthermore, while costs have trended upwards in recent years, part of the costs are reversible in the longer term, for example those related to medicinal treatments.[156]

3.3.5 Salmon Price Summarized

The supply indicators for Norway point towards zero growth. Current biomass levels are at an equal level to the previous year, while smolt release is trending downwards and into the negative. In other words, the only source of growth possible for Norway in the short-term is lower mortality and improved harvest weight. When viewed in conjunction with the current biological challenges facing the industry, Norwegian short-term supply growth seems unlikely. Looking further into the future, supply levels will depend on technological innovations, regulatory changes, and a resolution to the biological challenges.

Demand is similarly pressured in the short-term. High salmon prices are increasing the threat of substitutes, though some relief may come from the Chinese market and health-trends. In the long-term demand picks up due to world population and economic growth. Long-term demand is further amplified by a general increase in fish consumption as the availability of other protein-sources decreases, and a growing VAP-segment.

Cost levels are rising, and will likely remain high for a period primarily due to a challenging biological situation. Feed-prices are projected to come down slightly due a strengthened NOK and increased availability of raw materials. Other cost items will see a slight increase as sea-lice treatment continues. In the longer term, some of the costs should be reversible, and for salmon farming to be commercially viable, salmon prices would have to be at minimum equal to the cost of production plus the cost of capital.

Forward contracts are currently closing at 60 NOK / kg for fourth quarter 2017, 2018 contracts trade at 59,2 NOK / kg, and 2019 contracts trade at 57,75 NOK / kg[157]. This indicates a market which expects continued high but downward trending salmon prices, but none-the-less well above the minimum as required by cost-levels. As such the industry should continue turning strong profits.

3.4 Internal Analysis

The preceding analyses have covered the various external influences on SalMar and the industry, along with the competitive environment. However, to build a complete picture of SalMar's

[156] Iversen *et al.*, *Kostnader for lakseoppdrett i konkurrentland*, p.14.
[157] Fishpool, *Forward Prices*.

strategic position, we also need to investigate SalMar's internal capabilities. To achieve this, we utilize the VRIO-framework, first described by Jay B. Barney in his 1991 work; Firm Resources and Sustained Competitive Advantage[158].

The VRIO-framework is used to determine if any of a firms resources represent a competitive advantage for the company. Barney identifies four conditions which need to be satisfied in order for a resource to represent a lasting competitive advantage. The degree of which the conditions are met will influence both the duration and potential of any competitive advantage. According to Barney, the four factors which determine whether a resource represents a competitive advantage are value, rarity, imitability, and whether the resource is organized for use[159].

Resource can add value through either enabling the firm to exploit opportunities, defend against threats, provide differentiation, or otherwise increase perceived customer value[160]. In order to represent a competitive advantage a resource needs to be exclusive; resources and capabilities which are valuable but common among companies are a source of competitive parity.[161]If a firm possesses a resource which is both valuable and rare, they can gain, at least, a temporary competitive advantage. The time-scope is defined by the degree of imitability. A resource which is easily imitated will quickly be copied and appropriated by competing firms, while a resource which is imperfectly imitable can represent a sustained competitive advantage.[162]In order for a resource to fully utilize the potential of the three preceding attributes, the firm needs to be organized to exploit the full competitive potential. In other words, a firm needs to have the necessary organizational strategy and support-framework to utilize its resources[163]. In the following subsections the most relevant of SalMar's resources and capabilities are presented and analyzed through the VRIO lens.

3.4.1 Innovation

Audun Iversen, a researcher at Nofima, stresses that the aquaculture industry is dependent on innovation to slow cost developments[164]. As discussed in section 3.1.4, innovation through research and development is a growing priority for industry participants, and actively encouraged by the Norwegian government. SalMar prides itself on being on of the worlds largest and most effective producers of Atlantic salmon, a success which they ascribe in part to their focus on innovation[165]. This indicates that SalMar is organized to exploit their innovation, as required by the VRIO-model. Innovation can be hard to measure quantitatively though, and often needs to be considered on a discretionary basis instead. In SalMars case, there are two recent major projects which can be used to illustrate the results of successful innovation.

[158]Barney, "Firm Resources and Sustained Competitive Advantage".
[159]See appendix A.16
[160]Barney, "Looking inside for competitive advantage", p.51-52.
[161]Barney, "Looking inside for competitive advantage", p.52.
[162]Barney, "Looking inside for competitive advantage", p.53.
[163]Barney, "Looking inside for competitive advantage", p.56.
[164]Berge, *Ny teknologi må gi lavere produksjonskostnader for laks*.
[165]SalMar, *SalMar Annual Report 2015*, p.39.

The first is InnovaMar; a innovative and cost-effective facility for harvesting and processing salmon. Envisioned in 2009, and fully operational in mid 2012, InnovaMar represents an investment of around NOK 550 million in buildings and machinery. The plant is highly automated, with a focus on innovative solutions aimed at increasing the quality of the final product, reducing costs, and improving working conditions. SalMar report that the opening of InnovaMar boosted harvested volumes by 10% in 2012, illustrating the value of the resource.[166]

The second is SalMar's subsidiary Ocean Farming AS's Ocean Farming 1 project, the worlds first offshore salmon farm which will be located in Central Norway[167]. It is also the first digitally controlled fish-farm in the world and will transform the fish-farming industry to become more high-tech[168]. SalMar has invested around NOK 100 million in developing and testing its offshore fish farming concept. In 2016 the investment yielded its first dividends, with SalMar being awarded eight development licenses for the installation. The first transfer of fish to the ocean farm is scheduled to take place this summer.[169]

Source: Kyst

However, SalMar is not alone in their focus on innovation. The need for innovation is shared by all industry participants. Several, therein Marine Harvest, Grieg, and Lerøy, have joined the Seafood Innovation Cluster, which aims to innovate through strategic collaborative projects between the cluster's partners. The Seafood Innovation Cluster was recently accredited as a Norwegian Centre of Expertise, and represents 60% of Norway's total R&D capacity[170]. Lerøy and Marine Harvest have also invested in innovative processing facilities, similarly to SalMar. They differ slightly in that Lerøy focuses on several smaller, close-to-consumer facilities, while Marine Harvest has the worlds largest salmon processing plant at Eggesbønes[171][172]. Furthermore, while SalMar is the only company to date to have been awarded development concessions for ocean-farming, others are not far behind. Marine Harvest has applications pending on pilot-projects for closed ocean-going farms and farming in bulk-carriers. Lerøy and Grieg also have applications pending for their individual ocean-farming solutions[173]. This indicates that though innovation through ocean-farming technology is currently exclusive to SalMar, this is highly likely to change in the future.

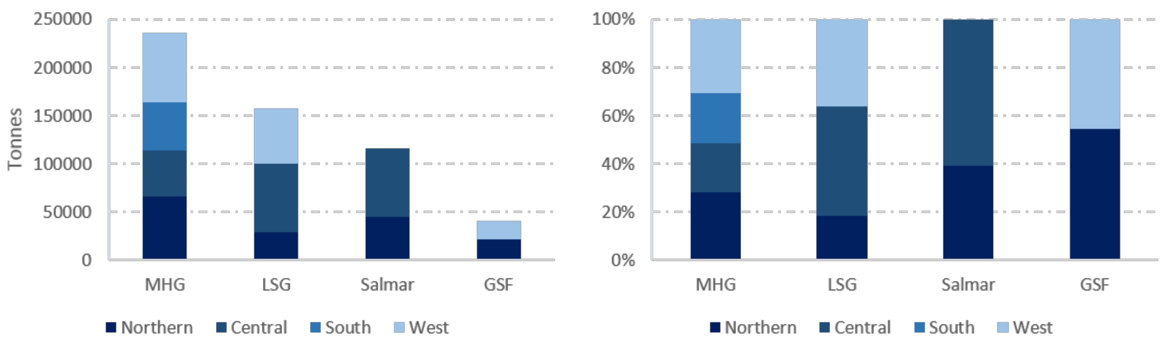
[166] SalMar, *InnovaMar - From Dream to Reality.*
[167] SalMar, *Offshore fish farming- a new era!*
[168] Stensvold, *Her kommer verdens første digitalt styrte fiskefarm.*
[169] SalMar, *SalMar Annual Report 2015*, p.8-12.
[170] Seafood Innovation Cluster, *The Seafood Innovation Cluster.*
[171] Lerøy Seafood Group, *Lerøy Annual Report 2015*, p.5.
[172] Marine Harvest Group, *Våre norske regioner.*
[173] Fiskeridirektoratet, *Oversikt over søknader om utviklingstillatelser.*

As a whole, it is hard to argue that SalMar is especially innovative in comparison to the peer group in the long-term. Looking at their innovative projects in particular can help to clarify. While their processing facility InnovaMar is certainly valuable, it is not unique enough to represent a significant competitive advantage. Their ocean-farming project Ocean Farm 1 though, is both valuable, rare, and presumably organized for use. The drawback is that other industry participants are not far behind, making the resource clearly imitable. Therefore, within the frame-work, Ocean Farming 1 represents a temporary competitive advantage for SalMar.

3.4.2 Location

Norway has a long coastline, with several regions viable for salmon farming. The viable regions will naturally differ slightly in the main prerequisite criteria of salmon farming; temperature, currents, and shelter. However, the largest difference between viable regions is the severity of sea-lice infestation.

Figure 3.22: Harvest volume by region



Author composed, Source: annual reports

SalMar has 68 licenses in Central Norway and 32 in Northern Norway, representing about 60 and 40% farmed volume respectively. As the figure indicates, SalMar is more exposed to Central Norway than the peer-group. Central Norway is the region hardest hit by sea-lice, according to data from Seafood Norway[174]. It is therefore possible that SalMar's heavy volume-exposure to Central Norway represents a competitive disadvantage.

Earlier sections have described how regulations limit the number of maximum allowed adult female lice per fish, leading to premature slaughter before optimal harvest weight is reached in infested regions. Furthermore, they covered how the Norwegian government has halted growth in the affected regions by withholding new licenses. Beringer Finance point to SalMar experiencing the largest percentage based harvest-volume drop in 2016, corroborating the effects of farming area on harvest volumes[175]. Therefore, we can posit that exposure to farming-region Central Norway is a negative resource. In other words, that limited exposure to Central Norway is a valuable resource.

[174]Lusedata, *Statistikk Nøkkeldata*.
[175]Beringer Finance, *Aquaculture Sector Preview 4Q2016*, p.7.

It's worth noting that despite significant exposure to salmon-lice, which should in theory drive up production costs through extensive medicinal treatments, SalMar are consistently posting strong financial ratios, as described in the following chapter. SalMar is committed to being an industry cost-leader, which they remain despite a challenging biological situation[176].

As illustrated in the preceding paragraphs, exposure to Central Norway is not rare per se. For example both Lerøy and Marine Harvest carry significant exposure to the region. However, it is also undoubtedly true that the degree of exposure is most severe for SalMar. As for the question of imitability, changing the location of fish-farms is deemed infeasible. This is due to the significant investments associated with fish-farms, the availability and cost of licenses, and the location of their processing facilities. However, the risks associated with Central Norway can be diversified away by increasing focus on other regions. SalMar are already well positioned in Northern Norway, the region least affected by lice, and are expanding globally through acquisitions in Scotland and Iceland[177]. These positions help alleviate some of the concerns to exposure in Central Norway. Furthermore, as discussed earlier, key industry professionals estimate the sea-lice threat to be contained within the next couple of years, diminishing the biological risks in Central Norway. As a result, the location of SalMar's farms represents a passing concern, and a temporary competitive disadvantage at most.

3.4.3 Value Chain Integration

The salmon farming industry is heavily vertically integrated. SalMar aims to control the entirety of the value-chain, from breeding to final sale, allowing SalMar complete control over every step in the production process. The theory is that control of the entire value chain leads to lower cost-levels and a higher quality product. The thesis will not investigate the veracity of that theory, given that exact margins from operating the individual parts of the value-chain, versus outsourcing costs, requires company insider knowledge. Instead, the thesis assumes that vertical integration adds value if the company is sufficiently organized to capture it, as defined in the VRIO-framework.

SalMar has initiated major investments, totalling over NOK 800 million, to increase smolt capacity in order to become fully self-sufficient. The hatchery investments were initiated in 2015, and production is scheduled to start in autumn of 2017[178]. When the hatcheries come online, SalMar will be completely self-sufficient across the value-chain, with the exception of feed production[179]. Furthermore, after the investment in increased smolt capacity SalMar will start to produce larger smolt which will reduce the risk of contracting diseases and life-cycle[180][181]. SalMar is expecting reduced total cost by NOK 1-2 per kg by increasing their smolt size.

[176] SalMar, *SalMar Annual Report 2015*, p.8.
[177] Lusedata, *Statistikk Nøkkeldata.*
[178] SalMar, *SalMar Annual Report 2015*, p.8-17.
[179] SalMar, *Business Areas.*
[180] Kongsberg Maritim, *Offshore fish farming: Food for thought.*
[181] Ilaks, *Jakter gevinster med stor smolt.*

Vertical integration is the industry-norm though, so SalMar is not unique in this regard. Most companies are integrated across the value-chain, at least in part. Marine Harvest has even begun investments in feed production, making them the current forerunner in vertical integration[182]. Vertical integration, feed production excluded, can therefore not be said to be rare. Going forward we therefore differentiate between vertical integration excluding feed production as a resource, and integrated feed production as a resource.

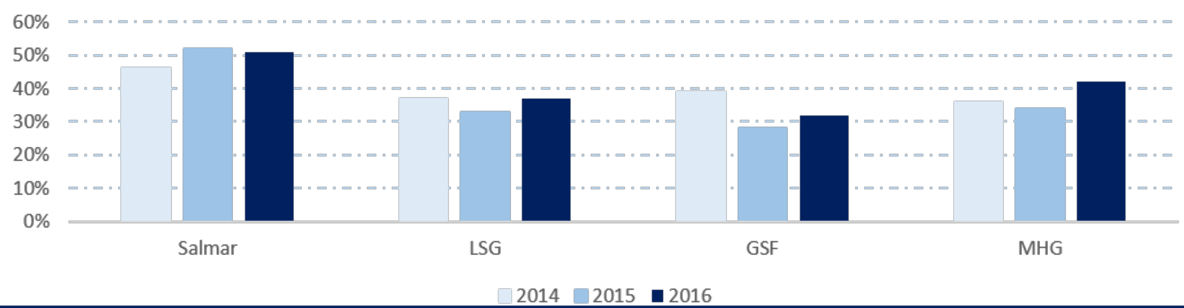
SalMar's position as an efficient producer and cost-leader indicates that they are arguably better organized to maximize the potential of value-chain integration. This is evidenced further by SalMars smolt facilities; which allow for year-round smolt-release, as opposed to the seasonal-release of the peer-group. SalMar's superior organization, or facilities, depending on how you look at it, should be imitable by the peer group though, either through increased investments or a change in strategy and control-mechanisms.

Marine Harvest's feed production facility on the other hand, is arguably rare. As discussed in section 3.3.4, feed costs are a rising part of production costs, and achieving production in-house could potentially represent significant value. However, given Marine Harvest's financial ratios, specifically their EBIT / kg (see section 4.2.4), indicates that they are not ideally organized to utilize this advantage. Furthermore, given the size of SalMar and the other peers, the initial capital expenditure costs to commence feed production should be manageable, should this prove valuable. Feed production integration as a resource is therefore deemed imitable.

To summarize, SalMar's current level of organization to utilize their vertical integration gives them a competitive advantage. This advantage should last until other are able to extract the full potential of their value chain. In other words, the peer group currently has an unrealized competitive parity in their vertical integration. Similarly, Marine Harvest has an unrealized competitive advantage in their feed production facilities, given their lack of organization.

3.4.4 Contract coverage

Figure 3.23: Contract coverage



Author composed, Source: annual reports

[182] Marine Harvest Group, *Salmon Farming Industry Handbook*, p.43.

Utilization of fixed-price contracts to hedge against unfavorable price-movements is an industry norm. The degree to which the peer-group utilizes hedging contracts differs though. SalMar typically has a higher contract-coverage compared to the norm, as shown in figure 3.23.

Whether a high contract coverage ratio is beneficial, or a valuable resource, will vary depending on the spot prices versus the achieved contract prices. In the case of 2016 for example, having a high contract coverage ratio would be seen as detrimental, as the contract prices were locked in at a lower price than the record-high spot-prices in December. On the other hand, the high-spot prices in late 2016 and early 2017 has pushed forward-prices up, which could be beneficial if prices drop. In the long-term though, due to absence of arbitrage arguments and the law of averages, profit and loss pertaining to fixed forward-contracts are assumed to even out. This makes the degree of contract-coverage ultimately a strategical consideration, depending on the wanted risk-exposure to the spot-market. The value of contract coverage as a resource is therefore indeterminable, and classified neither as a competitive advantage or disadvantage.

3.4.5 Organic Salmon

Organic salmon, a VAP-product, has seen an uptick in demand and production, tying into an increasingly environmentally conscious population and government. Norway has a stated goal of increasing organic food production to 15% total by 2020[183]. Organic salmon producers have been challenged in answering demand though, due to a closed European market. Due to the rules governing organic production in the EU not being incorporated into the EEA-agreement, the EU market for organic foods has been closed for Norway for almost a year, despite Norwegian organic salmon being produced according to the regulations. In March 2017, the regulations were incorporated into the EEA-agreement, opening the EU-market[184].

While the exact value of organic salmon is hard to pinpoint, SalMar report an increase demand for organic salmon since the first fish were harvested in 2011[185]. A 2016 study identified a price-premium of 20% for organic salmon in the Danish retail market, while the Agriculture and Rural Development Department of the European Commission point to organic salmon retailing of some 50% over conventional salmon[186][187]. It is therefore argued that organic salmon is a valuable resource.

The Norwegian Food Safety Authority has delegated the supervision of organic aquaculture production to Debio, making Debio responsible for organic salmon certification[188]. At the time of writing, SalMar is the only company which has been awarded organic farming concessions

[183] Byberg, *Økologisk Matproduksjon.*
[184] Norwegian Government, *Nå kan Norge selge økologisk laks til EU.*
[185] SalMar, *Norwegian Organic Salmon - Farmed, Processed, and Sold by SalMar.*
[186] Ankameh-Yeboah, Nielsen, and Nielsen, p.54.
[187] European Commission, *Aquaculture.*
[188] Norwegian Food Safety Authority, *Økologisk akvakultur.*

from the Norwegian ministry of fisheries[189]. They are consequently the only company in the peer group with production facilities certified for organic salmon production, making the resource rare.

Other companies wishing to start production of organic salmon are limited by license issuings from the Norwegian government. Given that no new organic salmon licenses have been issued since the original five granted to SalMar, it seems that organic salmon has been given a lower priority by the government in the face of biological challenges. This makes it hard for other companies to imitate SalMar. The only avenue available would be to transform any of their current licenses and facilities to conform to the stringent organic farming standards. This would require significant investments, and political willingness. Furthermore, the time-lag from the long production cycle means SalMar's position as sole supplier of organic salmon is secured for years to come.

Since SalMar already serves the EU, which is expected to be the largest market for organic salmon after the lift on the ban, it is presumed that SalMar are adequately organized to utilize the resource to its full potential. The production of organic salmon is therefore expected to represent a lasting competitive advantage for SalMar, with the impact depending on the underlying margins on organic salmon.

3.4.6 Summary

Figure 3.24: Summary of VRIO-analysis

Ressource	Valuable	Rare	Imitable	Organized	Consequence	Implications for returns
Innovation						
-InnovaMar	✓	✗	✓	✓	Comeptitive parity	Normal
-Ocean Farm	✓	✓	✓	✓	Temporary competitive advantage	Temporarily above normal
Location	✓	✗	✓	✓	Temporary disadvantage	Temporarily below normal
Value Chain integration	✓	✓	✓	✓	Temporary competitive advantage	Temporarily above normal
Organic salmon	✓	✓	✓	✓	Lasting competititve advantage	Above normal

Author composed

In brief, SalMars innovative capabilities has given them a small head start in ocean farming solutions, which represents a passing competitive advantage as the peer group catches up. The disadvantage associated with farming in Central Norway is expected to dissipate as the sea-lice situation is brought under control and SalMar's ocean farming solutions come to fruition. SalMar's position as sole Norwegian producer of organic salmon is expected to yield dividends again as the EU market opens up.

[189] Directorate of Fisheries, *Informasjon om akvakulturtillatelse.*

4. Financial Analysis

The goal of the financial analysis is to gain insight into a firms economic well-being, and uncovering different aspects of its performance and financial position. This is evaluated through a variety of financial ratios, which serve as indicators of financial performance[190]. We employ both a time-series approach, where historical levels and trends in key value drivers are investigated, and a cross-sectional approach, where SalMar's performance is evaluated in relation to its peer-group. In conjunction with the external and internal analysis, the financial analysis forms the basis for our forecast and valuation.

4.1 Analytical Financial Statements

In order for the analysis to provide actionable insight, we reformulate the financial statements to account for the pitfalls associated with time-series and cross-sectional analysis. The pitfalls typically relate to differing account policies over time or across firms, ensuring that special items are treated uniformly, and that any change in underlying risk is accounted for. In addition, we aim to separate the operating items from the financial items, since operating items represent the primary driving force behind value creation[191]. To get a complete picture, the analysis covers the last ten years, in order to capture several business cycles. The following subsections describe notable items, either included or excluded, in the reformulated statements.

4.1.1 Analytical Income Statement

Fair value adjustment of biomass

The treatment of live fish for accounting purposes is regulated by IAS 41[192]. According to IAS 41, the asset value of live fish shall be measured by fair value. However, effective markets for the sale of live fish do not exist, so the fair value of live fish is based on an estimated fair value in a hypothetical market. The estimations are therefore based on an informed, but ultimately subjective, basis. Efforts have been made to harmonize the fair value calculations across the industry, as pushed for by the Financial Supervisory Authority of Norway[193].

The account is closely related to the industries core operations and adjusted quarterly, making the item recurring and indicating an operational classification. However, the item is exposed to massive fluctuations due to salmon price volatility, making the account notoriously hard to forecast. As the different industry participants each use their own individual fair value calculations, including the item in the reformulated statements may also introduce a bias. Ultimately, the accounting item, while having a large effect on net income, does not impact cash flow, and

[190] Petersen and Plenborg, *Financial Statement Analysis*, p.63.
[191] Petersen and Plenborg, *Financial Statement Analysis*, p.68.
[192] SalMar, *SalMar Annual Report 2015*, p.78.
[193] SalMar, *SalMar Annual Report 2015*, p.79.

is excluded from operational EBIT. As such, the item is classified as non-operational, which is also the industry standard[194].

Income from associated companies

Income from associated companies represents income from companies where SalMar is a significant shareholder; with ownership ranging from 20-70% and where SalMar has majority voting rights[195]. The associated companies operate within salmon farming, harvesting and processing segments. This is considered to be a part of SalMar's core operations and the investments are assumed to have a similar risk profile as the parent company[196]. The item can, and will, therefore be classified as an operating activity. The reasoning can be generalized to the peer-group as a whole, with income from associated companies being classified as operational.

Value of excess inventory from acquisitions

The value of excess inventory relates to surplus or unusable inventory obtained through an earlier acquisition. Though acquisitions are an integral part of SalMar's growth strategy, the item is deemed non-recurring and not a part of core-operations.

Special biological events

The special biological events item pertains to losses incurred from government-mandated slaughter of salmon infected with pancreas disease, along with a one-time escape of a significant number of salmon[197]. While disease and escapees are current industry concerns, the events are considered irregular and classified as non-operational.

Onerous contracts

A provision for liability is made for fixed-price contracts committed at a lower rate than the basis for the market valuation of biomass. The effect is recognized on the line item, onerous contracts. The sale of fish is a core part of SalMar's operations, however the use of financial hedges is ultimately a financial activity and classified as such. The fact that the line item only appears once throughout the analyzed period supports the argument.

Tax considerations

Tax is a major consideration when constructing the reformulated statements. The apparent tax savings from debt financing, along with the profitability of the operating segment will depend heavily on how tax is calculated. When calculating the tax on on operating profits, the standard approach is to either use efficient tax rates or alternatively applying a flat corporate tax rate. Unfortunately, both methods have inherent weaknesses.

[194]SalMar, *SalMar Annual Report 2015*, p.62.
[195]SalMar, *SalMar Annual Report 2015*, p.60, 75-76.
[196]Damodaran, *Investment Valuation*, p.245.
[197]SalMar, *SalMar Annual Report 2015*, p.64.

Using the efficient tax rate, as calculated by dividing the actual tax payed on earnings before taxes, yields wildly fluctuating tax rates. The efficient tax rate, though representing the most accurate picture of tax, is often governed by opaque and hard to discern reasoning. Furthermore, using efficient tax relies on a number of assumptions, here-under that the company's borrowing costs are distributed in the same way as the firm's operating earnings[198], which we know to be untrue. Meanwhile, applying the corporate tax rate ignores any tax breaks or other tax saving measures, which results in imprecision. SalMar's increased international operations, along with an internationally operating peer group, also increases the imprecision from applying a flat Norwegian corporate tax rate. In all probability, the global scope of operations is a likely reason for the varying effective tax-rates in the peer-group as well.

Overall though, the goal of the reformulated statements is to provide comparability through homogeneity. We therefore apply the Norwegian corporate tax rate when calculating taxes, though we recognize that this is an imperfect approach.

4.1.2 Analytical Balance Sheet

Investments in associated companies

Income from associated companies was recognized as an operating activity, as discussed in the previous section. Accounting items in the balance sheet need to match the associated item in the income statement[199]. Consequently, investments in associated companies is recognized as an operating asset in the analytical balance sheet.

Cash and cash equivalents

Ideally cash and cash equivalents should be separated into cash required for continuing operations, and excess cash for financial activities. As SalMar does not separate the line item, nor supply any other distinguishable information, cash and cash equivalents as a whole is treated as a financial asset.

Deferred tax assets and liabilites

Deferred tax assets and liabilities arise due to a disparity between taxable income and accounting earnings. Accounting earnings are calculated based on IFRS or GAAP, while taxable income is the result of applying tax regulations[200]. Plenborg argues further that deferred tax liabilities should be classified as operating liabilities when they relate to intangible and tangible assets[201]. The annual reports show that this is primarily the case for the companies, and the accounting item is therefore classified as operational.

[198] Petersen and Plenborg, *Financial Statement Analysis*, p.265.
[199] Petersen and Plenborg, *Financial Statement Analysis*, p.73.
[200] Petersen and Plenborg, *Financial Statement Analysis*, p.430.
[201] Petersen and Plenborg, *Financial Statement Analysis*, p.88.

4.1.3 Operating Lease Adjustments

In addition to the aforementioned accounting items, several of the peer group, SalMar included, utilize off-balance sheet reporting for operating leases. From an economic perspective, operating leases are no different from traditional debt[202]. However current accounting standards allow for operating leases to be viewed as executory contracts that are treated as off-balance sheet. In other words, that operating leases are not recognized as an incurrence of debt, but rather report lease payments as rent expense in the income statement, and an operating cash outflow in the cash flow statements[203]. The exclusion of operating leases from the balance sheet biases nearly every financial ratio. Because of these distortions, the accounting rules governing operating leases is under scrutiny by the Security Exchange Commission, the Financial Accounting Standards Board, and the International Accounting Standards Board, and expected to change[204].

In order to standardize within the peer-group, and account for operating lease bias, the reformulated statements therefore include adjustments to capitalize off-balance sheet operating leases. The capitalization is done using Moodys approach. The approach adjusts the income statement by subtracting the annual rent expense of the lease from operating expenses, and reclassifying the amount to interest expense and depreciation. The balance sheet is adjusted by increasing assets and net interest-bearing debt by an amount equal to annual rent expense times a sector multiple. The applied multiple for the aquaculture industry is 3. The amount classified as interest expense is equal to annual lease expense multiplied by the firms pre-tax cost of debt, and the remaining sum is classified as depreciation.[205] This introduces a circular problem, since the pre-tax cost of debt is calculated on the basis of credit ratings, which depend on the accounting statements. To solve this, the thesis bases it's cost of debt calculations on the pre-adjustment statements. Ultimately, the adjustments are relatively minor, and will not have a significant impact on the valuation.

4.2 Profitability Analysis

The preceding reformulation of the financial statements allows us to analyze SalMar's profitability, both historically and through the peer-group benchmark. The profitability analysis yields insight into the financial value drivers, which is essential when constructing a robust forecast. The profitability analysis is based upon balance-sheet average, and utilizes the DuPont-model[206].

To minimize the noise distortion caused by taxes, as discussed in section 4.1.1, we choose to perform the financial analysis based on pre-tax measures when feasible. This is believed to yield a clearer picture and improve comparability of profitability. This despite the recognized fact that tax represents an important expense, which also affects cash flows. Ultimately, the need

[202] Koller, Goedhard, and Wessels, *Measuring and Managing the Value of Companies*, p.575.
[203] Moodys, "Financial Statement Adjustments in the Analysis of Non-Financial Corporations", p.9.
[204] Koller, Goedhard, and Wessels, *Measuring and Managing the Value of Companies*, p.575.
[205] Moodys, "Financial Statement Adjustments in the Analysis of Non-Financial Corporations", p.8-11.
[206] Petersen and Plenborg, *Financial Statement Analysis*, p.94.

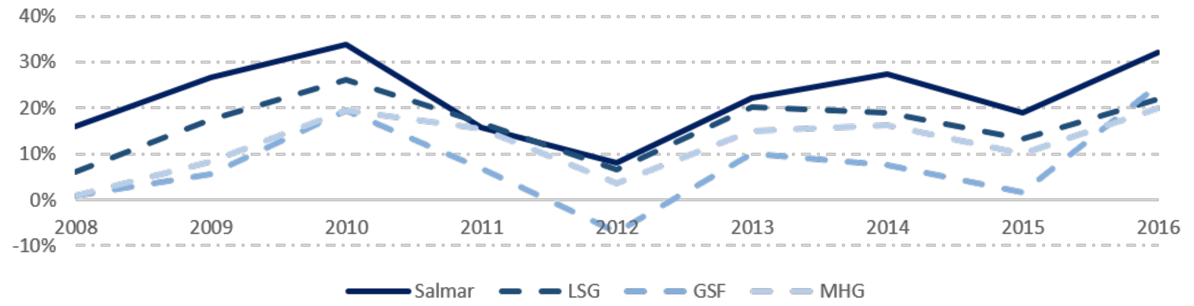
for the key ratios to be comparable trumps the tax considerations. When analyzing SalMar exclusively, post-tax measures are used to capture the tax effects.

4.2.1 Return on Invested Capital

The return on invested capital (ROIC) gives a sense of how well a company is allocating available capital to profitable investments. In other words, it is the prime profitability measure of operational activities. The trend and level of ROIC is presented in the following figure.

$$ROIC = \frac{Adjusted\ EBIT}{Average\ Invested\ Capital} \tag{4.1}$$

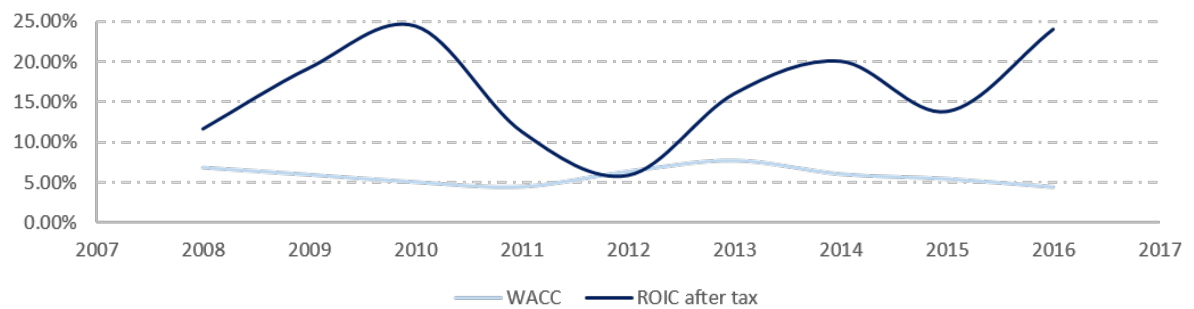
Figure 4.1: ROIC pre-tax



Compiled by authors

A few things become evident from figure 4.1. First and foremost, SalMar's ROIC has followed the same trend as the peer-group as a whole, which is unsurprising given the importance of salmon prices on operating profits. Secondly, that SalMar has consistently been the top performer in the peer-group when using ROIC as the key profitability measure, with the only exception being 2011 when Lerøy outperformed SalMar. In 2010-2012 where prices were depressed, the industry saw a significant drop in ROIC. Similarly, in the following year ROIC picked up again in line with salmon prices. SalMar's growth in 2014 is attributable to the acquisition of 19 new licences, while the general drop in 2015 came as a result of increased feed prices.

Figure 4.2: SalMar's ROIC vs WACC



Compiled by authors

When looking at ROIC, it's important to view it in conjunction with the WACC. As a ROIC which exceeds the WACC implies value creation, and value destruction if it does not. The following figure illustrates the development in ROIC and WACC, and shows that SalMar has managed to create shareholder value in all years, excepting 2012.

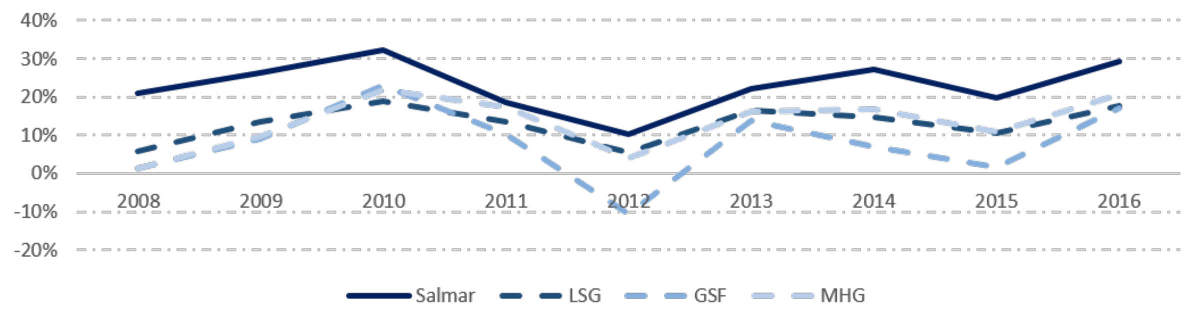
As per the DuPont model, ROIC is decomposed into profit margins and the turnover rate of invested capital in the following subsections.

Profit margin

The profit margin of SalMar expresses the relation between revenues and expenses. Due to the tax considerations the profit margin is measured as:

$$Profit\ Margin = \frac{Adjusted\ EBIT}{Net\ Revenues} \tag{4.2}$$

Figure 4.3: Profit margin



Compiled by authors

On a general level, the profit margin for the industry follows the cyclical pattern of the industry and ROIC. SalMar has achieved higher profit margins than the peer-group, explaining much of their superior ROIC. While salmon prices have trended up, so have costs. Costs have had a more steady growth, while prices have been more volatile, which explains the profit margin spikes[207]. As salmon prices are globally set, with the exception of VAP-pricing, it is reasonable to assume that SalMar's superior profit-margins are a result of their position as cost-leader and value-chain utilization[208]. SalMar saw the biggest profit-margin drop in 2011, which comes as a result of the partly problematic start-up of InnovaMar. Furthermore, the year saw SalMar's revenues relatively under-perform, as a result of a low contract coverage when prices fell[209].

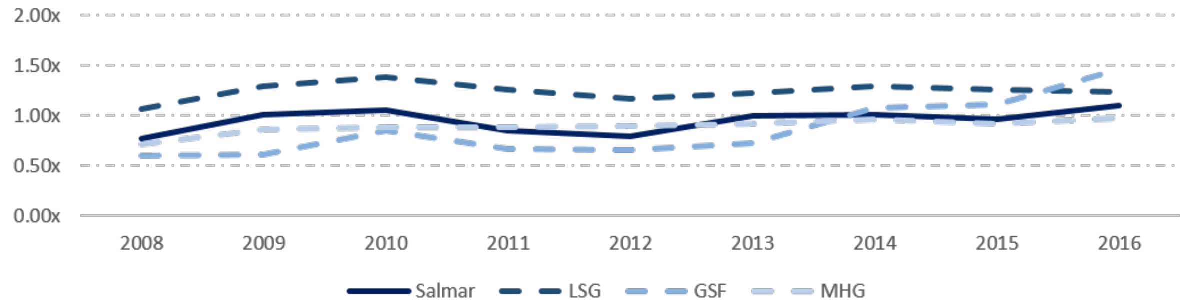
Turnover rate of invested capital

The turnover rate of invested capital describes a company's effectiveness at producing revenues from invested capital, and is defined as:

$$Turnover\ Rate\ of\ Invested\ Capital = \frac{Net\ Revenues}{Average\ Invested\ Capital} \tag{4.3}$$

[207] See Section 3.3
[208] See section 3.4
[209] SalMar, *SalMar Annual Report 2011*.

Figure 4.4: Turnover rate of invested capital



Compiled by authors

Despite higher revenues, the turnover rate of invested capital has held relatively stable. Salmon farming has been defined as a capital intensive industry[210]; implying that increased revenues comes at the cost of increased investments, for example in licenses or acquisitions. In relation to the preceding figures, turnover rate held steady in 2010, despite high salmon prices. For SalMar, this was a result of doubling their long-term debt in order to acquire two smaller companies, invest in InnovaMar, as well as acquire 23.39% of Bakkafrost[211]. SalMar divested their position in Bakkafrost in 2013, which impacted the turnover rate positively[212]. In the past year, revenues have significantly over-performed, resulting in an improved turnover rate of invested capital. Figure 4.4 shows the turnover rate to be relatively equal across the peer-group. Notably, Lerøy has traditionally been the top performer looking exclusively at the turnover rate, while Grieg has improved from having the worst ratio, to the top in 2016.

Overall, it's clear that SalMar's high ROIC is primarily a result of their high profit margins. SalMar's solid cost management and efficiency, which is especially important in a volatile and cyclical industry, allows for a greater return on invested capital and increased shareholder value-generation.

4.2.2 Indexing and common-size analysis

To delve further into the underlying trends and drivers of the profitability measures, a common-size and index-analysis is performed. The common-size analysis typically uses percentages of revenues, however we base it on volume harvested instead, because salmon prices do not impact expenses[213].

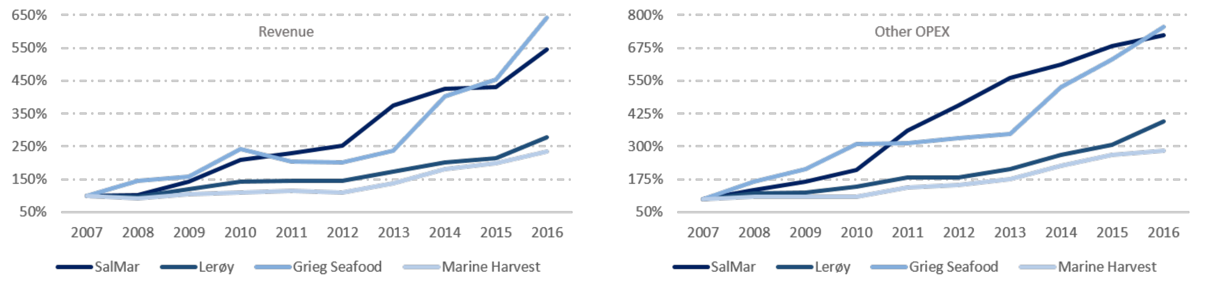
Indexing

The turnover rate of invested capital will not be analyzed further due to rate holding relatively stable, and because the industry is characterized as a capital intensive industry which usually results in a low turnover rate. However, it is included in the appendix[214].

[210] See section 3.2.1
[211] SalMar, *SalMar Annual Report 2010*, p.32.
[212] TDN Finans, *Salmar ute av bakkafrost*.
[213] Petersen and Plenborg, *Financial Statement Analysis*, p.112.
[214] See appendix A.19

An index-analysis allows for investigation into the development of individual revenue- and expense-items. As figure 4.5 shows, SalMar's revenues have grown by 538%, while other expenses have grown by 725%. SalMar and Grieg have seen the largest revenue-growth over the period, which supports SalMar's impressive profit margin, and also Grieg's movement from worst- to best-performing in invested capital turnover rate.

Figure 4.5: Indexing of SalMar's revenue and other OPEX compared with peer group



Compiled by authors, Source: Annual reports

SalMar and Grieg have also seen the largest increase in other operating expenses though. This has helped keep their profit margins in check. In SalMar's case, the dramatic increase in operating expenses can be linked to the challenge they face in sea-lice. Their heavy exposure to Central Norway explains why the other operating costs have increased significantly more than the peer-group. Number of treatments have increased in the last couple of years, however treatment resistant lice are becoming a problem, with new treatment methods further amplifying costs[215]. The other cost-items, which can be found in the appendix, show a similar development[216]

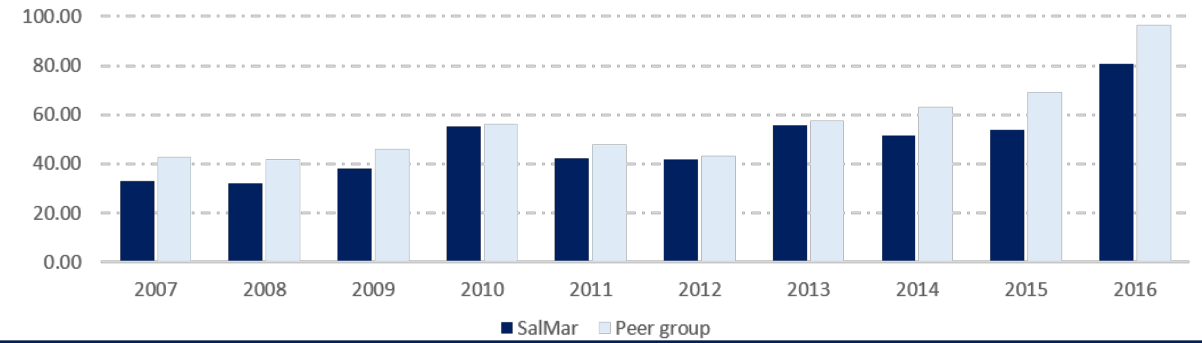
For SalMar, cost of goods sold has increased by 507%, which is primarily a result of increased harvest volumes, and from 2011 and onward higher feed prices have had a significant effect. Payroll and personnel costs have also grown, primarily due to SalMar's growth. However, payroll costs have seen a smaller increase than the other cost-items, which is theorized to be due to utilization of more and better technology and automated systems.

Common Size Analysis

Common-size analyze is used to illustrate the relative size of each item. In figure 4.6 and 4.7, the common-size comparison of revenues and other operating expenses are presented. The rest will be presented in appendix [217].

[215] Iversen *et al.*, *Kostnadsdrivere i lakseoppdrett*, p.36.
[216] See appendix A.20
[217] See appendix A.21A.22 A.23

Figure 4.6: Common-size of SalMar's revenue compared with peer group



Compiled by authors, Source: Annual reports

In contrast to the index-analysis, the common-size analysis shows SalMar's revenues and other operating expenses per kilo to be in line with the peer-group. Revenues per kilo are of course a direct consequence of the spot price. However, revenues are notably higher than the associated spot-prices of the years, which underlines the need to assign a price premium when forecasting revenues. This lends credence to the findings of section 3.4.5, that VAP and ecological salmon carries a significant price-premium. Further disparity could be an effect of achieved contract prices versus prices on the spot-market. Especially in recent years, SalMar's high contract coverage could explain the difference between SalMar and the top earners per kilo, as SalMar incurred significant losses on their contracts.

Figure 4.7: Common-size of SalMar's other OPEX compared with peer group

Compiled by authors, Source: Annual reports

Other operating expenses show SalMar moving in line with the peer group, excepting Grieg. Some disparity could arise from different accounting practices, however in sum the common size substantiates SalMar's position as historical cost-leader; despite costs growing more in percent, absolute values are in line with the peer-group. The remaining expenditure items show a similar trend, with the peer group moving in line, with the exception of Grieg who performs significantly worse. From 2012, the cost of goods sold for the peer-group is impacted heavily by the increased feed-costs.

The main takeaway from the indexing and common-size analysis is the need to forecast SalMar's revenues with a price-premium. The findings further verified the findings of salmon price analysis, with costs rising as a result of a worsened sea-lice situation and higher feed costs.

4.2.3 Return on equity

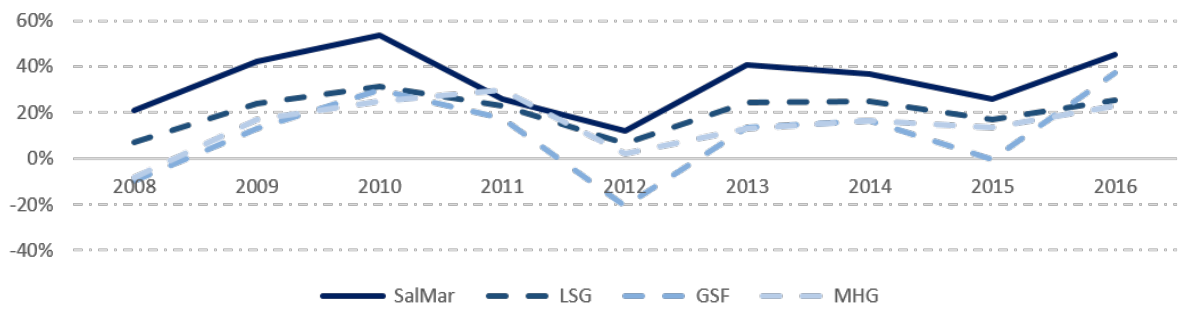
So far the focus has been on operating profitability. However, equally important is the return on equity, which expresses how much profit is generated from equity capital. The ROE can be measured by the two following equations, which should yield the same result in theory:

$$ROE = \frac{Net\ earnings\ before\ tax}{BVE} * 100 \tag{4.4}$$

$$ROE\ before\ tax = ROIC\ before\ tax\ + (ROIC\ before\ tax - NBC) * \frac{NIBD}{BVE} \tag{4.5}$$

However, due to our classification of certain items as transitory and handling of taxes, a disparity arises between the two measures. In order to preserve consistency with the earlier parts of the profitability analysis, we continue using equation 4.5.

Figure 4.8: Return on equity before tax



Compiled by authors

SalMar's ROE has fluctuated in line with the ROIC and the peers. SalMar's performance mirrors that of the ROIC, though both Lerøy and Marine Harvest outperformed SalMar in 2011. SalMar's ROE fell comparatively more in 2011 as they doubled their retained earnings, leading to a significantly higher level of equity. In burst years, financial gearing has a negative effect on ROE, which was the case in 2012, where ROE was lower than ROIC for SalMar. A further decomposition of the ROE can be found in the appendix [218]. The decomposition shows an industry which has fluctuated relatively in sync. However, there is a larger disparity in financial gearing. Marine Harvest and Grieg have a more levered strategy in comparison to SalMar and Lerøy. A lower financial gearing will affect ROE negatively if the spread is positive, and vice versa.

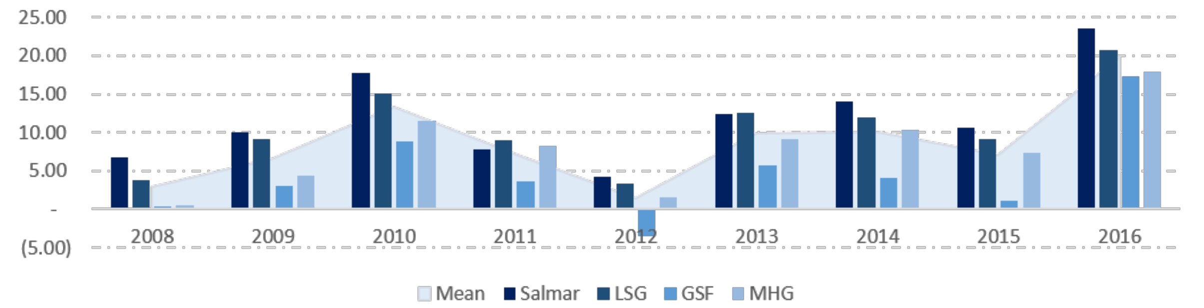
[218] See appendix A.6

4.2.4 Industry-specific Measures

EBIT/kilo

EBIT/kilo is an industry-specific profitability measure, which examines the firms capabilities to extract profits from harvested volumes. As indicated in section 3.3, the salmon price is volatile which results in an unstable EBIT/kilo multiple. SalMar has consistently obtained the highest EBIT/kilo in the industry, which again illustrates SalMar's superior ability to translate harvest volumes into value. As industry participants close in on their MAB-capacity and the rivalry intensifies, cost efficiency will play an increasingly important role in value creation.

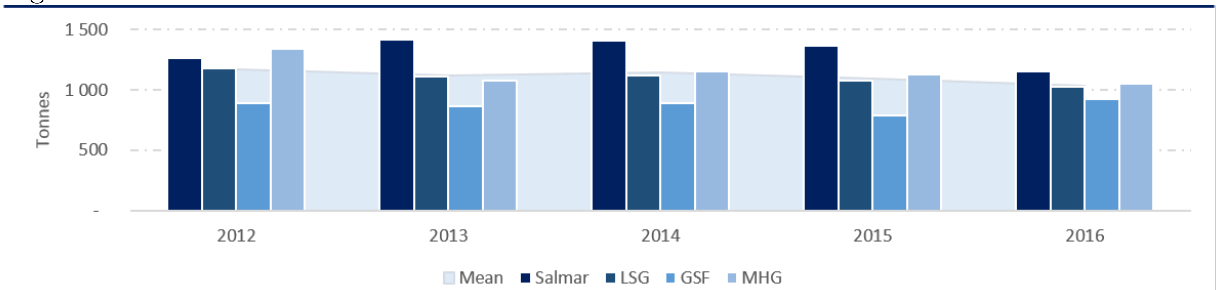
Figure 4.9: EBIT/kilo ratio



Compiled by authors

Another measurement for performance is how efficient the salmon farming companies utilize their licenses. Figure 4.10 indicates that SalMar has on average been able to harvest more salmon per license compared to the peers. This is highly relevant given the scarcity of licenses, and the difficulty associated with being granted new licences from the government.

Figure 4.10: Utilization of licenses



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4.2.5 Profitability Analysis Summarized

The profitability analysis has shown that SalMar has achieved better profitability than the peer-group, in most-all measures. SalMar provides a higher return on invested capital, which is mostly a result of higher profit margins. The profit margins are in turn a result of better cost-efficiency. SalMar are similarly more efficient at utilizing their licenses than the peer-group. However, the gap is closing between SalMar and the peers, as SalMar's costs rise in response to the biological challenges. The high contract-coverage of SalMar has also impacted revenues negatively in recent years, leading to lower overall realized prices. SalMar has shown a strong track-record in minimizing costs, which we believe will continue into the future, albeit in the short-term, costs will remain high due their heavy exposure to sea-lice infested waters.

4.3 Financial Risk Analysis

Assessment of liquidity risk is crucial, as a company without liquidity risks being unable to meet their financial obligations as they mature. Furthermore, liquidity risk affects a firms ability to generate positive net cash flows in both the short- and the long-term. Illiquid companies may also be prevented from investing in profitable investments. Companies ability to pay all short-term obligations as they fall due is portrayed by short-term liquidity risk. The long-term liquidity risk, refers to the long-term financial health of firm's and the firm's ability to pay all future obligations[219]. The liquidity ratios will be based on end balance sheet items because they are most up-to-date.

4.3.1 Short-Term Liquidity Risk

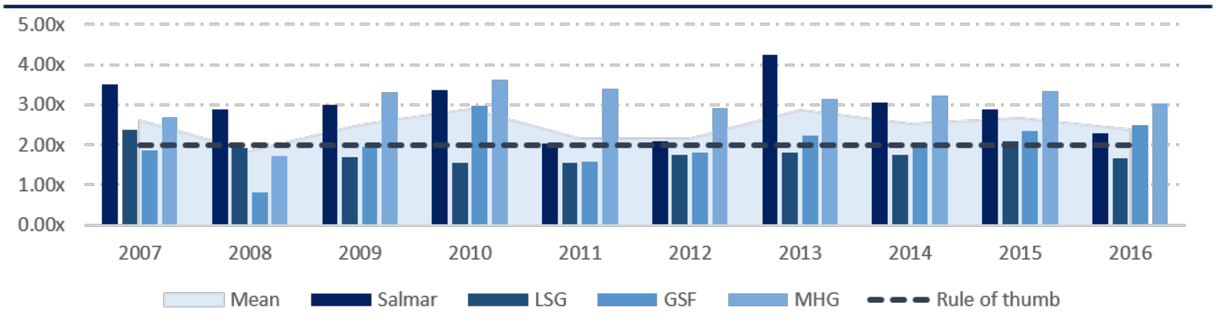
Current-ratio

The current ratio measures whether firms have enough short-term assets available to meet is short-term liabilities, and is defined as:

$$Current\ ratio = \frac{Current\ assets}{Current\ liabilities} \tag{4.6}$$

The greater the current-ratio is, the higher the likelihood that current assets are able to cover current liabilities, and the result of this is a lower liquidity risk. A rule of thumb is that a current-ratio exceeding 2 is an indication of low liquidity risk, but the rule of thumb will vary between businesses and industries. On the other hand, an exceedingly high current-ratio could be an indication of inefficient management of the firm's resources.[220]

Figure 4.11: Current ratio



Compiled by authors, Source: Annual reports

As illustrated by figure 4.11, applying the rule-of-thumb shows that the industry has achieved a low degree of liquidity risk in the last decade, averaging a current ratio of 2.45. SalMar has

[219]Petersen and Plenborg, *Financial Statement Analysis*, p.150.
[220]Petersen and Plenborg, *Financial Statement Analysis*, p.156.

over-performed relative to the industry, achieving a historical average of 2.93. In 2011 and 2012, short-term debt to credit institutions grew substantially, which led to SalMar's drop in current-ratio. SalMar's current-ratio has been quite volatile, but overall satisfactory using the rule-of-thumb. Marine Harvest has also posted strong current-ratios, with less volatility than SalMar. Therefore, these companies are deemed the least risky firms among the peer group, when using current-ratio as a measure.

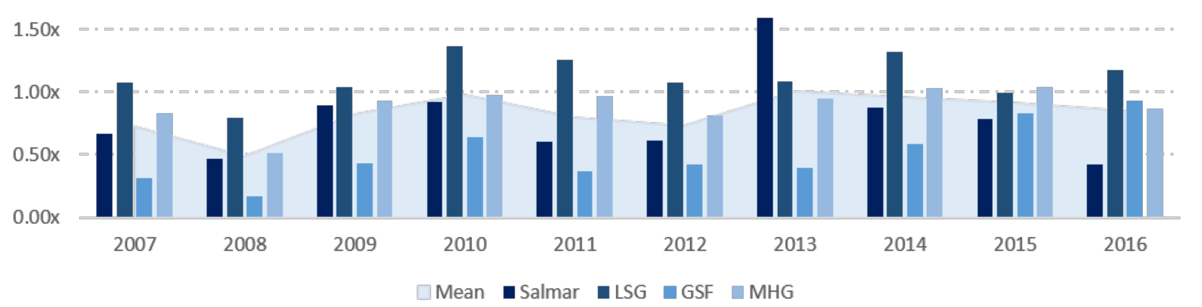
Quick ratio

The quick-ratio excludes inventory from current assets, thereby only including the most liquid assets in the calculation. It is defined as:

$$Quick\ ratio = \frac{Cash + Securities + Receivables}{Current\ liabilities} \tag{4.7}$$

Quick ratio is considered to be a more conservative indicator of the short-term liquidity risk than the current ratio, as only the most liquid current assets are included. The peer groups average is illustrated in the figure below, varying between 0.55 and 1. The industry mean over the period was 0.83.

Figure 4.12: Quick ratio



Compiled by authors, Source: Annual reports

As shown in the figure 4.12, Marine Harvest is no longer the most liquid company in the peer-group. Lerøy has overtaken the spot, owing to a large extent of their current assets being receivables, which represents future cash flow. SalMar is in the same boat as Marine Harvest, with large amount of current assets being tied up in inventory. SalMar achieved a mean of 0.78, just below the peer-group average. In 2013, SalMar experienced a temporary leap in their quick-ratio, owing to the divestment of shares in Bakkafrost. The quick-ratio indicates SalMar being slightly more risky. However, salmon is regarded as a liquid product, meaning we weight the liquidity risk from the current-ratio relatively more.

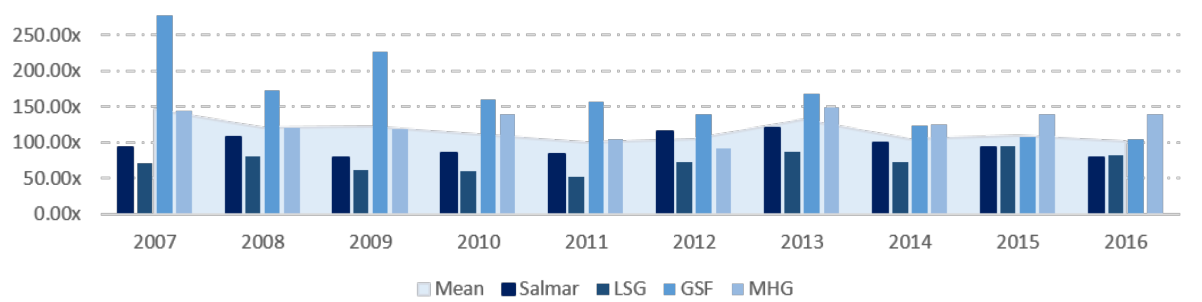
Liquidity cycle

The liquidity cycle measures how many days it takes to convert working capital into cash, with a lower ratio giving freer cash flows. Reducing the liquidity cycle can be achieved by either tightening control of receivables and inventory, or by gaining additional credit from the firm's suppliers. In this case, the most relevant suppliers are suppliers of feed. Other liquidity cycle reducing measures could include reducing the time capital is tied up in the production of salmon. The definition of liquidity cycle is:

$$Liquidity\ cycle = \frac{365}{NWC\ turnover\ rate} \tag{4.8}$$

$$NWC\ turnover\ rate = \frac{Revenues}{Inventory + Receivables + Prepaid\ expenses - Operating\ liabilities} \tag{4.9}$$

Figure 4.13: Liquidity cycle



Compiled by authors, Source: Annual reports

The turnover rate of net working capital is found in the appendix, while figure 4.13 shows the liquidity cycle of the peer-group[221]. Given the long production-cycle of farmed salmon, the liquidity cycle is unsurprisingly high. Lerøy has the lowest liquidity cycle, surpassed by SalMar in 2016. Grieg has historically performed considerably worse than the peer-group, dragging up the average. Overall, SalMar has historically performed towards the middle of the pack, achieving an average of approximately 96 days from capital is tied up until it is released.

4.3.2 Long-Term Liquidity Risk

Financial leverage

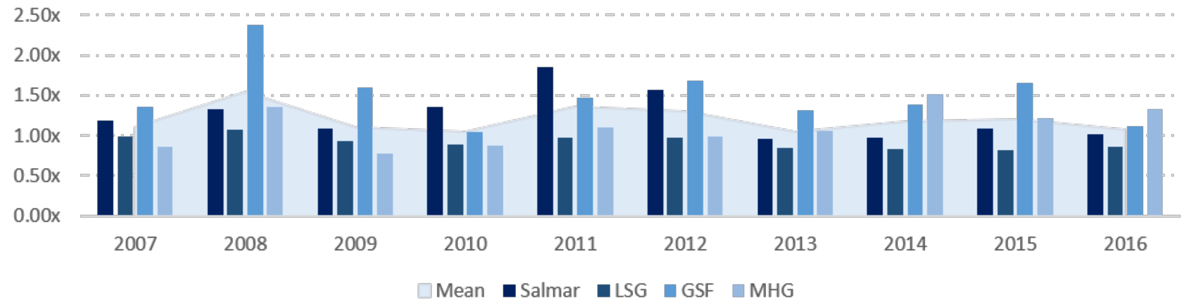
Financial leverage is a common measurement for long-term liquidity risk, and is the degree to which a firm uses fixed-income securities such as debt and preferred equity. The higher the financial leverage, the more of the company's use is financed by more debt and the higher the long-term liquidity risk[222]. This also impacts net income because a high degree of financial leverage implies higher interest expenses and tax shields[223]. It is defined as:

$$Financial\ leverage = \frac{NIBD}{Equity} \tag{4.10}$$

[221]See appendix A.25
[222]Investopedia, *Financial leverage.*
[223]Koller, Goedhard, and Wessels, *Measuring and Managing the Value of Companies.*

Figure 4.14 shows the financial leverage of the peer-groups measured by book values. The trend is relatively stable, indicating that firms operate with target leverage ratios based on their strategical considerations. SalMar's leverage ratio temporarily increased around 2011, as a result of the acquisitions already mentioned. Grieg has traditionally been the most levered in the group, but has been overtaken by Marine Harvest in recent years. Overall, SalMar is slightly less levered than the average.

Figure 4.14: Financial leverage



Compiled by authors, Source: Annual reports

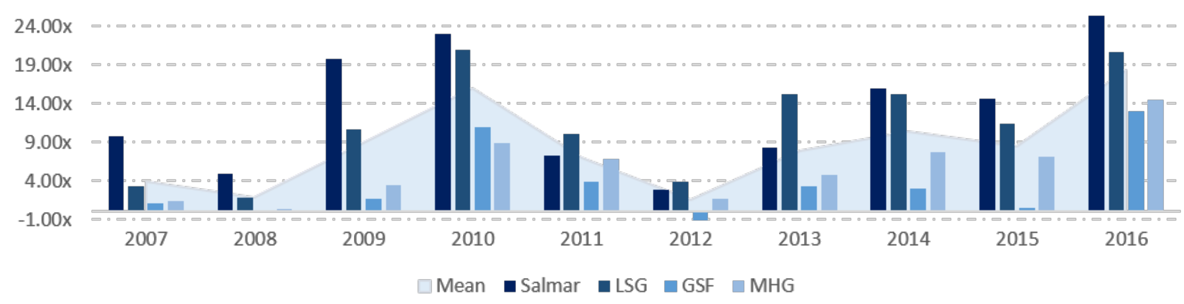
The picture differs when market values are applied, which Petersen & Plenborg recommends to use if it is available[224]. Financial leverage ratios can be found in the appendix, and show SalMar as the least levered company[225]. Grieg remains the most levered.

Interest coverage ratio

Interest coverage ratio measures how many times companies operating profit covers their interest expenses. The liquidity risk is higher the lower the ratio is, and it is defined as:

$$Interest\ coverage\ ratio(ICR) = \frac{EBIT}{Interest\ expenses} \tag{4.11}$$

Figure 4.15: Interest coverage ratio



Compiled by authors, Source: Annual reports

Looking at figure 4.15, interest coverage ratios appear highly volatile. However, this is unsurprising as EBIT is similarly fluctuating in line with salmon prices. SalMar has achieved a ratio

[224]Petersen and Plenborg, *Financial Statement Analysis*, p.158.
[225]See appendix A.24

higher than the peers, with a mean of 13.19 compared to the average 6.76. This is closely linked to SalMar's high EBIT/kg. SalMar's ratio fell significantly in 2011 as they took on more debt. Similarly, the ratio increased around 2009 due to falling interest rates and relatively low interest bearing debt, while salmon prices increased[226]. Based on the ratio, SalMar is the top-performer with the least long-term liquidity risk.

NIBD/EBITDA

Another measurement of long-term liquidity risk is NIBD/EBITDA which takes into account the firm's capability to take on more debt. This is a debt ratio which illustrates how many years it would take for a firm to pay back its debt if net interest-bearing debt and EBITDA are held constant[227].

The NIBD/EBITDA ratio is also present in SalMar's loan covenants, which are explored further in a later section. The covenants stipulate that the ratio may not exceed 4.5. The effect of the 2011 acquisitions on debt-levels is reflected in the NIBD/EBITDA ratio as well, however the ratio never exceeded 4.5. In 2011, SalMar reached an agreement with their lenders to temporarily increase the covenant stipulation to 5.44 in 2012, to give some leeway in their financial flexibility[228]. In recent years, the ratio has trended down as salmon prices have shot up, resulting in a higher EBITDA.

Figure 4.16: NIBD/EBITDA

NIBD/EBITDA	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Salmar	1.59x	2.39x	1.11x	1.46x	3.10x	4.45x	1.13x	1.03x	1.49x	0.79x
LSG	3.02x	3.87x	1.18x	0.67x	1.05x	2.83x	1.03x	0.89x	1.45x	0.97x
GSF	7.70x	10.87x	5.08x	1.57x	4.10x	-33.35x	3.15x	4.11x	7.54x	1.13x
MHG	4.90x	9.22x	2.43x	1.43x	1.95x	3.62x	2.11x	2.42x	3.03x	1.88x
Mean	4.30x	6.59x	2.45x	1.28x	2.55x	-5.61x	1.86x	2.11x	3.38x	1.19x
Median	3.96x	6.54x	1.81x	1.44x	2.52x	3.23x	1.62x	1.72x	2.26x	1.05x

Compiled by authors

Grieg again stands out as the worst performer, while SalMar performs better than the median. Lerøy and SalMar are perceived to be less risky by the ratio, with lower long-term liquidity risk and higher financial flexibility.

4.3.3 Liquidity-Risk Summarized

Overall, SalMar is identified as a low-risk company. The achieved ratios have been sufficiently high, and often out-performing the peer-group. Despite the acquisitions in 2011 coloring many of the ratios, and the implied volatility in earnings, SalMar on average performs well. Performance is within the rule-of-thumbs, and within the covenants stipulated by SalMar's loan agreements. SalMar has stated in their annual report that they are maintaining a flexible capital structure, secured by covenants. They want to manage the cash dynamically, and on a medium term have

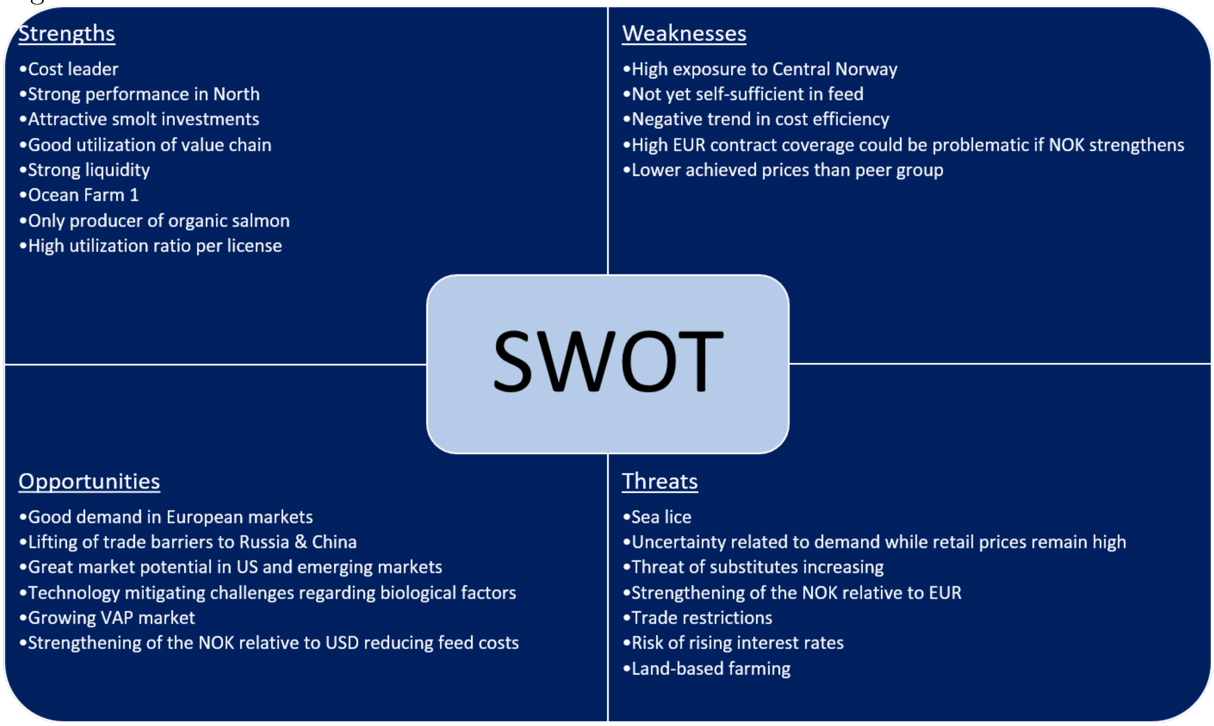
[226] SalMar, *SalMar Annual Report 2009*, p.38.
[227] Investopedia, *Definition of NIBD/EBITDA*.
[228] SalMar, *SalMar Annual Report 2011*.

satisfactory cash & cash equivalents to meet the short-term lending requirements. Combined, we assess both SalMar's short-term and long-term liquidty risk as low.

4.4 SWOT

After a comprehensive and thorough analysis of SalMar through the strategic and financial analysis have we acquired a profound understanding of SalMar's business and the industry it operates in. Based on this we have found the the external factors which provides opportunities and threats, and also the internal factors which demonstrates SalMar's strengths and weaknesses. This is summarized in the figure below.

Figure 4.17: SWOT



5. Cost of Capital

5.1 Weighted Cost of Capital

To estimate the fair value of SalMar, it is vital that the cost of capital is estimated as accurately as possible. FCFF is the cash flow to both equity investors and lenders, and since a company's stakeholder are risk averse they need to be compensated for bearing risk. In order to use the Discounted Cash Flow model (DCF), analysts use weighted cost of capital(WACC) to discount the free cash flow to the firm (FCFF)[229].

$$WACC = \frac{MVE}{NIBD + MVE} * r_E + \frac{NIBD}{NIBD + MVE} * r_e * (1 - t_c) \tag{5.1}$$

WACC represents the opportunity cost that investors face for investing in one company instead of another with a similar risk-profile[230]. It is important with consistency between the components in WACC and FCFF to successfully implement the cost of capital. SalMars WACC must include the required return to both equity and debt investors since the FCFF is the cash flow available for all investors.

The subsequent sections will cover the different components of the WACC formula in turn, to estimate the correct cost of capital for SalMar[231].

5.1.1 Capital Structure

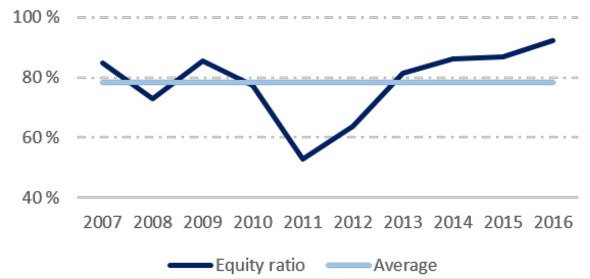
The capital structure determines the corresponding weights to the different components in the WACC calculation. Capital structure requires market values to be used, since market values reflect the true opportunity cost of investors and lenders[232]. Since SalMar has common stock publicly traded, the market value of equity can be calculated by multiplying the share price with the number of shares outstanding[233]. However, SalMar does not have any corporate bonds listed, therefore there are no true market value for SalMar's debt, and average NIBD book values will be used in the calculation instead.

SalMar is not operating with a target capital structure, but instead aim to have a degree of financial flexibility. The ratio is none-the-less capped by loan covenants, stipulating that the equity ratio shall exceed 35% measured in book value[234]. SalMar further manages capital through a second covenant which stipulates that NIBD/EBITDA should not exceed 4.5.

[229] Petersen and Plenborg, *Financial Statement Analysis*, p.245-246.
[230] Koller, Goedhard, and Wessels, *Measuring and Managing the Value of Companies*, p.328.
[231] The cost of capital is valid for 2016, historical cost of capital calculations are found in appendix A.32
[232] Petersen and Plenborg, *Financial Statement Analysis*, p.246.
[233] Koller, Goedhard, and Wessels, *Measuring and Managing the Value of Companies*, p.330.
[234] SalMar, *SalMar Annual Report 2016.*

The market-value based equity ratio of SalMar has varied greatly in the analyzed period. The equity ratio was lowest in 2011 because of a low price per share. However, after this period the equity ratio has increased steadily, reaching an all time high in 2016, with a ratio of 91.6%. The explanation for this is share-prices generally moving in line with salmon prices, which were also at an all time high in 2016.

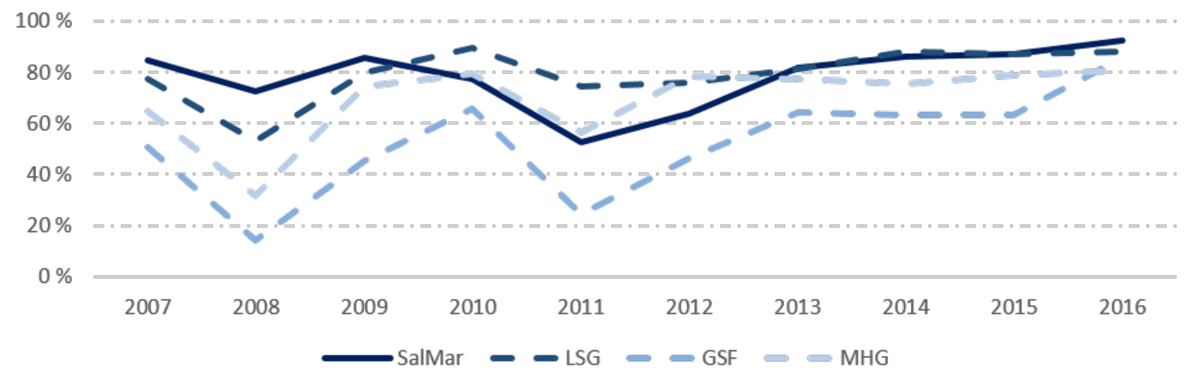
Figure 5.1: Equity ratio for SalMar



Author composed, data from Yahoo finance

Looking at the capital structure in the peer group, the equity ratios are correlated to a certain extent. Salmon farming companies experienced falling equity ratios in 2008 and 2011. The 2008 ratios were mainly affected by the financial crisis resulting in reduced liquidity in the market, and uncertainty in the future demand of salmon. The main culprit for the drop in equity ratios in 2011 was falling salmon prices, which led to significantly diminished share prices for all peer companies. SalMar, MHG and LSG have had quite similar capital structure during the last period, where SalMar has had historically the lowest average capital structure. Overall, the businesses had an average equity ratio of 69% during the last ten years.

Figure 5.2: Equity ratio for the peer group



Author composed, Yahoo finance

It may look as if leverage follows a cyclical pattern, where businesses obtain boosted market capitalization during periods with escalated salmon prices and good market outlooks. Since we perform individual WACC calculations for each year, the financial leverage ratio of 7.74% in 2016 is applied, corresponding to an equity ratio of 92.26%.

5.1.2 Cost of Equity

Cost of equity measures the required return of investors (r_e)[235]. To calculate the return, we are dependent on asset-pricing models which translate risk into expected return, since the expected

[235] Petersen and Plenborg, *Financial Statement Analysis*, p.249.

rate of return is not directly observable[236]. The Capital Asset Pricing Model (CAPM) is the most commonly used asset-pricing model[237]. Although the Fama-French three-factor model and arbitrage pricing theory (APT) can also be used to estimate the r_e. The three models differ in how they define systematic risk. The CAPM model is the most recognized method in most economic literature and the proper discount rate will therefore be determined by CAPM model. The underlying principle in the CAPM model is that all investors are able to diversify adequately to remove unsystematic risk. The CAPM formula is:

$$R_e = r_f + \beta(r_m - r_f) \tag{5.2}$$

The equation consists of three factors: the risk free rate (r_f), the systematic risk (β) and the market risk premium ($r_m - r_f$). After r_e is estimated, adjustments can be made to take account of risk factors explicit for the company. The individual variables will be discussed in the following subsections.

Risk-free rate

The risk-free rate reflects how much an investor can earn without incurring any risk[238]. The best estimate for r_f is theoretically the expected return on a zero-β portfolio, but this is both costly and complex, and therefore not used in practice[239]. Government default-free bonds is therefore used as a proxy for the risk-free rate, the underlying assumption being that government bond is risk-free. Each cash flow should ideally be discounted with a government bond with similar maturity, but this infers that an applied short-term rate is expected to apply in each future period. This would require a recalculation of the cost of capital in each forecast year and therefore few people use it in practice[240]. Therefore, most analysts apply a single yield to maturity from a government bond that best matches the cash flow being valued by using a local government bond.

To estimate the risk-free rate, Norwegian government bonds will be used as proxy. This will negate issues such as inflation, since the government bond is denoted in the same currency as SalMar's cash flows[241]. McKinsey argues that the most common proxy is to use a 10-year-government bond instead of a 30-year government bond. Despite a 30-year bond possibly matching the cash flow better, their illiquidity can cause yield premiums[242]. NIBOR is another measurement for the r_f, which is the short-term borrowing rate between the banks and needs to deduct the banks bankruptcy risk based on their ratings. The same applies to Norwegian

[236] Koller, Goedhard, and Wessels, *Measuring and Managing the Value of Companies*, p.300.
[237] Credit Suisse, *Estimating the cost of capital*, p.10.
[238] Petersen and Plenborg, *Financial Statement Analysis*, p.249.
[239] Koller, Goedhard, and Wessels, *Measuring and Managing the Value of Companies*, P.302.
[240] Koller, Goedhard, and Wessels, *Measuring and Managing the Value of Companies*, P.302.
[241] Petersen and Plenborg, *Financial Statement Analysis*, p.251.
[242] Petersen and Plenborg, *Financial Statement Analysis*, p.251.

government bonds, but the deduction is based on the general rating of Norway, and not individual banks. Norway has a AAA rating among rating agencies like Moodys, S&P and Fitch, which implies that Norway has little to no risk of default. The bankruptcy risk of Norway is lower than for banks and therefore yields on 10-year Norwegian government bonds chosen as the best proxy for r_f. A survey conducted by PWC in 2016 shows that the rate on 10-year government bond is the most commonly used measure of r_f in the Norwegian Market. The average rate for Norwegian 10-year government bonds 1.33% in 2016[243], which is applied as r_f.

Market risk premium

Market risk premium is the return investors requires as a compensation for obtaining risk. The spread between the market return and the risk-free rate is referred to as the market risk premium. However, the expected market return faces the same problem as the risk-free rate; being in-observable. According to Pettersen and Plenborg, there are two different approaches to estimating market risk premium; either ex-post or ex-ante. The ex-post method examines the spread between historical returns on the stock market to historical risk-free investments using the past 50 to 100 years. The underlying assumption is that the historical risk premium for market portfolios is a realistic indicator of market portfolios future risk premium, though whether this assumption holds is contested[244]. The ex-ante approach attempts to determine the implicit risk premium of market portfolios by using analysts' earnings forecast[245].Therefore, research studies and reports may be used in order to determine market return.

A myriad of researchers have discussed and provided different sources for market risk premiums. Damodaran provides historical risk premiums across equity markets from 1900-2016 , where the total equity risk premium for Norway was 5.69% for 2016[246]. Furthermore, Fernandez made an extensive survey of different countries market risk premium where the average risk-premium for Norway was 5.5% in 2016[247]. Additionally, PWC and The Norwegian society of Financial Analysts have made an extensive study on the risk premium in the Norwegian market for 2016, and concluded that the average market risk premium is 5% based on answers from respondents[248]. According to the Norwegian Central Bank, the Norwegian risk premium has been 5.9% and Statista claims a market premium of 5.5%[249][250]. We will apply an average of the the different estimates in order to define the risk premium, setting it at 5.52%.

[243] Bank, *10-year Norwegian government bond.*
[244] Petersen and Plenborg, *Financial Statement Analysis*, p.263.
[245] Petersen and Plenborg, *Financial Statement Analysis*, p.263.
[246] Damodaran, *Country risk premium.*
[247] Fernandez et al, "Market Risk Premium used in 71 countries in 2016: a survey with 6,932 answers", p.3.
[248] PwC, *Risikopremien i det norske markedet 2016*, p.8.
[249] Bank, *The equity risk premium*, p.12.
[250] Statista, *Average market risk premium in Norway from 2011 to 2016.*

5.1.3 Beta

Beta measures the systematic risk in the CAPM, which is a measure of the covariance between stock returns and market portfolio return[251]. Beta denotes the relative risk of a company in relation to the market portfolio, and changes in systematic risks influences shareholders required rate of return[252][253]. A beta of 1 indicates perfect correlation between a stock price and the market portfolio, meaning movements in the market will be matched exactly by movements in the stock price. An asset will have beta higher than 1 if the asset is more volatile than the market portfolio, and have a beta lower than 1 if it is less volatile than the market portfolio.

There are several methods used to estimate betas, and these methods all have inherent weaknesses which leads to measurement errors. To obtain a solid estimate of the systematic risk, these measurement problems have to be accounted for. Therefore, we will use a weighted average of the different betas obtained, in order to improve our estimate. The following sections presents the various beta estimations obtained through the most commonly used practices.

Raw beta

Perhaps the most common and conventional approach for beta estimation is to use a regression of historical stock returns against historical market portfolio returns[254]. Where again the most common regression approach to estimate the raw beta is the market model[255]:

$$R_i = \alpha + \beta R_m + \epsilon \tag{5.3}$$

Figure 5.3: SalMar's raw beta

Calcualtion of Raw beta	Salmar	OSEBX
Variance of return	0.00638	0.00110
SD of returns	0.07990	0.03317
Correlation(Salm,OSEBX)	0.08708	
SalMar's raw beta	**0.210**	

Compiled by authors, Source: Oslo børs

Estimation of raw beta by regression analysis is simple, but the model has some inherent weaknesses. The method relies on the length of the chosen measurement period, which could have a major impact on the estimated beta value[256]. The method also assumes that beta is static in the time-dimension. A static beta is not necessarily empirically true, as beta can differ over time due to changes in strategy or the acquiring of new businesses, which will change the risk-profile of the firm. McKinsey advocates checking for this by plotting the company's rolling beta, and visually inspecting for structural changes[257]. Inspection shows an apparent trend in the development of the beta[258]. This indicates that SalMar has

[251] Koller, Goedhard, and Wessels, *Measuring and Managing the Value of Companies*, p.312.
[252] Petersen and Plenborg, *Financial Statement Analysis*, p.251.
[253] Damodaran, Aswath, "Estimating Risk Parameters", p.4.
[254] Petersen and Plenborg, *Financial Statement Analysis*, p.252.
[255] Koller, Goedhard, and Wessels, *Measuring and Managing the Value of Companies*, p.312.
[256] Damodaran, Aswath, "Estimating Risk Parameters", p.11.
[257] Koller, Goedhard, and Wessels, *Measuring and Managing the Value of Companies*, p.252.
[258] See appendix A.26

undergone structural changes, which means we should be hesitant when applying the regression beta.

Another critique is that regression analyses uses ex-post data, but CAPM ideally warrants ex-ante data. The regression analyses also require liquidity in the trade of the share, illiquidity can make the beta undervalued.

Different empirical research suggest that the regression should be based on monthly data with a period of five years' data of a value weighted, well-diversified market portfolio[259]. Therefore, we will use monthly returns over a five-year period. SalMar's returns are regressed against the OSEBX, since standard practice is to estimate the beta of a stock relative to the index where it is traded. Since OSEBX has a propensity towards oil stocks[260], the estimated beta is unlikely to be the true measure of market risk[261]. We therefore adjust the regression beta using Bloomberg's method, which smooths betas towards 1. This is based on empirical evidence which shows that betas over time trend towards the average beta, which is 1[262]. The classic regression method results in a levered and adjusted beta value of 0.473 for SalMar.

Industry beta

Another approach to improve the precision of beta estimation is to use the beta from the industry SalMar is operating in as a whole, rather than company-specific betas. This will improve the beta precision since companies operating in the same industry face the similar operating risks and therefore should have similar operating betas. If the estimation errors across companies are uncorrelated, the individual beta which is underestimated or overestimated will tend to cancel each other out and the industry average beta will produce a better estimate[263]. It is important to adjust for leverage when an industry average beta is used, since a company's beta is a function of both operational and financial risk.

Unfortunately, there is no readily available beta-estimate for the aquaculture industry. Damodaran has estimated a beta for 87 companies operating in the "Food Processing" industry, which includes most major aquaculture companies. The industry also encompasses a lot of other firms, which are not necessarily comparable with SalMar. This introduces some concerns as to the validity of the beta, but Damodarans estimate is none-the-less the best available[264]. Using Damodaran's unlevered beta estimate of 0.61 for the industry, we arrive at a levered beta of 0.752 for SalMar.

[259] Koller, Goedhard, and Wessels, *Measuring and Managing the Value of Companies*, p.251.
[260] ForeignStocks, *The Components of the OSEBX Index.*
[261] Damodaran, *Investment Valuation*, p.190.
[262] Damodaran, *Investment Valuation*, p.187.
[263] Koller, Goedhard, and Wessels, *Measuring and Managing the Value of Companies*, p.318.
[264] Damodaran, *Betas by Sector.*

Bottom-up beta

Breaking down betas into their business risk and financial leverage components allow us to estimate betas without using past prices, and the bias it introduces, for the firm in question. Known as the bottom-up beta approach, it builds upon the arguments for the previous two approaches.

The method starts by computing regression betas for comparable firms to the firm to be estimated. The betas are averaged, and then unlevered by applying the overall average debt- to equity-ratio of the firms. The resulting beta is then re-levered by applying SalMar's current debt- to equity-ratio. In essence, the method is a more sharpened method to the industry beta approach we previously employed. The averaging of betas reduces the standard error of the estimate, and the usage of current debt levels accurately reflect the capital structure, alleviating the risk associated of non-static betas.[265] The bottom-up beta approach results in a levered bloomberg adjusted beta value of 0.598 for SalMar.

Other analysts

A final option is to simply use betas from a company providing beta estimates, such as Reuters, Bloomberg, or Financial Times. These services typically use a simple regression method for estimating the betas though, with some added adjustment techniques. Most services use a five-year regression window, while Bloomberg utilizes a two-year window. Furthermore, not all companies reveal their adjustment techniques to improve their beta-estimates, however the underlying beta is usually based on a simple regression, with the pitfalls that that entails.[266]

Averaging the sample betas from Bloomberg, Reuters, and Financial Times, gives a levered beta of 0.37 for SalMar.

Summarized beta

The preceding subsections have yielded differing estimates for SalMar's beta. As there is no flawless way to estimate the beta, the final beta applied for SalMar is based on a weighted average of the preceding results. Before the final beta-value is presented, the arguments for the weights are provided. This implies that the applied weights are ultimately discretionary, in the sense that they are not based on empirical research, and therefore may be biased.

The classic regression method is given little credence. This is mainly due to the prevalence of M&A activities within the sector, which changes the inherent risk-structure of SalMar, indicating that the fundamental assumptions have changed over time. This is evidenced by the rolling-beta plot, which clearly shows a trend in beta-development. Furthermore, the use of OSBEX, which is significantly influenced by oil-stocks, introduces skewness in the beta result.

[265] Damodaran, *Investment Valuation*, p.198-200.
[266] Damodaran, *Investment Valuation*, p.186-187.

The industry beta is similarly troubled by the choice of data. The "food-processing" industry defined by Damodaran includes many firms not directly comparable to SalMar, which means the industry beta is not perfectly applicable. Since the sample betas gathered from other analysts are usually based on a simple regression, and since we do not always know the adjustments which were made to arrive at the beta, the analyst beta is not given much weight.

The bottom-up approach is therefore given the most weight. Despite the underlying regressions also relying on the OSEBX, and the relatively small peer-group sample size. The averaging of the regressions reduces the standard error of the estimate, and using only the peer-group provides a more sharpened estimate. The results and final applied beta for SalMar is summarized in the following table.

Figure 5.4: Applied levered beta

Methods	Betas	Weights
Historical	0.473	10%
Bottom-Up Levered	0.598	60%
Industry Levered	0.752	20%
Financial Analysts	0.370	10%
Beta estimate	**0.594**	

Author composed, annual report

5.1.4 Cost of Debt

The cost of debt (r_d) represents the required rate of return of creditors supplying debt financing. According to SalMar's annual reports, they are currently borrowing at floating interest, as determined by NIBOR plus an undefined spread. Though SalMar does not explicitly state the spread they pay over NIBOR, they do specify that it is dependent on profitability covenants. SalMar's five-year term loan agreement from 2011 had a credit spread range of 1.25 to 4.50 %. The new five-year term loan agreement entered into in 2014 has an, as of yet, unspecified credit spread range. If we assume though that the credit spread range is held relatively unchanged, adding 3-month NIBOR would imply a cost of debt for SalMar in the range of 1.74 to 3.80 % for 2016.

We can investigate this further by looking at the historically incurred cost of debt, which yields a cost of debt between 2.72%-8.97%[267]. The resulting numbers show fluctuating historical cost of debt levels, with several years inconsistent compared to SalMar's stated credit spread and associated cost of debt. The historically incurred cost of debt is therefore discarded as invalid, due to unidentified noise or other effects skewing the results.

Alternatively, the cost of debt formula can be applied:

$$r_d = (r_f + r_s) * (1 - t_c) \tag{5.4}$$

[267] Cost of debt = Interest Expense / NIBD

The equation consists of three variables: the risk-free rate, the credit spread, and the corporate tax rate. The risk-free rate has already been covered in the section 5.1.2, however the remaining variables will be discussed in the subsections following.

Credit spread

The current credit spread is as mentioned undefined by SalMar, however the old credit spread is kept and used as a sanity check for calculated numbers. In order to arrive at a valid credit spread, a credit rating model is utilized. Credit rating models rely on statistical tests to select financial ratios to rank a companies credit risk and implied risk of default. This is a standard approach of banks and other financial institutions; and the chosen model for the thesis going forward is Standard & Poors credit risk model[268]. The model is adjusted slightly to better capture the credit risk of SalMar; i.e. financial ratios not deemed relevant are excluded from the model. This includes FFO / Total Debt, which is a profitability measure primarily used in the real-estate industry[269]. The credit spread associated with a specific rating is gathered from Damodaran, a leading authority in valuation[270].

Figure 5.5: Cost of debt

Implied Cost of Debt	2016
Median rating	A
Spread	1.10%
Risk free rate	1.33%
Cost of debt, pre-tax	2.43%
Marginal tax rate	25.00%
Cost of debt, post-tax	**1.82%**

Authors creation

The cost of debt levels implied by the credit rating model is more aligned to our sanity check. Therefore, the cost of debt implicit from the credit rating models is applied as SalMar's current cost of debt. As per the discussion in section 4.1.1, the corporate tax-rate in Norway of 25% is applied[271].

Weighted cost of capital summarized

The weighted cost of capital is summarized in the following figure.

Figure 5.6: Cost of capital

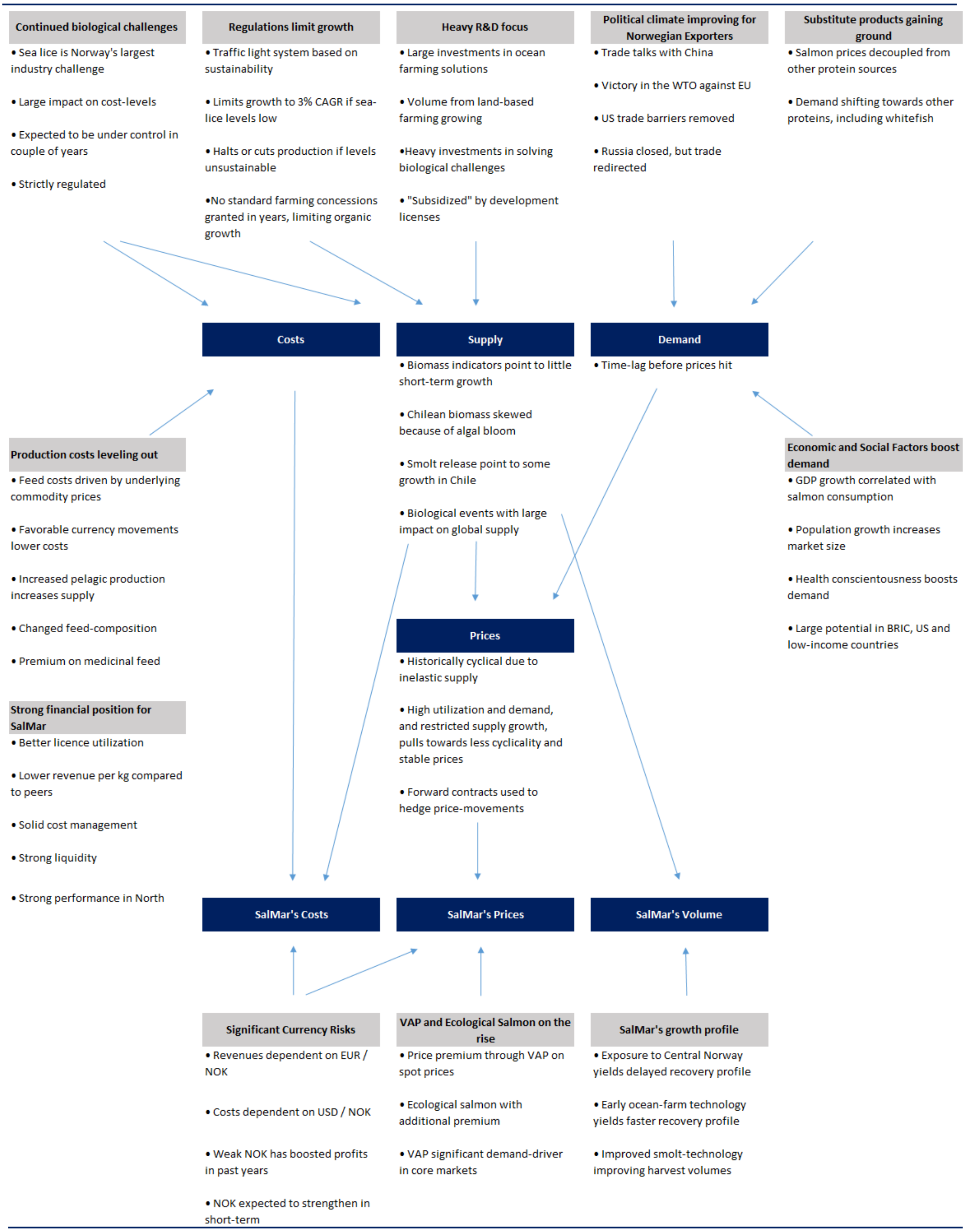
Cost of capital	2014	2015	2016
Cost of equity	6.48%	5.93%	4.60%
Cost of debt, post tax	3.01%	1.95%	1.82%
Financial leverage	13.8%	13.1%	7.7%
Equity	86.2%	86.9%	92.3%
WACC	**6.00%**	**5.41%**	**4.39%**

Cost of equity	2014	2015	2016
Risk-free rate	2.52%	1.57%	1.33%
Beta	0.683	0.792	0.594
Market risk premium	5.80%	5.50%	5.52%
Return on equity	**6.48%**	**5.93%**	**4.60%**

Author composed, annual report

[268] Petersen and Plenborg, *Financial Statement Analysis*, p.276.
[269] Investing Answers, *Funds from Operations (FFO)*.
[270] Damodaran, *Ratings, Interest Coverage Ratios and Default Spread.*
[271] KPMG, *Tax rates.*

Figure 5.7: Strategic and Financial Analysis Summarized



6. Forecasting

The forecast builds upon our findings in the strategic and financial analysis. As the future is unknown, a forecast will never be flawless, and some subjective assessments are unavoidable. In order to create as solid forecast as possible, we extract the most realistic and accurate assumptions from the preceding analyses.

Forecasting is typically done by developing an explicit forecast for a number of years, before the remaining years are valued by a perpetuity formula[272]. The first question is therefore determining the length of the explicit forecast. McKinsey argues for using an explicit forecast period between 10-15 years, since using a short explicit forecast period typically results in significant undervaluation or requires heroic growth assumptions. The trade-off to forecasting explicitly for so long, is the difficulty, and associated precision errors, in forecasting individual line-items several years ahead.

The forecast therefore compromises and is divided into three parts; the short-term, the medium-term and long-term. The short-term is fully explicit and includes the next three years, i.e 2017-2019. The medium-term is less specific, and forecasts the period from 2020-2024. The long-term is 2025 and onward, defined as our terminal period and valued using a perpetuity formula. The split is based on our findings in the strategic analyses; the short-term where prices are generally expected to remain high due to tight supply and biological challenges, the medium-term where ocean-based farming and other solutions are expected to take full effect, and the long-term where the industry is expected to have reached a steady-state.

In the long-term, a company's growth is limited to the growth of its markets. We have chosen to set the long-term growth equal to the target inflation rate of SalMar's main markets. The Euro-zone operates with an inflation target of 2%, or just below, while the US has a target of 2%[273][274]. The long-term growth is therefore set to 2%. This is congruent with PwC's survey, which finds a terminal growth of 2% to be the most appropriate[275].

Foreign exchange

As discussed extensively, SalMar are exposed to significant currency risk, both on the revenue and on the cost side. In the fully explicit short-term, we therefore apply forecasted exchange rates when forecasting revenues and costs for SalMar. As the thesis is not in a position to argue for specific exchange rates, forecasts from leading banks are applied instead. The foreign exchange discussion can be found in section 3.1.2. Applied exchange-rates for the short-term are reproduced in the following figure. For the medium- and long-term, exchange rates are held

[272]Koller, Goedhard, and Wessels, *Measuring and Managing the Value of Companies*, p.186.
[273]The Federal Reserve, *Why does the Federal Reserve aim for 2 percent inflation over time?*
[274]European Central Bank, *The definition of price stability.*
[275]PwC, *Risikopremien i det norske markedet.*

stable.

Figure 6.1: Foreign Exchange Rates

Exchange Rates	2017E	2018E	2019E
EUR / NOK	8.9	8.6	8.8
USD / NOK	8.3	7.7	7.1

Source: Danske Bank, SEB, Nordea, Handelsbanken

6.1 Forecasted Supply

The global salmon price was analyzed in section 3.3, and found to be highly dependent on global supply levels. In order to forecast the price, we therefore first need to forecast the supply. The supply is forecasted following the same logic applied to the forecast as a whole; i.e the supply-forecast is split into time-intervals. Supply is further divided into production from traditional salmon farms in Norway, Chile, and the rest of the world. Production from land- and ocean-based farming is further highlighted, to illustrate the massive growth.

6.1.1 Short-term (2017-2019)

Section 3.3 highlighted two primary indicators for the next two years supply - biomass levels and smolt release. Year-over-year Norwegian biomass levels are down 0.74% in 2016, while Chilean biomass is down 20% in the same period. For smolt, Norwegian release is down 2.5%, while Chilean release is 1% higher[276]. The indicators point towards zero- to negative growth in the next two years, however they do not paint a complete picture, at least for Chilean supply.

The Norwegian sea-lice situation is expected to remain a challenge throughout 2018, which restricts Norwegian growth in the period. Other regulation which affects global supply, is the regulation regimes instituted in both Norway and Chile, which limits growth to 6% semi-annually in sustainable areas. In 2019, as the sea-lice situation improves, Norwegian supply is expected to begin recovering towards pre-lice levels, with higher utilization and less mortality.

Overall, we project 1% growth in Norwegian supply in 2017, based on the biomass indicator and sea-lice situation. The slight growth stems from favorable conditions in Northern Norway. In 2018, growth is expected to pick up slightly, due to improved smolt-technology starting to take effect. 2019 marks the beginning of Norwegian recovery, with significantly improved supply as the sea-lice situation starts to resolve itself.

For Chile, the biomass indicator is lent less credence, due to the supply recovering from the algae bloom, meaning mortality rates will be significantly reduced. In addition, Chilean biomass is skewed by the higher share of younger, and therefore lighter, fish. Late 2016 smolt-release should yield significantly increased harvest volumes in 2017 and 2018, due to a slightly shorter growth cycle as a result of sea temperatures. Effectively, the years act as Chile's recovery years. As

[276]Beringer Finance, *Aquaculture Sector Preview 4Q2016*, p.3.

Chile again approaches their MAB-ceilings and firms adjust to the new growth regulations from the government, supply growth is expected to slow down in 2019. At the same time, the new growth regulations are assumed to diminish the likelihood of short-term volume spikes.

Growth in other producing countries is set to a modest 3.0% in the short-term, in line with historical trends and within typical industry regulation which limits CAGR to 3.0%.

Over the short-term, production from ocean- and land-based farms is set to explode, growing more than three-fold in 2018 for instance. Though collectively the production still represents a relatively small share of global production. Ocean-based farming is under heavy development among the major Norwegian farmers, with several solutions being applied for and tested, and production scheduled to start in the short-term. Land-based volumes are projected based on an extensive study performed by DnB[277]. The forecasted short-term volumes are summarized in the following table.

Figure 6.2: Short-term supply

Global Supply	2016	2017	2018	2019
Norway	1 171 000	1 182 710	1 200 451	1 272 478
Chile	504 000	539 280	571 637	600 219
Rest	489 000	503 670	518 780	534 344
Global Excl. Ocean/Land	2 164 000	2 225 660	2 290 868	2 407 040
Ocean / Land	5 000	13 000	61 000	91 000
Global Supply	**2 169 000**	**2 238 660**	**2 351 868**	**2 498 040**
Growth Y/Y	*-9.14 %*	*3.21 %*	*5.06 %*	*6.22 %*

Composed by authors, land volumes form DNB

6.1.2 Medium-term (2020-2024)

Unfortunately, there are no explicit indicators which can provide volume guidance when looking more than three years ahead. The forecasted volumes are therefore based exclusively on the strategic analyses and expectations of the future.

Analysts and industry participants hold a generally positive outlook in regards to the biological challenges, and expect the sea-lice situation to be mostly resolved in the early 2020's. 2020 therefore marks the second, and final, recovery year for Norwegian supply. From there supply is expected to level out towards the regulated growth-ceiling. Chile's situation is similar, with supply growth leveling out, however the forecast assumes a slightly higher growth-rate due to slightly lower current utilization.

However, the largest source of uncertainty for supply in the medium-term is the success of ocean- and land-based farming technology. Land-based production remains based on DNB's findings. However, we recognize that the future tends to be overestimated, so we revise the estimates slightly to arrive at a more sober forecast for land-volumes. Ocean volumes are based

[277] Aukner and Hanstad, *Farmed salmon market update*, p.15.

on the proliferation of development licenses. If all pending development licenses are approved, a potential 200,000 tonnes salmon could be harvested from the ocean[278]. However, this represents an absolute maximum, and production will take significant time in ramping up. We don't expect all licenses to be granted, and therefore apply a high, but tempered, growth-rate for ocean volumes. The forecasted medium-term volumes are summarized in the following table.

Figure 6.3: Medium-term supply

Global Supply	2020	2021	2022	2023	2024
Norway	1 361 551	1 409 205	1 451 482	1 495 026	1 539 877
Chile	630 230	661 741	688 211	715 739	737 211
Rest	555 717	577 946	601 064	625 106	643 860
Global Excl. Ocean/Land	2 547 498	2 648 892	2 740 756	2 835 871	2 920 948
Ocean / Land	130 000	182 000	236 600	307 580	399 854
Global Supply	**2 677 498**	**2 830 892**	**2 977 356**	**3 143 451**	**3 320 802**
Growth Y/Y	7.18 %	5.73 %	5.17 %	5.58 %	5.64 %

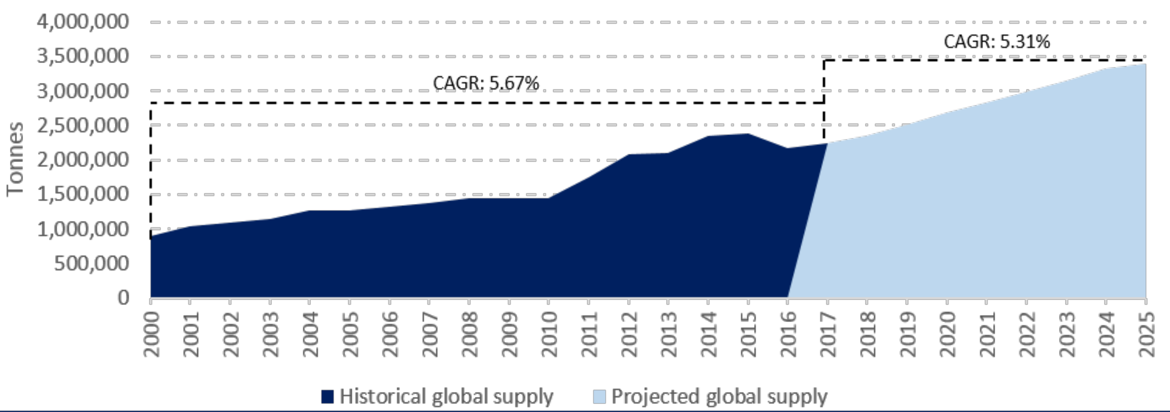
Authors creation, Source: Nordea Markets, Pareto

6.1.3 Long-term (2025-)

In the long-term, growth in supply is not divided by region, but simply dependent on a terminal global growth-rate. This presumes that supply reaches a steady-state. As technology allowing land and ocean-farming is expected to have matured by 2025, supply is expected to level out into steady-growth.

In the terminal year, the technology allowing for land and ocean-farming is expected to have matured. Furthermore, Chilean and Norwegian supply is expected to have recovered and leveled out, ref the preceding subsections. The growth in the terminal year is therefore set to 2%, consistent with SalMar's projected terminal growth rate.

Figure 6.4: Global Supply - Historical and Projected



Authors creation, historical volumes from FAO

[278] Aadland, *Dette kan gi 127.000 tonn ekstra laks i sjøen.*

6.2 Forecasting Demand

The historical demand figure found in section 3.3.3 were argued to be in large part a function of supply. However, when forecasting demand we disregard this interaction, and look at demand increase as a result of the other findings in the analyses. This is of some consequence as the coming price-models assumes consistent underlying assumptions in the data. However, given that the historical demand values are so biased by supply, we argue that it is not a true indicator of actual demand growth, and that the model will be skewed regardless. When looking forward, we therefore forecast demand as independent of supply, as we believe this is a better indicator of actual demand growth, and will result in a better model.

6.2.1 Short-term

The recent year has seen salmon prices decouple from other protein-sources, as per the discussion in 3.2.2. Given the time-lag from wholesaler to retailer to consumer, we believe the price-impact has not wholly hit the market yet. At current prices, substitute products are expected to take market share from salmon. Furthermore, the trade agreement between China and Norway is not finalized, meaning the market is not fully open. Worth noting is that China is already serviced in-part by other producers, we none-the-less believe that if the market should open for Norwegian salmon, it would result in a net-increase in global demand for salmon. Overall, this leads us to project a fall in demand for salmon in 2017.

In the two-years following, demand is expected to pick up again as prices stabilize and consumers adjust to the higher price-levels. We also expect a fully open Chinese market, significantly improving global demand. The increased focus on VAP, product innovation, and marketing should help amplify demand further, especially in core-markets. Acting as an overall demand-multiplier is the global populations health conscientiousness, which is expected to continue. We therefore project rising demand in 2018 and 2019, with a larger increase in the later year.

6.2.2 Medium- and long-term

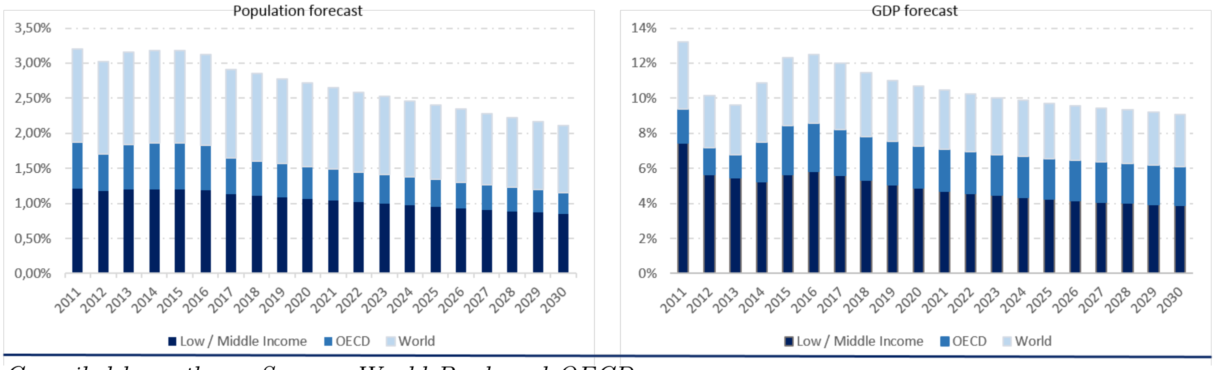
In the medium- and long-term, the short-term effects remain relevant, but harder to quantify. We therefore utilize broader indicators to project demand; primarily population and GDP-growth, both of which were found to correlate with salmon demand, as per section 3.1.2.

Figure 6.5 shows projected population- and GDP-growth from the World Bank and the OECD databases respectively[279][280]. As discussed in section 3.1.2, low and middle income countries stand for the majority of the future population growth, while also outperforming the average world GDP growth. Simultaneously, low to middle-income nations are underrepresented when it comes to fish consumption per-capita. This is also the case in the US, which is a massive market,

[279] oecdgdp
[280] worldbankpopulation

though consumption is significantly lower than their European peers. In addition, sanctions on Russia and Russian retaliatory sanctions are presumed to be resolved in the medium-term. These areas therefore represent a significant capacity for increased demand looking forward.

Figure 6.5: Forecasted growth in GDP and population



Compiled by authors, Source: World Bank and OECD

Furthermore, supply of substitute proteins is constrained in the medium- and long-term by a lack of available space on land for agriculture. The UN estimates discussed in 3.1.3 supports a significantly increased demand in the future.

Based on this, we forecast a strong-demand in the medium-term, slowing the price-reduction following similarly strong supply-growth. Overall, demand is projected to be slightly weaker than supply, implying falling prices. In the long-term, or terminal period, demand is expected to stabilize, with growth equal to the growth in supply. This ensures stable pricing in the terminal period.

6.3 Forecasting Salmon Prices

In the salmon price forecast we use the information from the supply and demand forecasts to model the future salmon price. The final forecasted salmon price is an educated estimate based on our findings, a regression analysis, analyst estimates, and forward-prices.

6.3.1 Short-Term

Regression analysis

Section 3.3 discussed the impact of supply and demand on spot-prices. For the forecast, we investigate this relationship further by performing a multiple linear regression. The multiple regression uses spot prices as the dependent variable, and supply and demand as explanatory variables. By performing the regression on year-over-year percentage changes, the forecasted supply and demand can be implemented into the model to find future prices. The model is based on changes in the salmon price denoted in Euro, as the EU is the largest market for salmon. The regression can be found in the appendix[281], and the resulting linear equation in

[281] See appendix A.33

6.1:

$$\Delta Price \ = \ 0.1322 - 2.1281 * \ \Delta Supply \ + \ 0.6506 * \ \Delta Demand \tag{6.1}$$

Due to a lack of available information, the regression is restricted to fifteen-years worth of data. In order to establish a valid statistical relationship between variables and proving stationarity, more observations would be beneficial. An investigation of the residual plots show no immediate reasons for concern[282]. Further checking Durbin-Watson's test statistic, we find no signs of auto-correlation[283]. The initial multiple regression shows a negative relation between price and supply, and a positive relation between price and demand; which makes sense. However, the model only explains roughly half of the price-variance. Furthermore, neither the demand variable, nor the intercept, is statistically significant. We can therefore not reject the null-hypothesis that demand has zero effect on prices. Presumably this is due to the intercept acting in part as demand. To elaborate; the intercept shows that with zero increase in supply, prices would still increase, indicating that the intercept incorporates elements of demand. Supply and demand is further assumed to have multicollinearity issues, as demand is based upon input-factors such as salmon consumption and import/export values, which necessarily depends on the salmon supply. This is confirmed by investigating the variance inflation factors[284].

In a perfectly modelled scenario and world; where our variables are independent, perfectly measured, and capture all relevant information, we would assume price-changes are dependent solely on changes in supply and demand. This would imply an intercept of zero in the model. We acknowledge that neither our explanatory nor dependent variables are perfect, and that several factors effecting salmon prices are not included in the model. Such factors could include prices for substitute products et cetera. Therefore, we largely disregard whether the intercept is statistically significant or not. Demand however was found to not be statistically significant, and we therefore investigate a model sans demand and accept the intercept acting as a catch-all. The result equation from the linear regression is found in equation 6.2:

$$\Delta Price \ = \ 0.1885 - 1.9338 * \ \Delta Supply \tag{6.2}$$

Given the discussion in the previous analyses though, demand was found to be an increasingly important factor for salmon pricing, especially looking forward as supply-levels even out. Therefore we would ideally have a model which incorporates demand. As there is a distinct lack of observations, our model is especially sensitive to outliers. This on the other hand makes identifying outliers equally difficult. Despite removing observations to fit the data being a general faux pas in statistical modelling, we none-the-less investigate a model where we remove outliers, in this case 2013. In the model, both supply and demand become statistically significant with meaningful coefficients, as shown in equation 6.3.

$$\Delta Price \ = \ 0.0706 - 2.0400 * \ \Delta Supply \ + \ 0.96227 * \ \Delta Demand \tag{6.3}$$

Overall though, prices found by the two regression models are used solely in the short-term,

[282]See appendix A.33
[283]See appendix A.34
[284]See appendix A.33

as we are hesitant to extrapolate further. In addition, given the weakness of the models and assumptions made, the regression prices are used only as a tool and additional data-point, not as the final forecasted price. The forecasted prices are instead set based on a combination of analyst expectations, forward-prices, regression prices, and the findings of the preceding analyses. The regression prices are reproduced in the following table.

Figure 6.6: Regressed forecasted salmon price

Regression 1: Supply

Year	2017	2018	2019
Supply	3.21%	5.06%	6.22%
% change in salmon price	*11%*	*8%*	*5%*
Projected salmon price (€)	7.57	8.15	8.57

Regression 2: Supply and Demand

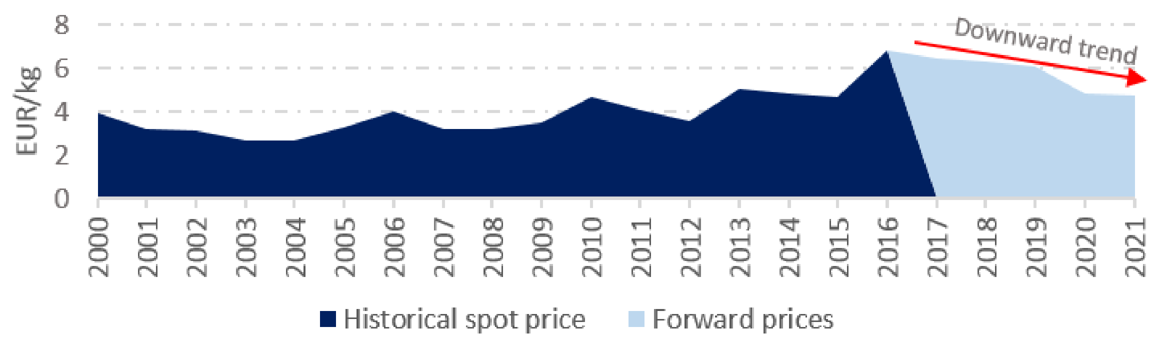
Year	2017	2018	2019
Supply	3.21%	5.06%	6.22%
Demand	-4%	2%	8%
% change in salmon price	*-3%*	*-1%*	*2%*
Projected salmon price (€)	6.57	6.49	6.62

Composed by authors

Other forecasts

Current forward prices are reproduced in figure 6.7. The prices imply a significantly weaker NOK than is forecasted by the Norwegian Central Bank and other analysts, ref section 3.1.2. It is unclear why the market is in disagreement, but the forecast takes the position that follows bank and analysts forecasts, which are in agreement. Therefore, forward contracts traded in EUR are believed to under-perform.

Figure 6.7: Forward prices



Year	2017	2018	2019	2020	2021	2022
Forward price (€)	6.47	6.32	6.09	6.09	4.85	4.75

Compiled by authors, Source: Fishpool

Price forecasts from Nordea put salmon prices at NOK 57 per kg and NOK 51 per kg for 2017 and 2018 respectively[285], while Beringer expect NOK 63 and NOK 62, respectively[286]. ABG maintain NOK 58 for 2017[287].

[285] Nordea Markets, *Seafood Sector report.*
[286] Beringer Finance, *Aquaculture Sector Preview 4Q2016.*
[287] Strat, *Stronger for Longer.*

Figure 6.8: Analysts predicted salmon price

Year	2017	2018	2019
Beringer	7.08	7.21	-
ABG	6.52	-	-
Nordea	6.40	5.93	5.68
Arctic Securities	6.83	6.51	-

Source: Nordea, Beringer, ABG, Arctic Securities

Applied prices

Overall, the thesis believes the forward-curve to underestimate the development in EUR/NOK. The linear regression yields ever-increasing salmon-prices given our supply forecasts, and is therefore discarded. The multiple linear regression yields reasonable results, but is not fully trusted due to its assumptions. It is argued further that analysts underestimate the negative impact of demand on prices in 2017, especially per the decoupling to other protein sources. On the other hand, we argue for a delayed recovery in supply, which adds some upwards-pressure on prices. The impact of the Chinese market and continued VAP efforts is set to hit demand in 2019, at the same point as Norwegian supply begins recovering, keeping prices EUR neutral.

Based on the above, we apply a price per kg of EUR 6.7 in 2017, EUR 6.6 in 2018, and EUR 6.6 in 2019. Which corresponds to NOK 59.63 , NOK 56.76, and NOK 58.08 respectively. This is below the forward-curve in NOK terms, but well above in EUR terms, owing to different EUR / NOK assumptions. Our prices are similarly above most analysts in EUR, due to a tighter forecasted supply situation in the short-term.

Medium-term prices are expected to trend downwards due to a stronger supply-side from new technology and better biological conditions. Norway's late recovery especially helps boost global supply. Demand is expected to strengthen, due to a growing demand in emerging and low-income markets, in addition to increased US consumption and continued VAP growth. In the terminal period, demand is forecasted equal to supply, resulting in a stable price of EUR 4.57 per kilo.Summarized price findings and final forecasted prices applied in the valuation are reproduced in the following figure 6.9:

Figure 6.9: Forecasted salmon prices

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025
Applied Price (€)	6.70	6.60	6.60	6.08	5.84	5.63	5.40	5.06	4.72
EUR/NOK	8.90	8.60	8.80	8.80	8.80	8.80	8.80	8.80	8.80
Applied price NOK	**59.63**	**56.76**	**58.08**	**53.50**	**51.40**	**49.50**	**47.50**	**44.50**	**41.50**

Composed by authors

6.4 Revenue Forecast

SalMar's future revenues are estimated based on the forecasted prices found in the previous section, and a forecast for SalMar's future harvest volumes. Furthermore, the revenues will depend on estimations of contract coverage and achieved contract prices, along with the estimated price premium.

6.4.1 Forecasting Harvest Volumes

Harvest volumes

Figure 6.10 reproduces the historical growth of SalMar's harvest volumes, versus SalMar's guiding volume estimates. Presumably, SalMar's guiding volumes are the best indicator of future harvest volumes. Notably though, the guiding figures have overestimated actual growth quite significantly in several periods, making us hesitant to apply SalMar's guiding volumes as our forecast value for 2017.

Figure 6.10: Difference between guided volumes and harvest volumes

Harvested volumes	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Guiding	61,500	73,000	78,000	85,000	103,500	116,500	116,000	133,000	139,000	133,000
Guiding growth		*19%*	*7%*	*9%*	*22%*	*13%*	*0%*	*15%*	*5%*	*-4%*
Actual	**52,100**	**53,700**	**64,300**	**65,000**	**93,000**	**102,600**	**115,000**	**141,000**	**136,400**	**115,700**
Actual growth		*3.1%*	*19.7%*	*1.1%*	*43.1%*	*10.3%*	*12.1%*	*22.6%*	*-3.3%*	*-15.2%*

Compiled by authors, Source: SalMar annual reports

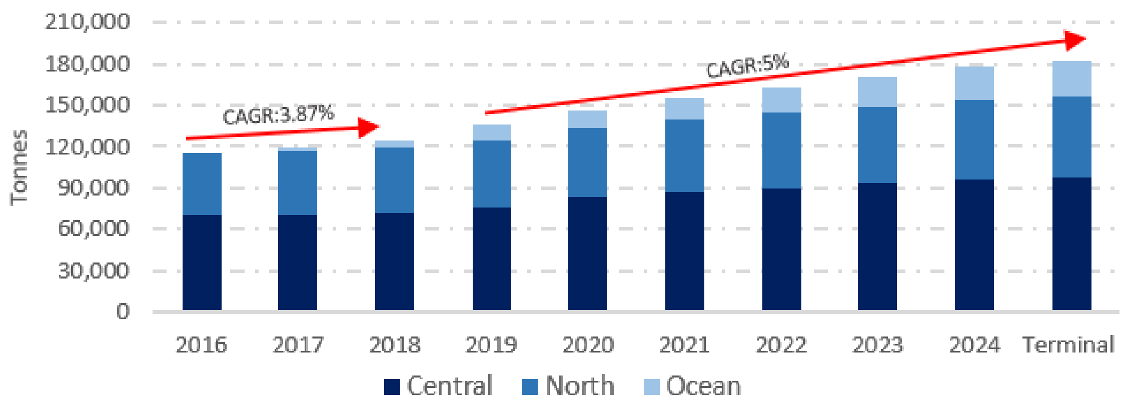
In the case of 2017, SalMar has released a guiding volume of 131,000 tonnes, which corresponds to an increase of 13% to actual volume harvested in 2016. This seems excessive when considering the findings of the strategic analyses. While we recognize that SalMar theoretically have the capacity to produce 131,000 tonnes, as evidenced by 2015 harvest volumes, the analyses has found the biological situation to be relatively unchanged. In the short-term in particular, SalMar's heavy exposure to sea-lice infested waters in Central Norway, means the thesis is in disagreement with SalMar's volume guidance.

In general, the forecasts of SalMar's future harvest volumes follow many of the same arguments and constraints as that of Norwegian supply in general. Growth in Central Norway volumes is depressed until the recovery years of 2019 and 2020, while Northern Norway sees some growth due to favorable biological conditions. Following the recovery years, growth is effected by the maximum allowed growth regulated by law, and trends towards the terminal growth-rate.

Though growth in SalMar's traditional farms is modest, the completion of Ocean Farm 1 represents a new avenue for growth. The first transfer of fish to the farm is set to mid to late 2017. Volumes in the short-term are therefore modest, as it takes time for the fish to grow to optimal harvest weights. Estimates from Pareto are applied in the short-term, as they are consistent with what we would expect given current utilization levels and the production life cycle[288] Throughout the mid-term, SalMar's ocean volumes are expected to continue to grow as the technology matures and new licences are granted and sites approved. In the long-term, growth is set to equal Norwegian supply growth in general, and is consistent with our terminal growth-rate.

[288]Pareto Securities, *SalMar Quarterly Review*, p.3.

Figure 6.11: SalMar's forecasted harvested volume



Compiled by authors

Contract coverage

In Q1 of the fiscal year, SalMar reported a current contract coverage for 30% of the expected volumes. This is consistent with previous years, indicating that SalMar target a fixed-price hedge of 30% of their harvest volumes. Historically, due to a mismatch between guiding volumes and actual harvested volumes, the actual volume sold on contracts has trended closer to 40%.

Given the discrepancy between the thesis's forecasted volumes and SalMar's guiding volumes, this is expected to continue. We therefore set the volume sold on contracts equal to 30% of SalMar's guiding volumes in 2017. In the remaining short-term, sales on contracts is set to equal 30% of harvested volumes. In the medium- and long-term, achieved contract prices are assumed equal to spot-prices. SalMar trade contracts through Fishpool, and Fishpool's forward-prices were found to be undervalued in EUR to our forecasted prices. Assuming SalMar sell half their contracts on EUR, SalMar are forecasted to incur losses on 15% of their guiding volume in 2017. Discrepancies arising from a difference in achieved contract prices to forecasted prices for their NOK forward contracts will also impact revenues in the short-term.

Figure 6.12: Contract revenue

Year	2017	2018	2019
EUR Contract Volume	19,650	18,990	20,667
NOK Contract Volume	19,650	18,990	20,667
EUR Contract Prices	6.5	6.3	6.07
NOK Contract Prices	60	59.2	57.75
Contract Revenue NOK	**2,315,753**	**2,153,048**	**2,297,511**

Compiled by authors

Price premium

SalMar has historically achieved a significant price-premium to the spot-market. Investigating past revenues against historical harvest volumes and average prices show that SalMar has achieved an average price-premium of 30% in the analyzed period. In recent years, the average is closer to 25%. The reasoning behind the price premium is not explicitly stated, but is presumed to be a result of selling VAP-products and ecological salmon. Furthermore, it is presumed that SalMar has the capability to sell more volume in periods with higher prices, which would imply that yearly average price is downward biased to the actual achieved price per kilo.

We choose to weight recent years relatively more, and therefore apply a price premium equal to 25% on the spot price for the forecast-period.

Other income

Income from associates is forecasted based on a percentage of revenues. As SalMar's associates operate in the same segment as SalMar, we presume that their revenues will fluctuate in line with SalMar's. Furthermore, we assume that as SalMar grows, they will continue to increase their holdings in associates, keeping the percentage stable. Other operating revenues are also forecasted as a percent of revenues, and equal to the historical average of 0.54%.

6.4.2 Forecasted Revenues

The full revenue forecast is found in the following table.

Figure 6.13: Forecasted revenues

Year	2017	2018	2019	2020	2021	2022	2023	2024	Terminal
Sales revenue	8,253,149	8,321,841	9,171,665	9,810,087	9,977,169	10,070,683	10,159,137	9,933,195	9,448,813
Other operating revenues	44,460	44,830	49,408	52,848	53,748	54,251	54,728	53,511	50,901
Income from associates	179,877	181,374	199,896	213,811	217,452	219,490	221,418	216,494	205,937
Net revenue	**8,477,486**	**8,548,045**	**9,420,970**	**10,076,745**	**10,248,369**	**10,344,424**	**10,435,284**	**10,203,200**	**9,705,651**

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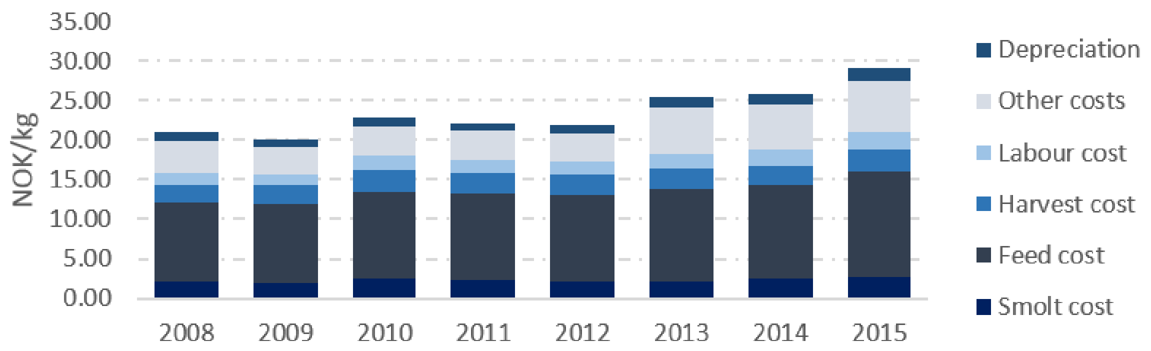
6.5 Forecasting Expenses

Operating expenses in the Norwegian salmon farming industry have surged upwards in the last couple of years. Rising feed and biological costs are primarily responsible, which is shown in figure 6.14. Feed has been the largest cost-driver historically, while biological costs has developed into the second biggest cost factor in the last years. Because of the relative importance of these two cost-drivers, they are forecasted explicitly in the following subsections. SalMar's costs will be forecasted by per kg, except from deprecation, write-downs and taxes.

Figure 6.14: Cost development



Compiled by authors, Source: Norwegian seafood council

6.5.1 COGS

Feed costs

The cost of goods sold per kilo has trended upwards during the historical period. The main reason for this increase is a significant escalation in fish feed costs. Feed costs, as mentioned earlier, accounts for almost 50% of the total production costs, and is driven by underlying commodity prices, exchange rate fluctuations and the feed factor.

As mentioned in section 3.3.4, the raw material components of fish feed has experienced falling prices lately, which we expect to continue, impacting feed cost levels positively. This trend will be further amplified by an appreciation of the NOK relatively to USD. Additionally, SalMar is scheduled to produce larger smolt, which will reduce the production life cycle in the sea, indicating reduced feed for the salmon and therefore reduced costs. However, larger smolt are estimated to increase the feed factor, which will impact feed costs negatively. Furthermore, increasing use of functional and medicinal feed will pressure costs upwards. In sum though, the contribution of feed costs to production costs is forecasted to decrease.

Overall, lower raw material prices and an appreciation of NOK relative to USD are assessed to have the largest impact on feed prices, and in turn the cost of goods sold. We therefore forecast a decrease in cost of goods sold of 1.5 NOK/kg in 2017, and a further 1.5 NOK/kg in 2018. In 2019, costs are assumed to decline even further with 2.61 NOK/kg. From 2020 and onward the cost per kg is set to NOK 29.

6.5.2 Other Operating Costs

Biological costs

In the last three years, increased operating expenses has accounted for 40% of the increase in production costs. The main cost driver here has been medicinal treatment costs, as mentioned in section 3.3.4. Other operating expenses per kilo have increased from 3.57 NOK/kg to 11.65

NOK/kg in the analyzed period. A significant part of this growth was seen in the last two years, when the sea-lice situation worsened significantly.

As pointed out in section 3.4.2, roughly 60% of SalMar's operation are located in the Central Norway, where the sea-lice situation is most critical. The sea-lice levels are expected to remain high in this area during the next three years, but assumed contained in 2019-2020. Therefore, costs related to biological challenges are predicted to remain high, and even increase in the short-term.

SalMar predicts that their total costs will be reduced in the long-term with 1-2 NOK/kg due to larger smolt, as mentioned in section 3.4.3. As stated in section 2.5, larger smolt may prevent diseases due to size making them more robust, increasing survival rates and reducing treatment costs. This thereby acts as a counterweight, slowing the upward trending biological costs. Additionally, SalMar's Ocean Farm 1 is expected to lead to lower biological costs in the medium-term, as the site is specifically designed to mitigate biological risks. However, the facility may have higher operating costs in the start-up phase.

Based on the above, we forecast the other operating costs to increase with 0.5 NOK/kg in 2017, mainly due to the sea-lice situation. From then on, an expected improvement in the sea-lice situation should reduce other operating expenses per kg. 2018 is projected to see a slight decrease in operating costs, continuing into 2019. In the medium-term the costs are projected to decrease further; with 1 NOK/kg in 2020, and 0.25 NOK/kg in 2021, due to a continued improvement and containment of the sea-lice situation. From there on, operating expenses are forecasted to 9.25 NOK/kg.

6.5.3 Other Cost Items

Salaries and personnel expenses

Salaries and personnel expenses per kilo has fluctuated between 4.13 and 7.45 NOK/kg in the analyzed period. Despite the range, the costs have in actuality held relatively stable, though with an upwards trend. Costs per kilo in 2016 were exceptionally high, mainly due to a drop in harvested volume.

In general, we project salary expenses per kilo to fall in the future. As technology and automation improves, we presume that the productivity per worker increases, implying lower costs per kilo. Additionally, as the sea-lice situation improves, related personnel expenses should decrease.

In the forecasted period, we therefore expect the costs to remain relatively stable, like the historical period. In 2017, salary costs are forecasted to equal 2016 levels, due to the projected low harvest. From there, salaries are expected to decrease to NOK 7 per kilo in 2018, as supply picks up. For 2019, costs are set to 6.45 NOK/kg as the recovery year kicks in due to better sea-lice situation. From there on we forecast salaries and payroll expenses to fall further in the medium- and long-term, due to increased automation.

Figure 6.15: Cost development

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025
Cost of goods sold per kg	33.11	31.61	29	26.75	26.75	26.75	26.75	26.75	26.75
Salaries and payroll expenses per kg	7.45	7	6.45	6	5.7	5.6	5.6	5.6	5.6
Other operating expenses per kg	12.16	12	11	10	9.75	9.25	9.25	9.25	9.25

Compiled by authors, Source: Norwegian seafood council

Depreciation & write-downs

Depreciation is measured in percentage of tangible assets, and has been relatively stable during the period. It has varied from 11.6%-15.3%, and obtained an average of 13.6%. Therefore, the average is expected to be a relatively good indicator for future depreciation levels, and will be applied throughout the whole forecast period.

Write-downs of intangible assets; licenses and goodwill, has been relatively stable between 0.05% and 0.68%. The same logic applies here, therefore write-downs is set to the average of 0.22% in the budget period.

Tax rate

In 2016, the government approved a corporate tax rate of 24% for the 2017 fiscal year. This is one percentage point lower than the 2016 fiscal year[289]. In section 4.1.1 we discussed how we use statutory tax-rates in order to calculate taxes and tax-related expenses, as opposed to the effective tax-rate. This remains valid for our forecast period as well. Therefore, the applied tax in the forecasted period is set to the new corporate tax level of 24%. The tax-rate is expected to fall further, to 23%, we therefore choose to apply a 23% tax-rate for the terminal period only.

Rest

Financial expenses is forecasted by multiplying NIBD by the forecasted cost of debt. Tax shield is forecasted by multiplying the forecasted financial expenses with the forecasted tax rate of 24%. In the terminal value, we apply a tax rate of 23%.

Value of excess inventory from acquisitions, fair value adjustment of biomass, non-recurring gains on acquisitions, onerous contracts and special biological events are not forecasted. This is because fair value is highly volatile and the other items are considered to be transitory. Therefore, these items should be excluded in the forecast of the future earnings[290].

[289] Deloitte, *Corporate tax rates 2017.*
[290] Petersen and Plenborg, *Financial Statement Analysis*, p.232.

6.6 Pro Forma Balance Sheet

The longer the budget period is, the more uncertainty is associated with the individual line items in the financial statement, which makes it complicated to make a certain opinion of the items in the future. Hence, we will focus on value drivers instead of single items due to our long budget period. Our forecast will therefore be presented on an aggregated level[291].

The balance sheet will be forecasted mostly by the direct method, which is considered to be more stable than other methods, and where the drivers are a function of harvested volume[292]. NIBD on the other hand, is measured as a percentage of invested capital. The forecast assumptions for SalMar's balance sheet may be found in the appendix[293].

6.6.1 Capital Expenditure

The capital expenditures consists of intangible assets, tangible assets and investment in associated companies. The intangible assets includes both licenses and goodwill, while tangible assets consists of PP&E.

Figure 6.16: Historical CAPEX

CAPEX (NOK 1000)	2008	2009	2010	2011	2012	2013	2014	2015	2016
Intangible and tangible assets, post	1,806,564	1,974,677	3,473,635	4,071,786	4,475,851	4,860,311	5,472,097	5,976,496	7,096,536
Depreciation of PP&E	60,262	72,490	104,958	165,447	207,247	261,432	281,762	312,624	387,248
Write-downs of intangible assets	0	11,600	1,668	543	547	5,000	2,399	14,169	0
Intangible and tangible assets, primo	1,708,413	1,806,564	1,974,677	3,473,635	4,071,786	4,475,851	4,860,311	5,472,097	5,976,496
CAPEX	158,413	252,203	1,605,584	764,141	611,859	650,892	895,947	831,192	1,507,288
CAPEX per kg	**2.95**	**3.92**	**24.70**	**8.22**	**5.96**	**5.66**	**6.35**	**6.09**	**13.04**

Composed by authors

The historical trend of CAPEX is illustrated in the figure above, showing that SalMar's CAPEX level has stayed relatively constant during the period. The only exception is 2010, where SalMar invested heavily in InnovaMar and in Bakkafrost. It was high in 2016 as well, due to low volumes, large smolt-investments, and investments in Ocean Farm 1. The investment in InnovaMar is considered as a non-recurring and therefore we exclude it from the average estimate, and in the forecast.

Intangible assets

SalMar's intangible assets contains goodwill and licenses. Historically, licenses has accounted for 82.72% of the intangible assets, and intangible assets per kilo have been moderately stable over the period. As pointed out in the strategic analysis, the government is hesitant in granting new farming concessions. Along with tighter regulatory controls, we consider licenses to remain relatively constant in the forecasting period.

Since the annual report or other sources doesn't provide any thoughts about acquisition candidates, we simply forecast goodwill at a historical constant level. Constant goodwill implies

[291] Petersen and Plenborg, *Financial Statement Analysis*, p.186.
[292] Koller, Goedhard, and Wessels, *Measuring and Managing the Value of Companies*, p.201.
[293] See Appendix A.39

constant acquisitions though, as goodwill is written-down. We believe this to be a fair assumption, as inorganic growth is an industry standard, and SalMar has a history of growth through acquisitions. As SalMar reaches a more mature phase, we believe the pace will slow down marginally.

Due to low forecasted supply in 2017, intangible assets per kg will be held at the same level as 2016, and because of higher utilization of licenses in 2018 we expect a decrease of 1 NOK/kg. During the rest of budget period we hold it constant at 22.27 NOK/kg.

Tangible assets

SalMar's tangible assets consists of PP&E and other receivables, which have represented a relatively stable fraction of invested capital, averaging 39%. PP&E has grown progressively over the historical period, which is natural given the increase in licenses and necessary sites. We expect it to increase further in the future, as we believe SalMar will continue improving their production capacity and facilities, in line with acquiring new licenses.

However, we forecast tangible assets as a function of harvest volumes. The preceding arguments therefore only argue for tangible assets to grow in absolute terms. Overall, our forecast builds upon the most recent tangible assets per kilo observations, and assumes harvest to slightly outperform growth in tangible assets due to increased utilization. We therefore set tangible assets to drop 1 NOK/kg in the short-term. In the medium- and long-term tangible assets is set to a constant 24 NOK/kg.

Investments in associated companies

We project investments in associated companies based on an historical average. The average is heavily affected by the years 2010-2013, where SalMar held a significant stake in Bakkafrost. The years are excluded from the average, as it is not deemed representative of SalMar's future holdings. This yields an average of NOK 4.80 per kg, which is applied for the future. This implies steadily increasing investments in absolute terms, which we accept as we deem it likely that SalMar will continue to acquire stakes in other salmon farming companies.

6.6.2 Conclusion CAPEX

The forecasted CAPEX is presented in the figure on the next page, which is based on the individual item forecasts.

Figure 6.17: Forecasted CAPEX

CAPEX (NOK 1000)	2017	2018	2019	2020	2021	2022	2023	2024	Terminal
Intangible and tangible assets, post	6,756,760	6,840,038	7,076,252	7,492,283	7,931,207	8,312,828	8,738,931	9,120,614	9,303,026
Depreciation of PP&E	431,687	436,181	456,598	473,192	500,913	525,015	551,927	576,033	587,554
Write-downs of intangible assets	5,773	5,815	5,875	6,342	6,714	7,037	7,398	7,721	7,875
Intangible and tangible assets, primo	7,096,536	6,756,760	6,840,038	7,076,252	7,492,283	7,931,207	8,312,828	8,738,931	9,120,614
CAPEX	97,684	525,273	698,687	895,565	946,552	913,673	985,428	965,436	777,841
CAPEX per kg	**0.821**	**4.208**	**5.142**	**6.105**	**6.096**	**5.614**	**5.759**	**5.406**	**4.270**

Composed by authors

6.6.3 Net Working Capital

Net working capital is defined as total current operating assets less operating liabilities. In the budget period we use the historical average of NWC, as we believe this is an accurate representation of future development.

Figure 6.18: Forecasted NWC

NWC (NOK 1000)	2017	2018	2019	2020	2021	2022	2023	2024	Terminal
Harvested volume	118,956.50	124,817.63	135,886.79	146,692.89	155,286.68	162,758.51	171,101.26	178,574.30	182,145.79
Net working capital	1,694,194.35	1,777,669.27	1,935,317.79	2,089,219.66	2,211,613.55	2,318,028.37	2,436,847.00	2,543,279.00	2,594,144.58
NWC per kg	**14.24**	**14.24**	**14.24**	**14.24**	**14.24**	**14.24**	**14.24**	**14.24**	**14.24**

Authors creation

6.6.4 Net Interest Bearing Debt

NIBD is estimated as a percentage of invested capital. In absolute terms, NIBD has increased dramatically, by more than 300%, as a result of SalMar's aggressive acquisition of licenses and other companies. In the future, we forecast steady NIBD of 38% of invested capital, which is consistent with the historical average.

6.7 Forecasting Cost of Capital

It is necessary to evaluate the direction the industry is developing towards, in order to determine SalMar's future capital structure. This is especially pertinent given the large variations in capital structure historically.

Past trends of industry cyclicality has been discussed throughout the thesis. However, based on our findings, the industry is expected to deviate from the traditional cyclicality and into a more steady growth-profile in the future. This is in line with analyst expectations and our supply and demand forecasts [294]. This is relevant for our forecast seeing as the standard when applying the DCF-model is to apply a constant WACC for discounting purposes. A cyclical industry would imply a more volatile WACC calculation, primarily due to volatile debt to equity ratios and betas. This could be solved by applying a time-sensitive WACC forecast, however this is cumbersome in practice, and there are valuation models other than the DCF which are better suited for the task.

However, as the thesis argues, and we conclude, the industry is assumed to have reached a more mature stage, with less cyclicality and smoother margins. We therefore find that applying

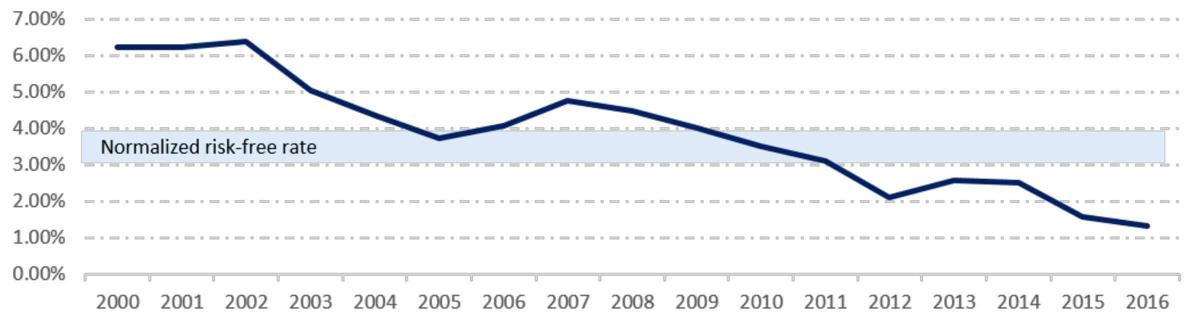
[294] See for instance section 3.3

a constant WACC over the forecast period is valid. However, the WACC arrived at in the previous cost of capital section is found to be poorly indicative of the cost of capital looking forward. This is primarily due to the historically low risk-free rate and an unreasonably low financial leverage in 2016.

Risk-Free rate

The risk-free rate was chosen based on the yield of a 10-year Norwegian government bond, which is currently at 1.33%. This is primarily due to low key interest rates in Norway, which is illustrated in figure 6.19. The real interest rate, i.e the nominal interest rate on Norwegian government bonds adjusted for inflation, measured by the consumer price index, is negative. While key interest rates are expected to remain low in the short-term, as discussed in section 3.1.2, the current levels are none-the-less deemed improbable for the forecast period as a whole. The Norwegian Bank estimates key interest rates towards 1.5% by 2020, and consequently government bond yields in the low 2%. Given how a "normal" key interest rate is usually considered as around 4.5-5%, we expect rates to increase further than the 2020 estimates for the period as a whole. The Norwegian bank expects a lower "normal" than traditional though, which tempers our estimates.[295]

Figure 6.19: 10-year Norwegian government bond



Compiled by authors, Source: Norwegian Central Banken

As constantly adjusting rates and the resulting bond-yields is problematic and cumbersome, we instead operate with an assumption that the yield on 10-year Norwegian government bonds in the future will be equal to the average yields the last ten years; 3.09%. This is higher than current levels, but more in line with historical data. A study performed by PwC in 2016 found that a large proportion of the market utilizes a normalized long-term risk-free rate of 3.5%, given unnaturally low government bond yields, which supports our arguments[296]. The applied risk-free rate for the forecasted WACC is therefore 3.09%.

Cost of debt

The same arguments apply for the forecasted cost of debt. As we assume a higher risk-free rate, the cost of debt, all else held equal, will increase. Our future outlook for SalMar is generally

[295] Norwegian Central Bank, *Pengepolitisk Rapport*, p.34-36.
[296] PwC, *Risikopremien i det norske markedet 2016.*

positive, as per all preceding analyses and arguments. We therefore apply an A-rating for SalMar in our credit-rating model, which is also the median rating. The Norwegian Parliament has approved the fiscal budget which sets the corporate tax-rate in Norway to 24% in 2017[297]. This results in a post-tax cost of debt equal to 3.18%, which is applied as our forecasted cost of debt. This is also within the sanity check spread discussed in the cost of debt section 5.1.4.

Cost of equity

The cost of equity is also effected by a change in the risk-free rate. Furthermore, we believe the current debt to equity levels are artificially low, and a result of the exceptional year of 2016. Therefore, we set the targeted leverage ratio to 26%, which equals the five-year average of the peer-group. This in turn affects our beta calculations. Updating our weighted beta calculation yields a beta of 0.6084, which is a slight increase. As betas are shown to move towards one, we accept the increase in our beta estimate. The resulting cost of equity is 6.45%.

WACC

We recognize that the preceding arguments rest on a few key assumptions, and that any change in WACC will have a profound effect on the resulting valuation. We none-the-less believe our arguments to be sound, and that adjusting the WACC gives a more precise picture of the future cost of capital for SalMar.

Based on the adjustments, the resulting WACC applied for SalMar is 5.60%. In the terminal period, the corporate tax rate is set to 23%, resulting in a terminal WACC of 5.61%.

Figure 6.20: Forecasted cost of capital

Cost of capital	
Rf	3.09 %
Beta	0.6084
Market risk premium	5.52 %
Return on equity	6.45 %

WACC	
Rd after tax	3.18 %
Financial leverage	26 %
Equity	74 %
WACC	5.60 %

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[297]EY, *Norwegian Parliament approves 2017 Fiscal Budget.*

7. Valuation

The objective of this paper has so far been to gain an insightful understanding of SalMar and the industry in which it operates in. This allowed us to build the forecast in the preceding chapter on well-grounded assumptions and arguments. Following this, we are finally ready to tackle our research question.

The fair value is found through a fundamental valuation approach, and supplemented by a relative valuation analysis. The reason behind using different valuation methods is to provide further depth, in order to arrive at a robust estimate. The fundamental valuation uses the discounted cash flow and economic value added approaches. The EVA model is included as a sanity check to our DCF valuation, and to further highlight SalMar's ability to create shareholder value. The relative valuation uses a multiple valuation approach, which is popular among analysts. The fundamental and relative valuation provides an initial interval for SalMar's fair value share price.

We further supplement our valuation with a comprehensive sensitivity and scenario analysis. The analyses allows us to further define our fair price interval, in addition to providing reasonable fair value estimates for specific plausible scenarios. Finally, we perform a Monte-Carlo simulation to find the standard deviation and distribution of our share price.

7.0.1 Discounted Cash Flow

The most popular present value models is undoubtedly the discounted cash flow approach, which measures the fundamental value of SalMar based on the predicted future cash flows discounted with a required return. The cash flow is divided into two periods, the forecast and a terminal period. The terminal period will be measured by using the Gordon growth method, and the required return in both periods is the weighted average cost of capital. The formula for enterprise value is:

$$\sum_{t=1}^{n} \frac{FCFF_t}{(1+WACC)^t} + \frac{FCFF_n + 1}{WACC - g} * \frac{1}{(1+WACC)^n} \tag{7.1}$$

Figure 7.1: The discounted free cash flow to the firm (DCF)

Growth	2%

Discounted Free Cash Flow to Firm Meth	NOK 1000	Short-term			Medium-term					Long-term
Year		2017	2018	2019	2020	2021	2022	2023	2024	TV
Free Cash Flow to the Firm (FCFF)		2,026,575.54	1,192,990.19	1,617,519.54	1,957,895.95	1,861,290.97	1,835,963.74	1,564,273.42	1,103,302.82	691,003.35
WACC		5.60%	5.60%	5.60%	5.60%	5.60%	5.60%	5.60%	5.60%	5.61%
Discount Factor		0.95	0.90	0.85	0.80	0.76	0.72	0.68	0.65	
Present Value of FCFF		**1,919,105.62**	**1,069,815.87**	**1,373,592.09**	**1,574,468.35**	**1,417,407.35**	**1,323,977.46**	**1,068,231.15**	**713,482.59**	

Value of FCFF in Forecast Horizon	10,460,080.48
Value of FCFF in Terminal Period	12,378,317.09
Estimated Enterprise Value 31/12/2016	**22,838,397.58**
Net Interest-Bearing Debt	2,452,655.00
Expected Market Value of Equity	**20,385,742.58**
Shares Outstanding	113,300.00
Share Price (31.12.2016)	179.93
Share Price (1.5.2017)	**183.22**

Compiled by authors

THe DCF-model yields a fair share price of 179.93 on the 31.12.2016, discounting forward using the WACC gives a share price of 183.23 at the cut-off date. We have thereby arrived at an initial answer to our problem statement.

7.0.2 Economic Value Added Model

We have supplemented the DCF valuation with an EVA model in order to determine how SalMar generates value for their shareholders. The EVA approach uses the same inputs as the DCF-model, and demonstrates whether SalMar is able to generates shareholder value. The cash flow from the EVA model is derived from NOPAT, adjusted directly for capital costs. The models should in theory yield the same share price value if performed correctly, and therefore function as a mutual sanity check. The formula for EVA is:

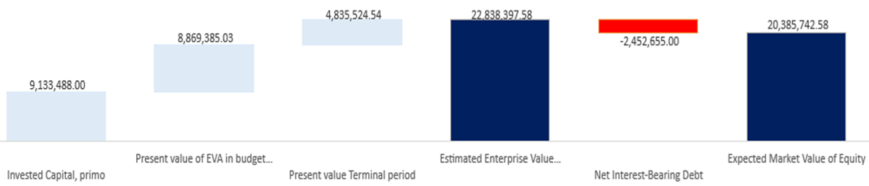
$$\sum_{t=1}^{n} \frac{EVA_t}{(1+WACC)^t} + \frac{EVA_n + 1}{WACC - g} * \frac{1}{(1+WACC)^n} \tag{7.2}$$

Figure 7.2: The economic value added model (EVA)

Growth	2%

Economic Value Added Method (EVA)	NOK 1000	Short-term			Medium-term					Long-term
Year		2017	2018	2019	2020	2021	2022	2023	2024	TV
NOPAT		1,344,042	1,359,743	2,011,382	2,527,828	2,422,609	2,323,999	2,109,195	1,591,417	924,281
Invested Capital incl, primo		9,133,488	8,450,955	8,617,708	9,011,570	9,581,502	10,142,821	10,630,856	11,175,778	11,663,893
WACC		5.60%	5.60%	5.60%	5.60%	5.60%	5.60%	5.60%	5.60%	5.61%
Cost of Capital		511,475	473,253	482,592	504,648	536,564	567,998	595,328	625,844	654,344
EVA		**832,567**	**886,490**	**1,528,790**	**2,023,180**	**1,886,045**	**1,756,001**	**1,513,867**	**965,574**	**269,937**
Discount Factor		1	1	1	1	1	1	1	1	
Present Value of EVA		788,416	794,961	1,298,243	1,626,968	1,436,258	1,266,314	1,033,809	624,416	

Invested Capital, primo	9,133,488.00
Present value of EVA in budget period	8,869,385.03
Present value Terminal period	4,835,524.54
Estimated Enterprise Value 31/12/2016	**22,838,397.58**
Net Interest-Bearing Debt	-2,452,655.00
Expected Market Value of Equity	20,385,742.58
Shares Outstanding	113,300.00
Share Price (31.12.2016)	179.93
Share Price (1.5.2017)	**183.22**



Compiled by authors

The EVA-model yields a fair share price of 183.22, which is equal to the DCF-price, indicating that there are no errors in the construction of our models.

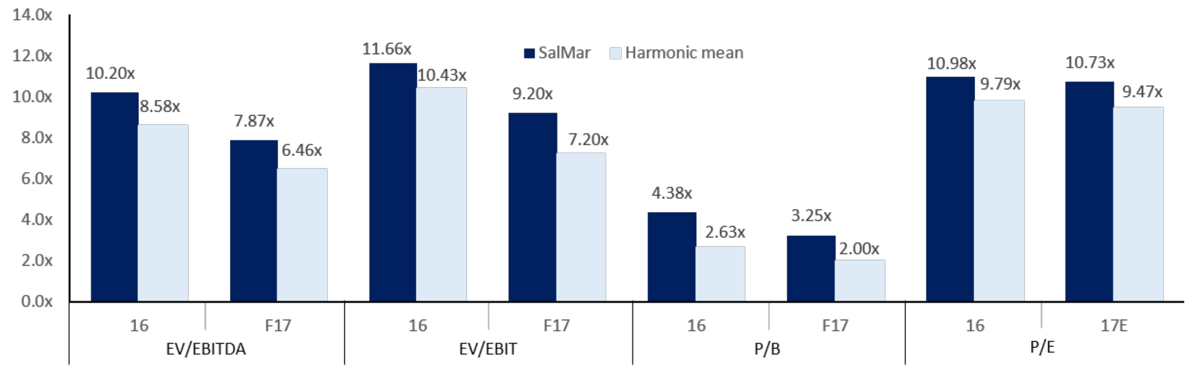
7.0.3 Multiple Valuation

To gain an additional perspective, we perform a valuation based on multiples. The inherent advantage with the method is that while our DCF valuation is based upon our forecast and is reflective of our expectations, the multiples are simply based on observable values and a single forward multiple estimate. As the forecast builds on a litany of assumptions, making the uncertainty large, a multiple valuation can help function as a sanity-check and provide confidence in our estimates. However, the fair-price can vary wildly with the chosen multiple, and choosing the most appropriate one can be challenging. To aid in this, figure A.43 summarizes the strengths and weaknesses of each multiple.

The above-mentioned multiples are commonly used to analyze the salmon farming industry. The applied multiples are defined as the harmonic mean of the peer-group. This average measurement gives less significance to high-value outliers, and according to researchers it is recognized as providing more precise estimates[298]. Both current-priced and forward-looking multiples are used, as empirical evidence demonstrates that future values is the more accurate predictor.

There are different underlying factors which influence the multiples. Companies should have similar growth expectations, cost of capital, and profitability. The historical growth between the firms has been different, however they have arguably the same premises for future-growth. The governing tax and depreciation regimes will impact the cost of capital. Furthermore, the companies should have the same accounting principles and economic characteristics. If the requirements are not fulfilled, multiple valuation should be used with caution[299]. In our case we are confident that the peer group is similar enough that the valuation should provide reasonable data. This is supported by the prevailing use of multiple valuation by analysts. The following figure presents the multiples for 2016 based on observed data, while the FY2017 multiples is based on an average of different investors and Bloomberg[300].

Figure 7.3: Multiples for the peer group



Compiled by authors, Source: Bloomberg, Nordea, Pareto, Beringer, and Arctic

Figure 7.3 illustrates that SalMar is trading at a higher EV/EBIT and EV/EBITDA than the harmonic mean, both historically and forward-looking. This indicates that SalMar is either overpriced, or is thought to have better prospects than the peer-group. It is our belief that the market has accredited SalMar's cost-efficiency and their ability to create higher return on invested capital with a premium. Cost-efficiency is especially valuable in an industry where we have forecasted costs to increase, while prices level out. EV/EBIT follows the same arguments, and yields similar results.

P/E is the most common equity multiple, though it is sensitive to differences in accounting policies, and does not isolate the effect of gearing. As a result, we are slightly hesitant in applying the ratio, especially seeing as salmon farming is a capital intensive industry, and the peer-group varies in their gearing. SalMar traded at a higher P/E multiple both in 2016 and

[298]Petersen and Plenborg, *Financial Statement Analysis*, p.234.
[299]Petersen and Plenborg, *Financial Statement Analysis*, p.232.
[300]See sector reports from Beringer, Nordea, Arctic, and Pareto in the bibliography

F2017 compared to the peers. This could indicate that investors believe SalMar to have better growth-opportunities, which could be plausible given the Ocean Farm 1 and smolt-projects. Inclusion of the P/B multiple to reduce the capital structure noise, also shows SalMar trading higher than the peers. SalMar trades at 3.25x F2017, indicating that investors believe SalMar to earn positive return on their assets. Looking at the industry specific EV/kg tells the same story, with SalMar trading at a higher multiple than the harmonic mean[301]. However, the multiple is colored by SalMar's low harvest volumes. The resulting share prices from the multiples are summarized in the following table.

Figure 7.4: Share price of SalMar using relative valuation

	EV/EBITDA		EV/EBIT		P/B		P/E		EV/kg	
	16	F17	16	F17	16	F17	16	F17	16	F17
SalMar's share price	**213.52**	**155.44**	**228.61**	**151.24**	**155.30**	**117.72**	**230.16**	**105.90**	**175.69**	**143.51**

Authors creation

Overall, the thesis has found several justifications for SalMar trading at a higher multiple. SalMar has a history of cost-efficiency, which is thought to become increasingly important. As the VAP-segment continues growing, SalMar position as sole producer of ecological salmon presents an advantage. Furthermore, their head-start in ocean farming technology could influence the multiples. We therefore find ourselves in agreement with the multiples, in that we find it reasonable that SalMar trades at a higher multiple than the peers. However, the multiples applied use 2016 and 2017 values. In our 2017 budget, we forecasted continued high costs on the back of sea-lice and feed costs, in addition to significantly depressed volumes. This will necessarily be reflected in 2017 earnings, and the multiple share price. The reason for the low prices compared to our forecast is therefore thought to be because the multiples do not adequately reflect future earnings and volumes, i.e. that 2017 is not representative for the future as a whole. We therefore urge caution when looking at the multiple share price.

7.1 Sensitivity

The share price from our valuation model is a result of our single-point value-driver estimates, and the estimated cost of capital. In other words, they are dependent on the budget assumptions we thought most reasonable. To evaluate our assumptions and the quality of the pro-forma statements, we perform a sensitivity analysis. This is achieved by examining the share price resulting from varying the value drivers to the WACC[302]. SalMar's key value drivers were found in the preceding analyses, a selection of which are tested here. The sensitivity analysis will provide an indication of which drivers to be especially aware of.

In each subsection, the volatility of the share price is found by changing a value-driver relative to a change in WACC, while holding all else equal. The WACC-range encapsulates the historical range, which adds plausibility. The most important value drivers are assumed to be the volume

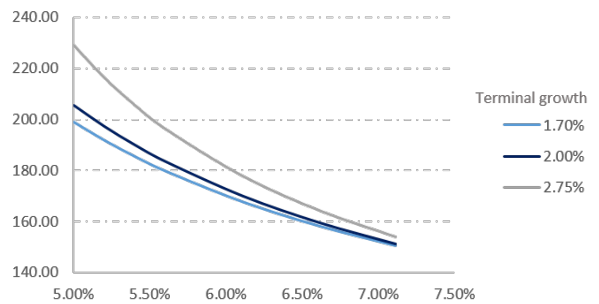
[301] See appendix A.44
[302] Petersen and Plenborg, *Financial Statement Analysis*, p.241.

harvested as reflected in the growth-assumptions, the salmon price, and the cost of goods sold[303].

7.1.1 Sensitivity to Terminal Growth

The terminal value constitutes 54% of the estimated enterprise value, as such the growth-rate is thought to be of significant importance for the share price. However, growth-rate is limited in the values it can take, as no company can grow more than the markets it operates in for perpetuity. Figure 7.5 shows how share prices for different growth assumptions vary with the WACC. In general, share prices are decreasing with the WACC, and increasing in the growth-rate. The lower the WACC, the higher the sensitivity to changes in the growth-rate, with prices converging as WACC increases. This is reasonable, as the harvest volumes in the terminal period is a function of the growth-rate, with higher volumes having a positive impact on the share price.

Figure 7.5: Sensitivity to the terminal growth



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The analysis yields a realistic share price between NOK 169.12 and 194.38; a spread of 25.26. Including slightly optimistic and pessimistic assumptions, the range becomes NOK 158.57-208.87, a spread of NOK 50.31.

7.1.2 Sensitivity to Salmon Prices

Salmon price has been identified as the most important value driver for SalMar and the industry. Prices have fluctuated greatly in the past, and though we forecast a more stable price in the future, it is not entirely unreasonable to presume otherwise. The basic sensitivity analysis only allows for testing of one price-value though, so we investigate what happens when we change the terminal price, which is the most influential. In essence, we assumed supply to outperform demand in the medium- long-term, until they converge in the terminal period. The point of convergence determines the terminal price.

Figure 7.6: Sensitivity to salmon prices

	WACC	Pessimistic		Realistic			Optimistic	
Salmon price (NOK/kg)		36.23	37.57	38.91	40.00	41.33	42.67	44.00
Pessimistic	5.00%	74.17	120.73	167.42	205.45	251.88	298.31	344.74
	5.20%	74.07	117.75	161.55	197.22	240.78	284.33	327.89
Realistic	5.40%	73.99	115.12	156.38	189.97	230.99	272.01	313.03
	5.61%	73.92	112.68	151.56	183.22	221.88	260.54	299.20
	6.10%	73.80	107.98	142.27	170.19	204.28	238.37	272.46
Optimistic	6.60%	73.73	104.24	134.85	159.78	190.21	220.64	251.08
	7.10%	73.69	101.26	128.91	151.43	178.92	206.41	233.90

Authors own creation

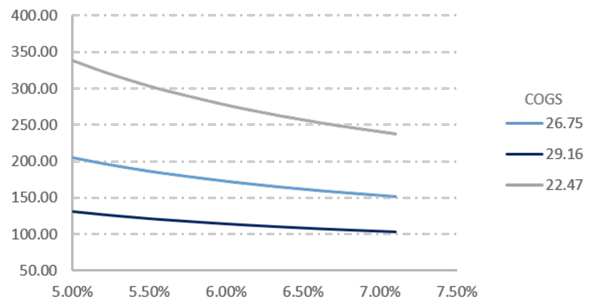
[303]The full analysis can be found in appendix A.11

The figure shows share prices to be highly dependent on the terminal spot price, as expected. The realistic prices ranges between NOK 142.27-230.99, a spread of NOK 88.72. Including broader assumptions yields estimates between NOK 104.24 and 284.33, a spread of NOK 180.09. This makes terminal prices the definite variable to watch, with a massive spread and range of possible share prices.

7.1.3 Sensitivity to Cost of Goods Sold

As we have forecasted all our costs as costs per kilo, we can technically view the share prices sensitivity to changes in COGS as the sensitivity to any other cost item, since absolute value changes will have the same effect. As indicated before, SalMar's COGS have also fluctuated in the historical period. Rising feed costs has been the main culprit behind the cost-inflation of recent years and 2016 especially. As discussed, feed costs are dependent on, inter alia, sea-lice and diseases, exchange rates, and feed composition. The variety of factors influencing feed-costs creates significant uncertainty in the forecast, which is why we perform a sensitivity analysis on the COGS.

Figure 7.7: Sensitivity to COGS



Authors creation

A realistic share price based on changes in COGS is per the analysis between NOK 150.99-212.41, constituting a spread of NOK 61.41. This indicates significant movement in the share price to movements in COGS. For SalMar who are currently priced in as a cost-efficient producer, monitoring cost-levels will be crucial. Especially in the future, as prices are expected come down and margin competition increase.

7.2 Scenario Analysis

Our base case is contingent on several key assumptions for the future. In the scenario analysis we seek to investigate what happens if we change the premise of our forecast. In other words we check what happens to the supply/demand levels, the prices, the costs, and ultimately SalMar's fair share price if we change a key assumption. The individual scenarios and new assumptions are explored in the following subsections.

7.2.1 Delayed Sea-Lice Relief

The sea-lice situation has been highlighted several times throughout the thesis as the main biological challenge facing Norwegian industry and SalMar in particular. Sea-lice has been the main culprit behind rising costs, and dwindling supply - which led to the extreme salmon-price hike in 2016. In our base forecast, we operated with the assumption that the sea-lice situation would be mostly contained by 2019-2020, with the consequence of a recovery in Norwegian supply and reduced costs for the industry. This assumption builds on the belief that current treatment-methods remain effective, in addition to new methods arriving to actually alleviate the issue. As current medicinal methods are losing effectiveness, the last year has seen increased non-medicinal treatment; methods which are still classified partly as an ongoing R&D effort. There is therefore some risk associated with our sea-lice assumption.

In a scenario where the sea-lice situation is not contained, we can not in good conscience argue for a Norwegian supply recovery. Pursuant to the traffic-light regime, production in exposed areas such as Central Norway will halt, or even fall further. In turn, global supply will be constrained further, with consequentially high prices for longer. We presume this will have a slight impact on demand, as it's questionable how long consumers will tolerate prices in excess of NOK 60 kg before turning to alternative products. Cost-levels for the industry will remain high, with our forecasted 2017 costs prevailing over the short-term and early medium-term. SalMar, who is particularly exposed to Central Norway, will be especially effected, with reduced harvest volumes and higher costs relative to the industry. We would expect increased investments in ocean- and land-based farming as the sea-lice situation remains unsolved, as it represents the only alternative avenue for growth.

To summarize, the scenario reduced Norwegian volumes in the medium- and long-term, giving slightly higher salmon prices, tempered by slightly lower demand in the mid-term. SalMar's volumes are scaled back, while costs are increased across the board. This results in a share price of NOK 120.02.

7.2.2 Continued Weak NOK

Our forecast used an amalgamation of NOK forecasts from leading Norwegian banks. These forecasts differed significantly from those operated by FishPool for instance. Seeing as FishPool is a part of the Norwegian Stock Exchange, and the premier contract clearing house for salmon contracts, we can view FishPool's forward contracts' implied EUR/NOK rates as a proxy for market sentiments. Doing so would imply a much weaker NOK in the short-term than we forecast, and in the medium- long-term where we apply a static exchange rate.

As a majority of salmon is sold in EUR, and we forecast prices in EUR, this would result in higher prices when denoted in NOK. Consequently, this would have a strong positive impact on SalMar's earnings. Simultaneously we assume NOK to be weak against the USD as well in this case, implying slightly increased costs for SalMar. Setting EUR / NOK equal to 9.4 in the short-term, which is closer to the forward rates applied by FishPool, and reducing costs slightly in the short-term following a higher USD / NOK yields a share price of NOK 295.41.

7.2.3 Implementation of BAT

Section 3.1.1 discussed the consequences an implementation of protectionist import taxes in the US would have on the global salmon market.

In essence, the proposed tax would lead to an estimated price increase of 25% in American supermarkets, making salmon even less competitive to alternative protein-sources. This would lead to a sharp decline in demand for the worlds largest salmon market, and as much as 30-50% of the salmon currently sold could need to be redirected to other markets[304]. Overall, this would lead to considerable downwards pressure on prices, through decreased global demand. We therefore adjust our price-estimates downwards in the scenario. Furthermore, an implementation of the tax would lead to an appreciation of the USD according to analysts. Consequently, SalMar's costs are raised slightly, due to increased feed costs as a result of commodity prices for fish-feed being quoted in USD. In sum, reducing salmon prices in the short- and medium-term due to reduced demand, while slightly increasing costs due to a stronger USD, yields a share price of NOK 159.03.

7.2.4 Closed Markets

The previous scenario isolated the US market specifically, however SalMar's earnings are similarly dependent on other current- and possible future markets; among them the Chinese and Russian market specifically. We therefore run a worst-case scenario, where we operate with all three major markets being closed to Norwegian exporters.

The effect of the US market follows from the previous scenario. The Russian market is currently closed and accounted for in the base case, with much of the trade having been redirected already. However, we theorize that in the long-term, a closed Russian market will impact pricing in Eastern-Europe, as demand saturates.

The Chinese market, similar to the US market, represents a significant demand potential. Should the trade-talks fail and the market remain closed for Norwegian exporters, volumes destined for the Chinese market would necessarily need to be redirected. This leads to over-saturation and reduced average achieved prices as supply outperforms demand-growth. This is especially consequential in the short-term, where demand from the Chinese market is projected to keep prices high, despite dwindling demand in other core-markets. We therefore revise our price-estimates for 2018 and 2019 downwards, due to a delayed demand-growth profile.

Overall, we reiterate that the scenario assumes markets being closed to Norwegian exporters specifically, and that the markets could theoretically be serviced by other exporters. However, as Norway represents such a large portion of Atlantic Salmon production, we assess the impact of Norwegian exports being redirected as the prime price-driver.

[304]Nordea Markets, *Equity Research - Seafood.*

Taking the previous scenario and turning down prices further due to significantly lower demand yields a share price of NOK 143.71.

7.3 Monte-Carlo

Monte Carlo approach

The DCF-model used in the valuation is based upon single most-likely point estimates. This despite the fact that many of the input variables contain a significant degree of uncertainty. For instance, the sensitivity analysis showed the share price to be largely susceptible to small changes in an input variable. However, the sensitivity analysis was built upon changing one value-driver, while keeping all else constant. This is rarely the case in the real-world.

To investigate the validity of our estimate and further test the price's sensitivity to changes in value-drivers, we perform a Monte Carlo simulation. Instead of most-likely point estimates, the Monte Carlo simulation allows us to define a range of possible values for each value-driver. The simulation runs 100 000 iterations of the DCF-model, with concurrent changes in the value-drivers. The simulation thereby provides a probability distribution for the share price based on our assumptions.

A standard approach to define the possible range for the value-drivers, is to define the variables as normally-distributed. However, we choose to use a triangular distribution, where our base-case estimates is deemed the most-likely value, and then an assigned maximum- and minimum-value for each driver. We believe this to be superior, as it allows us to utilize the strategic analyses in defining the most- and least-likely values for each driver. For instance, we have held operating costs high in the short-term, relative to the average, due to our analysis of the sea-lice situation. While we view this as reasonable, they are unlikely to rise much more, given the cost-level seen in 2016, when the sea-lice situation was similarly critical. However, costs could fall significantly more than they could rise, should the situation better itself. We therefore view a triangular distribution as superior to a standard normal distribution.

The simulation includes a range for drivers including, but not limited too, growth in harvest volumes, salmon prices, exchange rates, cost of goods per kilo, and the weighted average cost of capital. A comprehensive list of all the value-drivers and the assumptions regarding their range in the simulation can be found in the appendix[305].

Monte Carlo results

The results of the Monte-Carlo simulation is found in the figure. Compared to our base case of 183.22 NOK per share, the Monte Carlo yields a mean value of NOK 190.19. The standard deviation of our share price is NOK 77.78. This is quite a large deviation, however it is unsurprising

[305] See appendix A.14

given the inherent uncertainties in forecasting.

The Monte Carlo simulation shows a right-skewed distribution of share prices, which pushes the mean closer to the current OSEBX price of NOK 203.70. The reason for the skew is in all likelihood the left-skewed distribution of costs, which in turn are a result of the discussion in the previous subsection. The share price is especially sensitive to changes in the terminal salmon price and terminal exchange rates, which is deemed reasonable. Cost of goods sold is also impactful, which is in line with the findings of the sensitivity analysis.

Figure 7.8: Monte Carlo results

Monte Carlo	
Base Case	183.22
Mean	190.19
Median	186.41
Standard Deviation	77.78
Variance	6,049
Skewness	0.3013
Kurtosis	3.14
Minimum	(80.68)
Maximum	579.20
Range Width	659.88
Mean Std. Error	0.25

Percentiles	Forecast values
0%	(80.68)
10%	93.97
20%	123.78
30%	146.57
40%	166.72
50%	186.41
60%	206.28
70%	227.96
80%	254.10
90%	292.08
100%	579.20

Compiled by authors

Using our distribution assumptions, the Monte Carlo gives a 58.76% probability of the share price being below the closing price at the cut-off date, 74.50% probability of the share price being below the analyst mean. Testing our scenarios, the simulation yields a 81,49% chance of the fair price being above the sea-lice scenario, and a 90.6% chance of it being below the exchange rate scenario. The probability of the share price being within 10% of our estimate is 18.49%. Within 20% of our estimate, the probability becomes 36.43%[306]. Overall, the Monte Carlo shows our estimate to be reasonable, however as expected there is significant uncertainty linked to our estimate. The Monte Carlo simulation reiterates the importance of salmon prices, both spot-prices and prices as a function of exchange rates, on SalMar's value.

[306] See appendix A.14 for the full Monte Carlo analysis

8. Conclusion

The purpose of the thesis was to determine the fundamental value of SalMar ASA by finding the fair share price. To account for the inherent uncertainty, the thesis also sought to determine the interval of the share price through scenario and sensitivity triangulation and simulation.

In the introductory sections, Norway was outlined as the worlds largest producer of farmed salmon, with an aquaculture industry which has undergone significant consolidation. The industry was characterized as being highly cyclical historically due to production-cycle of farmed salmon. The life-cycle further helped define salmon farming as a capital intensive industry.

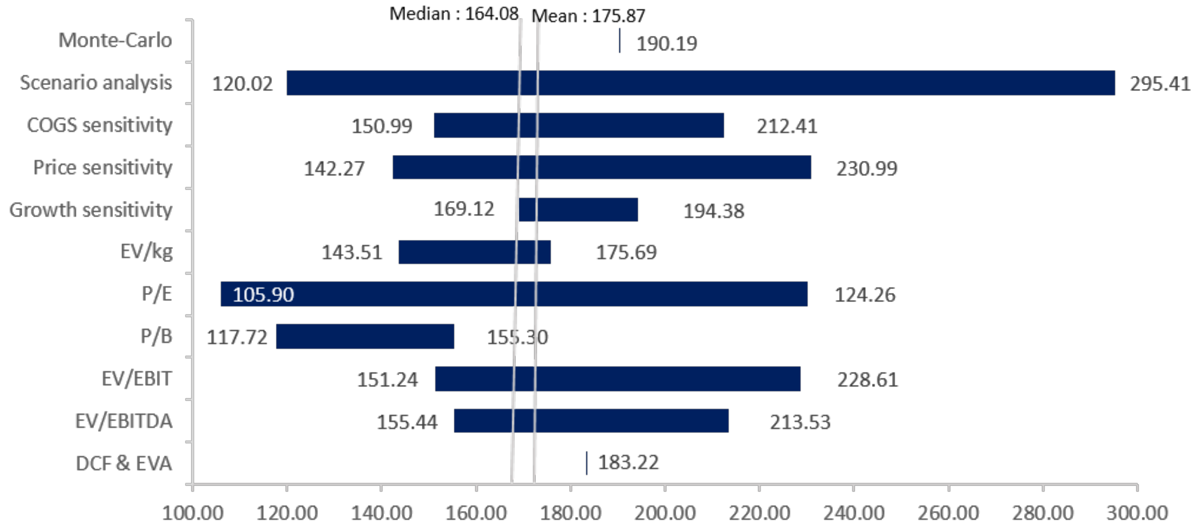
The strategic analyses showed the industry to be moderately competitive, as a result of high barriers to entry but a significant threat of substitutes. Industry profitability was further found to be highly contingent on favorable currency movements and international politics. SalMar was shown to possess competitive advantages through their value chain integration and production of ecological salmon, though their exposure to Central Norway represents a temporary disadvantage. Norwegian aquaculture in general, and SalMar especially, are facing prevailing challenges associated with sea-lice, which has led to rapidly increasing cost-levels and significantly reduced supply. In response to the biological situation, the industry is gearing heavily towards new R&D solutions, with the hope of enabling commercially viable salmon farming on land and in the open ocean.

The highly volatile salmon spot price emerged as the most important profitability driver. Historically, supply has been the prevailing price-determinant, due to the long production cycles making supply slow to react to changes in demand and price-levels. In recent times however, production is nearing capacity as restricted by strict government regulations and biological ceilings. As supply levels out and demand becomes increasingly important as a price-determinant, the industry is thought to have entered a more mature stage, with more price stability and steadier growth in supply and demand. Demand has proven hard to determine, but is projected to stay strong in the medium- and long-term, primarily due to population growth and increased purchasing power. As supply is set to slightly outperform demand, prices are projected to slowly trend down.

SalMar was shown to have sound profitability and performed well compared to the peer-group benchmark in most-all profitability measures; consistently achieving a higher return on invested capital and higher licence utilization rates. SalMar has a stated goal of being a cost-efficient producer, with the analysis showing SalMar as the historical industry cost-leader, and SalMar has retained this position despite exposure to Central Norway increasing sea-lice costs.

By extracting the relevant findings of the analyses, we were able to produce a sound forecast to be used in our valuation models. The fair-value resulting from the assorted valuation models are summarized in the following table, along with the individual scenarios and the sensitivity interval.

Figure 8.1: Summary of valuation



Authors own creation

The DCF-model is used as our principal model, which yields a fair share price of NOK 182.33. We are confident in our estimated price, as it builds on well-founded forecast assumptions. The sensitivity and scenario analysis found significant variations in the share-price, however mostly within one standard deviation. The Monte-Carlo analysis reiterated the importance of spot prices and exchange rates on share-prices. There is significant uncertainty in our estimated price, though the simulation-mean is close to our estimated price.

8.1 Thesis in Perspective

The thesis is written at a time where the salmon industry is booming. Spot prices for salmon peaked at an all-time high in December 2016 at NOK 78.75 per kilo, and prices have remained high since. The industry in general has experienced massive growth, and the general outlook consensus of investors has been positive. This has been reflected in the share price development, which has increased seven-fold for SalMar in just four years. The flourishing of the salmon industry comes at an opportune time, following a depressed Norwegian industry as a consequence of the oil-price crash of 2014. It is the hope of many that the aquaculture industry can continue to grow and lead the way for Norwegian industry.

In general, the thesis finds that salmon aquaculture remains an attractive industry. However, we caution against being overly-optimistic, as the biological challenges remain prevalent and unsolved. Solutions currently in the works are still very much a work-in-progress, and production costs remain high. This is reflected in our thesis share price, which is slightly lower than the trading price at the date of the valuation. We believe the discrepancy arises from the market overestimating SalMar's harvest volumes and slightly underestimating costs. None-the-less, it is worth re-iterating that the thesis shares a generally positive outlook, as evidenced by a target price well-above that of recent years.

We invite the reader to form their own conclusion based on the data we have presented, and draw attention to any potential weaknesses. We acknowledge that the thesis is limited in scope, and could benefit from inclusion of further modeling. For instance, an area of interest would be to perform a sum-of-parts valuation, by valuing each locale independently. This could provide actionable insight on each sites profitability, and further illustrate the effect of sea-lice on farming in Central Norway.

Furthermore, the thesis has been explicit in pointing out the limits to organic growth, due to the limited licenses and traffic-light regime imposed by the government. Growth through M&A has been a staple of the industry in the past, and the trend is argued to continue, albeit at a slower pace. It could therefore be of significant interest to identify potential M&A candidates for SalMar, and analyze the value of the potential merger or acquisition.

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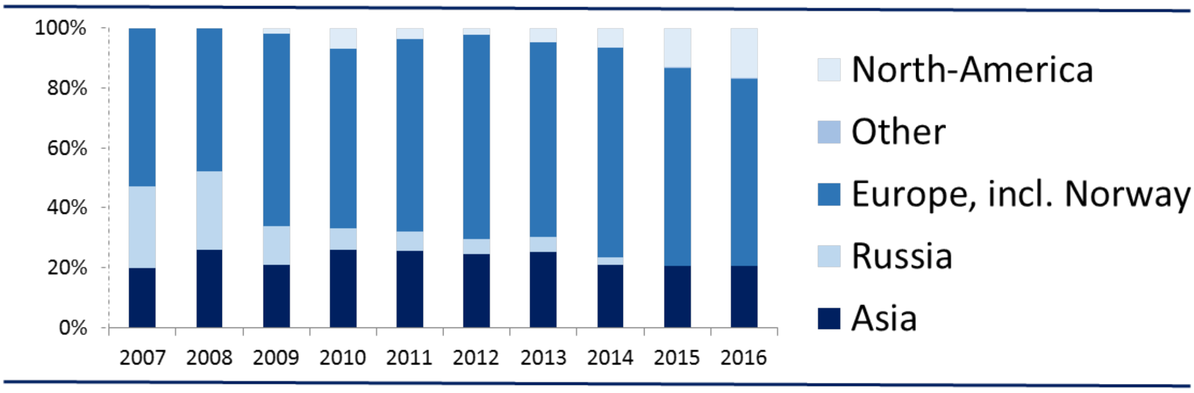
A. Appendix

List of Figures

A.1 SalMar

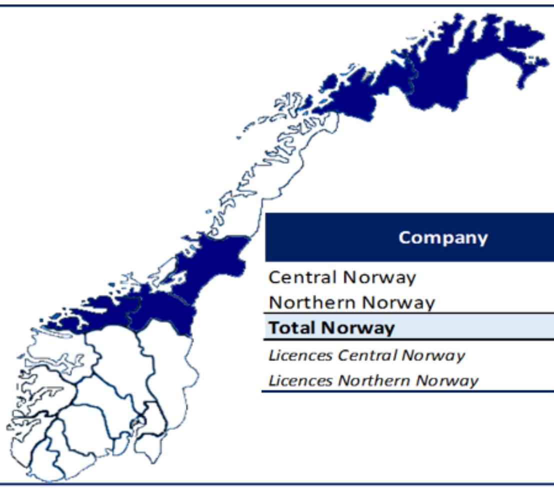
Figure A.1: SalMar's sales breakdown



Author composed, Source: SalMar annual reports

A.2 Salmon Industry

Figure A.2: Harvested volume in 1000 tonnes and licenses of SalMar's farming in Norway



Company	2012 GWT	2013 GWT	2014 GWT	2015 GWT	2016 GWT
Central Norway	80.2	85.1	91.7	96.9	70.5
Northern Norway	22.4	29.9	49.3	39.5	45.2
Total Norway	**102.6**	**115**	**141**	**136.4**	**115.7**
Licences Central Norway	58	58	68	68	68
Licences Northern Norway	13	23	32	32	32

Author composed, Source: SalMar annual reports

Figure A.3: Cost structure for the different regions

Costs per kg	Norway (NOK)	Canada (NOK)	Scotland (NOK)	Chile (NOK)
Feed	13,34	15,21	17,28	15,82
Primary processing	2,67	3,03	3,33	5,41
Smolt	2,67	3,22	3,70	6,62
Salary	1,62	3,34	2,34	1,37
Maintenance	0,94	1,26	1,23	1,37
Well boat	0,95	1,14	2,34	1,78
Depreciation	0,78	1,45	1,60	1,37
Sales & Marketing	0,62	0,06	0,37	0,08
Mortality	0,44	0,44	1,36	1,78
Other	4,47	6,82	7,78	5,41
Total production costs	**28,50**	**35,97**	**41,34**	**41,02**

A.3 Reformulated Statements

Figure A.4: SalMar - Reformulated Income Statement

SalMar Analytical Income Statement (NOK 1000)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Operating items										
Operating revenue	1 665 530	1 704 242	2 376 262	3 399 868	3 800 204	4 180 414	6 228 305	7 160 010	7 303 506	8 963 239
Other operating revenues	12 157	10 014	1 042	29 564	33 299	24 377	17 555	25 877	22 696	66 575
Income from associated companies	31 600	12 248	56 769	147 365	97 999	93 909	157980	96 136	40 242	286 844
Total revenues	**1 709 287**	**1 726 504**	**2 434 073**	**3 576 797**	**3 931 502**	**4 298 700**	**6 403 840**	**7 282 023**	**7 366 444**	**9 316 658**
Change in stock of goods in progress and finished goods	-47 750	-103 844	-25 567	-401 629	-395 900	-390 297	-324 914	-162 119	-246 712	-395 871
Cost of goods sold	836 652	922 016	1 162 445	2 013 312	2 373 168	2 715 056	3 376 109	3 337 411	3 809 523	4 396 689
Salaries and payroll expenses	217 808	240 393	265 517	313 290	391 745	483 215	623 053	710 430	765 881	861 534
Other operating expenses (adjusted)	185 942	248 257	305 710	390 924	670 970	846 335	1 043 177	1 136 698	1 266 695	1 347 839
EBITDA (adjusted)	**516 635**	**419 682**	**725 968**	**1 260 900**	**891 519**	**644 391**	**1 686 415**	**2 259 603**	**1 771 057**	**3 106 467**
Depreciation of PP&E (adjusted)	55 659	60 262	72 490	104 958	165 447	207 247	261432	281 762	312 624	387 248
Write-downs of PP&E and intangible assets (impairment)	-	-	11 600	1 668	543	547	5 000	2 399	14 169	-
EBIT (adjusted)	**460 976**	**359 420**	**641 878**	**1 154 274**	**725 529**	**436 597**	**1 419 983**	**1 975 442**	**1 444 264**	**2 719 219**
Tax on EBIT	129 073	100 638	179 726	323 197	203 148	122 247	397595	533 369	389 951	679 805
Tax shield	-358	34 764	16 509	20 530	190 042	-4 815	-21 100	120 005	135 060	-11 285
NOPAT (adjusted)	**331 903**	**258 782**	**462 152**	**831 077**	**522 381**	**314 350**	**1 022 388**	**1 442 072**	**1 054 312**	**2 039 414**
Non-operating and financial items										
Other interest income	4 706	3 485	330	5 639	5 276	2 956	9 958	9 057	3 477	5 014
Other financial income	364	364	30 066	18 495	2 774	50 177	374 357	2 044	685	78 142
Interest expenses (adjusted)	47 444	72 585	32 429	50 130	100 265	152 246	170 563	124 451	98 927	107 056
Other financial expenses	13 935	13 683	1 119	14 931	24 410	27 173	1 596	902	5 744	7 193
Financial items (adjusted)	**-56 309**	**-82 419**	**-3 152**	**-40 927**	**-116 625**	**-126 286**	**212 156**	**-114 252**	**-100 509**	**-31 093**
Tax shield	-358	34 764	16 509	20 530	190 042	-4 815	-21 100	120 005	135 060	-11 285
Net financial profit (adjusted)	**-56 667**	**-47 655**	**13 357**	**-20 397**	**73 417**	**-131 101**	**191 056**	**5 754**	**34 552**	**-42 378**
Value of excess inventory from acquisitions	17 641	9 303	-	33 587	20 259	-	-	-	-	-
Adjustment of biomass to fair value	94 234	-32 996	-4 624	184 658	-368 098	290 417	528 176	-232 349	39 932	653 955
Non-recurring gains on acquisitions	-	-	-	-	-	62 390	161 755	-	-	-
Onerous contracts	-	-	-	-3 635	-	-	-	-	-	-
Special biological events	-	-	-	-	-60 070	-54 614	-	-	-	-
Net non-operating items	**76 593**	**-42 299**	**-4 624**	**147 436**	**-448 427**	**298 193**	**689 931**	**-232 349**	**39 932**	**653 955**
Net profit for the year	**351 829**	**168 828**	**470 885**	**958 116**	**147 371**	**481 442**	**1 903 375**	**1 215 477**	**1 128 796**	**2 650 991**

Figure A.5: SalMar - Tax and Operating Lease Calculations

Tax calculations										
Corporate tax rate	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	27,00%	27,00%	25,00%
Effective tax rate	26,89%	28,07%	25,74%	24,01%	8,17%	20,88%	18,03%	25,38%	18,42%	20,66%
Corporate tax	129 431	65 874	163 217	302 667	13 106	127 062	418 695	413 364	254 891	691 090
Tax on EBIT	129 073	100 638	179 726	323 197	203 148	122 247	397 595	533 369	389 951	679 805
Tax shield	-358	34 764	16 509	20 530	190 042	-4 815	-21 100	120 005	135 060	-11 285
Extraordinary Tax	715									

Operating Lease Adjustment										
Annual operating lease rent expense	5 328	5 444	6 263	11 529	34 921	39 648	43 122	6 255	5 491	29 956
Industry multiplier	3	3	3	3	3	3	3	3	3	3
Applied cost of debt	6,38%	7,47%	5,60%	4,62%	4,22%	5,10%	5,82%	4,12%	2,67%	2,43%
Lease interest expense	340	407	351	533	1 474	2 022	2 510	258	147	728
Lease depreciation expense	4 988	5 037	5 912	10 996	33 447	37 626	40 612	5 997	5 344	29 228
Assets and NIBD	15 984	16 332	18 789	34 587	104 763	118 944	129 366	18 765	16 473	89 868

Figure A.6: SalMar - Reformulated Balance Sheet

SalMar Analytical Balance Sheet (NOK 1000)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Non-current operating assets										
Licenses	1,009,335	914,116	935,916	1,315,218	1,483,752	1,702,152	2,030,710	2,451,271	2,466,171	2,464,332
Goodwill	69,139	196,932	205,458	372,710	433,348	433,348	433,348	447,372	447,372	446,465
Property, plant and equipment (adjusted)	364,206	432,416	552,075	906,622	1,231,209	1,387,747	1,988,690	2,036,340	2,428,432	3,227,390
Investments in associated companies	258,203	257,615	268,508	866,809	918,868	948,575	402,338	523,711	627,681	908,400
Other non-current receivables	7,530	5,485	12,720	12,276	4,609	4,029	5,225	13,403	6,840	49,949
Total non-current operating assets	**1,708,413**	**1,806,564**	**1,974,677**	**3,473,635**	**4,071,786**	**4,475,851**	**4,860,311**	**5,472,097**	**5,976,496**	**7,096,536**
Current operating assets										
Biological assets	905,675	971,454	1,011,518	1,580,934	1,420,788	1,986,213	3,077,150	3,114,684	3,306,052	4,997,001
Other inventory	63,979	97,768	103,176	128,973	227,935	303,682	171,539	206,454	328,216	224,783
Accounts receivable	124,325	148,596	252,155	409,707	505,280	660,944	662,149	888,219	815,540	595,773
Receivables from parent company	165	552	83	-	-	-	-	-	-	-
Other receivables	57,321	33,604	73,163	136,266	144,993	245,501	217,584	292,644	258,288	302,078
Total current operating assets	**1,151,465**	**1,251,974**	**1,440,095**	**2,255,880**	**2,298,996**	**3,196,340**	**4,128,422**	**4,502,001**	**4,708,096**	**6,119,635**
Total operating assets	**2,859,878**	**3,058,538**	**3,414,772**	**5,729,515**	**6,370,782**	**7,672,191**	**8,988,733**	**9,974,098**	**10,684,592**	**13,216,171**
Current operating liabilities										
Tax payable	89,867	46,271	146,293	148,088	66,399	7,008	25,843	321,839	292,320	423,223
Accounts payable	98,713	133,022	204,394	351,042	412,802	762,765	515,856	409,485	649,274	1,199,402
Government fees payable	22,076	19,137	19,710	48,023	52,980	43,192	93,532	143,757	153,262	189,135
Other short-term debt	44,250	59,837	43,627	106,845	126,195	153,515	192,556	381,226	488,996	775,622
Deferred tax liabilities	460,067	481,813	498,508	761,633	738,475	872,398	1,199,557	1,262,594	1,230,815	1,495,301
Total current operating liabilities	**714,973**	**740,080**	**912,532**	**1,415,631**	**1,396,851**	**1,838,878**	**2,027,344**	**2,518,901**	**2,814,667**	**4,082,683**
Invested Capital (Operating)	**2,144,905**	**2,318,458**	**2,502,240**	**4,313,884**	**4,973,931**	**5,833,313**	**6,961,389**	**7,455,197**	**7,869,925**	**9,133,488**
Equity										
Share capital	25,750	25,750	25,750	25,750	25,750	28,325	28,325	28,325	28,325	28,325
Own shares	-	-150	-350	-350	-325	-325	-325	-325	-295	-246
Share premium fund	112,880	112,879	112,880	112,880	112,880	415,286	415,286	415,286	415,286	415,286
Other paid-in equity	6,547	15,551	20,454	25,685	38,337	49,957	32,822	34,834	57,768	85,673
Retained earnings	1,176,832	1,160,184	1,540,158	2,187,392	1,915,740	2,338,170	4,246,868	4,598,535	4,646,272	6,069,363
Minority interests	649	898	914	118,011	122,228	136,300	337,808	60,622	79,684	82,432
Total equity	**1,322,658**	**1,315,112**	**1,699,806**	**2,469,368**	**2,214,610**	**2,967,713**	**5,060,784**	**5,137,277**	**5,227,040**	**6,680,833**
Interest bearing debt										
Pension liabilities	2,741	5,233	5,784	1,714	1,213	528	-	-	-	-
Long-term debt to credit institutions	687,336	758,171	746,071	1,760,567	2,028,537	2,098,240	1,974,521	1,780,174	2,371,338	2,079,001
Leasing liabilities and other debt (adjusted)	93,705	82,096	86,859	143,193	278,223	244,132	601,082	430,153	406,508	450,424
Short-term debt to credit institutions	88,394	183,999	118,073	51,431	501,754	596,288	397,186	276,667	140,421	198,613
Total interest bearing debt	**872,176**	**1,029,499**	**956,787**	**1,956,905**	**2,809,727**	**2,939,188**	**2,972,789**	**2,486,994**	**2,918,267**	**2,728,038**
Interest bearing assets										
Investments in shares and securities	1,001	975	1,025	1,426	762	15,760	384	519	289	289
Pension fund assets	1,119	1,637	4,904	3,901	2,023	2,492	802	1,592	1,397	1,379
Bank deposits, cash, and cash equivalents	47,809	23,541	148,424	107,062	47,621	55,336	1,070,998	166,963	273,696	273,715
Total interest bearing assets	**49,929**	**26,153**	**154,353**	**112,389**	**50,406**	**73,588**	**1,072,184**	**169,074**	**275,382**	**275,383**
Net interest bearing debt	**822,247**	**1,003,346**	**802,434**	**1,844,516**	**2,759,321**	**2,865,600**	**1,900,605**	**2,317,920**	**2,642,885**	**2,452,655**
Invested Capital (Financing)	**2,144,905**	**2,318,458**	**2,502,240**	**4,313,884**	**4,973,931**	**5,833,313**	**6,961,389**	**7,455,197**	**7,869,925**	**9,133,488**

Figure A.7: Lerøy - Reformulated Income Statement

Lerøy Analytical Income Statement (NOK 1000)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Operating revenues	6 290 898	6 057 053	7 473 807	8 887 671	9 176 873	9 102 941	10 764 714	12 579 465	13 450 725	17 269 278
Other gains	-	-	-	-	-	-	53 805	117 409	34 206	457
Income from associated companies	35 509	13 716	62 744	122 006	19 741	24 831	192 188	91 939	61 376	262 783
Total revenues	**6 326 407**	**6 070 769**	**7 536 551**	**9 009 677**	**9 196 614**	**9 127 772**	**11 010 707**	**12 788 813**	**13 546 307**	**17 532 518**
Change in inventories	-	-	-135 068	132 291	-318 613	-57 449	-258 380	-447 053	-465 960	-296 387
Cost of materials	4 698 675	4 279 152	5 177 492	5 479 869	6 184 793	6 499 768	7 039 813	8 450 392	9 278 374	10 561 407
Salaries and payroll expenses	579 004	664 377	690 477	777 845	967 789	1 031 872	1 094 464	1 270 880	1 411 024	1 785 537
Other operating expenses	472 158	579 295	586 743	691 791	858 107	853 884	1 004 148	1 262 518	1 447 625	1 864 088
EBITDA	**576 570**	**547 945**	**1 216 907**	**1 927 881**	**1 504 538**	**799 697**	**2 130 662**	**2 252 076**	**1 875 244**	**3 617 873**
Depreciation	153 846	197 023	204 007	219 624	271 899	291 768	307 175	369 480	433 916	511 621
EBIT	**422 724**	**350 922**	**1 012 900**	**1 708 257**	**1 232 639**	**507 929**	**1 823 487**	**1 882 596**	**1 441 328**	**3 106 252**
Tax on EBIT	118 363	98 258	283 612	478 312	345 139	142 220	510 576	508 301	389 159	776 563
Tax shield	29 101	61 264	26 475	-32 640	188 828	-40 529	-83 405	179 362	120 933	-150 128
NOPAT	**304 361**	**252 664**	**729 288**	**1 229 945**	**887 500**	**365 709**	**1 312 911**	**1 374 295**	**1 052 169**	**2 329 689**
Non-operating and financial items										
Other interest revenues	29 583	32 664	13 182	16 704	41 229	33 972	17 951	21 006	12 169	18 539
Other financial revenues	30 125	5 537	1 761	3 773	3 231	2 967	4 305	14 843	329	8 565
Other interest costs	126 504	186 245	95 455	81 832	121 821	128 691	120 258	124 229	126 295	150 670
Other financial costs	2 940	2 463	5 593	4 917	4 523	3 401	3 838	31 410	14 931	7 925
Financial Items	**-69 736**	**-150 507**	**-86 105**	**-66 272**	**-81 884**	**-95 153**	**-101 840**	**-119 790**	**-128 728**	-131 491
Tax shield	29 101	61 264	26 475	-32 640	188 828	-40 529	-83 405	179 362	120 933	-150 128
Net Financial Profit	**-40 635**	**-89 243**	**-59 630**	**-98 912**	**106 944**	**-135 682**	**-185 245**	**59 572**	**-7 795**	**-281 619**
Adjustment of biomass to fair value	15 838	-36 369	60 483	298 538	-615 767	294 735	764 229	-327 414	188 508	1 470 561
Impairment loss	-	-	-	-	-	33 000	5 500	1 982	-	
Net non-operating items	**15 838**	**-36 369**	**60 483**	**298 538**	**-615 767**	**261 735**	**758 729**	**-329 396**	**188 508**	**1 470 561**
Net profit for the year	**279 564**	**127 052**	**730 141**	**1 429 571**	**378 677**	**491 762**	**1 886 395**	**1 104 471**	**1 232 882**	**3 518 631**

Figure A.8: Lerøy - Tax Calculations

Tax calculations										
Corporate tax rate	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	27,00%	27,00%	25,00%
Effective tax rate	24,20%	22,55%	26,05%	26,33%	29,22%	27,09%	23,95%	22,95%	17,87%	20,85%
Corporate Tax	89 262	36 994	257 137	510 952	156 311	182 749	593 981	328 939	268 226	926 691
Tax on EBIT	118 363	98 258	283 612	478 312	345 139	142 220	510 576	508 301	389 159	776 563
Tax Shield	29 101	61 264	26 475	-32 640	188 828	-40 529	-83 405	179 362	120 933	-150 128

Figure A.9: Lerøy - Reformulated Balance Sheet

Lerøy Analytical Balance Sheet (NOK 1000)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Non-current operating assets										
Deferred tax assets		-	4,461	3,697	6,546	21,545	11,807	42,263	41,536	31,059
Licenses, rights and goodwill	2,832,305	2,959,927	2,959,611	3,847,760	3,878,873	3,972,053	3,987,141	4,234,391	4,349,916	8,018,448
Buildings, real estate, operating acessories	1,149,128	1,294,818	1,225,399	1,586,334	1,836,384	2,094,539	2,377,012	2,676,716	2,899,633	4,209,108
Shares in associated companies	289,474	277,455	272,970	338,864	329,168	331,056	735,071	566,965	670,952	730,875
Long-term receivables	1,216	6,743	11,928	8,129	8,453	8,607	26,171	32,263	17,246	76,679
Total non-current operating assets	**4,272,123**	**4,538,943**	**4,474,369**	**5,784,784**	**6,059,424**	**6,427,800**	**7,137,202**	**7,552,598**	**7,979,283**	**13,066,169**
Current operating assets										
Biological assets	1,494,133	1,676,164	1,858,562	2,706,733	2,370,938	2,724,941	3,727,361	3,681,993	4,320,830	6,418,313
Other inventories	265,008	223,158	236,311	290,379	328,045	326,226	358,482	524,947	552,065	721,803
Accounts receivable	690,800	772,440	876,127	1,013,932	934,443	995,289	1,486,428	1,427,796	1,568,820	2,209,281
Other receivables	219,885	159,844	130,734	176,282	148,395	199,085	316,192	302,692	307,798	421,302
Total current operating assets	**2,669,826**	**2,831,606**	**3,101,734**	**4,187,326**	**3,781,821**	**4,245,541**	**5,888,463**	**5,937,428**	**6,749,513**	**9,770,699**
Total operating assets	**6,941,949**	**7,370,549**	**7,576,103**	**9,972,110**	**9,841,245**	**10,673,341**	**13,025,665**	**13,490,026**	**14,728,796**	**22,836,868**
Current operating liabilities										
Accounts payable	508,294	544,757	615,996	638,213	705,165	826,677	1,059,434	1,053,524	915,981	1,366,634
Taxes payable	76,154	16,631	93,551	395,233	322,105	88,925	320,344	335,062	200,151	477,842
Public duties payable	37,743	49,014	55,671	74,312	62,386	66,915	103,656	70,073	123,457	263,991
Other short-term liabilities	158,242	206,081	240,228	323,976	285,410	230,400	305,074	413,595	439,383	929,880
Deferred tax liabilities	643,529	669,327	834,877	1,260,028	1,083,693	1,230,458	1,486,972	1,531,262	1,567,973	2,802,271
Total current operating liabilities	**1,423,962**	**1,485,810**	**1,840,323**	**2,691,762**	**2,458,759**	**2,443,375**	**3,275,480**	**3,403,516**	**3,246,945**	**5,840,618**
Invested Capital (Operating)	**5,517,987**	**5,884,739**	**5,735,780**	**7,280,348**	**7,382,486**	**8,229,966**	**9,750,185**	**10,086,510**	**11,481,851**	**16,996,250**
Equity										
Share capital	53,577	53,577	53,577	54,577	54,577	54,577	54,577	54,577	54,577	59,577
Own shares	-8,687	-12,355	-12,355	-12,355	-330	-330	-330	-330	-330	-30
Share premium fund	2,601,390	2,601,390	2,601,390	2,731,690	2,731,690	2,731,690	2,731,690	2,731,690	2,731,690	4,778,346
Total paid-in capital	**2,646,280**	**2,642,612**	**2,642,612**	**2,773,912**	**2,785,937**	**2,785,937**	**2,785,937**	**2,785,937**	**2,785,937**	4,837,893
Other equity	1,111,733	1,101,073	1,639,076	2,671,798	2,476,898	2,528,637	3,969,263	4,476,377	5,099,758	7,702,055
Total retained earnings	**1,111,733**	**1,101,073**	**1,639,076**	**2,671,798**	**2,476,898**	**2,528,637**	**3,969,263**	**4,476,377**	**5,099,758**	7,702,055
Non-controlling interests	20,830	20,658	18,568	548,564	534,931	649,380	793,747	817,282	878,357	935,478
Total equity	**3,778,843**	**3,764,343**	**4,300,256**	**5,994,274**	**5,797,766**	**5,963,954**	**7,548,947**	**8,079,596**	**8,764,052**	**13,475,426**
Interest bearing debt										
Long-term interest-bearing debt	1,724,699	1,672,761	1,504,707	2,221,701	2,429,365	2,402,770	2,356,803	2,767,118	2,377,123	4,541,276
Other long-term debt	-	4,150	826	1,312	-	-	-	-	-	-
Pension liabilities	12,012	13,211	14,990	9,025	7,812	7,645	3,227	6,878	3,765	5,220
Other long-term liabilities	-	-	-	-	7,168	44,788	36,700	131,980	126,674	121,958
Short-term loans	566,594	841,921	646,105	434,121	760,977	911,887	682,574	469,276	1,465,144	1,094,089
Total interest bearing debt	**2,303,305**	**2,532,043**	**2,166,628**	**2,666,159**	**3,205,322**	**3,367,090**	**3,079,304**	**3,375,252**	**3,972,706**	**5,762,543**
Interest bearing assets										
Shares available for sale	26,423	23,161	23,115	22,989	23,173	18,281	5,553	8,066	7,293	8,019
Cash and cash equivalents	537,738	388,486	707,989	1,357,096	1,597,429	1,082,797	872,513	1,360,272	1,247,614	2,233,700
Total interest bearing assets	**564,161**	**411,647**	**731,104**	**1,380,085**	**1,620,602**	**1,101,078**	**878,066**	**1,368,338**	**1,254,907**	**2,241,719**
Net interest bearing debt	**1,739,144**	**2,120,396**	**1,435,524**	**1,286,074**	**1,584,720**	**2,266,012**	**2,201,238**	**2,006,914**	**2,717,799**	**3,520,824**
Invested Capital (Financing)	5,517,987	5,884,739	5,735,780	7,280,348	7,382,486	8,229,966	9,750,185	10,086,510	11,481,851	16,996,250

Figure A.10: Grieg - Reformulated Income Statement

Grieg Seafood Analytical Income Statement (NOK 1000)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Sales revenue	1 021 810	1 477 029	1 612 619	2 446 490	2 046 991	2 050 065	2 404 215	4 099 543	4 608 667	6 545 187
Share of profit from associated companies	-	-	377	4 747	13 704	12 744	5 645	3 576	6 994	569
Income from associated companies	-1 897	700	1 608	7 590	25 165	-913	2 244	2 865	3 142	12 083
Change in inventories	-205 859	-51 637	-158 085	10 412	-	-	-	-	-	-
Cost of goods sold	746 174	903 678	900 581	932 118	889 677	1 202 314	968 978	2 293 279	2 738 926	3 287 159
Salaries and personnel expenses	136 246	165 148	193 300	238 409	238 382	276 103	302 223	359 529	409 432	483 473
Other operating expenses	190 704	317 916	407 690	589 558	594 732	631 104	661 919	1 002 039	1 203 434	1 439 207
EBITDA (adjusted)	**152 648**	**142 624**	**271 118**	**688 330**	**363 069**	**-47 625**	**478 984**	**451 137**	**267 011**	**1 348 000**
Depreciation PP&E (adjusted)	78 029	119 036	120 909	118 850	145 264	167 731	145 888	160 341	192 885	225 548
Amortization licenses and other intangible assets	1 155	4 378	3 282	3 662	3 222	4 270	2 569	5 222	5 163	5 036
EBIT (adjusted)	**73 464**	**19 210**	**146 927**	**565 818**	**214 583**	**-219 626**	**330 527**	**285 574**	**68 963**	**1 117 416**
Tax on EBIT	20 570	5 379	41 140	158 429	60 083	-61 495	92 547	77 105	18 620	279 354
Tax shield	36 735	102 840	-45 500	-68 298	132 147	-6 325	-21 398	49 544	32 194	-59 151
NOPAT (adjusted)	**52 894**	**13 831**	**105 788**	**407 389**	**154 500**	**-158 131**	**237 979**	**208 469**	**50 343**	**838 062**
Non-operating and financial items										
Financial income	26 488	18 258	136 333	54 675	31 141	3 173	33 381	57 245	38 056	20 479
Other gains and losses	-	8 299	80	-763	201	-53	-	59 122	-15 218	17 386
Interest expenses	57 938	111 118	81 945	8 385	8 752	76 047	89 729	89 076	117 958	74 873
Other interest expenses (adj)	6 410	2 420	2 530	43 084	45 843	25 483	9 260	7 587	9 556	11 440
Other financial expenses	2 034	140 522	5 373	669	7 941	10 604	8 265	12 407	5 430	1 438
Financial items (adjusted)	-39 894	-227 503	46 565	1 774	-31 194	-109 014	-73 873	7 297	-110 106	-49 886
Tax shield	36 735	102 840	-45 500	-68 298	132 147	-6 325	-21 398	49 544	32 194	-59 151
Net financial profit (adjusted)	**-3 159**	**-124 663**	**1 064**	**-66 524**	**100 953**	**-115 339**	**-95 270**	**56 841**	**-77 912**	**-109 037**
Other gains	46 542	2 175	8 746	10 161	16 568	28 217	20 827	2 819	44 921	41 019
Impairment of fixed assets	-	38 012	-	-	-	-	-	-	46 195	-6 472
Impairment of goodwill and licenses	-	161 988	-	-	-	-	-	-	-	-
Reversal of previous amortisation of licenses	-	-	-	72 385	-	-	-	-	-	-
Fair value adjustment of biological assets	-44 075	-35 747	115 276	207 629	-395 180	98 063	267 450	-123 737	33 209	515 741
Net non-operating items	**2 467**	**-233 572**	**124 022**	**290 175**	**-378 612**	**126 280**	**288 277**	**-120 918**	**31 935**	**563 232**
Net profit for the year	**52 202**	**-344 404**	**230 874**	**631 040**	**-123 159**	**-147 190**	**430 986**	**144 392**	**4 366**	**1 292 257**

Figure A.11: Grieg - Tax and Operating Lease Calculations

Tax calculations										
Corporate tax rate	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	27,00%	27,00%	25,00%
Effective tax rate	-44,86%	22,06%	27,29%	26,43%	36,91%	27,26%	20,91%	16,03%	147,42%	21,69%
Corporate Tax	-16 165	-97 461	86 640	226 727	-72 064	-55 170	113 945	27 561	-13 574	338 505
Tax on EBIT	20 570	5 379	41 140	158 429	60 083	-61 495	92 547	77 105	18 620	279 354
Tax Shield	36 735	102 840	-45 500	-68 298	132 147	-6 325	-21 398	49 544	32 194	-59 151

Operating Lease Adjustment										
Annual operating lease rent expense	6 110	14 729	2 851	3 194	8 853	11 270	13 237	26 395	32 261	52 660
Industry multiplier	3	3	3	3	3	3	3	3	3	3
Applied cost of debt	9,28%	12,47%	8,50%	8,02%	6,47%	5,45%	6,17%	5,87%	4,92%	4,68%
Lease interest expense	567	1 837	242	256	573	614	817	1 549	1 587	2 464
Lease depreciation expense	5 543	12 892	2 609	2 938	8 280	10 656	12 420	24 846	30 674	50 196
Assets and NIBD	18 330	44 187	8 553	9 582	26 559	33 810	39 711	79 185	96 783	157 980

Figure A.12: Grieg - Reformulated Balance Sheet

Grieg Seafood Analytical Balance Sheet (NOK 1000)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Non-current operating assets										
Goodwill	138,661	87,665	87,583	90,540	105,373	105,108	107,310	108,708	110,647	108,595
Licences	849,838	831,921	818,340	926,170	987,596	976,740	994,066	1,066,184	1,093,338	1,060,622
Other intangible assets	-	8,205	5,578	3,160	4,618	3,800	4,546	11,517	16,993	17,598
Property, plant, and equipment (adjusted)	657,422	838,533	827,663	933,128	1,153,258	1,175,127	1,243,918	1,504,137	1,631,553	1,668,359
Investments in associated companies	10,879	11,579	13,619	33,456	37,387	49,229	41,190	22,379	25,947	-
Other non-current receivables	10,275	1,790	-	1,958	311	53	255	67	2,667	**4,167**
Total non-current operating assets	**1,667,075**	**1,779,693**	**1,752,783**	**1,988,412**	**2,288,543**	**2,310,057**	**2,391,285**	**2,712,992**	**2,881,145**	**2,859,341**
Inventories	34,927	44,592	49,180	58,409	67,355	65,692	74,015	91,016	90,867	89,164
Biological assets	1,067,574	1,073,341	1,367,061	1,564,041	1,404,934	1,310,142	1,766,332	1,844,097	1,929,115	2,459,625
Accounts receivable	111,893	157,876	188,052	265,350	223,682	124,657	177,814	504,110	581,904	800,591
Other current receivables	82,578	48,488	57,051	43,265	64,581	51,299	54,015	93,371	145,767	163,246
Total current operating assets	**1,296,972**	**1,324,297**	**1,661,344**	**1,931,065**	**1,760,552**	**1,551,790**	**2,072,176**	**2,532,594**	**2,747,653**	**3,512,626**
Total operating assets	**2,964,047**	**3,103,990**	**3,414,127**	**3,919,477**	**4,049,095**	**3,861,847**	**4,463,461**	**5,245,586**	**5,628,798**	**6,371,967**
Current operating liabilities										
Accounts payable	197,356	214,687	233,443	253,305	303,196	246,119	317,753	360,358	653,083	493,534
Tax payable	9,402	-	-	1,144	-	-	1,471	56,975	24,545	172,057
Accrued salary expense and public tax payable	8,619	13,611	13,869	23,960	22,514	19,720	21,731	14,232	12,134	48,819
Other current liabilities	25,535	23,702	72,400	41,674	48,452	53,982	54,761	131,515	122,796	222,213
Derivatives and other financial instruments	50	122,532	9,672	1,605	7,887	13,805	11,631	27,932	27,104	23,990
Deferred tax liabilities	281,294	251,069	331,995	531,498	486,702	426,781	557,350	560,320	539,040	674,684
Total current operating liabilities	**522,256**	**625,601**	**661,379**	**853,186**	**868,751**	**760,407**	**964,697**	**1,151,332**	**1,378,702**	**1,635,297**
Invested Capital (Operating)	**2,441,791**	**2,478,389**	**2,752,748**	**3,066,291**	**3,180,344**	**3,101,440**	**3,498,764**	**4,094,254**	**4,250,096**	**4,736,670**
Equity										
Share capital	306,048	306,048	446,648	446,648	446,648	446,648	446,648	446,648	446,648	446,648
Share premium reserve	811,120	621,550	716,634	-	-	-	-	-	-	-
Treasury shares		-	-	-	-5,000	-5,000	-5,000	-5,000	-5,000	-5,000
Other equity - not recognized	91,459	1,005	-19,734	1,561	-16,791	-46,523	-2,181	93,095	139,993	63,098
Retained earnings	57,456	-	230,873	1,534,196	1,265,292	1,118,104	1,549,090	1,687,351	1,625,522	2,645,935
Total controlling interests	**1,266,083**	**928,603**	**1,374,421**	**1,982,405**	**1,690,149**	**1,513,229**	**1,988,557**	**2,222,094**	**2,207,163**	**3,150,681**
Non-controlling interests	-	-	-	-	-	-	-	**19,357**	**30,349**	56,270
Total equity	**1,266,083**	**928,603**	**1,374,421**	**1,982,405**	**1,690,149**	**1,513,229**	**1,988,557**	**2,241,451**	**2,237,512**	**3,206,951**
Interest bearing debt										
Pension obligations	4,369	4,161	1,927	2,051	1,557	1,110	610	198	109	-
Cash-settled share options	-	-	1,351	5,845	194	9,267	-	2,334	4,389	11,360
Subordinated loans	9,800	13,517	13,548	14,581	-	-	-	-	-	-
Loan	563,484	8,065	711,419	646,686	613,673	951,043	850,646	958,828	1,518,261	979,874
Other long-term borrowings	19,096	5,882	691	3,292	-	24,801	24,056	23,640	21,425	15,963
Financial leasing liabilities (adjusted)	141,682	257,304	206,720	178,438	206,229	189,960	209,962	315,615	369,751	408,432
Bank overdraft	337,957	-	-	-	-	-	-	-	-	-
Short-term loan facilities	-	496,702	482,989	260,000	700,000	500,000	425,000	-	-	-
Current portion of long-term borrowings	76,184	807,827	85,295	79,000	79,983	109,542	111,060	487,664	101,922	98,490
Current portion of financial leasing liabilities	52,498	35,305	37,383	41,726	44,662	44,730	46,149	53,231	61,008	67,116
Factoring liabilities	-	-	-	-	-	-	-	195,560	338,231	502,535
Cash-settled share options	-	-	-	-	-	-	9,567	929	1,250	-
Total interest bearing debt	**1,205,070**	**1,628,763**	**1,541,323**	**1,231,619**	**1,646,298**	**1,830,453**	**1,677,050**	**2,037,999**	**2,416,346**	**2,083,770**
Interest bearing assets										
Deferred tax assets	-	-	-	-	-	-	-	2,180	10,317	-
Loans to associated companies	2,897	2,410	1,923	3,449	996	1,020	1,020	-	-	-
Available-for-sale financial assets	156	178	945	557	1,307	1,337	1,392	1,518	1,425	1,445
Derivatives and other financial instruments	1,991	8,243	20,350	-	1,178	-	518	-	-	48,993
Cash and cash equivalents	24,318	68,146	139,778	143,727	152,622	239,885	163,913	181,498	392,020	503,613
Total interest bearing assets	**29,362**	**78,977**	**162,996**	**147,733**	**156,103**	**242,242**	**166,843**	**185,196**	**403,762**	**554,051**
Net interest bearing debt	**1,175,708**	**1,549,786**	**1,378,327**	**1,083,886**	**1,490,195**	**1,588,211**	**1,510,207**	**1,852,803**	**2,012,584**	**1,529,719**
Invested Capital (Financing)	**2,441,791**	**2,478,389**	**2,752,748**	**3,066,291**	**3,180,344**	**3,101,440**	**3,498,764**	**4,094,254**	**4,250,096**	**4,736,670**

Figure A.13: Marine Harvest - Reformulated Income Statement

Marine Harvest Group Analytical Income Statement (NOK 1000)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Revenue	14 091 500	13 124 600	14 619 500	15 281 200	15 757 400	15 420 400	19 177 300	25 300 400	27 710 200	32 540 662
Other income	-	-	-	-	375 400	43 200	22 100	230 900	170 500	68 745
Income from associated companies	66 600	5 800	69 500	202 000	-8 500	88 300	221 800	149 500	209 700	581 548
Revenue and other income	**14 158 100**	**13 130 400**	**14 689 000**	**15 483 200**	**16 124 300**	**15 551 900**	**19 421 200**	**25 680 800**	**28 090 400**	**33 190 955**
Cost of materials	9 146 100	8 504 500	8 796 600	7 780 700	8 398 600	9 666 500	9 998 500	13 677 400	15 858 400	16 556 460
Salary and personnel expenses	2 165 000	2 139 800	2 167 400	2 202 500	2 177 800	2 418 600	2 674 300	3 320 900	3 825 500	4 087 556
Other operating expenses (adjusted)	1 304 300	1 393 800	1 413 800	1 423 300	1 879 000	1 998 600	2 291 200	2 964 600	3 505 600	3 679 729
Depreciation and amortization (adjusted)	791 800	685 300	719 692	681 511	842 206	836 095	1 036 281	1 330 926	1 701 582	2 012 763
Restructuring costs	196 300	241 000	169 500	4 400	21 800	800	272 800	52 900	136 300	51 094
EBIT (adjusted)	**554 600**	**166 000**	**1 422 008**	**3 390 789**	**2 804 894**	**631 305**	**3 148 119**	**4 334 074**	**3 063 018**	**6 803 352**
Tax on EBIT	155 288	46 480	398 162	949 421	785 370	176 765	881 473	1 170 200	827 015	1 700 838
Tax shield	44 888	455 780	39 862	-194 479	523 670	-199 735	-145 327	418 200	6 515	-342 011
NOPAT (adjusted)	**399 312**	**119 520**	**1 023 846**	**2 441 368**	**2 019 524**	**454 540**	**2 266 645**	**3 163 874**	**2 236 003**	**5 102 514**
Non-operating and financial items										
Interest expenses (adj)	380 900	485 400	406 708	382 289	414 494	388 905	657 119	565 874	431 218	470 427
Net currency effects	343 900	-632 200	682 000	366 700	236 400	523 300	-311 700	-388 400	37 700	249 898
Other financial items	-7 700	-451 500	35 100	-195 300	342 900	-320 000	-252 400	-1 213 700	-473 800	-1 955 524
Financial items (adjusted)	**-44 700**	**-1 569 100**	**310 392**	**-210 889**	**164 806**	**-185 605**	**-1 221 219**	**-2 167 974**	**-867 318**	**-2 176 052**
Tax shield	44 888	455 780	39 862	-194 479	523 670	-199 735	-145 327	418 200	6 515	-342 011
Net financial items	**188**	**-1 113 320**	**350 254**	**-405 368**	**688 476**	**-385 340**	**-1 366 545**	**-1 749 774**	**-860 803**	**-2 518 064**
Impairment losses	12 100	1 579 400	373 100	5 000	67 000	500	65 000	24 100	60 900	164 431
Other non-operational items	-	-	-	-	-	-	-74 400	-168 200	21 700	12 077
Onerous contracts provision	-	-	-	14 300	5 800	6 100	124 700	-23 700	6 600	1 009 812
Fair value uplift on harvested fish	-	-	-	-	-3 250 600	-1 575 800	-4 323 700	-5 518 500	-4 098 900	-8 078 497
Fair value adjustment on biological assets	-350 400	-278 800	301 200	1 091 700	1 736 600	1 926 000	6 118 300	5 007 700	4 189 200	11 666 256
Net non-operating items	**-362 500**	**-1 858 200**	**-71 900**	**1 072 400**	**-1 586 800**	**343 600**	**1 530 500**	**-679 400**	**44 500**	**2 425 593**
Profit after tax from discontinued operations	-31 900	-	-	-	-	-	91 900	204 800	-2 100	-
Net profit for the year	**5 100**	**-2 852 000**	**1 302 200**	**3 108 400**	**1 121 200**	**412 800**	**2 522 500**	**939 500**	**1 417 600**	**5 010 043**

Figure A.14: Marine Harvest - Tax and Operating Lease Calculations

Tax calculations										
Corporate tax rate	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	27,00%	27,00%	25,00%
Effective tax rate	74,90%	12,55%	21,58%	26,90%	18,92%	47,70%	29,70%	50,58%	36,63%	28,96%
Corporate Tax	110 400	-409 300	358 300	1 143 900	261 700	376 500	1 026 800	752 000	820 500	2 042 849
Tax on EBIT	155 288	46 480	398 162	949 421	785 370	176 765	881 473	1 170 200	827 015	1 700 838
Tax Shield	44 888	455 780	39 862	-194 479	523 670	-199 735	-145 327	418 200	6 515	-342 011
Operating Lease Adjustment										
Annual operating lease rent expense	-	-	34 400	30 500	184 200	165 000	290 700	385 400	464 300	709 748
Industry multiplier	3	3	3	3	3	3	3	3	3	3
Applied cost of debt	7,78%	8,97%	7,00%	6,52%	4,72%	3,70%	5,82%	5,52%	3,17%	2,93%
Lease interest expense	-	-	2 408	1 989	8 694	6 105	16 919	21 274	14 718	20 796
Lease depreciation expense	-	-	31 992	28 511	175 506	158 895	273 781	364 126	449 582	688 953
Assets and NIBD	-	-	103 200	91 500	552 600	495 000	872 100	1 156 200	1 392 900	2 129 245

Figure A.15: Marine Harvest - Reformulated Balance Sheet

Marine Harvest Group Analytical Balance Sheet (NOK 1000)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Non-current operating assets										
Licences	5,566,600	5,766,600	5,409,500	5,442,500	5,577,500	5,435,400	6,036,100	6,514,900	7,163,800	7,101,200
Goodwill	3,344,600	2,239,900	2,142,600	2,111,600	2,146,100	2,115,500	2,374,900	2,416,900	2,484,700	2,489,693
Deferred tax assets	27,000	230,500	54,500	118,600	160,100	73,900	178,800	147,300	110,300	24,154
Other intangible assets	135,900	160,000	136,000	132,900	123,100	114,100	188,500	166,500	264,900	300,993
Property, plant and equipment (adjusted)	3,894,700	4,243,600	3,621,300	3,976,600	4,720,100	4,606,900	7,549,300	9,413,400	10,639,300	11,494,393
Investments in associated companies	541,100	513,500	520,100	678,900	624,400	647,300	900,400	978,200	1,188,800	1,625,733
Other non-current assets	-	-	-	2,600	25,800	73,200	8,800	14,500	20,400	46,450
Total non-current operating assets	**13,509,900**	**13,154,100**	**11,884,000**	**12,463,700**	**13,377,100**	**13,066,300**	**17,236,800**	**19,651,700**	**21,872,200**	**23,082,615**
Current operating assets										
Inventory	917,400	1,074,500	742,700	775,800	783,000	819,700	1,751,100	2,400,800	2,664,500	**2,305,753**
Biological assets	5,553,900	5,620,600	5,351,100	7,278,100	6,285,200	6,207,900	9,536,600	10,014,000	10,939,600	**14,620,445**
Trade receivables	1,883,400	1,903,400	1,672,100	1,844,900	1,914,900	1,782,000	3,191,400	3,360,200	3,926,200	**4,626,370**
Other receivables	667,500	532,400	551,600	814,700	609,800	592,600	956,400	883,400	1,260,300	**1,047,901**
Total current operating assets	**9,022,200**	**9,130,900**	**8,317,500**	**10,713,500**	**9,592,900**	**9,402,200**	**15,435,500**	**16,658,400**	**18,790,600**	**22,600,469**
Total operating assets	**22,532,100**	**22,285,000**	**20,201,500**	**23,177,200**	**22,970,000**	**22,468,500**	**32,672,300**	**36,310,100**	**40,662,800**	**45,683,083**
Current operating liabilities										
Trade payables	1,349,700	1,729,200	1,339,800	1,450,200	1,481,800	1,452,500	2,232,600	2,039,200	2,379,700	2,559,367
Deferred tax liabilities	1,199,700	732,900	1,142,600	2,237,900	2,351,900	2,543,700	3,365,000	3,568,900	3,759,300	4,212,970
Provisions	-	-	-	-	-	-	492,200	507,700	440,300	1,427,858
Other current liabilities	907,100	2,349,900	1,048,600	1,112,200	1,180,300	1,475,400	1,393,300	1,794,200	1,450,900	1,670,324
Total current operating liabilities	**3,456,500**	**4,812,000**	**3,531,000**	**4,800,300**	**5,014,000**	**5,471,600**	**7,483,100**	**7,910,000**	**8,030,200**	**9,870,519**
Invested capital (Operating)	**19,075,600**	**17,473,000**	**16,670,500**	**18,376,900**	**17,956,000**	**16,996,900**	**25,189,200**	**28,400,100**	**32,632,600**	**35,812,565**
Equity										
Share capital and reserves attributable to owners	12,449,600	9,579,600	11,415,500	12,500,200	10,766,300	11,619,700	16,318,500	14,702,200	18,178,300	19,215,229
Non-controlling interests	34,400	45,100	45,000	70,500	75,900	68,900	27,800	16,000	8,900	8,361
Total equity	**12,484,000**	**9,624,700**	**11,460,500**	**12,570,700**	**10,842,200**	**11,688,600**	**16,346,300**	**14,718,200**	**18,187,200**	**19,223,590**
Interest bearing debt										
Liabilities held for sale	-	-	-	-	-	-	190,500	-	-	-
Non-current interest-bearing debt	5,856,900	6,747,700	5,116,900	5,107,300	6,589,400	5,338,500	7,710,200	10,669,100	10,279,300	9,228,587
Other non-current financial liabilities	-	-	-	-	-	-	855,300	2,218,600	2,010,500	4,083,840
Other non-current liabilities (adjusted)	136,400	116,700	203,000	662,600	652,000	909,700	992,900	1,272,100	1,507,700	2,236,079
Current tax liabilities	-	69,900	50,800	49,700	86,600	26,200	252,600	525,200	696,300	1,324,740
Current interest-bearing debt	1,249,200	1,365,500	130,300	429,700	157,000	377,800	686,700	7,000	1,500	929
Other current financial liabilities	-	-	-	-	-	-	82,200	810,400	940,300	849,097
Total interest bearing debt	**7,242,500**	**8,299,800**	**5,501,000**	**6,249,300**	**7,485,000**	**6,652,200**	**10,770,400**	**15,502,400**	**15,435,600**	**17,723,271**
Interest bearing assets										
Restricted cash	-	-	-	-	66,000	89,300	167,100	213,100	111,700	147,709
Cash in bank	362,600	372,600	172,200	318,900	213,100	246,000	439,100	1,195,200	577,000	817,511
Other shares	288,300	78,900	118,800	124,200	92,100	1,008,600	132,100	166,100	4,000	2,787
Other current financial assets	-	-	-	-	-	-	130,100	227,100	280,100	132,846
Assets held for sale	-	-	-	-	-	-	1,059,100	19,000	17,400	33,444
Total interest bearing assets	**650,900**	**451,500**	**291,000**	**443,100**	**371,200**	**1,343,900**	**1,927,500**	**1,820,500**	**990,200**	**1,134,297**
Net interest bearing debt	**6,591,600**	**7,848,300**	**5,210,000**	**5,806,200**	**7,113,800**	**5,308,300**	**8,842,900**	**13,681,900**	**14,445,400**	**16,588,974**
Invested capital (Financing)	**19,075,600**	**17,473,000**	**16,670,500**	**18,376,900**	**17,956,000**	**16,996,900**	**25,189,200**	**28,400,100**	**32,632,600**	**35,812,565**

A.4 Strategic Analysis

Figure A.16: VRIO-framework

VRIO framework	
Valuable (V)	Does the resource in question add value in the competitive environment it exists in?
Rare (R)	Is a resource currently controlled by only a small number of competing firms?
Imitability (I)	Do firms without a resource face a cost disadvantage in obtaining or developing it?
Organized (O)	Are a firm's other policies and procedures organized to support the exploitation of its valuable, rare, and costly-to-imitate resources?

Author composed, Source: Barney

A.5 Capital Structure

Figure A.17: SalMar's and peers capital structure

Salmar	Shareprice	No. of shares	Market value of equity	Book value of equity	NIBD	NIBD/MVE	NIBD/BVE	Financial leverage
2007	44	103,000.00	4,532,000.00	1,322,658.00	822,247.00	0.18	0.62	0.15
2008	26	103,000.00	2,678,000.00	1,315,112.00	1,003,346.00	0.37	0.76	0.27
2009	46	103,000.00	4,738,000.00	1,699,806.00	802,434.00	0.17	0.47	0.14
2010	61.5	103,000.00	6,334,500.00	2,469,368.00	1,844,516.00	0.29	0.75	0.23
2011	30	103,000.00	3,090,000.00	2,214,610.00	2,759,321.00	0.89	1.25	0.47
2012	44.7	113,300.00	5,064,509.96	2,967,713.00	2,865,600.00	0.57	0.97	0.36
2013	74	113,300.00	8,384,199.93	5,060,784.00	1,900,605.00	0.23	0.38	0.18
2014	127.5	113,300.00	14,445,749.87	5,137,277.00	2,317,920.00	0.16	0.45	0.14
2015	155	113,300.00	17,561,499.85	5,227,040.00	2,642,885.00	0.15	0.51	0.13
2016	258.1	113,300.00	29,242,729.74	6,680,800.00	2,452,655.00	0.08	0.37	0.08
					Median	0.204	0.62	0.18
					Mean	0.31	0.68	0.2315
					Average last 5 years	0.237	0.71	0.26

Marine Harvest Group	Shareprice	No. of shares	Market value of equity	Book value of equity	NIBD	NIBD/MVE	NIBD/BVE	Financial leverage
2007	3.49	3,478,898.33	12,141,355.17	12,484,000.00	6,591,600.00	0.54	0.53	0.35
2008	1.05	3,478,898.33	3,652,843.25	9,624,700.00	7,848,300.00	2.15	0.82	0.68
2009	4.23	3,574,898.33	15,121,819.93	11,460,500.00	5,210,000.00	0.34	0.45	0.26
2010	6.17	3,574,898.33	22,057,122.69	12,570,700.00	5,806,200.00	0.26	0.46	0.21
2011	2.59	3,581,140.54	9,275,154.01	10,842,200.00	7,113,800.00	0.77	0.66	0.43
2012	5.12	3,748,341.60	19,191,508.98	11,688,600.00	5,308,300.00	0.28	0.45	0.22
2013	7.385	4,103,777.58	30,306,397.44	16,346,300.00	8,842,900.00	0.29	0.54	0.23
2014	102.9	410,377.76	42,227,871.40	14,718,200.00	13,681,900.00	0.32	0.93	0.24
2015	119.6	450,085.65	53,830,243.98	18,187,200.00	14,445,400.00	0.27	0.79	0.21
2016	155.7	450,085.65	70,078,336.02	19,223,590.07	16,588,974.43	0.24	0.86	0.19
					Median	0.32	0.54	0.24
					Mean	0.55	0.63	0.31
					Average last 5 years	0.39	0.68	0.27

Lerøy Seafood Group	Shareprice	No. of shares	Market value of equity	Book value of equity	NIBD	NIBD/MVE	NIBD/BVE	Financial leverage
2007	110	53,577.37	5,893,510.48	3,778,843.00	1,739,144.00	0.30	0.46	0.23
2008	45	53,577.37	2,410,981.56	3,764,343.00	2,120,396.00	0.88	0.56	0.47
2009	105	53,577.37	5,625,623.64	4,300,256.00	1,435,524.00	0.26	0.33	0.20
2010	198.5	54,577.37	10,833,607.55	5,994,274.00	1,286,074.00	0.12	0.21	0.11
2011	84	54,577.37	4,584,498.91	5,797,766.00	1,584,720.00	0.35	0.27	0.26
2012	129.5	54,577.37	7,067,769.16	5,963,954.00	2,266,012.00	0.32	0.38	0.24
2013	177	54,577.37	9,660,194.14	7,548,947.00	2,201,238.00	0.23	0.29	0.19
2014	273	54,577.37	14,899,621.46	8,079,596.00	2,006,914.00	0.13	0.25	0.12
2015	330	54,577.37	18,010,531.44	8,764,052.00	2,717,799.00	0.15	0.31	0.13
2016	481.1	54,577.37	26,257,171.74	13,475,426.00	3,520,824.00	0.13	0.26	0.12
					Median	0.26	0.31	0.20
					Mean	0.30	0.34	0.22
					Average last 5 years	0.24	0.30	0.19

Grieg Seafood Group	Share price	No. of shares	Market value of Equity	Book value of equity	NIBD	NIBD/MVE	NIBD/BVE	Financial leverage
2007	15.8	76,512.00	1,208,889.60	1,266,083.00	1,175,708.00	0.97	0.93	0.49
2008	3.3	76,512.00	252,489.60	928,603.00	1,549,786.00	6.14	1.67	0.86
2009	10.2	111,662.00	1,138,952.40	1,374,421.00	1,378,327.00	1.21	1.00	0.55
2010	18.7	111,662.00	2,088,079.40	1,982,405.00	1,083,886.00	0.52	0.55	0.34
2011	4.33	111,662.00	483,496.46	1,690,149.00	1,490,195.00	3.08	0.88	0.76
2012	12.35	111,662.00	1,379,025.70	1,513,229.00	1,588,211.00	1.15	1.05	0.54
2013	24.5	111,662.00	2,735,719.00	1,988,557.00	1,510,207.00	0.55	0.76	0.36
2014	28.5	111,662.00	3,182,367.00	2,241,451.00	1,852,803.00	0.58	0.83	0.37
2015	31	111,662.00	3,461,522.00	2,237,512.00	2,012,584.00	0.58	0.90	0.37
2016	81.7	111,662.00	9,122,785.40	3,206,951.00	1,529,719.00	0.17	0.48	0.14
					Median	0.97	0.90	0.49
					Mean	1.64	0.95	0.51
					Average last 5 years	1.19	0.88	0.48

A.6 Profitability Analysis

Figure A.18: Decomposing of ROE before tax

ROIC pre-tax

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	16.1%	26.6%	33.9%	15.6%	8.1%	22.2%	27.4%	18.8%	32.0%
LSG	6.2%	17.4%	26.2%	16.8%	6.5%	20.3%	19.0%	13.4%	21.8%
GSF	0.8%	5.6%	19.4%	6.9%	-7.0%	10.0%	7.5%	1.7%	24.9%
MHG	1 %	8 %	19 %	15 %	4 %	15 %	16 %	10 %	20 %
average	6.0%	14.5%	24.7%	13.7%	2.8%	16.9%	17.5%	11.0%	24.6%

Financial gearing

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	69.2%	59.9%	63.5%	98.3%	108.5%	59.4%	41.4%	47.9%	42.8%
LSG	51.2%	44.1%	26.4%	24.3%	32.7%	33.1%	26.9%	28.1%	28.1%
GSF	124.2%	127.1%	73.3%	70.1%	96.1%	88.5%	79.5%	86.3%	65.1%
MHG	65 %	62 %	46 %	55 %	55 %	50 %	73 %	85 %	83 %
average	77.5%	73.3%	52.3%	62.0%	73.1%	57.8%	55.1%	61.9%	54.7%

NBC

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	5.2%	-1.5%	1.5%	-3.2%	4.7%	-8.0%	-0.3%	-1.4%	1.7%
LSG	4.6%	3.4%	7.3%	-7.5%	7.0%	8.3%	-2.8%	0.3%	9.0%
GSF	9.1%	-0.1%	5.4%	-7.8%	7.5%	6.1%	-3.4%	4.0%	6.2%
MHG	15 %	-5 %	7 %	-11 %	6 %	19 %	16 %	6 %	16 %
average	8.6%	-0.9%	5.4%	-7.3%	6.4%	6.4%	2.3%	2.3%	8.3%

Spread

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	6.4%	28.1%	32.3%	18.8%	3.4%	30.2%	27.7%	20.2%	30.3%
LSG	1.5%	14.1%	19.0%	24.3%	-0.5%	12.0%	21.8%	13.0%	12.8%
GSF	-8.4%	5.7%	14.0%	14.7%	-14.5%	3.9%	10.9%	-2.4%	18.7%
MHG	-15 %	14 %	12 %	26 %	-3 %	-4 %	1 %	4 %	4 %
average	-3.7%	15.4%	19.3%	21.0%	-3.5%	10.4%	15.3%	8.7%	16.4%

A.6.1 Indexing

Figure A.19: Indexing turnover rate

Invested Capital	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	100 %	108 %	117 %	201 %	232 %	272 %	325 %	348 %	367 %	426 %
Lerøy	100 %	107 %	104 %	132 %	134 %	149 %	177 %	183 %	208 %	308 %
Grieg Seafood	100 %	101 %	113 %	126 %	130 %	127 %	143 %	168 %	174 %	194 %
Marine Harvest	100 %	92 %	87 %	96 %	94 %	89 %	132 %	149 %	171 %	188 %

NWC	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	100 %	117 %	121 %	193 %	207 %	311 %	481 %	454 %	434 %	467 %
Lerøy	100 %	108 %	101 %	120 %	106 %	145 %	210 %	203 %	281 %	315 %
Grieg Seafood	100 %	90 %	129 %	139 %	115 %	102 %	143 %	178 %	177 %	242 %
Marine Harvest	100 %	78 %	86 %	106 %	82 %	71 %	143 %	157 %	193 %	229 %

Licenses	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	100.0%	90.6%	92.7%	130.3%	147.0%	168.6%	201.2%	242.9%	244.3%	244.2%
Lerøy	100.0%	104.5%	104.5%	135.9%	137.0%	140.2%	140.8%	149.5%	153.6%	283.1%
Grieg Seafood	100.0%	97.9%	96.3%	109.0%	116.2%	114.9%	117.0%	125.5%	128.7%	124.8%
Marine Harvest	100.0%	103.6%	97.2%	97.8%	100.2%	97.6%	108.4%	117.0%	128.7%	127.6%

PP&E	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	100.0%	118.7%	151.6%	248.9%	338.1%	381.0%	546.0%	559.1%	666.8%	886.1%
Lerøy	100.0%	112.7%	106.6%	138.0%	159.8%	182.3%	206.9%	232.9%	252.3%	366.3%
Grieg Seafood	100.0%	127.5%	125.9%	141.9%	175.4%	178.7%	189.2%	228.8%	248.2%	253.8%
Marine Harvest	100.0%	109.0%	93.0%	102.1%	121.2%	118.3%	193.8%	241.7%	273.2%	295.1%

NIBD	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	100.0%	122.0%	97.6%	224.3%	335.6%	348.5%	231.1%	281.9%	321.4%	298.3%
Lerøy	100 %	122 %	83 %	74 %	91 %	130 %	127 %	115 %	156 %	202 %
Grieg Seafood	100.0 %	131.8 %	117.2 %	92.2 %	126.7 %	135.1 %	128.5 %	157.6 %	171.2 %	130.1 %
Marine Harvest	100.0 %	119.1 %	79.0 %	88.1 %	107.9 %	80.5 %	134.2 %	207.6 %	219.1 %	251.7 %

Figure A.20: Indexing of income statement

OPEX	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	100 %	110 %	143 %	194 %	255 %	306 %	396 %	421 %	469 %	521 %
Lerøy	100 %	96 %	110 %	123 %	134 %	145 %	154 %	183 %	203 %	242 %
Grieg Seafood	100 %	154 %	155 %	204 %	199 %	243 %	223 %	421 %	502 %	601 %
Marine Harvest	100 %	96 %	98 %	89 %	97 %	110 %	119 %	156 %	182 %	190 %

COGS	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	100 %	110 %	139 %	241 %	284 %	325 %	404 %	399 %	455 %	526 %
Lerøy	100 %	91 %	110 %	117 %	132 %	138 %	150 %	180 %	197 %	225 %
Grieg Seafood	100 %	121 %	121 %	125 %	119 %	161 %	130 %	307 %	367 %	441 %
Marine Harvest	100 %	93 %	96 %	85 %	92 %	106 %	109 %	150 %	173 %	181 %

Other OPEX	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	100 %	134 %	164 %	210 %	361 %	455 %	561 %	611 %	681 %	725 %
Lerøy	100 %	123 %	124 %	147 %	182 %	181 %	213 %	267 %	307 %	395 %
Grieg Seafood	100 %	167 %	214 %	309 %	312 %	331 %	347 %	525 %	631 %	755 %
Marine Harvest	100 %	107 %	108 %	109 %	144 %	153 %	176 %	227 %	269 %	282 %

D&A	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	100 %	108 %	130 %	189 %	297 %	372 %	470 %	506 %	562 %	696 %
Lerøy	100 %	128 %	133 %	143 %	177 %	190 %	200 %	240 %	282 %	333 %
Grieg Seafood	100 %	153 %	155 %	152 %	186 %	215 %	187 %	205 %	247 %	289 %
Marine Harvest	100 %	87 %	91 %	86 %	106 %	106 %	131 %	168 %	215 %	254 %

EBIT	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	100 %	78 %	139 %	250 %	157 %	95 %	308 %	429 %	313 %	590 %
Lerøy	100 %	83 %	240 %	404 %	292 %	120 %	431 %	445 %	341 %	735 %
Grieg Seafood	100 %	26 %	200 %	770 %	292 %	-299 %	450 %	389 %	94 %	1521 %
Marine Harvest	100 %	30 %	256 %	611 %	506 %	114 %	568 %	781 %	552 %	1227 %

NOPAT	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	100 %	78 %	139 %	250 %	157 %	95 %	308 %	434 %	318 %	614 %
Lerøy	100 %	83 %	240 %	404 %	292 %	120 %	431 %	452 %	346 %	765 %
Grieg Seafood	100 %	26 %	200 %	770 %	292 %	-299 %	450 %	394 %	95 %	1584 %
Marine Harvest	100 %	30 %	256 %	611 %	506 %	114 %	568 %	792 %	560 %	1278 %

Net profit	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	100 %	48 %	134 %	272 %	42 %	137 %	541 %	345 %	321 %	753 %
Lerøy	100 %	45 %	261 %	511 %	135 %	176 %	675 %	395 %	441 %	1259 %
Grieg Seafood	100 %	-660 %	442 %	1209 %	-236 %	-282 %	826 %	277 %	8 %	2475 %
Marine Harvest	100 %	-55922 %	25533 %	60949 %	21984 %	8094 %	49461 %	18422 %	27796 %	98236 %

Figure A.21: Common size income statements per kg for Salmar and peer group

Common Size Peer Compa	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Revenue										
SalMar	32.81	32.15	37.85	55.03	42.27	41.90	55.69	51.65	54.01	80.59
Lerøy	71.16	65.49	68.08	79.17	67.33	59.46	76.04	80.81	85.95	116.74
Grieg Seafood	25.21	28.57	33.12	38.29	35.16	32.45	41.54	57.66	69.83	101.32
Marine Harvest	42.22	40.20	44.91	52.48	47.03	39.64	56.49	61.31	66.86	87.20

OPEX	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	22.89	24.34	26.56	35.63	32.69	35.62	41.02	35.62	41.02	53.72
Lerøy	64.68	59.58	57.09	62.23	56.31	54.25	61.33	66.58	74.05	92.65
Grieg Seafood	21.43	25.81	27.56	27.57	29.04	33.20	33.29	51.33	65.79	80.49
Marine Harvest	38.21	37.59	38.36	38.68	36.40	35.90	44.32	47.78	55.52	64.04

COGS	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	16.06	17.17	18.08	30.97	25.52	26.46	29.36	23.67	27.93	38.03
Lerøy	52.85	46.16	46.77	48.15	45.28	42.34	48.62	53.40	58.87	70.32
Grieg Seafood	18.44	17.47	18.47	14.52	14.99	18.92	16.69	32.21	41.41	50.78
Marine Harvest	27.28	26.04	26.89	26.37	24.50	24.64	29.08	32.65	37.74	43.50

Other expenses	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	3.57	4.62	4.75	6.01	7.21	8.25	9.07	8.06	9.29	11.66
Lerøy	5.31	6.25	5.30	6.08	6.28	5.56	6.93	7.98	9.19	12.41
Grieg Seafood	4.71	6.15	8.36	9.18	10.02	9.93	11.40	14.07	18.19	22.24
Marine Harvest	3.89	4.27	4.32	4.82	5.48	5.09	6.66	7.08	8.34	9.67

EBITDA	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	9.92	7.82	11.29	19.40	9.59	6.28	14.66	16.03	12.98	26.87
Lerøy	6.49	5.91	10.99	16.94	11.01	5.21	14.71	14.23	11.90	24.09
Grieg Seafood	3.77	2.76	5.56	10.72	6.12	-0.75	8.25	6.34	4.04	20.83
Marine Harvest	4.02	2.61	6.55	13.80	10.64	3.74	12.17	13.52	11.34	23.16

EBIT	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	8.85	6.69	9.98	17.76	7.80	4.26	12.35	14.01	10.59	23.52
Lerøy	4.76	3.79	9.15	15.01	9.02	3.31	12.59	11.90	9.15	20.68
Grieg Seafood	1.82	0.37	3.01	8.81	3.62	-3.46	5.69	4.01	1.04	17.26
Marine Harvest	1.65	0.51	4.35	11.49	8.18	1.61	9.16	10.35	7.29	17.87

NOPAT	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	6.37	4.82	7.19	12.79	5.62	3.06	8.89	10.23	7.73	17.64
Lerøy	3.42	2.73	6.59	10.81	6.50	2.38	9.07	8.68	6.68	15.51
Grieg Seafood	1.31	0.27	2.17	6.34	2.60	-2.49	4.10	2.93	0.76	12.95
Marine Harvest	1.19	0.37	3.13	8.28	5.89	1.16	6.59	7.55	5.32	13.41

Net profit	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	6.75	3.14	7.32	14.74	1.58	4.69	16.55	8.62	8.28	22.93
Lerøy	3.14	1.37	6.60	12.56	2.77	3.20	13.03	6.98	7.82	23.43
Grieg Seafood	1.29	-6.66	4.74	9.83	-2.08	-2.32	7.42	2.03	0.07	19.96
Marine Harvest	0.02	-8.73	3.98	10.54	3.27	1.05	7.34	2.24	3.37	13.16

Figure A.22: Common size balance sheet per kg for Salmar and peer group

Common Size Peer Comparison (NOK per KG)										
Invested Capital	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
SalMar	40.86	42.87	38.62	65.84	52.36	55.70	59.41	52.74	57.58	78.23
Lerøy	62.07	63.48	51.81	63.97	54.04	53.62	67.34	63.73	72.85	113.17
Grieg Seafood	60.35	47.91	56.47	47.75	53.60	48.82	60.26	57.50	64.25	73.18
Marine Harvest	56.89	53.50	50.96	62.29	52.38	43.33	73.27	67.80	77.67	94.09

NWC	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	8.38	9.53	8.20	12.93	9.70	13.23	18.27	14.06	13.88	17.62
Lerøy	14.01	14.52	11.39	13.14	9.69	11.74	18.05	16.01	22.22	26.17
Grieg Seafood	19.15	13.51	20.51	16.79	15.03	12.46	19.07	19.40	20.70	29.00
Marine Harvest	16.60	13.22	14.63	20.04	13.36	10.02	23.13	20.89	25.61	33.45

PP&E	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	6.99	8.05	8.59	13.95	13.24	13.53	17.29	14.44	17.80	27.92
Lerøy	12.93	13.97	11.07	13.94	13.44	13.65	16.42	16.91	18.40	28.03
Grieg Seafood	16.25	16.21	16.98	14.53	19.44	18.50	21.42	21.12	24.67	25.78
Marine Harvest	11.61	12.99	11.07	13.48	13.77	11.74	21.96	22.47	25.32	30.20

licenses and goodwill	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	20.70	20.69	17.75	25.97	20.61	20.81	21.43	20.56	21.36	25.18
Lerøy	31.86	31.93	26.74	33.81	28.40	25.88	27.54	26.76	27.60	53.39
Grieg Seafood	24.43	17.78	18.58	15.83	18.42	17.03	18.97	16.50	18.20	18.06
Marine Harvest	26.57	24.51	23.09	25.61	22.53	19.25	24.47	21.32	22.96	25.20

NIBD	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	15.78	18.68	12.48	28.38	29.67	27.93	16.53	16.44	19.38	21.22
Lerøy	19.56	22.87	12.97	11.30	11.60	14.76	15.20	12.68	17.24	23.44
Grieg Seafood	29.06	29.96	28.28	16.88	25.12	25.00	26.01	26.02	30.43	23.63
Marine Harvest	19.66	24.03	15.93	19.68	20.75	13.53	25.72	32.66	34.38	43.58

Figure A.23: Volume harvested by Salmar and peer group

Harvested volume

Year	2 007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SalMar	52 100	53 700	64 300	65 000	93 000	102 600	115 000	141 000	136 400	115 600
Lerøy	88 900	92 700	110 700	113 800	136 600	153 500	144 800	158 258	157 600	150 182
GSF	40 461	51 731	48 747	64 214	59 332	63 531	58 061	71 205	66 148	64 727
MHG	335 328	326 623	327 100	295 010	342 820	392 306	343 772	418 873	420 148	380 621

A.7 FinancialAnalysis

Figure A.24: Financial leverage comparison

Financial leverage (Market)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Mean
Salmar	0.35x	0.65x	0.39x	0.53x	1.33x	0.92x	0.58x	0.35x	0.33x	0.23x	0.57x
LSG	0.63x	1.67x	0.71x	0.49x	1.24x	0.82x	0.66x	0.45x	0.40x	0.44x	0.75x
GSF	1.41x	8.75x	1.93x	0.99x	5.15x	1.85x	0.95x	0.98x	1.07x	0.39x	2.35x
MHG	0.88x	3.59x	0.59x	0.50x	1.29x	0.61x	0.57x	0.53x	0.41x	0.36x	0.93x
Mean	0.82x	3.67x	0.90x	0.63x	2.25x	1.05x	0.69x	0.58x	0.55x	0.36x	1.15x
Median	0.76x	2.63x	0.65x	0.51x	1.31x	0.87x	0.62x	0.49x	0.41x	0.38x	0.86x

Figure A.25: NWC comparison

NWC Turnover	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Mean
Salmar	3.92x	3.37x	4.61x	4.26x	4.36x	3.17x	3.05x	3.67x	3.89x	4.57x	3.88x
LSG	5.08x	4.51x	5.97x	6.02x	6.95x	5.06x	4.21x	5.05x	3.87x	4.46x	5.12x
GSF	1.32x	2.11x	1.61x	2.28x	2.34x	2.61x	2.18x	2.97x	3.37x	3.49x	2.55x
MHG	2.54x	3.04x	3.07x	2.62x	3.52x	3.96x	2.44x	2.94x	2.61x	2.61x	2.98x
Mean	3.21x	3.26x	3.82x	3.80x	4.29x	3.70x	2.97x	3.66x	3.44x	3.78x	3.63x
Median	3.23x	3.21x	3.84x	3.44x	3.94x	3.56x	2.75x	3.32x	3.62x	3.98x	3.43x

A.8 Cost of Capital

A.8.1 Beta

Figure A.26: Rolling beta

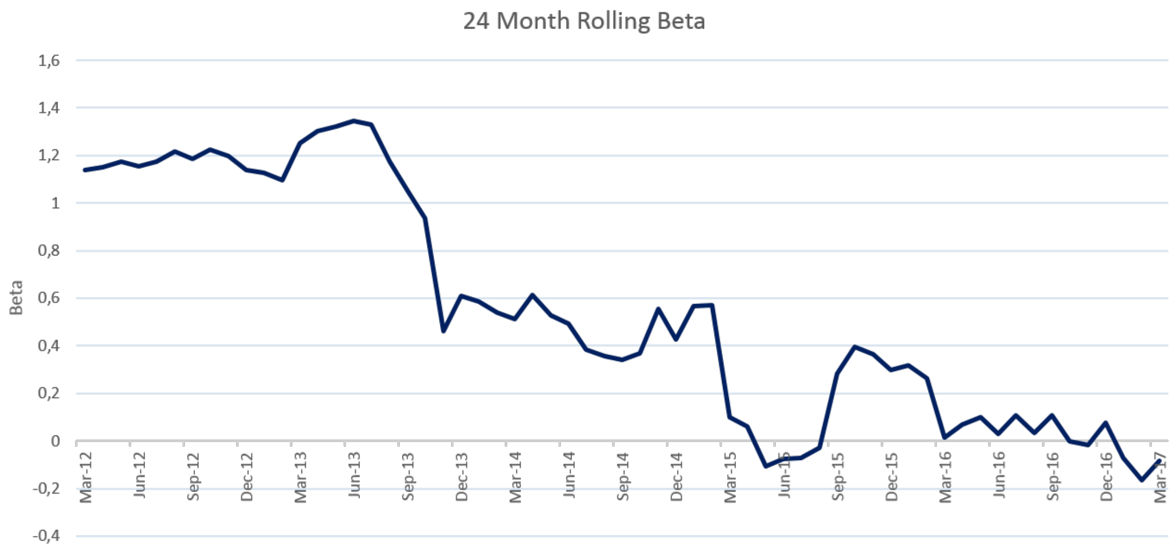


Figure A.27: Regression beta

Raw beta		Salmar	OSEBX
Variance of return		0.0064	0.0011
Standard deviation of returns		0.0799	0.0332
Correlation(Salm,OSEBX)	0.0871		
Raw beta	**0.2097**		
Bloomberg Adjusted	0.4732		

Raw beta		GSF	OSEBX
Variance of return		0.0099	0.0011
Std.dev of returns		0.0997	0.0332
Correlation(GSF,OSEBX)	0.1881		
Raw beta	0.5653		

Raw beta		Lerøy	OSEBX
Variance of return		0.0060	0.0011
Std.dev of returns		0.0775	0.0332
Correlation(Lerøy,OSEBX)	0.2045		
Raw beta	0.4780		

Raw beta		MHG	OSEBX
Variance of return		0.0057	0.0011
Std.dev of returns		0.0754	0.0332
Correlation(MHG,OSEBX)	0.1488		
Raw beta	0.3383		

Figure A.28: Beta calculations

Bottom-Up Beta	Regression	NIBD / MVEQ	Unlevered Beta
Lerøy	0.478	0.15	0.358
GSF	0.565	0.58	0.424
MHG	0.338	0.27	0.254
Average	0.461	0.33	0.345
		Salmar Capital Structure	0.15
		Bottom-Up Beta	0.397
		SalMar Bottom-Up Bloomberg adjusted	**0.598**

Financial Services Betas - SalMar	
Bloomberg	0.530
Financial Times	0.291
Reuters	0.290
Average	0.370

	Beta	Weights
Historical	0.473	10%
Bottom-Up Levered	0.598	60%
Industry Levered	0.750	20%
Financial Analysts	0.370	10%
Weighted Beta	**0.593**	

A.9 Cost of debt

Figure A.29: SalMar - Cost of debt

Standard & Poor's rating								
Three years median	**AAA**	**AA**	**A**	**BBB**	**BB**	**B**	**CCC**	**<CCC**
Numerical score	0	1	2	3	4	5	6	7
EBIT Interest cover	21.4	10.1	6.1	3.7	2.1	0.8	0.1	
EBITDA interest cover	26.5	12.9	9.1	5.8	3.4	1.8	1.3	
Operating cash flow/ total liabilities	84.20%	25.20%	15.00%	8.50%	2.60%	-3.20%	-12.90%	
Return on invested capital	34.90%	21.70%	19.40%	13.60%	11.60%	6.60%	1.00%	
Total liabilities / total capital	22.90%	37.70%	42.50%	48.20%	62.60%	74.80%	87.70%	

Information (NOK 1000)	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Interest expenses	47,104	72,178	32,078	49,597	98,791	150,224	168,053	124,193	98,780	-30,365
EBIT	460,636	359,013	641,527	1,153,741	724,055	434,575	1,417,473	1,975,184	1,444,117	2,718,491
EBITDA	511,307	414,238	719,705	1,249,371	856,598	604,743	1,643,293	2,253,348	1,765,566	3,076,511
Operating cash flow	297,646	213,215	513,607	531,071	294,871	186,794	1,105,951	1,647,004	1,622,292	2,724,599
Average Invested capital	2,128,921	2,215,524	2,392,789	3,381,374	4,574,233	5,291,769	6,273,196	7,134,228	7,644,942	9,043,620
NOPAT	331,658	258,489	461,899	830,694	521,320	312,894	1,020,581	1,441,884	1,054,205	2,038,868
Total liabilities	1,571,165	1,753,247	1,850,530	3,337,949	4,101,815	4,659,122	4,870,767	4,987,130	5,716,461	6,720,853
Total capital	2,843,894	3,042,206	3,395,983	5,694,928	6,266,019	7,553,247	8,859,367	9,955,333	10,668,119	13,126,303
Ratios	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
EBIT interest cover (x)	9.78	**4.97**	**20.00**	**23.26**	**7.33**	**2.89**	**8.43**	**15.90**	**14.62**	**89.53**
EBITDA interest cover (x)	10.85	**5.74**	**22.44**	**25.19**	**8.67**	**4.03**	**9.78**	**18.14**	**17.87**	**101.32**
Operating cash flow/ Total liabilities (%)	18.94%	**12.16%**	**27.75%**	**15.91%**	**7.19%**	**4.01%**	**22.71%**	**33.03%**	**28.38%**	**40.54%**
Return on invested capital (%)	15.58%	**11.67%**	**19.30%**	**24.57%**	**11.40%**	**5.91%**	**16.27%**	**20.21%**	**13.79%**	**22.54%**
Total liabilities / capital (%)	55.25%	**57.63%**	**54.49%**	**58.61%**	**65.46%**	**61.68%**	**54.98%**	**50.10%**	**53.58%**	**51.20%**
Ratings	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
EBIT interest cover (x)	2	3	1	0	2	4	2	1	1	0
EBITDA interest cover (x)	2	4	1	1	3	4	2	1	1	0
Operating cash flow/total liabilities (%)	2	3	1	2	4	4	2	1	1	1
Return on invested capital (%)	3	4	3	1	5	6	3	2	3	1
Total liabilities/total capital (%)	4	4	4	4	5	4	4	4	4	4
Yearly rating	2.6	3.6	2	1.6	3.8	4.4	2.6	1.8	2	1.2
Yearly rating	BBB	BB	A	A	BB	B	BBB	A	A	AA
Three-year Median			**BBB**	**A**	**A**	**BB**	**BB**	**BBB**	**A**	**A**

Implied Cost of Debt	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Median rating	BBB	BB	BBB	A	A	BB	BB	BBB	A	A
Spread	1.60%	3.00%	1.60%	1.10%	1.10%	3.00%	3.00%	1.60%	1.10%	1.10%
Risk free rate	4.78%	4.47%	4.00%	3.52%	3.12%	2.10%	2.82%	2.52%	1.57%	1.33%
Marginal tax rate	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	27.00%	27.00%	25.00%
Cost of debt, pre-tax	6.38%	7.47%	5.60%	4.62%	4.22%	5.10%	5.82%	4.12%	2.67%	2.43%
Cost of debt, post-tax	**4.59%**	**5.38%**	**4.03%**	**3.33%**	**3.04%**	**3.67%**	**4.19%**	**3.01%**	**1.95%**	**1.82%**

Figure A.30: GSF - Cost of debt

Standard & Poor's rating Three years median	AAA	AA	A	BBB	BB	B	CCC	<CCC
Numerical score	0	1	2	3	4	5	6	7
EBIT Interest cover	21.4	10.1	6.1	3.7	2.1	0.8	0.1	
EBITDA interest cover	26.5	12.9	9.1	5.8	3.4	1.8	1.3	
Operating cash flow/ total liabilities	84.20%	25.20%	15.00%	8.50%	2.60%	-3.20%	-12.90%	
Return on invested capital	34.90%	21.70%	19.40%	13.60%	11.60%	6.60%	1.00%	
Total liabilities / total capital	22.90%	37.70%	42.50%	48.20%	62.60%	74.80%	87.70%	

Information (NOK 1000)	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Interest expenses	65,815	252,223	89,606	51,882	61,963	111,520	106,437	107,521	131,357	155,213
EBIT	72,897	17,373	146,685	565,562	214,010	-220,240	329,710	284,025	67,376	1,114,952
EBITDA	146,538	127,895	268,267	685,136	354,216	-58,895	465,747	424,742	234,750	1,295,340
Operating cash flow	-37,247	108,328	67,192	594,731	215,406	202,733	317,282	156,541	369,665	953,113
Average Invested capital	2,423,461	2,428,832	2,589,199	2,900,452	3,105,247	3,110,708	3,263,342	3,737,061	4,084,191	4,444,992
NOPAT	52,486	12,509	105,613	407,205	154,087	-158,573	237,391	207,338	49,184	836,214
Total liabilities	1,708,996	2,210,177	2,194,149	2,075,223	2,488,490	2,557,050	2,602,036	3,110,146	3,698,265	2,461,259
Total capital	2,945,717	3,059,803	3,405,574	3,909,895	4,022,536	3,828,037	4,423,750	5,166,401	5,532,015	6,371,967
Ratios	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
EBIT interest cover (x)	1.11	**0.07**	**1.64**	**10.90**	**3.45**	**1.97**	**3.10**	**2.64**	**0.51**	**7.18**
EBITDA interest cover (x)	2.23	**0.51**	**2.99**	**13.21**	**5.72**	**0.53**	**4.38**	**3.95**	**1.79**	**8.35**
Operating cash flow/ Total liabilities (%)	-2.18%	**4.90%**	**3.06%**	**28.66%**	**8.66%**	**7.93%**	**12.19%**	**5.03%**	**10.00%**	**38.72%**
Return on invested capital (%)	2.17%	**0.52%**	**4.08%**	**14.04%**	**4.96%**	**-5.10%**	**7.27%**	**5.55%**	**1.20%**	**18.81%**
Total liabilities / capital (%)	58.02%	**72.23%**	**64.43%**	**53.08%**	**61.86%**	**66.80%**	**58.82%**	**60.20%**	**66.85%**	**38.63%**
Ratings	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
EBIT interest cover (x)	5	7	5	1	4	5	4	4	6	2
EBITDA interest cover (x)	5	7	5	1	4	7	4	4	6	3
Operating cash flow/total liabilities (%)	5	4	4	1	3	4	3	4	3	1
Return on invested capital (%)	6	7	6	3	6	7	5	6	6	3
Total liabilities/total capital (%)	4	5	5	4	4	5	4	4	5	2
Yearly rating	5	6	5	2	4.2	5.6	4	4.4	5.2	2.2
Yearly rating	B	CCC	B	A	BB	CCC	BB	BB	B	A
Three-year Median			**B**	**B**	**BB**	**BB**	**BB**	**BB**	**BB**	**BB**

Implied Cost of Debt	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Median rating	B	CCC	B	B	BB	BB	BB	BB	BB	BB
Spread	4.50%	8.00%	4.50%	4.50%	3.35%	3.35%	3.35%	3.35%	3.35%	3.35%
Risk free rate	4.78%	4.47%	4.00%	3.52%	3.12%	2.10%	2.82%	2.52%	1.57%	1.33%
Marginal tax rate	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	27.00%	27.00%	25.00%
Cost of debt, pre-tax	9.28%	12.47%	8.50%	8.02%	6.47%	5.45%	6.17%	5.87%	4.92%	4.68%
Cost of debt, post-tax	**6.68%**	**8.98%**	**6.12%**	**5.77%**	**4.66%**	**3.92%**	**4.44%**	**4.29%**	**3.59%**	**3.51%**

Figure A.31: MHG - Cost of debt

Standard & Poor's rating Three years median	AAA	AA	A	BBB	BB	B	CCC	<CCC
Numerical score	0	1	2	3	4	5	6	7
EBIT Interest cover	21.4	10.1	6.1	3.7	2.1	0.8	0.1	
EBITDA interest cover	26.5	12.9	9.1	5.8	3.4	1.8	1.3	
Operating cash flow/ total liabilities	84.20%	25.20%	15.00%	8.50%	2.60%	-3.20%	-12.90%	
Return on invested capital	34.90%	21.70%	19.40%	13.60%	11.60%	6.60%	1.00%	
Total liabilities / total capital	22.90%	37.70%	42.50%	48.20%	62.60%	74.80%	87.70%	

Information (NOK 1000)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Interest expenses	380,900	485,400	404,300	380,300	405,800	382,800	640,200	544,600	416,500	449,631
EBIT	554,600	166,000	1,419,600	3,388,800	2,796,200	625,200	3,131,200	4,312,800	3,048,300	6,782,556
EBITDA	1,346,400	851,300	2,107,300	4,041,800	3,462,900	1,302,400	3,893,700	5,279,600	4,300,300	8,106,367
Operating cash flow	973,000	1,498,600	2,360,000	2,569,100	2,798,000	1,552,900	2,023,000	3,944,200	2,090,300	6,439,759
Average Invested capital	19,075,600	18,274,300	17,020,150	17,426,350	17,844,400	16,952,650	20,409,500	25,780,500	29,241,800	32,461,510
NOPAT	399,312	119,520	1,022,112	2,439,936	2,013,264	450,144	2,254,464	3,148,344	2,225,259	5,086,917
Total liabilities	10,699,000	13,111,800	8,928,800	10,958,100	11,946,400	11,628,800	17,381,400	22,256,200	22,072,900	25,464,545
Total capital	22,532,100	22,285,000	20,098,300	23,085,700	22,417,400	21,973,500	31,800,200	35,153,900	39,269,900	43,553,838
Ratios	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
EBIT interest cover (x)	1.46	**0.34**	**3.51**	**8.91**	**6.89**	**1.63**	**4.89**	**7.92**	**7.32**	**15.08**
EBITDA interest cover (x)	3.53	**1.75**	**5.21**	**10.63**	**8.53**	**3.40**	**6.08**	**9.69**	**10.32**	**18.03**
Operating cash flow/ Total liabilities (%)	9.09%	**11.43%**	**26.43%**	**23.44%**	**23.42%**	**13.35%**	**11.64%**	**17.72%**	**9.47%**	**25.29%**
Return on invested capital (%)	2.09%	**0.65%**	**6.01%**	**14.00%**	**11.28%**	**2.66%**	**11.05%**	**12.21%**	**7.61%**	**15.67%**
Total liabilities / capital (%)	47.48%	**58.84%**	**44.43%**	**47.47%**	**53.29%**	**52.92%**	**54.66%**	**63.31%**	**56.21%**	**58.47%**
Ratings	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
EBIT interest cover (x)	5	6	4	2	2	5	3	2	2	1
EBITDA interest cover (x)	4	6	4	2	3	4	3	2	2	1
Operating cash flow/total liabilities (%)	3	3	1	2	2	3	3	2	3	1
Return on invested capital (%)	6	7	6	3	5	6	5	4	5	3
Total liabilities/total capital (%)	3	4	3	3	4	4	4	5	4	4
Yearly rating	4.2	5.2	3.6	2.4	3.2	4.4	3.6	3	3.2	2
Yearly rating	BB	B	BB	A	BBB	BB	BB	BBB	BBB	A
Three-year Median			**BB**	**BB**	**BBB**	**BBB**	**BB**	**BB**	**BBB**	**BBB**

Implied Cost of Debt	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Median rating	BB	B	BB	BB	BBB	BBB	BB	BB	BBB	BBB
Spread	3.00%	4.50%	3.00%	3.00%	1.60%	1.60%	3.00%	3.00%	1.60%	1.60%
Risk free rate	4.78%	4.47%	4.00%	3.52%	3.12%	2.10%	2.82%	2.52%	1.57%	1.33%
Marginal tax rate	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	27.00%	27.00%	25.00%
Cost of debt, pre-tax	7.78%	8.97%	7.00%	6.52%	4.72%	3.70%	5.82%	5.52%	3.17%	2.93%
Cost of debt, post-tax	**5.60%**	**6.46%**	**5.04%**	**4.69%**	**3.40%**	**2.66%**	**4.19%**	**4.03%**	**2.31%**	**2.20%**

Figure A.32: Historical WACC

Cost of capital	2008	2009	2010	2011	2012	2013	2014	2015
Risk-free rate	4.47%	4.00%	3.52%	3.12%	2.10%	2.82%	2.52%	1.57%
Beta	0.522	0.407	0.358	0.463	0.987	0.944	0.683	0.792
Market risk premium	5.52%	5.52%	5.52%	5.50%	5.80%	6.00%	5.80%	5.50%
Return on equity	7.35%	6.24%	5.49%	5.67%	7.82%	8.48%	6.48%	5.93%
Cost of debt	5.38%	4.03%	3.33%	3.04%	3.67%	4.19%	3.01%	1.95%
Financial leverage	0.27	0.14	0.23	0.47	0.36	0.18	0.14	0.13
Equity	0.73	0.86	0.77	0.53	0.64	0.82	0.86	0.87
WACC	**6.81%**	**5.92%**	**5.01%**	**4.43%**	**6.32%**	**7.69%**	**6.00%**	**5.41%**

A.10 Regressions

Figure A.33: Supply and demand regression

Supply and Demand Regression

Year	Supply	Demand	Prices
2003	5.67%	12.50%	-11.00%
2004	9.95%	7.00%	7.00%
2005	0.43%	16.50%	23.00%
2006	4.06%	23.00%	23.00%
2007	4.56%	2.00%	-21.00%
2008	5.25%	3.50%	1.00%
2009	0.03%	9.50%	12.00%
2010	-1.00%	22.50%	35.00%
2011	20.76%	12.00%	-17.00%
2012	19.54%	22.00%	-10.00%
2013	0.94%	2.00%	42.00%
2014	12.14%	6.00%	-5.00%
2015	1.43%	6.00%	-4.00%
2016	-9.14%	-1.00%	44.68%

Regression Statistics	
Multiple R	0.7502
R Square	0.5628
Adjusted R Square	0.4833
Standard Error	0.1571
Observations	14

ANOVA

	df	*SS*	*MS*	*F*
Regression	2	0.3493	0.1746	7.0804
Residual	11	0.2713	0.0247	
Total	13	0.6206		

	Coefficient	*Std.Error*	*t Stat*	*P-value*	***VIF***	*Sxj*
Intercept	0.1322	0.0705	1.8758	0.0875		
Supply	-2.1281	0.5655	-3.7629	0.0031	44.4724	0.0807
Demand	0.6506	0.5631	1.1554	0.2724	44.4724	0.0810

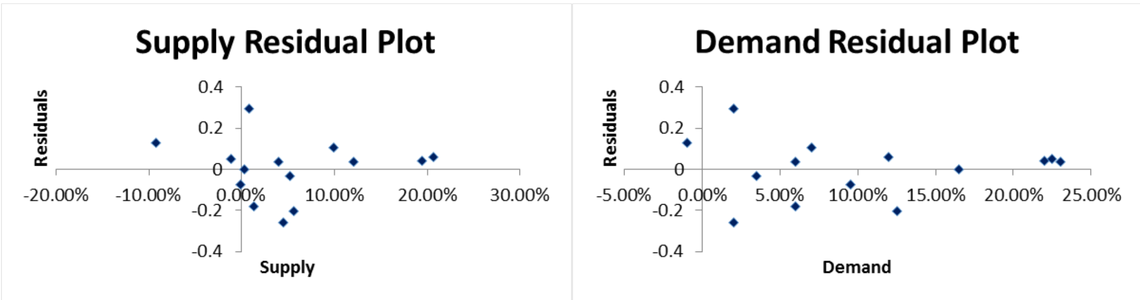


Figure A.34: Durbin Watson

Observation	*Std Residuals*	*Squared Difference*	*Squared Residuals*
1	-1.4047		1.9731
2	0.7205	4.5165	0.5192
3	-0.0034	0.5241	0.0000
4	0.2389	0.0587	0.0571
5	-1.7868	4.1034	3.1926
6	-0.2301	2.4233	0.0529
7	-0.5085	0.0775	0.2586
8	0.3463	0.7308	0.1200
9	0.4259	0.0063	0.1814
10	0.2796	0.0214	0.0782
11	2.0408	3.1018	4.1648
12	0.2564	3.1841	0.0657
13	-1.2519	2.2750	1.5673
14	0.8770	4.5322	0.7691

Durbin-Watson	**1.9658**

Figure A.35: Supply regression

Supply Regression

Year	Supply	Prices
2001	14.98%	-25%
2002	5.45%	-3%
2003	5.67%	-11%
2004	9.95%	7%
2005	0.43%	23%
2006	4.06%	23%
2007	4.56%	-21%
2008	5.25%	1%
2009	0.03%	12%
2010	-1.00%	35%
2011	20.76%	-17%
2012	19.54%	-10%
2013	0.94%	42%
2014	12.14%	-5%
2015	1.43%	-4%
2016	-9.14%	44.68%

Regression Statistics	
Multiple R	0.738924
R Square	0.546008
Adjusted R Square	0.51358
Standard Error	0.154259
Observations	16

ANOVA

	df	*SS*	*MS*	*F*
Regression	1	0.400663	0.400663	16.83757
Residual	14	0.333141	0.023796	
Total	15	0.733804		

	Coefficients	*Standard Err*	*t Stat*	*P-value*
Intercept	0.180371	0.048855	3.69198	0.002415
Supply	-2.07207	0.504969	-4.10336	0.001075

Figure A.36: Demand regression without outlier

Supply and Demand Regression without 2013

Year	Supply	Demand	Prices
2003	5.67%	12.50%	-11.00%
2004	9.95%	7.00%	7.00%
2005	0.43%	16.50%	23.00%
2006	4.06%	23.00%	23.00%
2007	4.56%	2.00%	-21.00%
2008	5.25%	3.50%	1.00%
2009	0.03%	9.50%	12.00%
2010	-1.00%	22.50%	35.00%
2011	20.76%	12.00%	-17.00%
2012	19.54%	22.00%	-10.00%
2014	12.14%	6.00%	-5.00%
2015	1.43%	6.00%	-4.00%
2016	-9.14%	-1.00%	44.68%

Regression Statistics	
Multiple R	0.8145
R Square	0.6634
Adjusted R Square	0.5961
Standard Error	0.1297
Observations	13

ANOVA

	df	*SS*	*MS*	*F*
Regression	2	0.3318	0.1659	9.8557
Residual	10	0.1683	0.0168	
Total	12	0.5001		

	Coefficients	*Standard Err*	*t Stat*	*P-value*
Intercept	0.0706	0.0633	1.1150	0.2909
Supply	-2.0400	0.4685	-4.3539	0.0014
Demand	0.9623	0.4819	1.9967	0.0738

A.11 Sensitivity Analysis

Figure A.37: Sensitivity of changes in different value drivers

Terminal growth	WACC	Pessimistic		Realistic			Optimistic	
		1.70 %	1.80 %	1.90 %	2.00 %	2.25 %	2.50 %	2.75 %
Pessimistic	5.00 %	198.98	201.00	203.15	205.45	211.92	219.69	229.19
	5.20 %	191.83	193.52	195.32	197.22	202.55	208.87	216.48
	5.40 %	185.47	186.88	188.38	189.97	194.38	199.55	205.70
Realistic	5.61 %	179.49	180.67	181.91	183.22	186.85	191.06	196.00
	6.11 %	167.56	168.32	169.12	169.96	172.24	174.84	177.83
Optimistic	6.61 %	158.08	158.57	159.07	159.59	161.01	162.59	164.39
	7.11 %	150.38	150.67	150.97	151.28	152.11	153.03	154.05

Salmon price (NOK/kg)	WACC	Pessimistic		Realistic			Optimistic	
		36.23	37.57	38.91	40.00	41.33	42.67	44.00
Pessimistic	5.00 %	74.17	120.73	167.42	205.45	251.88	298.31	344.74
	5.20 %	74.07	117.75	161.55	197.22	240.78	284.33	327.89
	5.40 %	73.99	115.12	156.38	189.97	230.99	272.01	313.03
Realistic	5.61 %	73.92	112.68	151.56	183.22	221.88	260.54	299.20
	6.10 %	73.80	107.98	142.27	170.19	204.28	238.37	272.46
Optimistic	6.60 %	73.73	104.24	134.85	159.78	190.21	220.64	251.08
	7.10 %	73.69	101.26	128.91	151.43	178.92	206.41	233.90

COGS (NOK/kg)	WACC	Pessimistic		Realistic			Optimistic	
		29.16	28.89	27.55	26.75	25.95	23.01	22.47
Pessimistic	5.00 %	130.54	138.86	180.48	205.45	230.42	321.98	338.62
	5.20 %	126.35	134.22	173.60	197.22	220.85	307.47	323.22
	5.40 %	122.66	130.14	167.53	189.97	212.41	294.68	309.64
Realistic	5.61 %	119.22	126.34	161.89	183.22	204.56	282.78	297.00
	6.10 %	112.60	119.00	150.99	170.19	189.39	259.78	272.58
Optimistic	6.60 %	107.31	113.14	142.29	159.78	177.26	241.39	253.04
	7.10 %	103.08	108.46	135.31	151.43	167.54	226.63	237.37

Other operating expenses (NOK/kg)	WACC	Pessimistic		Realistic			Optimistic	
		10.18	9.99	9.53	9.25	8.97	8.51	8.33
Pessimistic	5.00 %	180.36	185.38	197.92	205.45	212.98	225.52	230.54
	5.20 %	173.69	178.40	190.16	197.22	204.28	216.05	220.76
	5.40 %	167.81	172.24	183.32	189.97	196.62	207.70	212.13
Realistic	5.61 %	162.34	166.51	176.96	183.22	189.49	199.94	204.11
	6.10 %	151.77	155.46	164.67	170.19	175.72	184.93	188.61
Optimistic	6.60 %	143.33	146.62	154.84	159.78	164.71	172.93	176.22
	7.10 %	136.57	139.54	146.97	151.43	155.88	163.31	166.28

A.12 Forecast

Figure A.38: Historical data and averages

Historical data	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average
Harvested volume	52,100	53,700	64,300	65,000	93,000	102,600	115,000	141,000	136,400	115,600	
Revenues	1,665,530	1,704,242	2,376,262	3,399,868	3,800,204	4,180,414	6,228,305	7,160,010	7,303,506	8,963,239	
Income/loss from associated companies % of revenue	2%	1%	2%	4%	3%	2%	3%	1%	1%	3%	2.2%
Other operating revenues	0.7%	0.6%	0.0%	0.9%	0.9%	0.6%	0.3%	0.4%	0.3%	0.7%	0.54%
Net revenue margin	103%	101%	102%	105%	103%	103%	103%	102%	101%	104%	103%
Cost drivers											
Cost of goods sold / KG	15.14	15.24	17.68	24.80	21.26	22.66	26.53	22.52	26.12	34.61	25.50
Salaries and payroll expenses / KG	4.18	4.48	4.13	4.82	4.21	4.71	5.42	5.04	5.61	7.45	5.32
Other operating expenses (adjusted) / KG	3.57	4.62	4.75	6.01	7.21	8.25	9.07	8.06	9.29	11.66	8.51
EBITDA margin	31%	25%	31%	37%	23%	15%	27%	32%	24%	35%	28%
Depreciation % of tangible assets (PPE)	15%	14%	13%	11%	13%	15%	13%	14%	13%	12%	13%
Write-downs % of PPE & intangible assets	0.00%	0.00%	1.02%	0.10%	0.03%	0.03%	0.20%	0.08%	0.49%	0.00%	0.19%
EBIT margin	28%	21%	27%	34%	19%	10%	23%	28%	20%	30%	24%
Tax on net financial items	28%	28%	28%	28%	28%	28%	28%	27%	27%	25%	28%
NOPAT margin	20%	15%	19%	24%	14%	8%	16%	20%	14%	23%	17%
Intangible assets in KG	20.70	20.69	17.75	25.97	20.61	20.81	21.43	20.56	21.36	25.18	22.27
Tangible assets in KG	7.14	8.15	8.78	14.14	13.29	13.57	17.34	14.54	17.85	28.35	17.49
Investments in associated companies in KG	4.96	4.80	4.18	13.34	9.88	9.25	3.50	3.71	4.60	7.86	6.61
Operating NWC in KG	8.38	9.53	8.20	12.93	9.70	13.23	18.27	14.06	13.88	17.62	14.24
NIBD in % of invested capital	38.3%	43.3%	32.1%	42.8%	55.5%	49.1%	27.3%	31.1%	33.6%	26.9%	38.0%

Figure A.39: Forecast Assumptions

Forecast Assumptions	Short-term			Medium-term					TV
	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	
Harvested volume	118,957	124,818	135,887	146,693	155,287	162,759	171,101	178,574	182,146
Revenues	8,253,149	8,321,841	9,171,665	9,810,087	9,977,169	10,070,683	10,159,137	9,821,586	9,107,289
Income/loss from associated companies % of revenue	2%	2%	2%	2%	2%	2%	2%	2%	2%
Other operating revenues	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Net revenue margin	103%	103%	103%	103%	103%	103%	103%	103%	103%
Cost drivers									
Cost of goods sold / KG	33.11	31.61	29.00	26.75	26.75	26.75	26.75	26.75	26.75
Salaries and payroll expenses / KG	7.45	7.00	6.45	6.00	5.70	5.50	5.50	5.50	5.50
Other operating expenses (adjusted) / KG	12.16	12.00	11.00	10.00	9.75	9.25	9.25	9.25	9.25
EBITDA margin									
Depreciation % of tangible assets (PPE)	13.44%	13.44%	13.44%	13.44%	13.44%	13.44%	13.44%	13.44%	13.44%
Write-downs % of PPE & intangible assets	0.19%	0.19%	0.19%	0.19%	0.19%	0.19%	0.19%	0.19%	0.19%
EBIT margin	20.9%	20.9%	28.1%	33.0%	31.1%	29.6%	26.6%	20.8%	12.8%
Tax on net financial items	24%	24%	24%	24%	24%	24%	24%	24%	23%
NOPAT margin	16%	16%	21%	25%	24%	22%	20%	16%	10%
Intangible assets in KG	25.00	24.00	22.27	22.27	22.27	22.27	22.27	22.27	22.27
Tangible assets in KG	27.00	26.00	25.00	24.00	24.00	24.00	24.00	24.00	24.00
Investments in associated companies in KG	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80
Operating NWC in KG	14.24	14.24	14.24	14.24	14.24	14.24	14.24	14.24	14.24
NIBD in % of invested capital	38%	38%	38%	38%	38%	38%	38%	38%	38%

Figure A.40: SalMar's Pro Forma Income Statement

SalMar's Pro Forma income statement									
		Short-term				Medium-term			TV
Analytical income statement (NOK 1000)	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	
Operating items									
Operating revenue	8,253,149	8,321,841	9,171,665	9,810,087	9,977,169	10,070,683	10,159,137	9,821,586	9,107,289
Other operating revenues	44,460	44,830	49,408	52,848	53,748	54,251	54,728	52,910	49,062
Income from associated companies	179,877	181,374	199,896	213,811	217,452	219,490	221,418	214,061	198,493
Total revenues	**8,477,486**	**8,548,045**	**9,420,970**	**10,076,745**	**10,248,369**	**10,344,424**	**10,435,284**	**10,088,557**	**9,354,844**
Cost of goods sold	3,938,549	3,945,379	3,940,717	3,924,035	4,153,919	4,353,790	4,576,959	4,776,863	4,872,400
Salaries and payroll expenses	886,549	873,723	876,470	880,157	885,134	895,172	941,057	982,159	1,001,802
Other operating expenses (adjusted)	1,446,452	1,497,812	1,494,755	1,466,929	1,514,045	1,505,516	1,582,687	1,651,812	1,684,849
EBITDA (adjusted)	**2,205,936**	**2,231,131**	**3,109,029**	**3,805,624**	**3,695,271**	**3,589,946**	**3,334,581**	**2,677,724**	**1,795,794**
Depreciation of PP&E (adjusted)	431,687	436,181	456,598	473,192	500,913	525,015	551,927	576,033	587,554
Write-downs of intangible assets (impairment)	5,773	5,815	5,875	6,342	6,714	7,037	7,398	7,721	7,875
EBIT (adjusted)	**1,768,476**	**1,789,136**	**2,646,555**	**3,326,090**	**3,187,644**	**3,057,894**	**2,775,257**	**2,093,970**	**1,200,365**
Tax on EBIT	424,434	429,393	635,173	798,262	765,035	733,895	666,062	502,553	276,084
Tax shield									
NOPAT (adjusted)	**1,344,042**	**1,359,743**	**2,011,382**	**2,527,828**	**2,422,609**	**2,323,999**	**2,109,195**	**1,591,417**	**924,281**
Non-operating and financial items									
Financial items (adjusted)	**-102,227**	**-103,235**	**-106,626**	**-112,455**	**-119,297**	**-125,644**	**-131,892**	**-138,140**	**-142,503**
Tax shield	24,534	24,776	25,590	26,989	28,631	30,155	31,654	33,154	32,776
Net financial profit (adjusted)	**-77,692**	**-78,459**	**-81,036**	**-85,466**	**-90,666**	**-95,490**	**-100,238**	**-104,986**	**-109,727**
Net profit for the year	**1,266,350**	**1,281,284**	**1,930,346**	**2,442,362**	**2,331,943**	**2,228,510**	**2,008,957**	**1,486,431**	**814,554**

Figure A.41: SalMar's Pro Forma Balance Sheet

SalMar's Pro Forma Balance Sheet									
		Short-term				Medium-term			TV
Analytical Balance Sheet (NOK 1000)	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	
Intangible assets	2,973,912.50	2,995,623.00	3,026,790.41	3,267,489.22	3,458,910.33	3,625,340.53	3,811,170.01	3,977,627.10	4,057,179.64
Tangible assets	3,782,847.74	3,844,415.42	4,049,461.79	4,224,793.39	4,472,296.78	4,687,487.46	4,927,760.98	5,142,986.42	5,245,846.15
Total non-current operating assets	**6,756,760.24**	**6,840,038.42**	**7,076,252.20**	**7,492,282.61**	**7,931,207.10**	**8,312,827.99**	**8,738,930.99**	**9,120,613.52**	**9,303,025.79**
Net Working Capital	**1,694,194.35**	**1,777,669.27**	**1,935,317.79**	**2,089,219.66**	**2,211,613.55**	**2,318,028.37**	**2,436,847.00**	**2,543,279.00**	**2,594,144.58**
Invested Capital (Operating)	**8,450,954.59**	**8,617,707.69**	**9,011,569.99**	**9,581,502.26**	**10,142,820.66**	**10,630,856.35**	**11,175,777.99**	**11,663,892.52**	**11,897,170.37**
Total equity	**5,240,716.13**	**5,344,125.24**	**5,588,372.27**	**5,941,806.10**	**6,289,898.18**	**6,592,545.23**	**6,930,469.14**	**7,233,165.09**	**7,377,828.39**
Net interest bearing debt	**3,210,238.46**	**3,273,582.45**	**3,423,197.73**	**3,639,696.17**	**3,852,922.48**	**4,038,311.12**	**4,245,308.85**	**4,430,727.43**	**4,519,341.98**
Invested Capital (Financing)	**8,450,954.59**	**8,617,707.69**	**9,011,569.99**	**9,581,502.26**	**10,142,820.66**	**10,630,856.35**	**11,175,777.99**	**11,663,892.52**	**11,897,170.37**

Figure A.42: SalMar's FCFE

Pro Forma Cash Flow Statement	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	TV
NOPAT	1,344,042	1,359,743	2,011,382	2,527,828	2,422,609	2,323,999	2,109,195	1,591,417	924,281
Depreciation and Amortization	437,460	441,995	462,474	479,534	507,627	532,052	559,325	583,754	595,429
Change in Net working capital	342,758	-83,475	-157,649	-153,902	-122,394	-106,415	-118,819	-106,432	-50,866
CAPEX	-97,684	-525,273	-698,687	-895,565	-946,552	-913,673	-985,428	-965,436	-777,841
FCFF	**2,026,576**	**1,192,990**	**1,617,520**	**1,957,896**	**1,861,291**	**1,835,964**	**1,564,273**	**1,103,303**	**691,003**
Change in NIBD	757,583	63,344	149,615	216,498	213,226	185,389	206,998	185,419	88,615
Net financial expenses after tax	-77,692	-78,459	-81,036	-85,466	-90,666	-95,490	-100,238	-104,986	-109,727
FCFE	**2,706,467**	**1,177,875**	**1,686,099**	**2,088,928**	**1,983,851**	**1,925,863**	**1,671,033**	**1,183,735**	**669,891**
Dividends	-2,706,467	-1,177,875	-1,686,099	-2,088,928	-1,983,851	-1,925,863	-1,671,033	-1,183,735	-669,891
Cash surplus	-	-	-	-	-	-	-	-	-

Figure A.43: Multiples Strengths and Weaknesses

EV/EBITDA	EV/EBIT	EV/kg
Strenghts	**Strenghts**	**Strenghts**
This multiple can be utilized to directly compare companies operates in the same industry with different levels of debt. Furtermore, it eliminates the effects of depreciation and amortization which can have big influence in the result. It is also unaffected by the capital structure.	EBIT is a better measure of FCF than EBITDA, and it is also more comperable where the capital intensitity differ.	Commonly used multiple in the industry, where kilo express the company's harvested volume, which normally equals the volume sold. The multiple express the amount you have to pay for each kilo of production per year.
Weaknesses	**Weaknesses**	**Weaknesses**
Not applicable for comparison of companies operating in different industries, and may in some cases overlook minority interests that can result in a skewed number	This multiple is affected by accounting policy differernce for depreciation & amortization	Can be skewed in periods with low supply and therefore may this multiple be biased.

P/B	P/E
Strenghts	**Strenghts**
Provides a good impression to investors of the company if the ratio is high- and financial reports back up theses expectations. Book value is also most times little bit more stable than EPS, which makes it more suitable.	This multiple is the most commonly used multiple and the classification if income and expensses is irrelavant
Weaknesses	**Weaknesses**
The valuse of intangibles assets are not captured in assets which may skew the actual value. The second weakness is that a high P/B can affect the stock value negatively if the company's financial reports demostrates results below investors.	This multiple is affected by different capital structure becasue of a gearing effect on earnings. Accounting policies will also affect this.

Figure A.44: Relative valuation

	EV/EBITDA		EV/EBIT		P/B		P/E		EV/kg	
	16	F17	16	F17	16	F17	16	17E	16	F17
MHG	9.83	7.64	12.74	8.69	3.65	2.95	13.90	10.35	227.70	204
LSG	8.23	6.62	9.59	7.12	1.95	1.62	13.25	9.40	198.28	184
GSF	7.90	5.48	9.53	6.21	2.84	1.83	9.90	8.80	164.58	122
Harmonic mean	8.58	6.46	10.43	7.20	2.63	2.00	12.08	9.47	193.41	161.87
Median	8.23	6.62	9.59	7.12	2.84	1.83	13.25	9.40	198.28	184.00
SalMar	10.20	7.87	11.66	9.20	4.38	3.25	10.98	10.73	274.18	215.00

A.13 Scenario Analysis

Figure A.45: Sea-Lice Scenario

Discounted Free Cash Flow to Firm	NOK 1000	Short-term			Medium-term					Long-term
Year		2017	2018	2019	2020	2021	2022	2023	2024	TV
Free Cash Flow to the Firm (FCFF)		2 026 575,54	1 192 990,19	1 719 991,89	2 004 687,61	1 653 259,86	1 454 673,31	1 182 171,17	758 216,71	342 653,17
WACC		0,06	0,06	0,06	0,06	0,06	0,06	0,06	0,06	0,0561
Discount Factor		0,95	0,90	0,85	0,80	0,76	0,72	0,68	0,65	
Present Value of FCFF		**1 919 105,62**	**1 069 815,87**	**1 460 611,26**	**1 612 096,49**	**1 258 987,82**	**1 049 015,63**	**807 296,25**	**490 322,71**	
Value of FCFF in Forecast Horizon	9 667 251,67									
Value of FCFF in Terminal Period	6 138 131,75									
Estimated Enterprise Value 31/12/2016	**15 805 383,41**									
Net Interest-Bearing debt	2 452 655,00									
Expected Market Value of Equity	**13 352 728,41**									
Shares Outstanding	113 300,00									
Share Price (31.12.2016)	117,85									
Share Price (1.5.2017)	**120,02**									

Figure A.46: FX Scenario

Discounted Free Cash Flow to Firm	NOK 1000	Short-term			Medium-term					Long-term
Year		2017	2018	2019	2020	2021	2022	2023	2024	TV
Free Cash Flow to the Firm (FCFF)		2 336 827,98	1 716 827,21	2 043 042,89	2 458 907,95	2 406 807,26	2 379 476,29	2 135 645,61	1 612 501,87	1 217 220,37
WACC		0,06	0,06	0,06	0,06	0,06	0,06	0,06	0,06	0,0561
Discount Factor		0,95	0,90	0,85	0,80	0,76	0,72	0,68	0,65	
Present Value of FCFF		**2 212 905,28**	**1 539 567,56**	**1 734 945,07**	**1 977 363,89**	**1 832 828,04**	**1 715 923,31**	**1 458 417,14**	**1 042 770,85**	
Value of FCFF in Forecast Horizon	13 514 721,14									
Value of FCFF in Terminal Period	21 804 727,49									
Estimated Enterprise Value 31/12/2016	**35 319 448,62**									
Net Interest-Bearing debt	2 452 655,00									
Expected Market Value of Equity	**32 866 793,62**									
Shares Outstanding	113 300,00									
Share Price (31.12.2016)	290,09									
Share Price (1.5.2017)	**295,41**									

Figure A.47: USA Scenario

Discounted Free Cash Flow to Firm	NOK 1000	Short-term			Medium-term					Long-term
Year		2017	2018	2019	2020	2021	2022	2023	2024	TV
Free Cash Flow to the Firm (FCFF)		2 026 575,54	610 756,85	1 127 424,58	1 600 030,24	1 346 081,15	1 426 535,38	1 133 858,38	741 217,37	676 978,12
WACC		0,06	0,06	0,06	0,06	0,06	0,06	0,06	0,06	0,0561
Discount Factor		0,95	0,90	0,85	0,80	0,76	0,72	0,68	0,65	
Present Value of FCFF		**1 919 105,62**	**547 697,19**	**957 405,12**	**1 286 685,83**	**1 025 065,58**	**1 028 724,39**	**774 303,79**	**479 329,60**	
Value of FCFF in Forecast Horizon	8 018 317,12									
Value of FCFF in Terminal Period	12 127 075,64									
Estimated Enterprise Value 31/12/2016	**20 145 392,76**									
Net Interest-Bearing debt	2 452 655,00									
Expected Market Value of Equity	**17 692 737,76**									
Shares Outstanding	113 300,00									
Share Price (31.12.2016)	156,16									
Share Price (1.5.2017)	**159,03**									

Figure A.48: Closed Market Scenario

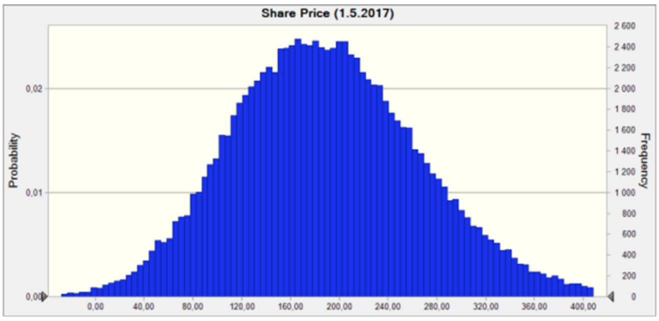
Discounted Free Cash Flow to Firm	NOK 1000	Short-term			Medium-term					Long-term
Year		2017	2018	2019	2020	2021	2022	2023	2024	TV
Free Cash Flow to the Firm (FCFF)		2 026 575,54	244 139,14	719 012,13	884 298,82	891 484,24	791 241,43	632 964,77	566 960,47	721 998,31
WACC		0,06	0,06	0,06	0,06	0,06	0,06	0,06	0,06	0,0561
Discount Factor		0,95	0,90	0,85	0,80	0,76	0,72	0,68	0,65	
Present Value of FCFF		**1 919 105,62**	**218 932,17**	**610 582,65**	**711 120,78**	**678 881,66**	**570 591,78**	**432 247,12**	**366 641,34**	
Value of FCFF in Forecast Horizon	5 508 103,14									
Value of FCFF in Terminal Period	12 933 546,62									
Estimated Enterprise Value 31/12/2016	**18 441 649,76**									
Net Interest-Bearing debt	2 452 655,00									
Expected Market Value of Equity	**15 988 994,76**									
Shares Outstanding	113 300,00									
Share Price (31.12.2016)	141,12									
Share Price (1.5.2017)	**143,71**									

A.14 Monte Carlo

Figure A.49: Monte Carlo Simulation

Forecast: Share Price (1.5.2017)

Summary:
Entire range is from (80,68) to 579,20
Base case is 183,22
After 100 000 trials, the std. error of the mean is 0,25



Statistics:	Forecast values
Trials	100 000
Base Case	183.22
Mean	190.19
Median	186.41
Mode	---
Standard Deviation	77.78
Variance	6 049.22
Skewness	0.3013
Kurtosis	3.14
Coeff. of Variation	0.4090
Minimum	(80.68)
Maximum	579.20
Range Width	659.88
Mean Std. Error	0.25

Percentiles:	Forecast values
0%	(80.68)
10%	93.97
20%	123.78
30%	146.57
40%	166.72
50%	186.41
60%	206.28
70%	227.96
80%	254.10
90%	292.08
100%	579.20

Figure A.50: Monte Carlo Sensitivity

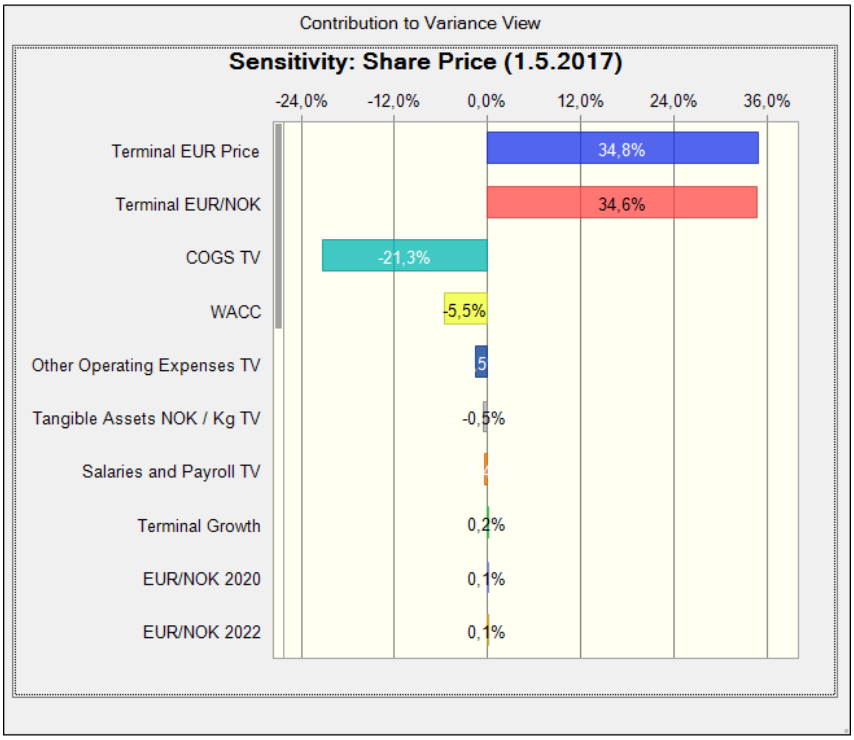


Figure A.51: MC Probability Cut-Off

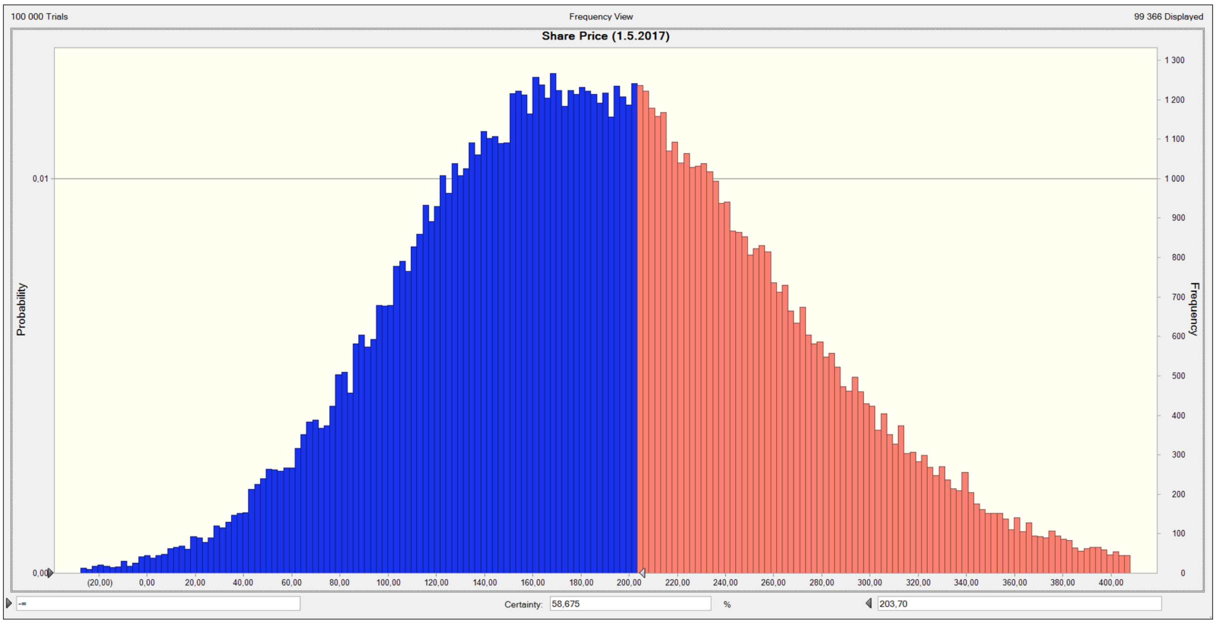


Figure A.52: MC Probability Analysts

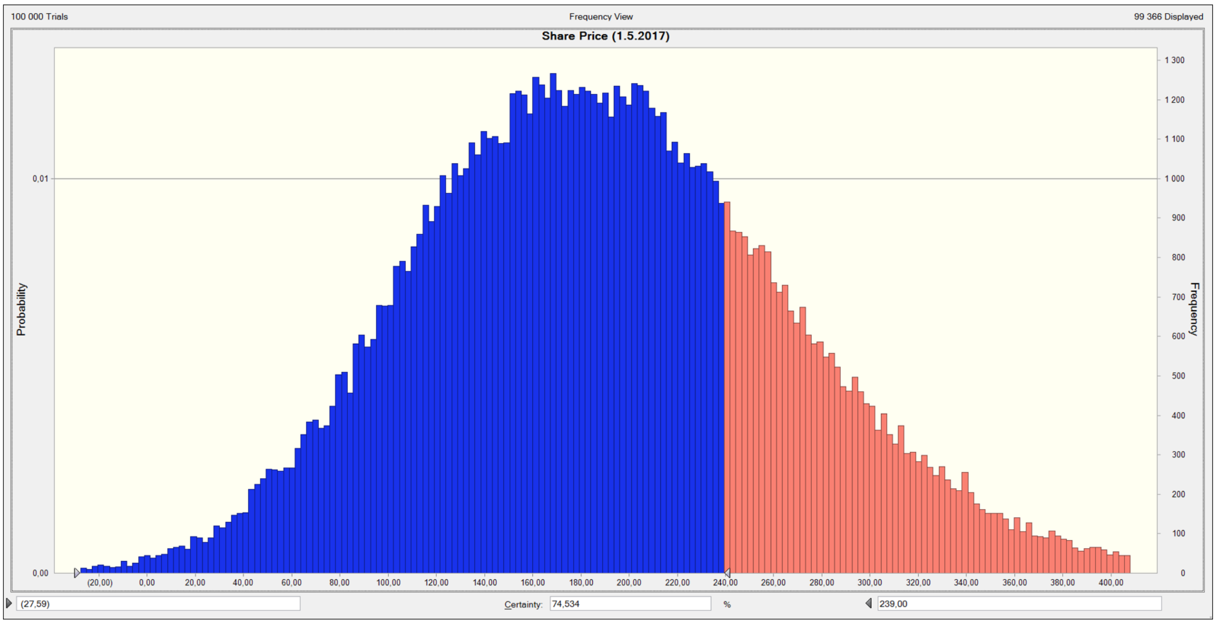


Figure A.53: MC Probability Lice Scenario

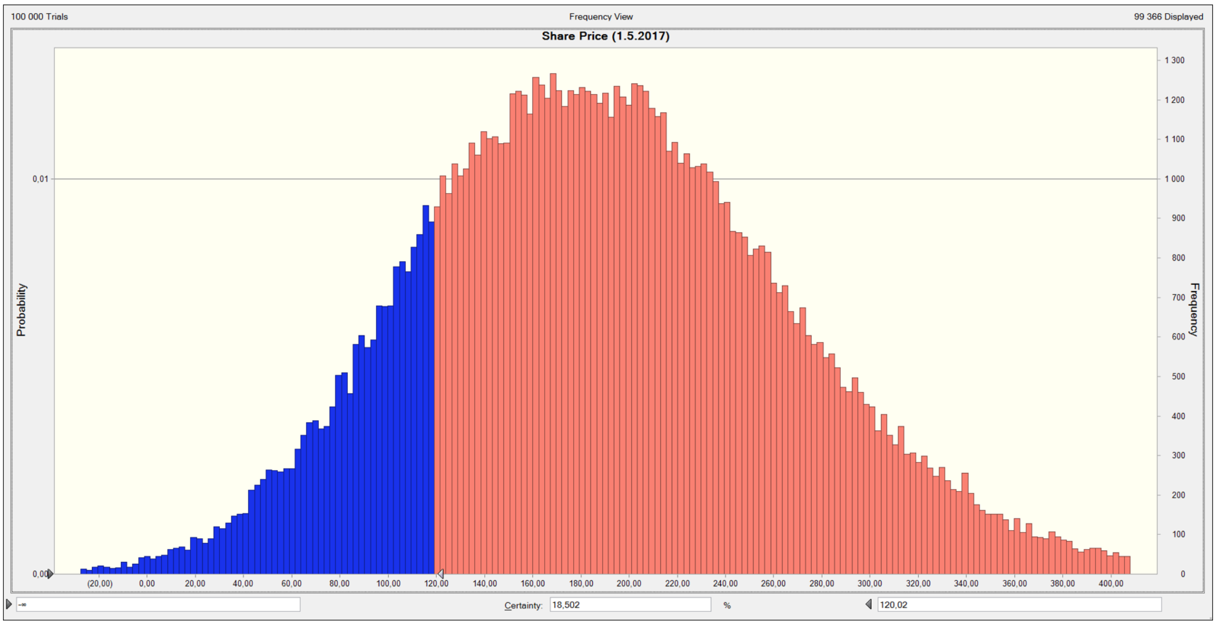


Figure A.54: MC Probability Exchange Rate Scenario

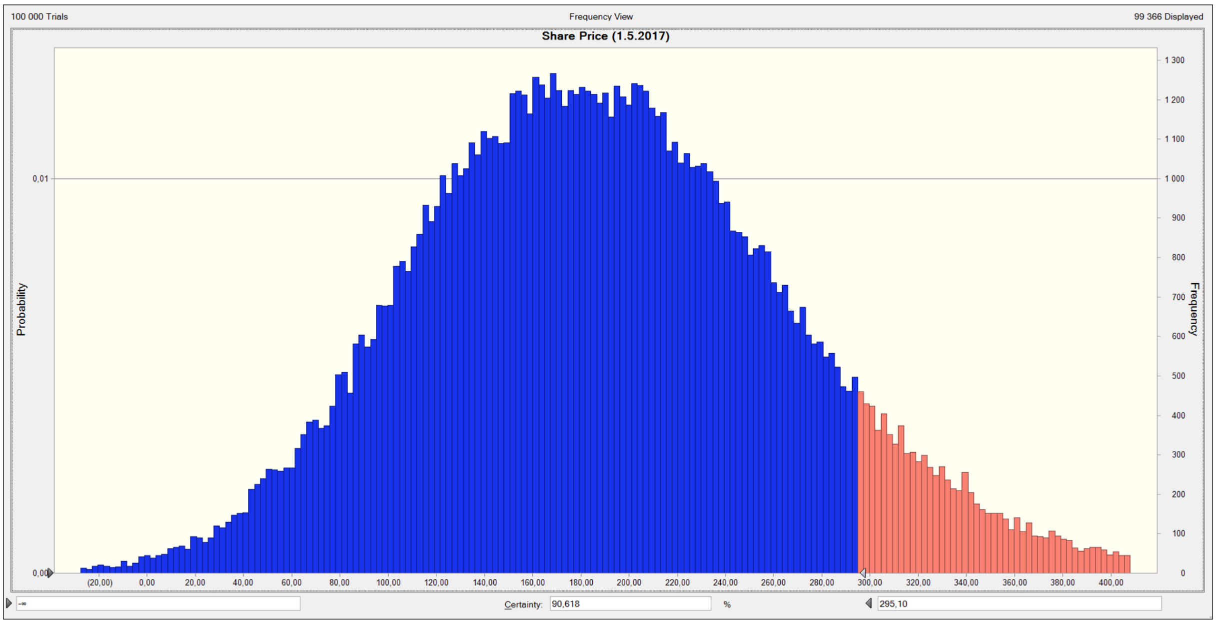


Figure A.55: MC Probability Ten Percent

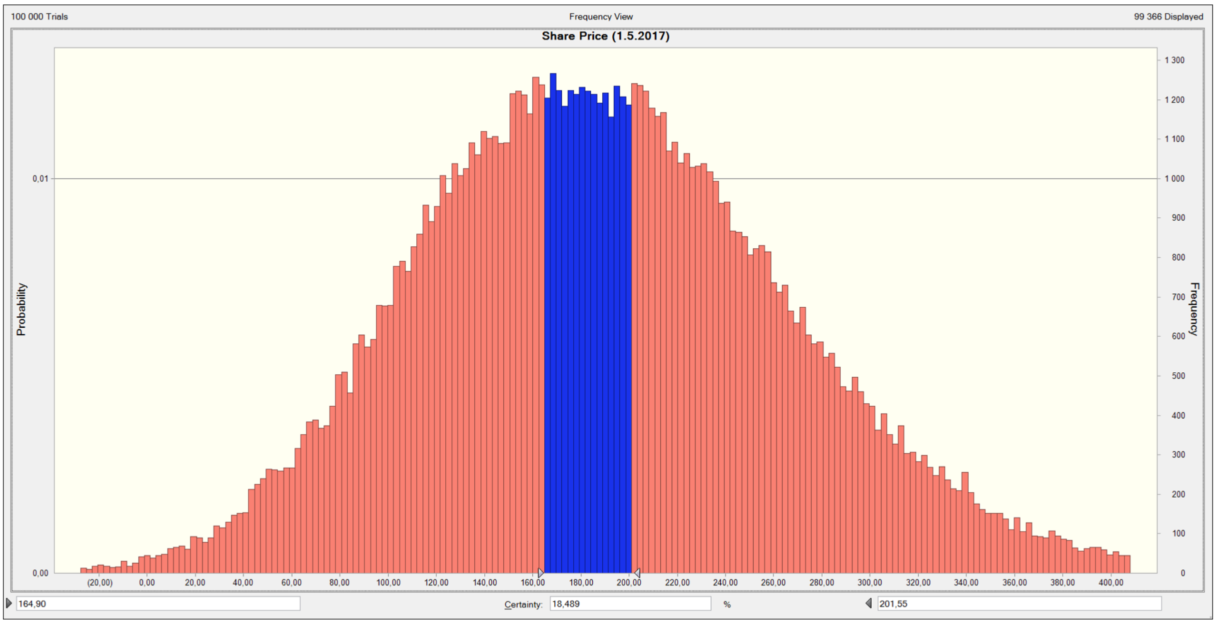
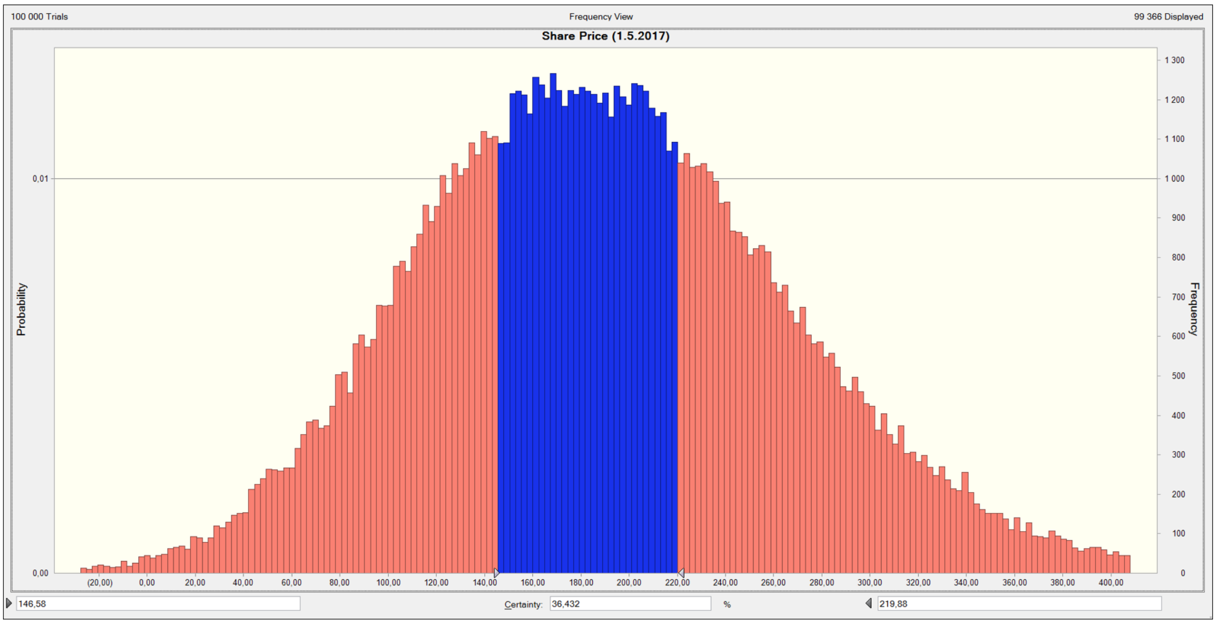


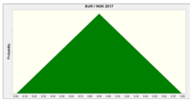
Figure A.56: MC Probability Twenty Percent



Assumption: EUR / NOK 2017

Triangular distribution with parameters:

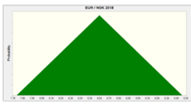
Minimum	8.01
Likeliest	8.90
Maximum	9.79



Assumption: EUR / NOK 2018

Triangular distribution with parameters:

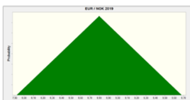
Minimum	7.74
Likeliest	8.60
Maximum	9.46



Assumption: EUR / NOK 2019

Triangular distribution with parameters:

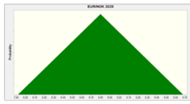
Minimum	7.92
Likeliest	8.80
Maximum	9.68



Assumption: EUR/NOK 2020

Triangular distribution with parameters:

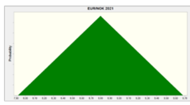
Minimum	7.92
Likeliest	8.80
Maximum	9.68



Assumption: EUR/NOK 2021

Triangular distribution with parameters:

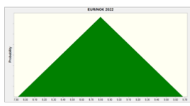
Minimum	7.92
Likeliest	8.80
Maximum	9.68



Assumption: EUR/NOK 2022

Triangular distribution with parameters:

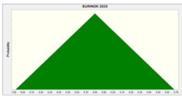
Minimum	7.92
Likeliest	8.80
Maximum	9.68



Assumption: EUR/NOK 2023

Triangular distribution with parameters:

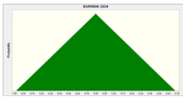
Minimum	7.92
Likeliest	8.80
Maximum	9.68



Assumption: EUR/NOK 2024

Triangular distribution with parameters:

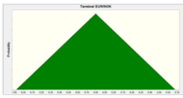
Minimum	7.92
Likeliest	8.80
Maximum	9.68



Assumption: Terminal EUR/NOK

Triangular distribution with parameters:

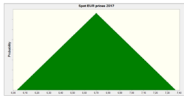
Minimum	7.92
Likeliest	8.80
Maximum	9.68



Assumption: Spot EUR prices 2017

Triangular distribution with parameters:

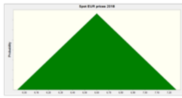
Minimum	6.03
Likeliest	6.70
Maximum	7.37



Assumption: Spot EUR prices 2018

Triangular distribution with parameters:

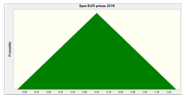
Minimum	5.94
Likeliest	6.60
Maximum	7.26



Assumption: Spot EUR prices 2019

Triangular distribution with parameters:

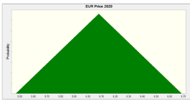
Minimum	5.94
Likeliest	6.60
Maximum	7.26



Assumption: Spot EUR prices 2020

Triangular distribution with parameters:

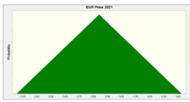
Minimum	5.47
Likeliest	6.08
Maximum	6.69



Assumption: Spot EUR prices 2021

Triangular distribution with parameters:

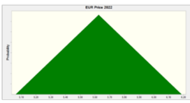
Minimum	5.26
Likeliest	5.84
Maximum	6.43



Assumption: Spot EUR prices 2022

Triangular distribution with parameters:

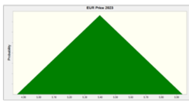
Minimum	5.06
Likeliest	5.63
Maximum	6.19



Assumption: Spot EUR prices 2023

Triangular distribution with parameters:

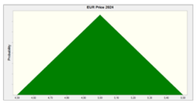
Minimum	4.86
Likeliest	5.40
Maximum	5.94



Assumption: Spot EUR prices 2024

Triangular distribution with parameters:

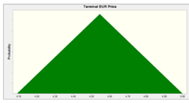
Minimum	4.50
Likeliest	5.00
Maximum	5.50



Assumption: Terminal EUR Price

Triangular distribution with parameters:

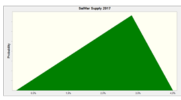
Minimum	4.09
Likeliest	4.55
Maximum	5.00



Assumption: SalMar Supply 2017

Triangular distribution with parameters:

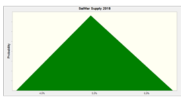
Minimum	-0.5%
Likeliest	2.8%
Maximum	4.0%



Assumption: SalMar Supply 2018

Triangular distribution with parameters:

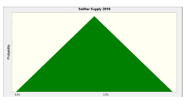
Minimum	3.5%
Likeliest	4.9%
Maximum	6.5%



Assumption: SalMar Supply 2019

Triangular distribution with parameters:

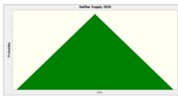
Minimum	8.0%
Likeliest	8.9%
Maximum	9.8%



Assumption: SalMar Supply 2020

Triangular distribution with parameters:

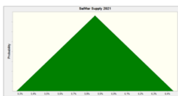
Minimum	7.2%
Likeliest	8.0%
Maximum	8.7%



Assumption: SalMar Supply 2021

Triangular distribution with parameters:

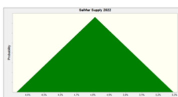
Minimum	5.3%
Likeliest	5.9%
Maximum	6.4%



Assumption: SalMar Supply 2022

Triangular distribution with parameters:

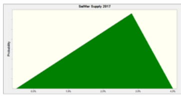
Minimum	4.3%
Likeliest	4.8%
Maximum	5.3%



Assumption: SalMar Supply 2017

Triangular distribution with parameters:

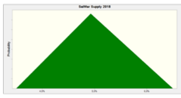
Minimum	-0.5%
Likeliest	2.8%
Maximum	4.0%



Assumption: SalMar Supply 2018

Triangular distribution with parameters:

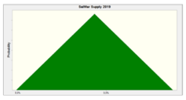
Minimum	3.5%
Likeliest	4.9%
Maximum	6.5%



Assumption: SalMar Supply 2019

Triangular distribution with parameters:

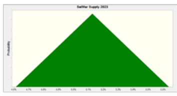
Minimum	8.0%
Likeliest	8.9%
Maximum	9.8%



Assumption: SalMar Supply 2023

Triangular distribution with parameters:

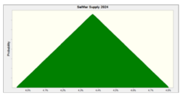
Minimum	4.6%
Likeliest	5.1%
Maximum	5.6%



Assumption: SalMar Supply 2024

Triangular distribution with parameters:

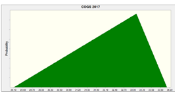
Minimum	3.9%
Likeliest	4.4%
Maximum	4.8%



Assumption: COGS 2017

Triangular distribution with parameters:

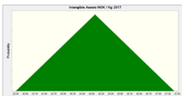
Minimum	29.11
Likeliest	33.11
Maximum	34.11



Assumption: Intangible Assets NOK / Kg 2017

Triangular distribution with parameters:

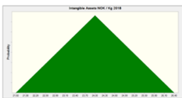
Minimum	22.50
Likeliest	25.00
Maximum	27.50



Assumption: Intangible Assets NOK / Kg 2018

Triangular distribution with parameters:

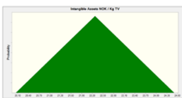
Minimum	21.60
Likeliest	24.00
Maximum	26.40



Assumption: Intangible Assets NOK / Kg TV

Triangular distribution with parameters:

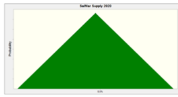
Minimum	20.05
Likeliest	22.27
Maximum	24.50



Assumption: SalMar Supply 2020

Triangular distribution with parameters:

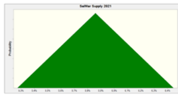
Minimum	7.2%
Likeliest	8.0%
Maximum	8.7%



Assumption: SalMar Supply 2021

Triangular distribution with parameters:

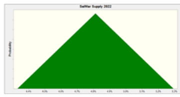
Minimum	5.3%
Likeliest	5.9%
Maximum	6.4%



Assumption: SalMar Supply 2022

Triangular distribution with parameters:

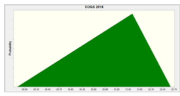
Minimum	4.3%
Likeliest	4.8%
Maximum	5.3%



Assumption: COGS 2018

Triangular distribution with parameters:

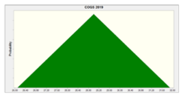
Minimum	28.61
Likeliest	31.61
Maximum	32.61



Assumption: COGS 2019

Triangular distribution with parameters:

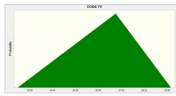
Minimum	26.10
Likeliest	29.00
Maximum	31.90



Assumption: COGS TV

Triangular distribution with parameters:

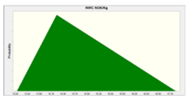
Minimum	22.47
Likeliest	26.75
Maximum	29.16



Assumption: NWC NOK/Kg

Triangular distribution with parameters:

Minimum	13.24
Likeliest	14.24
Maximum	17.24



Assumption: Other Operating Expenses 2017

Triangular distribution with parameters:

Minimum	11.50
Likeliest	12.16
Maximum	13.00

Assumption: Other Operating Expenses 2018 **Cell: Q21**

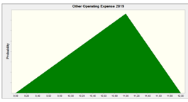
Triangular distribution with parameters:

Minimum	10.50
Likeliest	12.00
Maximum	13.00

Assumption: Other Operating Expense 2019

Triangular distribution with parameters:

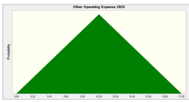
Minimum	9.00
Likeliest	11.00
Maximum	12.00



Assumption: Other Operating Expense 2020

Triangular distribution with parameters:

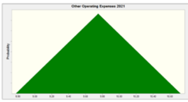
Minimum	9.00
Likeliest	10.00
Maximum	11.00



Assumption: Other Operating Expenses 2021

Triangular distribution with parameters:

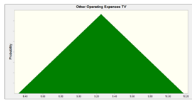
Minimum	8.78
Likeliest	9.75
Maximum	10.73



Assumption: Other Operating Expenses TV

Triangular distribution with parameters:

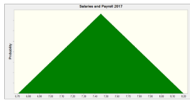
Minimum	8.33
Likeliest	9.25
Maximum	10.18



Assumption: Salaries and Payroll 2017

Triangular distribution with parameters:

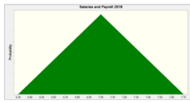
Minimum	6.71
Likeliest	7.45
Maximum	8.20



Assumption: Salaries and Payroll 2018

Triangular distribution with parameters:

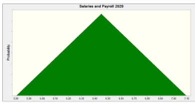
Minimum	6.30
Likeliest	7.00
Maximum	7.70



Assumption: Salaries and Payroll 2019

Triangular distribution with parameters:

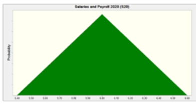
Minimum	5.81
Likeliest	6.45
Maximum	7.10



Assumption: Salaries and Payroll 2020

Triangular distribution with parameters:

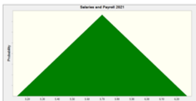
Minimum	5.40
Likeliest	6.00
Maximum	6.60



Assumption: Salaries and Payroll 2021

Triangular distribution with parameters:

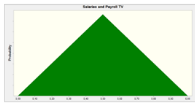
Minimum	5.13
Likeliest	5.70
Maximum	6.27



Assumption: Salaries and Payroll TV

Triangular distribution with parameters:

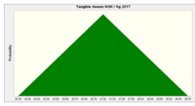
Minimum	5.00
Likeliest	5.50
Maximum	6.00



Assumption: Tangible Assets NOK / Kg 2017

Triangular distribution with parameters:

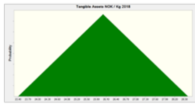
Minimum	24.30
Likeliest	27.00
Maximum	29.70



Assumption: Tangible Assets NOK / Kg 2018

Triangular distribution with parameters:

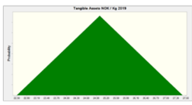
Minimum	23.40
Likeliest	26.00
Maximum	28.60



Assumption: Tangible Assets NOK / Kg 2019

Triangular distribution with parameters:

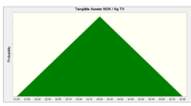
Minimum	22.50
Likeliest	25.00
Maximum	27.50



Assumption: Tangible Assets NOK / Kg TV

Triangular distribution with parameters:

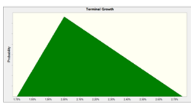
Minimum	21.60
Likeliest	24.00
Maximum	26.40



Assumption: Terminal Growth

Triangular distribution with parameters:

Minimum	1.70 %
Likeliest	2.00 %
Maximum	2.75 %



Assumption: WACC

Triangular distribution with parameters:

Minimum	5.00 %
Likeliest	5.60 %
Maximum	7.10 %