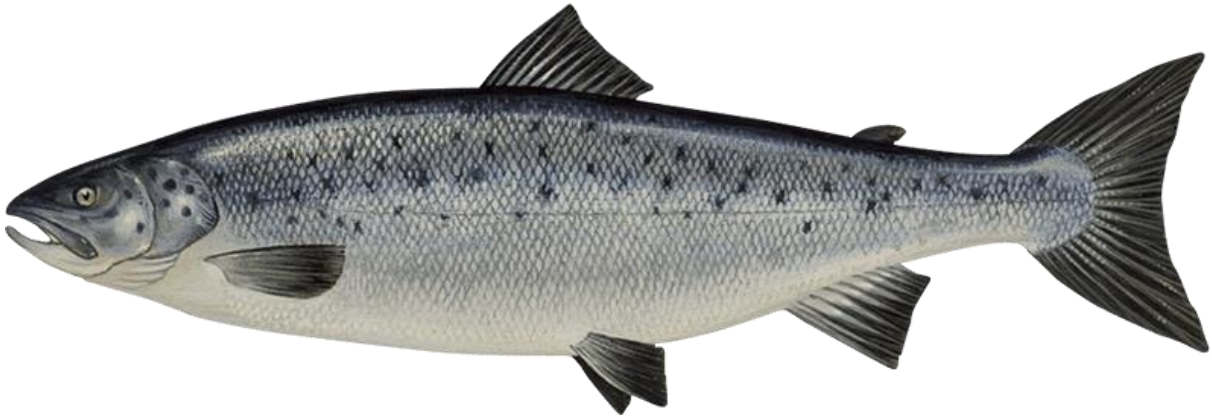
Valuation of Bakkafrost



Copenhagen Business School

Master Thesis, May 2018

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Pages: 120

Characters: 249,612

Executive summary

Bakkafrost has experienced tremendous growth in the recent years and has established itself as the 10th largest salmon producer in the world. The company is well-renowned in the industry and has for many years been a profitability leader. From April 6rd 2017 to April 6th 2018 its stock price has increased from 272,30 NOK to 454,5 NOK per share. The scope of this thesis is to examine the underlying fundamentals of Bakkafrost and perform a valuation to estimate its intrinsic value.

To arrive at an estimate of Bakkafrost's value, tools associated with a fundamental valuation has been applied. The thesis follows Penman's (2012) 5 steps of a fundamental analysis. The first step of *knowing the business* will provide the reader with an insight of the industry's history and the current business environment. The second step, *analyzing strategic information*, will apply the strategic tools of a PESTEL-analysis, Porter Five forces, a Value Chain Analysis and VRIO-Analysis to explore sources of competitive advantage, and investigate the future direction of the industry. The third step entails *Analyzing financial information* where data from financial statements will be examined, to understand drivers of profitability. The fourth step is concerned with *Developing forecasts*, where the insight from the previous steps are combined to forecast the future payoffs of Bakkafrost. The last step entails the *Valuation*, where a cost of capital is estimated, and the Residual operating income model is applied in order to arrive at a fundamental value. Moreover, the result from the fundamental analysis is critically assessed with a multiple valuation, a scenario- and a sensitivity analysis.

The results from the fundamental valuation was a value of 372,6 NOK per share, which was 20% below the listed stock price at 454,6 NOK on the cut-off date. Thus indicating an overpricing in the market. In short, the main findings were that the drivers of profitability in the industry mainly derived from the salmon price, and the firms' ability to control production costs. The analysis indicate that Bakkafrost's competitive advantage has been sustained by its fully-integrated value chain, which has allowed high cost-control and premium prices. Moreover, favorable geopolitical positioning has led to increased demand for Bakkafrost's produce in periods when sanctions restricted competition's trade. The thesis concludes that these drivers of profitability are not sustainable in the future, and that Bakkafrost's current level of profitability will revert toward an industry average.

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1. Introduction

Aquaculture in the form of Salmon production is an industry that has expanded rapidly in the recent decades. During the last ten years, the global production has increased twofold and reached a total output of 2.1 million tons in 2017. Salmon has grown to become an essential part of consumers' diets, and its attractiveness is often grounded in the confidence of it being a healthy and nutritious source of protein (Øglend, 2010). Moreover, its advocates claim that aquaculture of salmon production, in general, will gain increased importance in the future, as it is argued to have a lower environmental footprint than conventional animal husbandry (Bailey, 2014). The substantial growth in the industry has led to an increased securitization of the industry's firms since the late 1990's (Misund, 2018). The growth has also lead to increased consolidation of the firms within the industry, which currently is dominated by a few large firms producing the majority of the global output (Marine Harvest, 2017). One of these firms is Bakkafrost. The company was established in 1968 primarily specializing in the fishing and export of white herring. The salmon aquaculture operations were initiated in 1979. Since then Bakkafrost has had tremendous growth, and in 2010, they were listed at the Oslo Stock exchange.

The price of Bakkafrost's stock price at 6th of April 2017 was 454.6 NOK. In that relation, the scope of this thesis is to perform a fundamental valuation to challenge the listed price of Bakkafrost's stock, and assess whether it is under or overpriced in the market. As the term fundamental valuation implies, the assessment will study the underlying fundamentals of Bakkafrost's value.

The paper is structured in accordance with Penman's (2013) 5 steps of a fundamental valuation: In the first part, an introduction to the company and industry will be given. Furthermore, a strategic analysis will be performed using the PESTEL-framework, Porter's five forces, VRIO and a value chain analysis. This section attempts to portray the current business environment where Bakkafrost operates, on the subject of competition and sources of competitive advantage. Further, a profitability analysis of Bakkafrost and its peer group is performed, with the scope of analyzing historical performance and value drivers. Also, a quantitative industry analysis is conducted to explore how value drivers settle in the industry over time. The information collected from the above steps will assist in establishing a forecast of future payoffs. The forecast together with a derived cost of capital will yield the inputs in the Residual Operating Income Model, so that a theoretical fundamental value of Bakkafrost's equity can be established. Furthermore, a relative valuation, a sensitivity and scenario analysis will supplement a discussion concerning whether the results of the valuation has the credibility to contest the listed price of Bakkafrost's stock.

2. Problem statement

As mentioned in the introduction, this thesis aims to conduct a thorough analysis of Bakkafrost and to arrive at a valuation of its equity at the cut-off date 06.04.2018. A fundamental analysis will be carried out in accordance with the five steps of a fundamental valuation presented by Penman (2013, pp. 85–97). The framework was applied to understand the business and how it creates value, before analyzing the relevant information, both qualitative and quantitative. The third and arguably most important step involves two stages, namely the measuring and forecasting of operational payoffs. Subsequently, the future payoffs are converted into a valuation by discounting for the time value of money and risk. In the fifth and final step, often referred to as the investment decision, the implied value of the stock is compared to the market price at the cut-off date. The problem statement is therefore as following:

"What is the fundamental value of Bakkafrost's stock as at 6th of April 2018, and does this value imply an under- or overpricing of the stock at Oslo Stock Exchange at the concurrent date?"

2.1 Sub-questions

To be able to answer the overall problem statement, a series of sub-questions have been formulated. The purpose of these underlying questions is to complement the research questions and guide the thesis according to the five steps of fundamental valuation. The problem statement represents the fifth step in the fundamental analysis. Hence the sub-questions will be structured according to the four preceding steps:

2.1.1 Knowing the business: Bakkafrost and salmon farming industry

- What characterizes the industry, and how has it developed over time?

2.1.2 Analysing the strategic information

- Which macro drivers affect Bakkafrost and the other industry participants, and what are the implications of the competitive forces in the industry?
- To which extent is Bakkafrost integrated into the value chain compared to its close peers, and how do the resources and capabilities affect its competitiveness?

2.1.3 Analysing the financial information

- What are the key drivers of profitability in the industry, and what historical trends can explain these?

- Is there a tendency of mean reversion of typical drivers, such as PM, ATO, sales growth and RNOA, in the industry and to which level is this realistic for Bakkafrost?

2.1.4 Developing forecasts

- What factors determine the salmon price and what are the future implications?
- Are the main drivers behind value creation expected to sustain in the future?

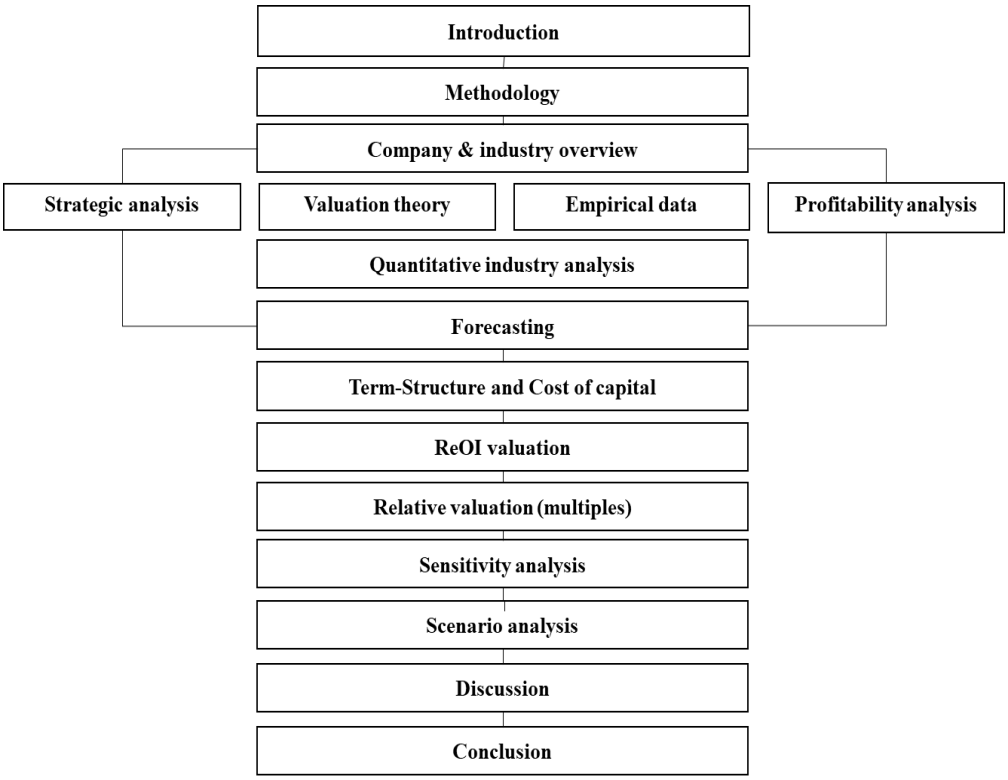
2.1.5 Valuation

- What is the cost of capital for Bakkafrost's operations?
- What does relative valuation imply for Bakkafrost's value?
- What intrinsic value does the ReOI-model yield?

3. Methodology and structure

The purpose of this section is to provide an overview of the thesis from a theoretical and methodological perspective. As the overall objective has been to answer the problem statement and sub-questions, the research design, approach, and delimitations play a crucial role. The thesis structure is illustrated in figure 3.1.

Figure 3.1 – Thesis structure
(Source: Own contribution)



3.1 Theoretical approach

As briefly mentioned in the introduction, the valuation theory applied in this thesis is mainly based on the fundamental analysis framework of Penman (2013). Additionally, concepts from Nissim and Penman (2001), Petersen & Plenborg (2012), Petersen, Plenborg & Kinserdal (2017) Lundholm & Sloan (2004), Damodaran (2017), and Koller, Goedhart & Wessel (2010) were used as a supplement to discussions. These theoretical frameworks have also been applied when estimating the cost of capital, complemented with additional academic research within corporate finance, such as Damodaran (2014) and Brealey, Myers, and Allen (2014). Furthermore, based on work of Nelson-Siegel (1987), Svensson (1994) and Christensen & Feltham (2009), a non-static cost of capital variation was chosen, grounded on a varying term structure. The theories and frameworks applied in this paper, are discussed in depth in their respective section.

The qualitative, strategic analysis has mainly been based on Porter (2008), Barney (1995; 2007) and Grant (2016).

A quantitative industry analysis complemented the insights from the qualitative industry analysis, to assess whether key drivers of ReOI tend toward mean-reversion the industry, by the work of Nissim & Penman (2001).

3.2 Data collection

The thesis is written from an external perspective, and the valuation and financial statements analysis is based on publicly available data in the form of annual and quarterly reports, as well as company websites from Bakkafrost and close peers. When conducting the qualitative analysis, the data mainly consisted of articles and market and industry reports from third-party agencies, such as Nofima, FAO, and the World Bank. Furthermore, this was supplemented by studies conducted by relevant researchers within the field of aquaculture, for instance, Asche (2018) Misund (2018), and Øglend (2010, 2013). For the quantitative analyses, cost of capital and forecasting, financial and statistical data and estimates were collected from Bloomberg, FAOSTAT, Indexmundi, Hagstova, Fishpool, Compustat Capital IQ, Danmark Statistik, OECD and official government websites.

In the forecast and to some extent other sections, the data is based on market reports from DnB Markets (2018), Nordea Markets (2018), and Pareto Securities Research (2018). These reports are not publicly available and have therefore been handed-in with the thesis. These documents are considered confidential and should not be distributed or published.

3.3 Criticism of sources

A substantial part of the thesis is based on information from Bakkafrost and other industry participants. It could be argued that these firms might have an incentive to portray themselves as attractive (Skærbæk, 2005), and as a result, the information might be biased. However, the analyzed firms are publicly listed, entailing that published information is subject to legal requirements regarding validity and audit. To prevent any potential informational bias and to enhance the objectiveness of the analysis, all reports released by the market participants have been used critically, and where possible, information from academic sources have been supplemented.

3.4 Delimitations and assumptions

To conclude the problem statement and its sub-questions, specific delimitations and assumptions were deemed necessary.

- Due to the scope of the thesis, the reader is assumed to possess a general economic knowledge and be familiar with basic concepts within valuation, strategy and corporate finance. The level of elaboration of minor concepts is therefore limited.
- Since the thesis is written from an external perspective, all information is based on public reports, except for the analyst's reports from DNB Markets, Pareto, and Handelsbanken. No internal information has been retrieved from the case company or other market participants.
- The cut-off date was set to 6th of April 2018. Therefore, the thesis is only based on information published before this date. The choice of cut-off date was based on the publication date of the annual report for 2017, but with a three-week delay to allow the market to settle.
- The focus of this valuation has been on Bakkafrost's farming operations and production of Value-added Processing (VAP). The group also has a presence in the fishmeal, fish oil and fish feed segment. However, the focus of analysis in this paper has been on the farming and VAP segment due to time and space constraints.
- The currency conversions performed in the thesis are based on the currency at 31.12.2017 for accounting values and 06.04.2018 for market values. The exchange rates from Danmarks Nationalbank will be applied unless stated otherwise.
- Since the Norwegian salmon farmers account for around half of the global production volume of farmed salmon (Marine Harvest, 2017), the average price in this region is assumed to be the market price. Moreover, the Norwegian industry was also perceived to be the most transparent source regarding data and information.

4. Industry and company overview

As argued by Penman (2013, p. 85), it is imperative to understand the business and the industry when conducting a fundamental analysis. Accordingly, this section will describe the essential characteristics of the industry and its dynamics, followed by a presentation of Bakkafrost and the close peer group.

4.1 Aquaculture and the salmon farming industry

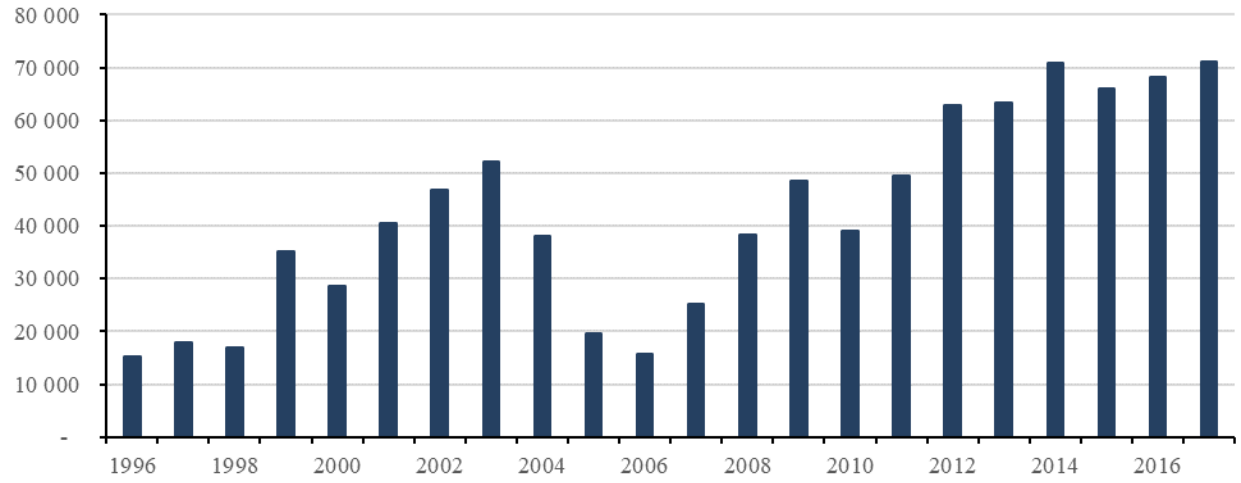
The aquaculture industry entails the aquatic production of organisms such crustaceans, mollusks, aquatic plants and fresh- and saltwater fish. Aquaculture was globally commercialized in the 1970s. However, archeological findings indicate that the predecessor of modern aquaculture dates back to 2000 B.C (OECD - FAO, 2016). A majority of the supply is produced in the Asia-Pacific region, with China alone accounting for almost 60% of the global production (World Bank, 2013). As a result of substantial growth in production volume the last decades, and due to stagnation in the supply from the wild-capture fisheries, aquaculture has become the primary global source of fish for human consumption, surpassing the amount supplied from wild-capture fishing in 2013 (OECD-FAO, 2017a).

Salmon farming is a segment within aquaculture and was commercialized during the aquaculture boom in the 1970s. The first sea-based production was initiated in Norway in 1970, but other regions also started producing shortly after (Norwegian Seafood Council, 2016). Norway and Chile are currently the largest producers, accounting for 53% and 25% of the global supply in 2015, respectively. The remainder is mainly supplied from the UK, Canada and Faroe Islands. All regions share one common trait, they all have conditions that are vital for marine salmon production, namely stable seawater temperature, coastlines sheltered by fjords, bays and strong currents (Marine Harvest, 2013, 2017). However, these natural attributes may be less important going forward, as new technology supporting land-based and off-shore salmon farms are evolving (Liu *et al.*, 2016; Bjørndal and Tusvik, 2017). Ultimately, this could result in the emergence of new regions being able to produce salmon. The discussion 5.1 will address this in-depth. The most commonly farmed salmonid species is Atlantic salmon, followed by trout. Moreover, there is also a substantial production of Coho and Chinook in Chile, Canada and New Zealand (Marine Harvest, 2013, p. 8).

The salmon farming segment accounted for around 4.4% of the worldwide aquaculture production in 2016 (Marine Harvest, 2017). Even though this volume only is a fraction of the global supply, salmon farming is attracting the most attention and investments within the international aquaculture sphere (Intrafish 2017). The leading driver of this is perceived to be the substantial focus on research and development, and continuous technological advancements in the segment. Salmon farming is widely regarded as the most sophisticated and developed aquaculture sector, and several of the new innovative approaches has had spillover effects to the cultivation of other species (IntraFish, 2017).

The Faroese aquaculture industry was established in the 1950 and 1960s with the farming of rainbow trout (Iversen *et al.*, 2017; House of Industry, 2018). In 1978, the Faroese company, p/f Fiskaaling, imported salmon roe from Norway and started producing Atlantic salmon(Faroe Fish Farmers Association, 2013). During the 1980s several new companies were established within salmonid production, which eventually led to the emergence of a new industry. During the same period, the salmon prices vastly increased, resulting in salmon surpassing trout in regards to volume in 1986 (FAROEISLANDS.FO, 2018). Since then, the production volume has grown substantially, developing into one of the most central industries in the Faroese economy, representing around half of the export value from the Faroe Islands (FAROEISLANDS.FO, 2018).

Figure 4.1 – Historical supply development in the Faroe Islands
(Source: Own contribution; (Hagstova, 2018)*)*



As illustrated by the graph, the production experienced rapid growth. Due to the lack of regulative bodies in the late 1980s, the industry was severely impacted by biological issues, such as sea lice, furunculosis, and BKD[1]. To prevent further spread of the infection, in the late 1980's The Faroese Authorities enforced a slaughtering of the current biomass[2] (NASCO, 2010). As a result, the production output was profoundly affected as long as until 1993-1995. During the five following years, the production experienced a new upswing, before an outbreak of the infamous ISA[3] disease between 2000-2005. In relative terms, this was the most destructive epidemics in the history of salmon farming (Asche *et al.*, 2010). Consequently, to prevent new outbreaks of this magnitude, the Faroese authorities implemented one of the most stringent and extensive

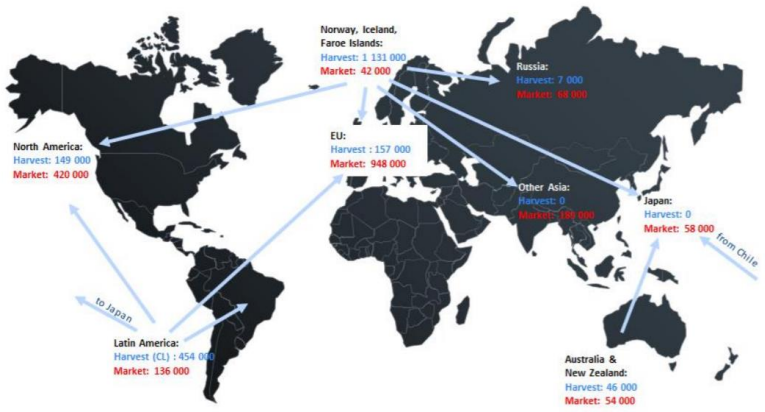
[1] Bacterial Kidney Disease
[2] The current stock of biological organisms/assets in the sea
[3] infectious Salmon Anemia

veterinary acts (Bakkafrost, 2018a). As a result, the biological issues have decreased significantly, and Faroese salmon farming industry has evolved into one of the most efficient and profitable in recent years (Nystøyl, 2017; iLaks, 2018).

4.2.1 Markets

The European Union (EU) is the most significant import region for farmed salmon, followed by North America and Asia. In the EU, Poland and France are the leading importers. The Polish market has increased significantly in the last decade and operates as a hub for value-added-processing (VAP)[4] for Norwegian salmon. The US represents the most significant market as a single country (Marine Harvest, 2017).

Figure 4.2 – Global production and export overview
(Source: Own contribution; Marine Harvest, 2017)

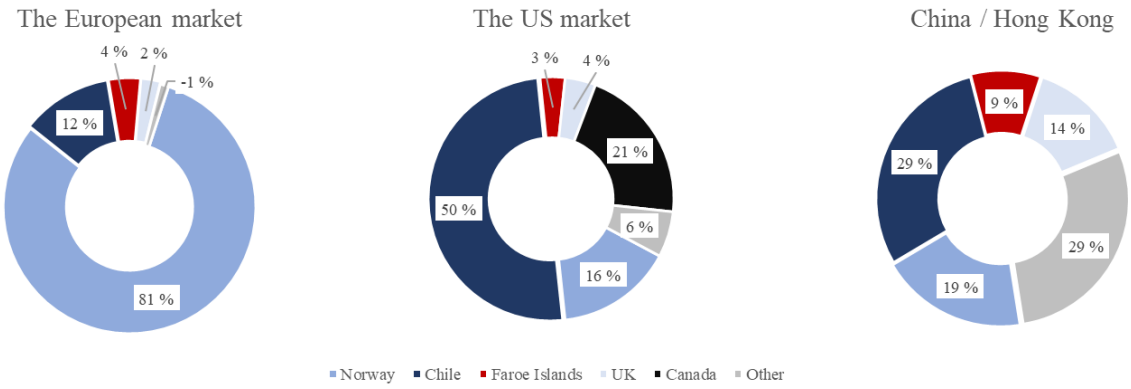


Historically, each producing region has focused on developing nearby markets. The main reason behind this is that the salmon is perishable and the majority trades as a fresh product. Thus the transportation costs play a significant role when the focus is to supply fresh salmon to the market. As a result, producers whose location is close to the market will have a cost advantage (DNB Markets, 2017a; Liu et al. 2016). However, the importance of distance to the market is reduced when trading frozen salmon, since it allows for less costly transportation by shipping (Marine Harvest, 2017, p. 28). For instance, the presence of fresh European salmon in south-America is close to non-existent due to the Chilean proximity to this market (Marine Harvest, 2013, 2017). The Asian market has generally been shared by all the producing regions, due to relatively similar transportation costs. Since all sizeable producers are located far away from the Asian market, the means of

[4] Value-added products involves fileting, smoking portioning and freezing (Bakkafrost, 2018a)

transport is exclusively air freight (DNB Markets, 2017a; Marine Harvest, 2018, p. 28)(MHG 2017, p. 28; DnB 2017). Figure 4.3 illustrated the market share in the primary importing regions.

Figure 4.3 – Volume share in main markets
(Source: Own contribution; Kontali Analyse 2017; cited in BAKKA AR 2017*)*



The salmon export from Norway has mainly focused towards the EU, Asia, and Russia (Marine Harvest, 2017). However, due to political tension, Russia and China imposed trade restrictions on various Norwegian products, which have impacted the salmon trade considerably. The export ban to Russia was a consequence of trade sanctions the western world imposed on Russia after its annexation of Crimea in 2014. Before this incident, this was the most significant market for Norwegian salmon (Norwegian Seafood Council, 2017). The Chinese sanctions were introduced as retaliation after the Norwegian Nobel Committee awarded the Nobel Peace Prize to the Chinese dissident, Liu Xiaobo, in 2010 (Chen and Garcia, 2016). Nevertheless, a substantial quantity of Norwegian salmon has still been present in the Chinese market, as it has been exported to nearby countries, particularly Vietnam and Hong Kong, and then re-exported to China (Chen and Garcia, 2016). However, recently the political tension between Norway and China has improved, and Chinese imports of Norwegian salmon have steadily increased since 2017Q3 (Statistics Norway, 2018). The impact and consequences of these incidents will be discussed in-depth in section 5.1.

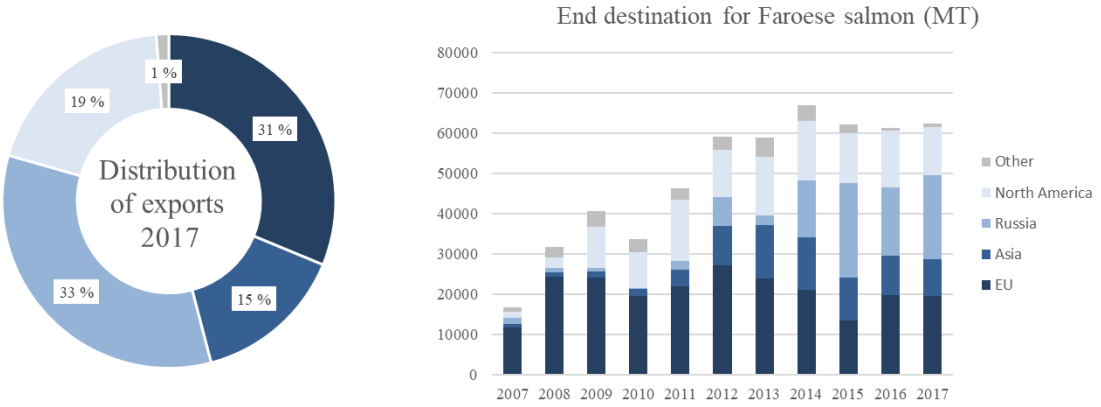
The Chilean producers mainly export to USA, South-America, and Asia. Chilean salmon dominate the South-American market due to its proximity to the market, and since there are no other significant producers in the region (Marine Harvest, 2013, 2017). Moreover, the presence of Chilean salmon in the US-market is substantial, accounting for close to 50 % of the total share in 2017. However, due to significant biological issues in Chile the last decade, Norwegian, Faroese, and UK salmon have increased their share in the US (OECD-FAO, 2017b, 2017c).

Traditionally, the salmon volume in the UK has been traded domestically, and the export has been limited (Marine Harvest, 2017). Nevertheless, there has been an increase in export the last few years, especially to the US, China, and France. This trend has followed the depreciation of GBP towards USD, CNY, and EUR, as this has led to lower import prices for the respective regions (OECD-FAO, 2017c).

The majority of the Canadian production is exported to the US, more specifically, the west coast. In recent years, Canada has been the second largest supplier to this market (Marine Harvest, 2013, 2017; OECD-FAO, 2017b).

Historically, Europe and Asia have been the primary markets for the Faroese salmon producers. However, in recent years, the export focus has been shifted towards the US, Chinese and Russian markets due to favorable prices and the geopolitical events (Bakkafrost, 2017, 2018a). In the tide of the Norwegian trade sanctions with Russia, the Faroese producers became the leading suppliers in the market, experiencing record high prices due to the lack of competition (OECD-FAO, 2014, p. 20). Also, the Chinese trade restrictions imposed on Norwegian salmon and biological issues in Chile affected the Faroese salmon export positively due high demand in the US and China (World Bank, 2013; Bakkafrost, 2018a). The distribution of Faroese salmon export is illustrated in figure 4.4.

Figure 4.4 – Export market for Faroese salmon (Volume)
(Source: Own contribution; Hagstova, 2018)



4.2.2 Market concentration

Throughout the history of modern salmon aquaculture, there have been numerous mergers and acquisitions, resulting in a relatively consolidated sector in the central farming regions (Misund, 2018). Norway and Chile are the most fragmented, where the top 10 players accounted for 69% and 73% of the region's production in 2016. Faroe Islands are the most consolidated region as there are only three producers, while in UK and Canada the top 5 players accounted for 93% and 98% in 2016, respectively (Marine Harvest, 2017). There is expected a tendency towards more consolidation in the future, as new farming licenses are scarce in all regions. Consequently, M&A is anticipated to be a dominant growth strategy for certain producers in the years to come (Marine Harvest, 2017, pp. 36–38).

4.2.3 Production cycle and value chain

The traditional salmon farming cycle, from egg to harvest, lasts between 24-40 months, depending on environmental factors and production techniques. The cycle begins with the procurement of viable eggs. These are collected from female broodstock and subsequently fertilized with milt from the male broodstock. The eggs are kept in hatcheries for approximately 60 days until they spawn into fry. All these steps take place in fresh water and the total process time is between 10-16 months. The next step is when the fry develops into smolt (Marine Harvest, 2013, 2017; OECD-FAO, 2018). Smoltification is the phase where the juvenile salmon undergo a transformation where they adapt from living in freshwater to residing in seawater (Stefansson, Björnsson and Ebbesson, 2008). Traditionally, the weight of the smolt has been between 60-100 gram, but recently there has been a trend of producing smolts of 100-1000 grams, commonly known as post-smolt. The purpose of this is to decrease the time in the sea and thereby reduce biological risk (Nofima, 2015). After the smoltification, the salmon is transferred to seawater pens and is grown over a 14-24 month-period towards an average market weight of 4-5 kg GWE[5]. The growth rate is highly dependent on seawater temperature, which will be discussed in section 5.1 (Marine Harvest, 2013, 2017). When the salmon reach the market weight, it is transferred to a processing plant where it is slaughtered and gutted. A portion of the salmon goes to secondary processing, also known as Value-added-products (VAP), which include filleting, portioning, smoking, freezing and further processing of by-products. However, the majority of salmon is sold Head-on-gutted (HOG) on ice in a box. The processed salmon is transported by truck, airfreight or shipping, dependent on the end-destination (Marine Harvest, 2017).

[5] Gutted-weight equivalent

4.2 Bakkafrost

Bakkafrost is the largest salmon producer in the Faroe Islands with total operating revenue of 3,8 billion DKK in 2017. The group currently holds 21 farming licenses across 17 fjords and produced a total volume of 54.600 TGW in 2017. All operations are located in the Faroe Islands, and Bakkafrost is the largest private employer in the country (Bakkafrost, 2018a). The group is regarded as one of the most efficient salmon farmers in the world, in addition to being one of the most integrated into the value chain (iLaks, 2015, 2018).

Bakkafrost was at first a family owned business and was established in 1968 by the two brothers, Hans and Róland Jacobsen. In the beginning, the firm caught herring in the Faroese fjords, which they further processed and sold. In 1979, Bakkafrost moved into the salmon farming segment. They entered the smolt production segment in the late 1980s, harvesting and VAP production was initiated in the early 1990s. At this time, the current CEO, Regin Jacobsen, was appointed (Bakkafrost, 2017, 2018a). Before the ISA crisis in 2000-2005 (Asche *et al.*, 2010), Bakkafrost experienced steady growth. During the ISA-crisis, 26 out of 28 Faroese salmon farmers went bankrupt, whereas Bakkafrost was one of the surviving firms (iLaks, 2018). In 2006 the group grew substantially through mergers and acquisitions and thereby increased the production capacity from 3.000 TGW[6] to 18.000 TGW. Through these M&A activities, Bakkafrost obtained access to six new farming fjords and two facilities for smolt and fry production. In 2010, Bakkafrost merged with Vestlax, which had a production capacity of 11.000 TGW. With this additional capacity, the group became the largest salmon producer in the Faroe Islands (Bakkafrost, 2018b). Concurrent with the merger with Vestlax, Bakkafrost was listed on Oslo Stock Exchange (OSE). The following year, the fish oil, fishmeal and fish feed (FOF) producer, The Havsbrún Group was acquired. Through this integration, Bakkafrost became self-sufficient of salmon feed for their farming operations. Also, the group obtained access to 5 new licenses for farming production (Bakkafrost, 2018a). In the later years, Bakkafrost has invested substantially in new VAP, FOF, smolt and harvesting facilities to increase organic growth and to reduce biological risk. In addition, two new vessels for fish transport and non-medicinal delousing were acquired (Bakkafrost, 2018b).

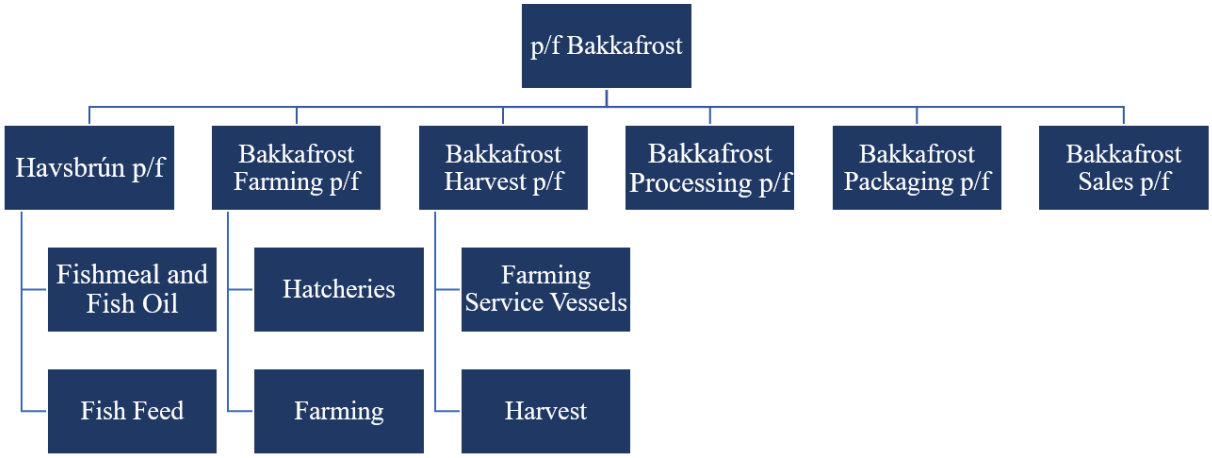
4.2.1 Strategy and corporate structure

Bakkafrost's vision is to be a world-class company in the salmon industry. The overall strategy of the group focus on sustainable value creation through strength, capability, and reputation of their business; the quality of

[6] Tons Gutted Weight

their workforce; and collective social and environmental wellbeing (Bakkafrost, 2017, 2018a). The group's structure is illustrated in Figure 4.5.

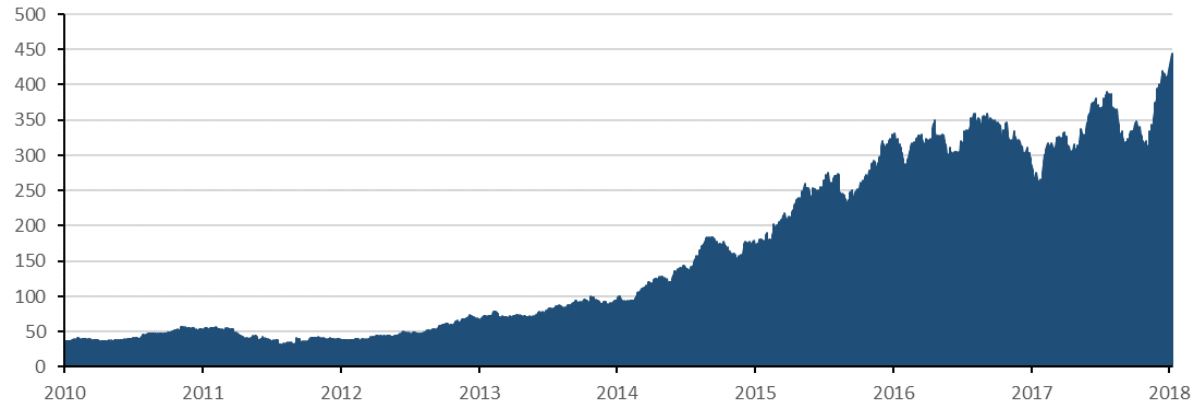
Figure 4.5 – Group Structure
(Source: Own contribution; Bakkafrost, 2018b)



4.2.2 Share price development and ownership structure

Since the initial public offering (IPO) in 2010, there has been considerable growth in the share price of Bakkafrost. From 26.03.2010 until the cut-off date 06.04.2018 the share price has increased 1193%, and the first four months of 2018 by 31%, as illustrated in figure 4.6. The rapid increase of share price since 2016 was caused by spiking salmon prices (Bakkafrost, 2016, 2017, 2018a).

Figure 4.6 – Share price development
(Source: Own contribution; Bloomberg terminal*)*



The ten largest shareholders are listed in Figure 4.7. Johan Regin Jacobsen and his mother, Oddvør, accounts for 18,6% of all shares. Institutional investors own the remainder. The 20 largest investors account for 55,2% of the total shares, which can be seen in detail in appendix 41. In 2017, Bakkafrost's share was one of the 20 highest traded shares on Oslo Stock Exchange (Oslo Stock Exchange, 2018)

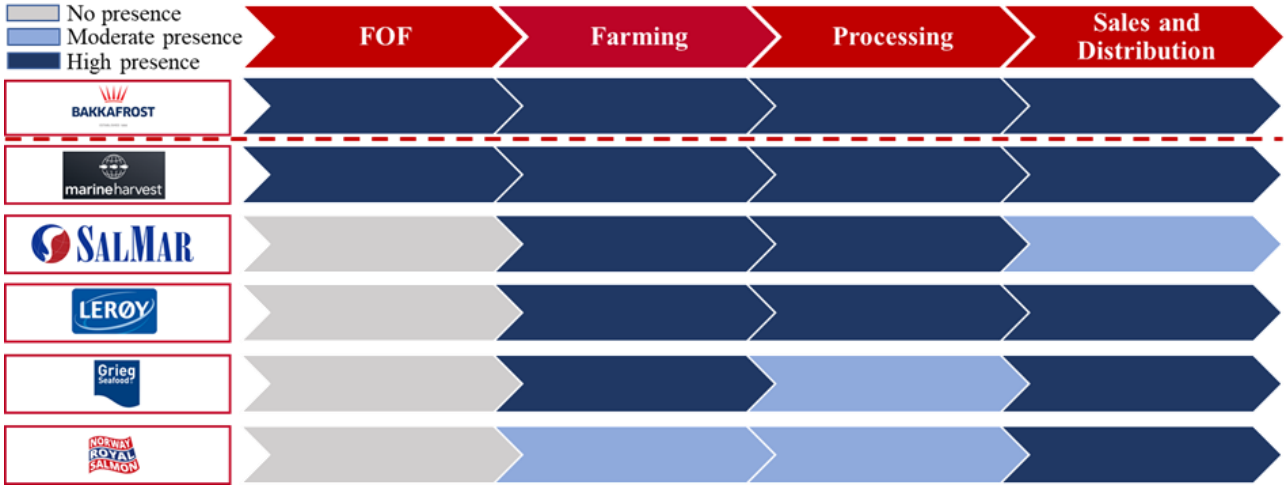
Figure 4.7 – Ownership Structure
(Source: Own contribution; Bakkafrost, 2018d)

#	10 Largest Shareholders	Origin	No. of shares	Share
1	JACOBSEN Oddvør	FRO	4.594.437	9,40 %
2	JACOBSEN Johan Regin	FRO	4.494.825	9,20 %
3	FOLKETRYGDFONDET	NOR	3.531.841	7,20 %
4	Nordea Bank AB Denmark Branch, CCA	DNK	3.497.015	7,20 %
5	CLEARSTREAM BANKING	LUX	1.276.977	2,60 %
6	SWEDBANK ROBUR SMABO NORDEN	SWE	985.433	2,00 %
7	AVIVA INVESTORS JPML SA RE CLT AVIVA	LUX	888.989	1,80 %
8	JPMorgan Chase Bank, S/A NON-TREATY LENDI	GBR	821.529	1,70 %
9	State Street Bank an A/C CLIENT OMNIBUS F	USA	715.565	1,50 %
10	VERDIPAPIRFONDET DNB V/DNB ASSET MANAGEME	NOR	683.293	1,40 %
	Total share of the 20 largest shareholders		**27.898.066**	**44,00 %**

4.2.3 Peer Group

This section will present and discuss the selection of closest peers of Bakkafrost. These peers will be used as a benchmark in the financial and strategic analysis, and as comparables when conducting relative valuation in section 15. When identifying comparable firms for a peer group analysis and relative valuation, one should select based on similarity to the operating characteristics of the target firm. Optimally, the peer group should match by industry, product, size, growth, and risk. However, this is rarely the case, as no firms are exactly alike (Penman, 2013, pp. 76–78). Operational similarities of the peer group are shown by the companies' vertical integration in the value chain and are illustrated in Figure 4.8.

Figure 4.8 – Bakkafrost's and selected peers' value chain integration
(Source: Own contribution; Bakkafrost, 2018a; Grieg Seafood, 2018; Lerøy Seafood Group, 2018; Marine Harvest, 2018; Norway Royal Salmon, 2018a; SalMar, 2018a)



All firms in the peer group are traded on Oslo Stock Exchange (OSE) and comply with the IFRS accounting standards (Bakkafrost, 2018a; Grieg Seafood, 2018; Lerøy Seafood Group, 2018; Marine Harvest, 2018; Norway Royal Salmon, 2018a; SalMar, 2018a). Figure 4.8 illustrates that all companies have a presence in all activities in the value chain, except FOF.

Marine Harvest (MHG) is the industry leader, accounting for approximately 20% of the global supply in 2016. The group is one of the most integrated producers, and besides Bakkafrost, MHG is the only major producer integrated into the FOF segment (Marine Harvest, 2016a, 2018). MHG has farming activities in Norway, Chile, Canada, Scotland, Ireland and Faroe Islands, in addition to several process facilities and sales offices around the world. The headquarter is located in Bergen, Norway. Moreover, the company has been one of the most active in M&A activities globally, since it was founded in 1965 (Marine Harvest, 2017).

Lerøy Seafood Group (LSG) is based in Bergen, Norway, and is the second largest producer in Norway with a total production of 164.200 TGW in 2016. Adding to this includes 14.200 GWT from Norskott Havbruk, which is a joint venture with SalMar in the UK. Besides this joint venture, all farming activities are located in Norway (Lerøy Seafood Group, 2018). Furthermore, LSG has processing plants for VAP in various regions in Europe and sales offices around the globe. Moreover, LSG has white fish and pelagic operations in Norway and wholesale operations of other seafood, which together accounts for approximately 15% of the total revenue (Lerøy Seafood Group, 2017, 2018)

SalMar (SALM) is regarded as one of the most efficient salmon farmers globally and has integrated into the value chain from broodstock and roe to sales & distribution. The firm holds 100 licenses in Norway and operates in the UK (joint venture with LSG) and Iceland. Since SALM was established in 1991, they have executed several M&A's, resulting in the third largest production volume (135.200 GWT) in Norway in 2017 (SalMar, 2018a)The headquarter for the group is located in Trondheim, Norway (SalMar, 2018b).

Grieg Seafood (GSF) is the fifth largest producer in Norway, UK, and Canada, with a total production of 64.700 GWT in 2017 (Marine Harvest, 2017, p. 36). GSF controls the value chain from smolt to S&D in all regions, but there are currently no VAP operations. All sales are administrated through Ocean Quality AS, which is a joint venture with Bremnes Fryselager AS. They operate sales offices in all producing regions, in addition to China and Portugal. GSF's headquarters are located in Bergen, Norway (Ocean Quality, 2014; Bremnes Seashore, 2018; Grieg Seafood, 2018).

Royal Norwegian Salmon (NRS) was founded as a sales and distribution company by 34 salmon farmers in 1992. Since then the firm has grown into an integrated producer, with operations in all parts of the value chain from smolt to sales and distribution (Norway Royal Salmon, 2018b). However, NRS is not self-sufficient in all stages and is therefore dependent on external suppliers (Norway Royal Salmon, 2017, 2018a). The farming operation's total production in 2017 amounted to 32.000 MT, which accounts for approximately 40% of the revenue of NRS, as the company source the majority of salmon from other farmers (Norway Royal Salmon, 2018a). This is the main difference of NRS compared to the other peers, but they are still regarded as a close peer due to their similarities in their core salmon farming operations. Historically, all activities have been based in Norway, but in 2016, NRS entered the farming segment in Iceland. The headquarters is located in Trondheim, Norway (Norway Royal Salmon, 2018a).

5. Strategic analysis

5.1 PESTEL

A PESTEL analysis has been conducted, to identify the critical drivers of change in the macro-environment. The framework categorizes the environmental influence into six main types: Political, Economic, Social, Technological, Environmental and Legal (Johnson, Scholes and Whittington, 2008, p. 55). In this analysis, the

political and legal section will be combined due to the high degree of inter-dependency of various factors, especially for policies regarding restrictions and licenses.

5.1.1 Political and legal factors

Since the introduction of The Home Rule Act in 1948, the Faroe Islands has been a self-governed state within the Danish Kingdom (Føroya landsstýri, 2018b). The act states that: "*the Foreign Policy Act gives full powers to the Government of the Faroes to negotiate and conclude agreements under international law on behalf of the Kingdom of Denmark where such agreements relate solely to matters which have been fully transferred to the Faroese Authorities*" (Føroya landsstýri, 2018b). While some fields of responsibility remain under the authority of the Danish Government and constitution, the Faroese Government holds the administrative and legislative responsibility in the majority of areas, such as external exports, conservation and management of marine resources, taxation and customs, business regulation and financial policy (Føroya landsstýri, 2018b).

When Denmark joined the European Union, the Faroes had the option to follow. However, like many other fishery-dependent nations, the Faroes decided to remain outside and handle trade themselves (Føroya landsstýri, 2018c). The Faroese economy is fuelled by exports from fisheries and aquaculture, which accounts for 95% of the total export value (Danmarks Nationalbank, 2017). Thus, the free trade agreements (FTA) have been paramount in facilitating competitive conditions for the export-focused companies, such as Bakkafrost (Føroya landsstýri, 2018c). Since the 1970s, bilateral FTAs have been secured with the EU, Norway, Turkey, Iceland, and Switzerland, while there are ongoing negotiations with the Russian Federation. Furthermore, the Faroese Government is looking into the possibility of obtaining membership in the World's Trade Organisation (Føroya landsstýri, 2018a). In few years, new FTAs could play a significant role for the Faroese salmon industry, especially in regards to BREXIT and the current increase of trade tariffs imposed by the US and China. Even though the imposed trade tariffs do not involve salmon or any other direct materials used in the production, this could change in the future. There are implications of additional tariffs, and if other economies follow, a trade war could be initiated (Bloomberg, 2018; Reuters, 2018).

As mentioned in section 4.2.1, Faroese exports were not affected by the Chinese and Russian trade embargoes. The latter was a result of the Faroe Islands not holding a membership in the EU, and it turned out to be tremendously beneficial for the Faroese aquaculture and fishery exports (OECD-FAO, 2014, p. 20). Recently, however, the trade between Norway and China was re-initiated. In regards to the Russian market, it is not assured when or if the economic sanctions will be removed. If the Norwegian salmon is re-granted access to

the Russian market, this could pose a threat to the Faroese producer's market share, as Norway is located closer to Russia (Norwegian Seafood Council, 2017).

The corporate tax rate is 18% in the Faroes, which is lower compared to the other central regions: Norway (23%), Chile (26%), UK (20%) and Canada (26,5%) (KPMG, 2018). However, until 2016 the Faroese salmon farmers were required to pay a license tax equal to 4,5% of taxable income and 0,5% of farming revenue. In 2016, a new tax bill was implemented, reducing the former to 0% and increasing the latter to 4,5% (Reuters, 2015; Bakkafrost, 2018a, p. 109) Thus the earnings of the Faroese salmon farmers have been impacted, as the new tax regime is higher than the old.

Local authorities regulate salmon production with licensing, in order to facilitate sustainable operations and growth in production regions. All regions have different policies in regards to allocating the licenses, varying between regular auctions or applications to licenses gained through environmentally friendly R&D projects (Marine Harvest, 2013, 2017). The latter is discussed further in section 5.1.4. The licenses regulate the total production output of any salmon farmer, as the production volume per license is limited, commonly referred to as "maximum allowed biomass" (MAB). In Norway for instance, the MAB is defined as the maximum amount of fish a company can hold in the sea at all times, and it amounts to 780 tonnes LW[7] per license (945 tonnes LW in the two northernmost counties (Marine Harvest, 2017). Recently, as the biological boundaries have been pushed to the maximum in all producing regions, the regulatory conditions have tightened (Nofima 2017). As a result, new licenses have become increasingly scarce, resulting in a stronger consolidation of the market (Asche *et al.*, 2013). There is also legislation regulating the total share each individual company can hold. For example, in the Faroes, where no single producer can control more than 50% of total licenses (Bakkafrost, 2018a). When Bakkafrost acquired P/F Havsbrún, the company also received ownership of P/F Faroe Salmon and P/F Viking Seafood, which together held five licenses. After the deal, Bakkafrost held more than 50% of the licenses in the Faroes and had to sell 51% of P/F Faroe Farming to an investment firm to fulfill the legal requirements (Bakkafrost, 2017, p. 53). In 2016, Bakkafrost purchased back the 51% share in P/F Faroe Farming and simultaneously filed two licenses to the authorities (Bakkafrost, 2018a, p. 138). Since Bakkafrost currently owns the maximum amount of licenses (21), the future growth needs to come from other sources than new licenses, such as efficiency gains, land-based or off-shore facilities.

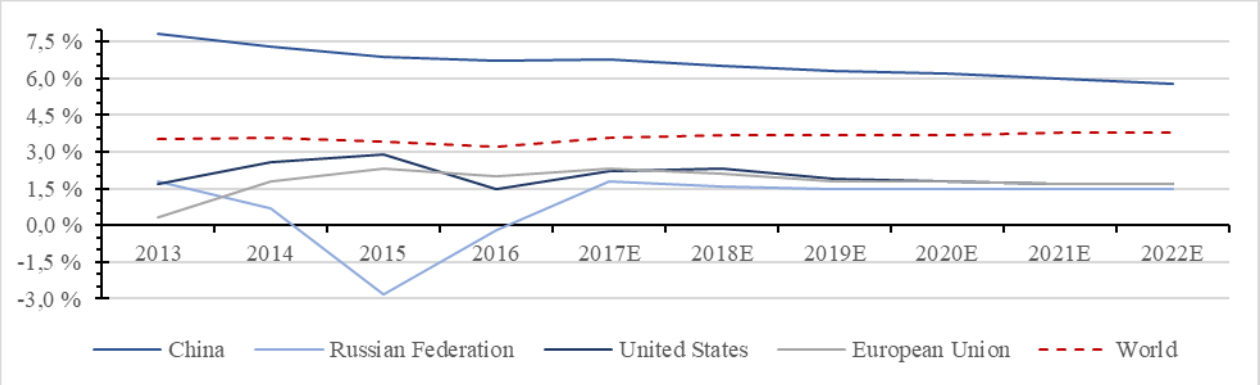
[7] Live-weight

Regarding licenses in the Faroese industry, there is one particular condition that differs considerably from the other production regions, namely the concept "*one fjord – one producer*." According to Bakkafrost's CEO, Regin Jacobsen (iLaks, 2018), this has been a critical factor for the satisfactory operational results of the Faroese producers compared to other salmon farming regions. When there is only one producer in each fjord, it is easier to optimize the production, as all the salmon are transferred to the sea, harvested and deloused at the same time. Furthermore, in case of disease outbreaks, the whole fjord can efficiently be contained, cleaned and fallowed. Thus increasing the controllability of each producer, lowering the local competition between farms, and reducing the biological risk (Iversen *et al.*, 2017; Bakkafrost, 2018a; iLaks, 2018).

5.1.2 Economic factors

Since Bakkafrost's operations are highly export-focused, various economic factors can profoundly influence future performance, both locally and in distant markets. One of the most critical factors is GDP growth in the primary export markets. GDP values an economy's total output of goods and services. More importantly, the real GDP growth is regarded as a measure of an economy's well-being (Mankiw, 2014). Figure 5.1 displays the historical and expected real GDP growth for Bakkafrost's primary markets, and the average in the world (IMF, 2018). The real GDP growth in US and EU is expected to decrease from 2.3% and 2.2% in 2017 towards 1.7% in E2022. The Russian market has been facing some years with negative real GDP growth, but have shifted the trend the last few years and are expected to stabilize at a long-term rate of 1.5%. As the graph shows, the rate in the Chinese market is expected to remain at a higher level than the other regions (IMF, 2018). However, the rate is expected to decrease towards a level of 5,8% in 2022. Additionally, the world's real GDP growth rate is expected to sustain a higher level to that of the US and EU, mostly driven by the Asian region (IMF 2018).

Figure 5.1 – Real GDP growth in Bakkafrost's primary markets
(Source: Own contribution; IMF, 2018)(Bakkafrost, 2018a; Grieg Seafood, 2018; Lerøy Seafood Group, 2018; Marine Harvest, 2018; Norway Royal Salmon, 2018a; SalMar, 2018a)



Because of the international nature of Bakkafrost's operations, there is an exposure towards currency risk. Regarding currency, the sales are mostly denominated in EUR, DKK, and USD, while the majority of costs are denominated in DKK(Bakkafrost, 2018a). However, some input costs related to the feed segment, such as soy meal and soy oil, are linked to USD (Bakkafrost, 2015, 2017, 2018a). When hedging against currency risk, the group has historically applied currency forward contracts. Furthermore, since the DKK are fixed exchange rate policy towards EUR (Danmarks Nationalbank, 2014), Bakkafrost achieves some natural hedging (Bakkafrost, 2018a).

Historically, Bakkafrost's financing has been a combination of a revolving credit facility in DKK from Nordea and a 500 million NOK bond issued at Oslo Stock Exchange (OSE) in 2013 with a five-year maturity (Bakkafrost, 2012, 2013, 2018a). Since the NOK have been somewhat correlated to the oil price (Akram, 2000), the NOK substantially depreciated towards EUR after the oil crisis in 2014 (Cappelen, Eika and Prestmo, 2014). To mitigate the currency exposure on the bond, Bakkafrost entered into a currency/interest swap. Moreover, this also changed the interest rate from 4,15% + CIBOR 3m instead of NIBOR 3m. However, this bond was repaid in February 2018, and Bakkafrost entered into a new financing agreement with their current lender, Nordea. The new agreement is a senior secured five-year 200 million EUR credit facility (Bakkafrost, 2018a, p. 120). Consequently, this will mitigate the interest and currency risk of Bakkafrost and provide high financial flexibility going forward.

5.1.3 Social factors

The world's consumption of seafood has experienced a significant increase in the commercialization of aquaculture during the 1970s (Misund 2018). This development has been driven by an increase in world population, income per capita and a growing middle-class, especially in developing regions (Bodirsky *et al.*, 2015). For instance, between 1960 and 2016, the yearly consumption of fish per capita has doubled, from approximately 9,9 kg to over 20 kg. In 2025, this is expected to increase to 21,8 kg per capita (OECD-FAO, 2016b). According to the United Nations (2017, p. 1), the world population is expected to grow to 9,7 billion in 2050, and the demand for sustainable protein sources is expected to grow substantially. Since most capture fishery regions are operating at their maximum capacity, the future increase in seafood supply is expected to derive from aquaculture (World Bank, 2013).

Recently, there has been a shift in consumer trends towards more sustainable and healthy diets (Carlucci *et al.*, 2015). Seafood is considered as a healthy food source, due to a nutrient composition rich in omega-3 fatty acids, minerals, and vitamins (OECD-FAO, 2017a; United Nations, 2017). Governments and other

organizations publish guidelines for recommended seafood intake, where the most common amount is two portions a week. At least one of these portions is recommended to be "oily," which salmon is (Thurstan and Roberts, 2014).

5.1.4 Technological factors

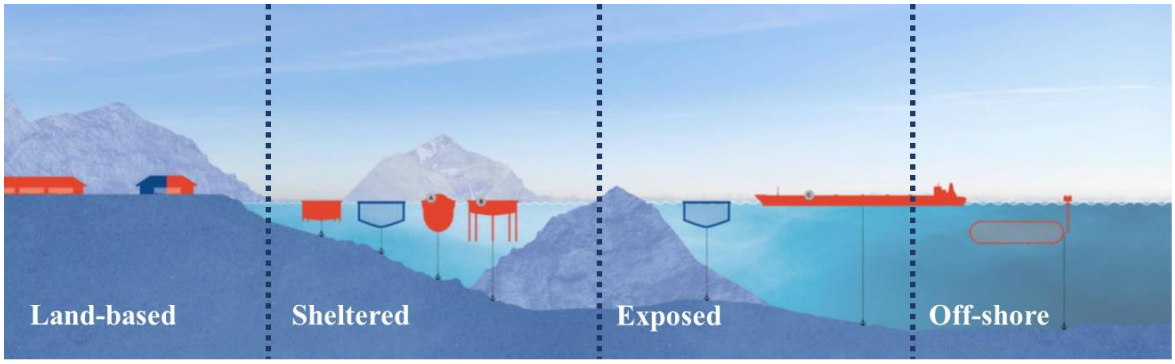
The salmon farming segment is regarded as the most sophisticated and developed segment within aquaculture (IntraFish, 2017). Several of the industry participants invest substantially in R&D, and there is a continuous flow of new technology that can reduce costs, enhance efficiency and mitigate biological risk. The extensive focus on R&D is partially due to the biological issues the industry has faced, especially with sea lice and diseases (Pwc, 2017; Xie et al., 2016). Recently, there has been a consensus among the producers and researchers that using land-based facilities to produce larger smolt (post-smolt) can decrease the biological risk factors significantly. Decreased time in the ocean makes it less exposed to lice and diseases. Moreover, the increased size improves the robustness of the smolt (Nofima, 2015). The Faroese producers, especially Bakkafrost (Bakkafrost, 2018a), have been strategically focused on increasing the smolt size for some years. Subsequently, this has resulted in one of the most effective production outputs globally concerning mortality rates, reduced production time and increased smolt yield[8] (Iversen *et al.*, 2016, pp. 51–52). In that regard, Bakkafrost released a 2 billion investment plan for 2016-2020, where the main focus is on developing post-smolt facilities (Bakkafrost, 2017; Danmarks Nationalbank, 2017). Other producers, such as GSF, SALM, and MHG, are also following this strategy, and have presented investment plans for the construction post-smolt facilities as well (Grieg Seafood, 2018; Marine Harvest, 2018; SalMar, 2018a). Another driver for this development is that regulations and licenses for producing on lands tend to be less strict than for conventional open net production (Government.no, 2015a). Ultimately, this new trend could increase the production cycle in the sea, which should yield a higher production volume per license. As licenses are scarce, efficiency gains from this strategy could increase the performance of the salmon producers significantly.

The Norwegian authorities have incentivized the salmon farmers in the region to invest more heavily in R&D by introducing "green" and development licenses. The aim of the former is to stimulate the use of environmentally friendly technology in commercial use, thus making the region more competitive and sustainable. Furthermore, "Green" licenses are granted on a perpetual basis and are free of charge. Development licenses are intended to motivate innovations and investments into new technologies that can

[8] Smolt yield is the gutted weight (GWE), per smolt released in the sea. This metric reflects both the growth of the salmon and the mortality rate while in sea (Nofima, 2015, pp.51-52)

counter the biological issues, enhance animal welfare and support sustainable growth. The concepts currently in development varies between open vs. closed structure, submerged vs. unsubmerged solutions or their exposure to sea, as seen in figure 5.2 (Government.no, 2015b; Marine Harvest, 2017, p. 74). The licenses are allocated free of charge on a 15-year basis and can be converted into commercial licenses through applications at the cost of 10 million NOK. In comparison with the market price of a license, this is a low price, as DnB (2017b) states that the current market price could be as high as 120 milllion NOK.

Figure 5.2 – Salmon production variations
(Source: (Engle, Quagrainie and Dey, 2016; Marine Harvest, 2017)



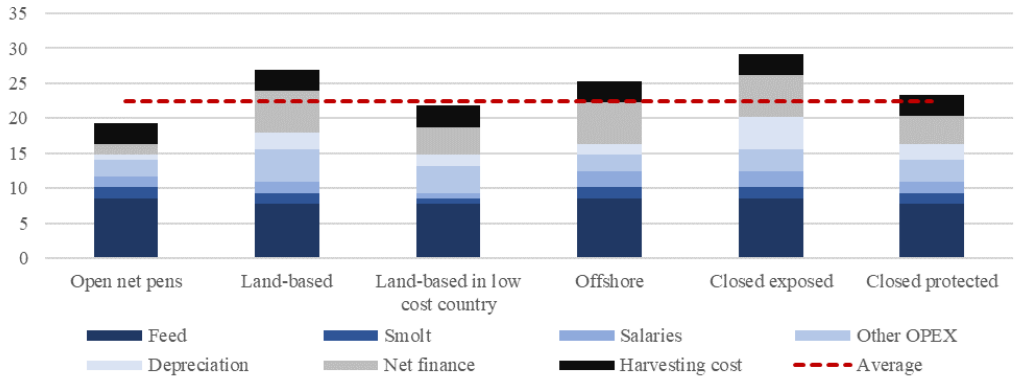
A prime threat towards the conventional salmon farming is the emergence of land-based facilities, where the salmon production solely occurs places on land (Liu *et al.*, 2016; Bjørndal and Tusvik, 2017; DNB Markets, 2017b). Historically, these facilities have been too expensive to compete with traditional cage-based marine farming, as the electricity, water, and maintenance costs have been substantial. However, this technology has developed considerably in recent years, and there is an ongoing trend of investments in both existing and new markets (DNB Markets, 2017b). For instance, Atlantic Sapphire and Nordic Aquafarms are investing in new facilities in the USA, with a yearly production volume of 90.000 MT and 33.000 MT, respectively (Dagens Næringsliv, 2018a, 2018b). This volume is substantial in comparison with the existing producers. For instance, it is larger than the total supply in 2016 from the four largest producers in the UK (118.300 MT)[9] or the volume produced by LSG in 2016 (115.700 MT), which is the second largest producer in Norway (Marine Harvest, 2017, p. 36). One of the main reasons the new producing regions can impose a threat to existing farmers is the proximity to the market. The transport costs for air-freight from Europe to the US have typically amounted to 10-14 DKK per kg, which is reflected in the price for the importers and in turn could be challenged by the new producers (Liu *et al.*, 2016; DNB Markets, 2017b; Dagens Næringsliv, 2018a). Furthermore, the natural conditions that are necessary for marine salmon farming are not of same importance for the land-based farming

[9] Marine Harvest (45.000 MT), Scottish Seafarms (28.000 MT), The Scottish Salmon Co. (24.300) and Cooke Aquaculture (21.000 MT) (MHG HB, p. 36).

(DNB Markets, 2017b). Thus, entailing that companies in low-cost regions could potentially invest in such facilities, and challenge the current industry. Figure 5.3 displays the estimated cost difference of the different salmon farming systems (DNB Markets, 2017b). When comparing open net pens (ONP) with land-based, one can clearly see the advantage of the latter. The costs of land-based production in low-cost countries is estimated to match that of ONP. Currently the cost of land-based production is 6 DKK pr kilogram higher than that of ONP. However, if considering the possible reduction in transportation costs due to the closer proximity to the market, this could lead to total savings of 10-14 DKK pr kilogram. Thus, implying that land-based production is becoming a profitable alternative to the conventional ONP.

However, until now few land-based facilities have been profitable, though this might change with technological advancements, high salmon prices and lower transportation costs (Intrafish, 2018; Liu et al. 2016). Furthermore, figure 5.3 also displays that offshore facilities also could yield high margins with the high price level the producers have experienced in recent years. As the Faroese archipelago and its fjords are producing salmon close to maximum capacity, this could be a possible solution for increased volume in the future ((Asche *et al.*, 2013; Iversen *et al.*, 2016, 2017)

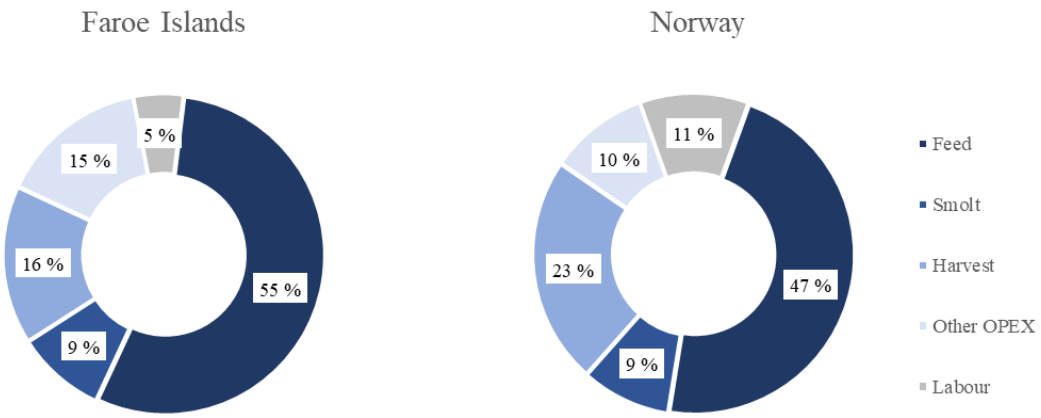
Figure 5.3 – Cost structure of salmon farming technologies (DKK/kg)
(Source: Own contribution; DnB Markets, 2017)



There are also technological advancements within fish feed that could impact salmon farming in the upcoming years. As mentioned in 4.2.1, the feed costs account for a substantial part of total production costs. Historically, fish oil and fishmeal has been the essential inputs of the fish feed. As these commodities have become scarcer in recent years, the prices have increased substantially (Nofima 2015). Consequently, this led to a change in the composition of fish feed in most of the salmon farming regions, where there is a tendency of substituting these inputs for more plant-based commodities, such as soy meal or soy oil (Marine Harvest, 2017). However, in the Faroe Islands, this trend is not evident as there is a belief that marine inputs enhance the quality of the salmon (Nystøyl, 2017; iLaks, 2018). Hence the reason that feed accounts for a more significant share of production costs in the Faroe Islands than compared to for instance Norway, as illustrated in figure 5.4.

Recently, research on new protein sources that could substitute marine-based input has been in focus for producers. Recent test projects have applied insects as an alternative, and the results indicate an insignificant difference in regards to the growth, taste and nutrient composition of the salmon (NIFES, 2015; Lock, Arsiwalla and Waagbø, 2016). As the marine inputs are becoming finite, the use of insect meal and oil could prove to be a more sustainable alternative, and thus have considerable potential in the future (ILaks, 2018).

Figure 5.4 – Comparison of cost distribution per kg
(Source: Own contribution; Bakkafrost, 2018a)



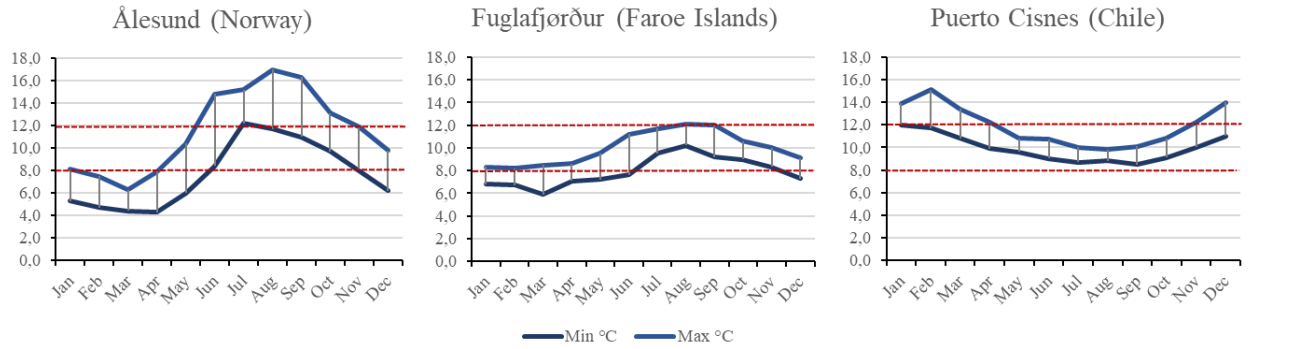
5.1.5 Environmental factors

Since salmon is an ectothermic species, its growth, metabolism, and survivability are highly dependent on seawater temperature (Kullgren 2013; MHG HB 2017). If the temperature is too high, the feed conversion rate decreases, and the salmon's growth along with it. Furthermore, higher temperatures also boost the biological risks, as sea lice, algae and disease outbreaks occur more often. On the other hand, with too low water temperatures, the feed intake become lower, which lead to decreased growth and ultimately reduce the feed conversion ratio. The survivability is however enhanced by low temperature, as long as it stays above sub-zero temperatures (Kullgren *et al.*, 2012).

The optimal temperature for salmon farming is between 8 and 14 ˚C (Marine Harvest, 2017). In figure 5.5, the seawater temperature in Norway, Faroe Islands, and Chile in 2017 have been compared. The optimal temperature is specified with the red dotted line. The figure shows that the Faroese seawater temperature is more stable than in the other regions. The upper limit of the optimal temperature interval was only exceeded in one month, and then only by 0,10 C. Accordingly, this is a definite geographical advantage on the subject of lowering biological risk exposure, and for increased growth and survivability. For instance, compared to

Norwegian salmon, the Faroese is on average around 1 kg larger. Larger salmon are usually sold at a premium, making the Faroese salmon more expensive than the salmon from the other central regions (Nystøyl, 2017).

Figure 5.5 – Seawater Temperature 2017
(Source: Own contribution; World Sea Temperature, 2018)



Even though the Faroese region is less prone to biological issues, there have been incidents there as well. For instance, between 2000-2005, the industry was hit by the ISA-virus, as mentioned in section 4.1. The effect was a reduction in the Faroese harvest volume from 47.000 GWT in 2004, to 12.000 GWT in 2006 before it rebounded (Asche *et al.*, 2010). During the ISA crisis, 26 out of 28 Faroese salmon farmers went bankrupt. Bakkafrost was one of two surviving companies (iLaks, 2018). In the aftermath, the Faroese government imposed new regulations, and a new veterinarian model was implemented to support sustainable development in the industry. This resulted in a volume growth rate of 26,5% between 2006 to 2014 in the region (Marine Harvest, 2017). In Chile, there was a similar crisis in 2007-2010, where the total production volume decreased from 379.000 GWT in 2007 to 98.000 GWT in 2010 (Asche *et al.*, 2010). Moreover, the Chilean region had an algae outbreak in 2016 Q1, which during the three first months of the year had killed as many as 27 million salmon (OECD-FAO, 2016a). When these incidents occur and affect the global supply, the prices usually increase substantially. For instance, after the algae outbreak, the prices in 2016 reached an all-time high (Nystøyl, 2017).

5.2 Porter's five forces

The Porter's five forces analysis provide an insight into the attractiveness of an industry by analyzing the firms' ability to earn abnormal returns (Petersen and Plenborg, 2012). The five forces focus on the competition within an industry by breaking it down to five forces: The threat of new entrants; bargaining power of buyers; the threat of substitutes; the bargaining power of suppliers; and rivalry among existing firms. This section tries to unveil the five forces of the salmon aquaculture industry, and then consider whether this poses any threat to

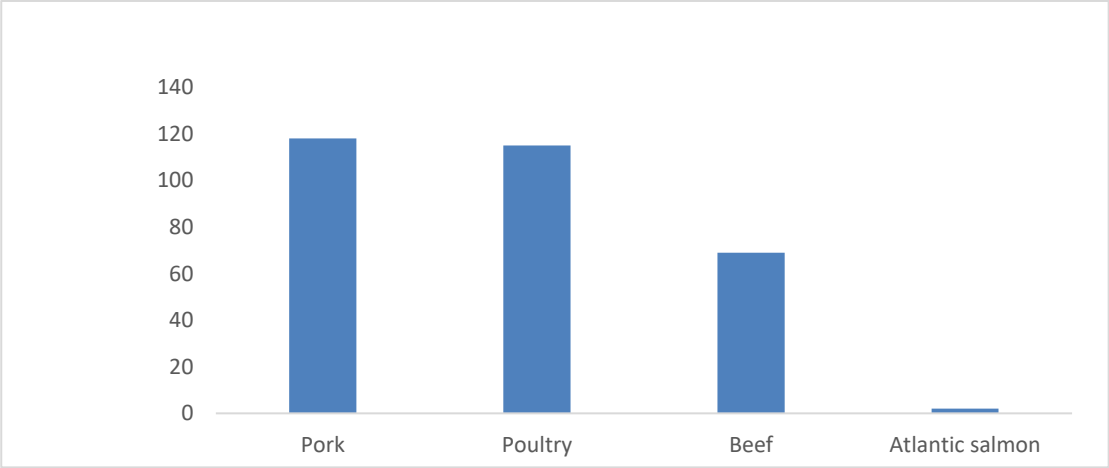
Bakkafrost's current operations. Thus providing a snapshot of the current competitive forces existing in the salmon industry and will provide a basis for understanding future industry profitability.

5.2.1 Competition from substitutes

The threat of substitutes provides the valuation with an understanding of the potential pressure between substitute products that contest for their share of the market (Petersen and Plenborg, 2012). Grant (2016) argues that the power of substitutes depends upon two elements: First, the buyer's propensity to substitute, which grounds in the willingness to pay for substitute products. Secondly, the relative price-performance of substitute products can decide the threat of substitution.

The substitutes of salmon could be many. However, a typical view of close substitutes is alternative protein sources such as beef, poultry, and pork (Torrissen and Onozaka, 2017). According to Kontali Analyse (2016, Cited in Marine Harvest, 2017), the greatest share of animal protein in our diets come from Pork, Poultry, and Beef. Pork represents 118 tons of global consumption, poultry 115 million tons and beef 69 million tons. In comparison, the global consumption of farmed Atlantic salmon was 2.1 million tons in 2016 (Marine Harvest, 2017). The farmed fish-segment is a segment in growth. In 2015, approximately half of all fish consumed worldwide came from aquaculture, and it is expected that by 2030 aquaculture will sustain the production of 62% of fish for human consumption (World Bank, 2013).

Figure 5.5 – Protein Consumption
(Source: Own contribution; Marine Harvest, 2017)



In the recent decades, the consumption of fish and salmon has increased. According to Claret et al. (2012), this trend is an effect of clear messages from marketing campaigns that eating sufficient amounts of fish is key to a healthy and balanced diet. It is a well-established fact among consumers that salmon contains a wide range of vital nutrients, vitamins and healthy fatty acids (Shepherd, Monroig and Tocher, 2016). Moreover, consumption of salmon has the positive effect on reducing cardiovascular and other diseases, whereas consumption of beef and pork can increase this risk (WHO, cited in Marine Harvest, 2017). However, recent research has indicated that salmon can contain contaminants like mercury, which could pose a threat to pregnant women if overeaten. Nevertheless, the health benefits of eating salmon as a part of a balanced diet exceed the adverse effect of contaminants (Carlucci *et al.*, 2015).

A recent trend is that consumers are becoming increasingly concerned with sustainability and ethics regarding food production (Shepherd, Monroig and Tocher, 2016). In the case of farmed fish, there has historically been a perception among consumers that farmed fish is more manipulated, processed and unsustainable, compared to fish caught in the wild and meat from conventional agriculture (Carlucci *et al.*, 2015). However, the opinion is that this perception is likely to decrease in the future once consumers become more 'used' to aquaculture as food production (Claret *et al.*, 2012). The expectation is that over time, the negative images and attitudes connected to aquaculture are likely to erode. For instance, with the continued use of environmental packaging and certifications. An example of such certification is the ASC-certification (Aquaculture Stewardship Council), which assures sustainability throughout the value chain (Sogn-Grundvåg and Young, 2013; MarketLine, 2017)

Moreover, in the future, this notion is likely to increase as another expectation is that aquaculture will contribute to creating a safer and more efficient supply of fish in the future (World Bank, 2013; OECD-FAO, 2017a). Currently, over-fishing of wild fish is a threat to ecosystems in many of the world's oceans (World Bank, 2013; MarketLine, 2017; OECD-FAO, 2017a). However, there are currently environmental challenges linked to farming salmon, such as pollution of the seafloor; domesticated Atlantic salmon escaping to the wild and the spreading of parasites, diseases, and distortion of wild salmon's gene pools (Fischer, Guttormsen and Smith, 2017). Nonetheless, the belief is that technology currently under development, such as land-based and deep-water installations, discussed the PESTEL-analysis, will remedy these challenges in the near future. Therefore, if current producers of salmon such as Bakkafrost succeed in implementing this technology, this could assist in establishing an even stronger positioning of farmed salmon. Resulting in the trend in recent years is that end-consumers have become increasingly engaged in the sustainability of food production. Therefore, this could be argued to be a determinant factor in choosing salmon in favor to other protein sources (Claret *et al.*, 2012; Carlucci *et al.*, 2015).

Based on the above analysis, the situation regarding the threat of substitution to alternative sources of protein might appear low. Nonetheless, a study performed by Claret et al. (2012), indicated that even though fish and salmon have a strong positioning due to its well-known health benefits, the price will still play a significant role. Carlucci et al. (2015) performed a systematic review of 49 studies on consumer purchasing behavior towards customers. Their research indicated that even in affluent countries such as Denmark, Iceland, Norway and Australia the most significant barrier to increased consumption was the price. The question for the future is whether consumers are willing to pay a price premium for a healthy and sustainable protein source, or whether they will remain with cheaper protein from that of conventional agriculture.

To conclude, even though end-consumers proves to be price sensitive, farmed salmon's positive attributes regarding health benefits and new potential towards sustainable production, the threat of substitutes is considered low.

5.2.2 Threat of new entrants

If industry earnings are abnormal, it will attract new firms, or competing firms will vertically integrate their way into production from other industries (Grant, 2016). If entry to the market was unrestricted, the returns would converge towards that of a fully competitive market (Porter, 2008). An entry barrier is defined as any disadvantage that meets new potential market entrants. The threat of new entrants decreases when barriers to entry increase. Grant (2016) points out that usual entry-barriers could be the following: Capital requirements, Economies of scale; Absolute cost advantages; Product differentiation; Access to Channels of distribution and Governmental and legal barriers.

The capital requirements for entering the salmon industry is high. Salmon farming requires large amounts of cash to be locked up in working capital for an extended period, due to the long production cycle, high feed costs and significant capital investments required in production equipment such as nets, cages, feed automats, vessels, and processing plants (Iversen *et al.*, 2016, 2017; Marine Harvest, 2017). Grant (2016, p. 71)also argues that industries with high capital requirements also are subject to economies of scale. Considerable investments in facilities and R&D programs, for instance, requires a significant output to be profitable. Therefore, a prosperous entrance in the market usually requires establishing high amounts of production output relatively quick. This trend is evident in the Scandinavian salmon industry with its consolidated structure with a few numbers of firms controlling the majority of output to the market (Asche *et al.*, 2013; Marine Harvest, 2017).

Another element of high entry-barriers evident in the industry are absolute cost advantages, which refer to the already established firms having secured access to low-cost sources(Grant, 2016). In the industry, there appears to be a trend that firms focus on vertical integration throughout their value chains (Kvaløy and Tveterås, 2008; Engle, Quagrainie and Dey, 2016). As will be accentuated in the value chain analysis, Bakkafrost has backwardly integrated by acquiring feed producers such as P/f Havsbrun, and forward into the Value Added Processing. This trend is also evident among Bakkafrost's Norwegian peers. Subsequently, this provides them with increased control over the industry's most important input and a cost advantage (Kvaløy and Tveterås, 2008). Hence, to be competitive in salmon farming, there are clear indicators that vertical integration, both upstream in terms of feed production and downstream in VAP, is a success factor (Kvaløy and Tveterås, 2008).

In industries with differentiated products, established firms may reap benefits from brand recognition and customer loyalty, which may increase the entry barriers for new entrants (Porter, 2008; Grant, 2016). In the aspect of the product's attributes, salmon could, however, be considered a homogenous with little room for differentiation. Even though there is some form of differentiation through value-added processes such as smoked salmon, these do not lead to any unique positioning that is challenging to imitate (Sogn-Grundvåg and Young, 2013). According to MarketLine (2017), the importance of differentiated products is lower in this industry, which implies that new entrants might not have any difficulties of selling their salmon as long as they meet the standards and certifications reflecting ethical production and sustainability (Sogn-Grundvåg and Young, 2013; Engle, Quagrainie and Dey, 2016)

Government and legal barriers, especially in the form of licenses is an instance that is creating high barriers to entry in the salmon industry. The Faroe Islands, similar to Norway issue licenses, which are required for the production of salmon (Iversen *et al.*, 2017). There is, however, in many cases a high demand for acquiring these licenses among the existing firms in the industry, which means that for new entrants to acquire these are challenging (DNB Markets, 2017b; Marine Harvest, 2017). There might, however, be instances in the future where new entrants could enter the market through innovation. As discussed in the PESTEL analysis, the new land-based technology could disrupt conventional salmon production, and also, the license regulations might be less restrictive as land-based production might not pose a threat to eco-system in the oceans (Government.no, 2015a; Christiansen and Jacobsen, 2017). Thus, the entry barriers to the market could decrease.

To summarize, regarding the above considerations, in addition to the expected growth of the industry in the future, the threat of new entrants in the future is moderate to low unless potential entrants innovate and succeed in land-based production or off-shore production.

5.2.3 Bargaining power of suppliers

The most crucial input in the industry is fish feed, which generally comprise up to 50% of total production cost (Marine Harvest, 2017). The fish feed generally consists of agricultural products such as rapeseed oil, soy meal, and wheat, which are sourced from land-based agricultural production (OECD-FAO, 2011; Marine Harvest, 2013, 2017; Bakkafrost, 2018a). Moreover, the feed is based on marine inputs as fishmeal and fish oil, which are processed products from fish caught in the wild and bi-products from other processing (Iversen *et al.*, 2017; Bakkafrost, 2018a). Thus, the industries' leading suppliers are considered to be the suppliers of fish feed (Kvaløy and Tveterås, 2008; MarketLine, 2017)

As elaborated above, the trend in the industry is that firms to an increasing extent integrate their operations vertically in the value chain. A common strategy is to acquire firms producing the feed, as for Bakkafrost acquired P/F Havsbrun in 2011, and Marine Harvest is developing a feed production plant in Norway and Scotland in 2014 and 2018, respectively (Marine Harvest, 2017; Bakkafrost, 2018a). According to Bakkafrost (2015) and Marine Harvest (Marine Harvest, 2018), by doing this, they obtain control over quality and the security of supply of fish feed (Marine Harvest, 2017). Moreover, they could shield themselves from potential opportunistic behavior from the feed suppliers (Kvaløy and Tveterås, 2008).

On the other hand, there are firms such as Lerøy, NRS, and Salmar, which still not have integrated their feed production (Lerøy Seafood Group, 2018; Norway Royal Salmon, 2018a; SalMar, 2018a). In some cases, such as for NRS, they previously divested their operations in feed production, as it was not considered a part of core operations (Norway Royal Salmon, 2016). Porter (2008) argues that a supplier group is dominant if they are more concentrated than the group whom it supplies. The trend in the past ten years is that the feed industry has become more consolidated, perhaps even more consolidated than the salmon industry itself (Kvaløy and Tveterås, 2008). According to MHG (2016b), there have been three major global companies controlling the output of salmon feed in the recent years, who are not involved in salmon farming themselves. These are *Biomar* with 22% of the Norwegian market share in 2015; *Skretting* with 30% of the market share in 2015 and *EWOS* with 32% of the market share (Marine Harvest, 2017). Consequently, this would imply substantial bargaining power to feed suppliers over the salmon farmers that are dependent on feed sourced externally.

Porter (2008) considers a supplier group secure if they do not depend heavily on one industry alone for its revenues. In the case of EWOS (owned by Cargill) and Skretting, these are large multinational companies that that supply a range of industries with feed. Skretting, for instance, has a diversified industry portfolio and serves other segments within aquaculture such as sea bass, sea bream, and whiteleg shrimp. EWOS, which is a subsidiary of the feed-producing giant, Cargill, also supplies the same markets as Skretting (Marine Harvest, 2017; Grieg Seafood, 2018). Also, they are a significant player in feed supply for agricultural products such as dairy, beef, pork, and poultry. In other words, the feed producers are well diversified (MarketLine, 2017), and not dependent solely on salmon to be profitable.

Porter (2008) argues that if a supplier is only dependent on one industry, it will price products reasonably and collaborate in ways as assisting in R&D technology to protect their segment. On the other hand, if suppliers serve several industries, which is the case in the salmon industry, their propensity to maximize profits by price-increases in each market might increase. Currently, fish feed is the most vital input in the industry, and there are no substitutes for it. Subsequently, this could also increase the supplier power according to Porter (2008). On the other hand, there is little differentiation in the fish feed supplied, moreover, the switching costs between suppliers are low unless individual long-term contracts for the deliverance of feed has been settled (MarketLine, 2017). Overall, in the industry, for those firms who have not integrated vertically, the bargaining power of suppliers is perceived to be strong.

In the case of Bakkafrost which is entirely self-sufficient, and Marine Harvest which are self-sufficient to a large extent – its Norwegian plant provides 86% of feed self-sufficiency on Norwegian operations, their suppliers are the firms that supply soy meal, rapeseed oil, wheat, fish meal and fish oil. The agricultural commodities are sourced from companies in countries such as Argentina and Brazil (OECD-FAO, 2011). For fish meal and fish oil, Bakkafrost source this directly from fisheries located on or close to the Faroe Islands Bakkafrost (2017). Such agricultural commodities are perceived as homogenous, whose price is determined by supply and demand (Bakkafrost, 2017). The suppliers of raw material are deemed not have considerable bargaining power due to the homogenous nature of the product (Øglend, 2010; Engle, Quagrainie and Dey, 2016).

To summarize, the supplier power in the industry is believed to be strong concerning the producers that are dependent on sourcing feed externally. In the case of Bakkafrost, which is entirely sufficient on own feed, and Marine Harvest which is mostly self-sufficient, the power of the feed suppliers is considered weak.

5.2.4 The power of buyers

According to Porter (2008, pp. 83–84), influential customers can capture more value by demanding lower prices, better quality, more service and making industry participants bid against each other. Buyers with substantial negotiating leverage relative to industry participants are considered strong. Moreover, if the buyers themselves are sensitive to price, they would put increased pressure on the industries' firms. Porter points out that buyers can posit bargaining power if: (1) buyers are few; (2) the industry's products are undifferentiated; and (3) there are few switching costs.

To determine the buyer power of the suppliers, an understanding of how salmon is distributed is required. The salmon industry mainly sells its produce B-2-B to wholesale buyers or directly to retail companies, which in turn serve end-consumers. According to Eagle, Quagrainie and Dey (2016), argues that salmon is distributed by the farmers. The products are either sold in the form of whole fish or fillet fresh, where they are further distributed to further processors or wholesalers and from there distributed to retailers and restaurants. As elaborated earlier, many farmers also produce VAP themselves. In Bakkafrost's case, approximately 50% of their value-added products are sold to retailers within the supermarket industry on long-term contracts, which relationships has lasted up to 15 years (Bakkafrost, 2018a). In 2017 for instance, 59% of all VAP sold to one customer (Bakkafrost, 2017).

According to analysts' reports provided by MarketLine (2017), the consensus is that buyers come in sizes as small food brokers who may act as both wholesale dealers and retailers, to food processing buyers and supermarket chains. Using Porter's (2008) arguments, supermarkets are likely to have incentives to decrease the price, also, adding to that effect that the end-consumers are considered price-sensitive (Carlucci *et al.*, 2015). However, according to Asche, Misund and Øglend (2016), salmon has become a staple part of consumer's diets, and the supermarkets are therefore required to have it in their counters. Nevertheless, it is probable that they will have some bargaining power over prices, at least in the case of the largest retail chains (MarketLine, 2017). Furthermore, the buyers could also benefit from low switching costs between salmon producers, unless they have engaged in long-term supply contracts (MarketLine, 2017).

The salmon sold directly to other processors and wholesale, as the figure above illustrates, are less differentiated compared to products that the salmon producers further process themselves, such as smoked salmon. Overall, the differentiation of salmon products is low, and combined with low switching costs of the choice from which producer to source the salmon (Sogn-Grundvåg and Young, 2013; Engle, Quagrainie and

Dey, 2016; MarketLine, 2017), this might have some effect on the bargaining power. The overall buyer power is considered moderate (MarketLine, 2017).

5.2.5 Rivalry among existing firms

Porter (2008, p. 85) argues that rivalry among existing competitors can take many forms such as price wars, new product introductions, advertising campaigns and improved services. Porter (2008) argues that the most competitive industries are those where the firms mainly are of the same size and in a large number. In such situation, growth without stealing other firm's business might be difficult to avoid; this would, however, be in contrast to the structure in the salmon industry.

In the salmon industry, the sizes of the firms are varied and represent small to very large firms. Moreover, the firms' output is highly regulated with farming licenses allotted to each firm (Larsen and Asche, 2011). Therefore as long as demand stays high and constant, which currently is the trend (Øglend, 2010; Zhang, Myrland and Xie, 2016), and as long as supply remains steady, producers would not have little to gain from undercutting each other on price (Larsen and Asche, 2011). According to Fischer et al. (2017, p. 11), the salmon industry has many traits that resemble that of Cournot competition. The firms commit to a given quantity, as the scheduled future production is determined 2-3 years before harvest. Thus, price wars are not that likely as long as players commit to quantity, and as long as demand does not change drastically (Larsem and Asche, 2011)

Porter (2008) also argues that the intensity of the rivalry is likely to be higher if the industry growth is low. The salmon farming industry is still an industry with substantial growth regarding revenue. According to EY (2017) salmon production has experienced significant growth since 2007 and is expected to continue at a steady growth at a rate of 5% CAGR[10] globally. Moreover, if the new technologies are to be successfully implemented allowing for land-based and deep-sea production, current well-established firms might be allowed to produce more without having to compete for already a limited amount of licenses (EY, 2017).

Due to the relatively low differentiation of salmon products (Sogn-Grundvåg and Young, 2013), the leading competition in the market is mainly for lucrative supply contracts to large-scale wholesalers and retailers. Also, low switching cost between buyers increases the rivalry within the industry. However, as will be illustrated in the profitability analysis (section 8), the profitability in salmon aquaculture is relatively good, which could be

[10] CAGR – Compounded annual growth rate

an indicator that competition is not fierce. Another indicator of the low degree of rivalry is the collaboration of various market participants. For instance, Salmar's and LSG's joint venture in Scotland and GSF's joint venture with Bremnes Fryselager[11] (Grieg Seafood, 2018; Lerøy Seafood Group, 2018; SalMar, 2018a). Similar traits are also evident in the Faroes, where the farmers divided the fjords between them when the "one fjord – one producer" initiative was implemented (Iversen *et al.*, 2017). Conclusively, the rivalry is considered low to moderate.

5.3 Value chain analysis

The term "fully integrated value chain" is frequently used by the major players in the salmon farming industry when describing themselves (Grieg Seafood, 2018; Lerøy Seafood Group, 2018; Marine Harvest, 2018; Norway Royal Salmon, 2018a; SalMar, 2018a). The value chain describes the full range of activities that are required from the conception of a product or service, through the production phase and to its end-destination. By controlling the value chain, the companies can mitigate risk, secure long-term sustainability and incorporate competencies into the organization (Kaplinsky and Morris, 2001). However, after researching the salmon producers in-depth, it became evident that the degree of integration varies, and that the term might be misused.

In order to examine Bakkafrost's degree of integration compared to peers, a value chain analysis has been conducted. The primary purpose of the analysis in this section, is to examine the core activities in the industry and to complement the VRIO analysis. Therefore, the whole value chain, from upstream to downstream activities has been analyzed.

5.3.1. Eggs and hatcheries

Bakkafrost currently has no broodstock or egg production and is therefore dependent on external suppliers for fertilized eggs used in their hatcheries. However, this will change in the future, as Bakkafrost succeeded the Faroese broodstock program from p/f Fiskaaling 1st of April 2018 (Bakkafrost, 2017, 2018a). In this agreement, there is also an option that Bakkafrost can exercise if they want to take over the genome rights in 2021. The group announces that they will use the next three years to evaluate whether they will integrate into this part and if a new broodstock facility should be constructed. Most of the peer group are present in this part of the value chain, but only LSG is self-sufficient. Similarly, as Bakkafrost, NRS has no presence (Lerøy

[11] A non-listed salmon producer from Norway (seashore.no).

Seafood Group, 2017; Grieg Seafood, 2018; Marine Harvest, 2018; Norway Royal Salmon, 2018a; SalMar, 2018a).

BAKKA and all peers, except NRS, are self-sufficient regarding spawning facilities. NRS has a long-term goal to become self-sufficient at this stage in the value chain and has invested in new facilities (Norway Royal Salmon, 2018a)

5.3.2. Smolt and farming activities

Regarding smolt production Bakkafrost is self-sufficient. The management has announced that the recent and upcoming investments in new post-smolt facilities are expected to yield an average smolt size of 500 grams in 2020. If successful, this should reduce the production time in the sea from 24 to 14 months (including fallowing period), and thereby increase efficiency and mitigate the biological risk exposure substantially (Bakkafrost, 2018a). Likewise, this is also a trend among the peer companies. All the peer companies are self-sufficient of smolt, except SALM and GSF (Lerøy Seafood Group, 2017; Grieg Seafood, 2018; Marine Harvest, 2018; Norway Royal Salmon, 2018a; SalMar, 2018a).

As farming is the core business of all Bakkafrost and its peers, all are self-sufficient at this stage. Bakkafrost has 21 farming licenses in the Faroe Islands, where each account for the yearly production of salmon of 3.000 TGW with the current production regime (BAKKA AR 2017). As mentioned, the post-smolt can reduce the production cycle and thereby increase efficiency, which ultimately can maximize the output per license. As a support to the farming operations, the group has five farming service vessels (FSV). These vessels transport the salmon between the marine stages in the production cycle, and two of the FSVs can do mechanical delousing treatment, with lukewarm water technology (Bakkafrost, 2017, 2018a).

5.3.3 Fish Feed

The global fish feed production is dominated by three players, namely Skretting, Ewos, and Biomar, as discussed in section 5.2. Their share of the total production volume amounted to about 84% in 2015. MHG is the fourth largest producer, with a market share of approximately 16% in the same year (Marine Harvest, 2017). Of the peer group, MHG and Bakkafrost are the only salmon farmers with a presence in this segment (Bakkafrost, 2018a; Grieg Seafood, 2018; Lerøy Seafood Group, 2018; Marine Harvest, 2018; Norway Royal Salmon, 2018a; SalMar, 2018a). This grants further control over the value chain, and reduce the exposure to input price (Marine Harvest, 2013, 2017; Bakkafrost, 2018a). However, MHG is not self-sufficient of fish

feed, like Bakkafrost has been since 2011. MHG supplied about 86,5% of their Norwegian operations in 2016, while the other production regions were dependent on external suppliers (Marine Harvest, 2018). Bakkafrost used about 93% of their fish feed internally in 2017, while the remainder was sold externally. Also, the group has been selling excess fishmeal and fish oil in the market (Bakkafrost, 2016, 2017, 2018a).

5.3.4 Processing

All the salmon Bakkafrost produces, is harvested at their factories in Glyvrar, Kollafjørður and Vágur. The daily production capacity of these facilities based on single shifts amounts to 350, 100 and 40 tonnes WFE[12], respectively. However, if required, the double shift can increase the overall daily capacity of 100-150 tonnes WFE (Bakkafrost, 2018a). All peers self-sufficient in this phase of the value chain companies, except GSF (Lerøy Seafood Group, 2018; Marine Harvest, 2018; Norway Royal Salmon, 2018a; SalMar, 2018a). While GSF is self-sufficient in three out of four of their regions, they are dependent on external suppliers in the Canadian region (GSF AR 2016; GSF AR 2017).

Concerning the secondary processing, Bakkafrost has a long-term target of using 40-50% of their volume share for VAP production and to accommodate this; the group has built a top-of-the-line factory at Glyvrar (Bakkafrost, 2018a). This facility started the operating in 2017, with a daily production capacity of 100 TGW. Moreover, MHG, LSG and SALM have operations in this segment, while GSF and NRS buy their VAP products from external suppliers (Lerøy Seafood Group, 2018; Marine Harvest, 2018; Norway Royal Salmon, 2018a; SalMar, 2018a).

5.3.5 Sales and distribution

BAKKA operates one sales office in the Faroe Islands and one in the UK. All the sales are made in-house, and the group's strategy is to balance the mix of sales between different geographical markets and product segments (Bakkafrost, 2017, 2018a). All VAP are sold on 6-12-month contracts, while the larger-size salmon are sold HOG[13] in the spot marked. The distribution network is based on transport by ships to Russia and Europe, while air freight is used for Asia and US exports. For frozen products to the far away markets, shipping is preferred (BAKKA AR 2017; BAKKA AR 2015). All peer companies have a presence in this phase, but

[12] WFE – Whole Fish Equivalent
[13] HOG – Head On Gutted

SALM outsources a portion of their sales, and are therefore dependent on external sales agencies (Lerøy Seafood Group, 2018; Marine Harvest, 2018; Norway Royal Salmon, 2018a; SalMar, 2018a).

The level of integration in the value chain for Bakkafrost and selected peers are summarized in Figure 5.6.

Figure 5.6 – Level of integration in the close peer group
(Source: Own contribution; (Bakkafrost, 2018a; Grieg Seafood, 2018; Lerøy Seafood Group, 2018; Marine Harvest, 2018; SalMar, 2018a)

	Broodstock & Eggs	Spawning	Smolt	Farming	FOF	Processing		Sales & Distribution
						Primary	VAP	
BAKKA	X	✓	✓	✓	✓	✓	✓	✓
MHG	O	✓	✓	✓	O	✓	✓	✓
SALM	O	✓	O	✓	X	✓	✓	O
LSG	✓	✓	✓	✓	X	✓	✓	✓
GSF	O	✓	O	✓	X	O	X	✓
NRS	X	O	✓	✓	X	✓	X	✓

5.4 VRIO Analysis

To analyze and evaluate BAKKA's resources and capabilities, the VRIO-framework have been applied (Barney, 1995). This analysis applies four criteria for evaluating if the resources and capabilities cause any competitive advantage and to which degree. The first criterion is if the resource adds value to the firm, while the second is the rarity of the resource in the industry. If a firm's resource or capability possess the mentioned attributes, it holds a temporary competitive advantage. However, for this to sustain, the degree of imitability needs to be assessed. Consequently, this is dependent on if competitors face a cost disadvantage if they obtain the same resources. Lastly, to fully reach its potential, a firm must be able to be organized around the resource or capability to exploit the full competitive advantage. If all these attributes are present, the firm is facing a sustainable competitive advantage (Barney, 1995; Barney and Clark, 2007). The structure of the analysis is illustrated in figure 5.7. In this analysis, the focus will be on the following resource categories: Value chain integration, geographical location, human capital, leadership, and technology.

Figure 5.7 – Decision criteria for the VRIO analysis
*(*Source: Own contribution; Barney & Clark 20017*)*

Valuable?	Rare?	Costly to imitate?	Organized to capture value?	Result
no				Competitive disadvantage
yes	no			Competitive parity
yes	yes	no		Temporary competitive advantage
yes	yes	yes	no	Unused Competitive advantage
yes	yes	yes	yes	Sustainable competitive advantage

5.4.1 Value chain integration

As mentioned in the value chain analysis, Bakkafrost's level of integration is rare and without a doubt valuable (Bakkafrost, 2018a). Kvaløy & Tveterås (2006) argue that companies within the industry can obtain cost advantages if they vertically integrate into the FOF segments, which Bakkafrost currently has done. This notion will also be supported later, in the section analyzing peer group profitability in section 8. Therefore, it might be realistic that other major players, such as SALM and LSG, could consider entering this segment if there is a significant cost reduction benefit arising in the long-term. By considering this, the value chain is not regarded as inimitable. The level of organization of the value is high (Bakkafrost, 2017, 2018a) as BAKKA's value chain seems to be one the most streamlined and efficient in the industry. Conclusively, the value chain integration has been considered to be a temporary competitive advantage.

5.4.2 Geographical location

The location of the Faroese archipelago has proven to be valuable for Bakkafrost, as the stable seawater temperature enhances growth and lowers the mortality rate of the salmon (Nystøyl, 2017; Bakkafrost, 2018a). When comparing the salmon's mortality rate in the Faroes and Norway, there is a distinctive difference. In the former, the mortality rate has recent years varied around 6%, while in Norway it has been close to 20% in the same period (DNB Markets, 2017b; Iversen *et al.*, 2017). Furthermore, as there are only three producers at the Faroe Islands, access to this region is rare and limited (Marine Harvest, 2017). The larger-sized salmon produced in the region has historically been sold at a premium, which has improved Bakkafrost's performance (Bakkafrost, 2018a). Also, there is a plentiful access to raw material for feed production in their region from local fisheries (Bakkafrost, 2018a). However, there is one limitation, namely the limited space for growth of conventional cage-based salmon farming (Iversen *et al.*, 2016; Danmarks Nationalbank, 2017) To continue to grow, Bakkafrost is dependent on efficiency gains, expanding to new regions or investing in new salmon

production technologies, such as off-shore or land-based. All into consideration, the geographical location is regarded as a sustainable competitive advantage.

5.4.3 Human capital

In the annual report, BAKKA (Bakkafrost, 2018a) states that the employees are the most critical assets of the firm. The group disclose that investing in their employees regarding training and education is of importance, but this is a common perception among the other firms in the peer group as well (Lerøy Seafood Group, 2018; Marine Harvest, 2018; Norway Royal Salmon, 2018a; SalMar, 2018a). To determine if the employees possess knowledge and expertise that is rare or inimitable is difficult from an external standpoint. It is reasonable to assume that the other peers also have competent employees. Based on this, the employees are perceived to be valuable for BAKKA, but they are not considered rare or inimitable. Therefore the human capital is regarded as a competitive parity.

5.4.4 Leadership

The CEO of BAKKA, Johan Regin Jacobsen, has been influential in the decision making in Bakkfrost since 1989 when he was appointed CEO (Bakkafrost, 2018b). Some of the decisions, such as focusing on salmon instead of herring; integration in the value chain; and the IPO were all decisions Jacobsen was a part of. In hindsight, these have proven to be crucial for Bakkafrost's development (Ilaks.no). However, it is hard to predict how Bakkafrost would have developed under different leadership. The leaders of the other peer companies also have a good result to show for, but not over the same time span as Jacobsen (Grieg Seafood, 2018; Lerøy Seafood Group, 2018; Marine Harvest, 2018; Norway Royal Salmon, 2018a; SalMar, 2018a). Based on this, Jacobsen is considered to have been a valuable and rare resource for BAKKA, but not inimitable. The leadership is therefore considered to be a temporary competitive advantage.

5.4.5 Technology

In consideration of technology, Bakkafrost's has been strategically focused on post-smolt facilities and non-medical sea lice treatments (Bakkafrost, 2018a). In that relation, they have built the new VAP facility at Glyvrar, with a high degree of automation (Bakkafrost 2017). Even though Bakkafrost entered early into post-smolt and non-medical sea lice treatment technologies, this is common among some of the other peer companies as well (Grieg Seafood, 2018; Marine Harvest, 2018; SalMar, 2018a). On the other hand, peers such as MHG and SALM are more invested in new technologies than Bakkafrost. For instance, the off-shore

and closed pens (Marine Harvest, 2017; SalMar, 2018a). Therefore, the group's technological resources are regarded as valuable, but not rare or inimitable, which would classify it as a competitive parity (Barney, 1995).

Figure 5.8. Illustrates the result from the VRIO analysis.

Figure 5.8 – Summary of VRIO analysis
Source: Own contribution; Bakkafrost, 2018a; Grieg Seafood, 2018; Lerøy Seafood Group, 2018; Marine Harvest, 2018; SalMar, 2018a)

Resource / Capability	Valuable?	Rare?	Costly to imitate?	Organized to capture value?	Conclusion
Technology	yes	no	no	yes	Competitive parity
Human capital	yes	no	no	yes	Competitive parity
Value chain	yes	yes	no	yes	Temporary competitive advantage
Leadership	yes	yes	no	yes	Temporary competitive advantage
Geographical location	yes	yes	yes	yes	Sustainable competitive advantage

6. Accounting quality

Petersen & Plenborg (2012) argues that a financial statement analysis in a time series requires that a company has used the same financial reporting standards over time. Moreover, in a cross-sectional profitability analysis of peer companies, it is important that peer companies have applied similar accounting policies. This section will briefly discuss some issues relating to accounting quality in the Salmon farming industry, drawn from conclusions in a report published by the Finance Supervisory Authority of Norway (2015), and issues relating to accounting for leases.

6.1 Fair Value Accounting for Biological Assets

In salmon aquaculture, the practice of fair value adjustments of biological assets is especially an item that has been argued to detriment accounting quality for its users (Misund, 2018). Penman (2013) points out that the issue with fair value accounting, in general, is that circularity can occur, where the accounting used to challenge prices is incorporated in the prices to be challenged. Consequently, this might cause a drift in the anchor laid in financial statements in a fundamental valuation (Penman, 2013).

Biological assets pose a large proportion of the assets of the firms in this industry; commonly in the range of 30-50% of total assets (FSA, 2015; Misund, 2018). Due to the substantial proportions, the associated fair value adjustments performed each year can significantly affect firms' operating income. The fair value accounting for biological assets in the salmon industry is considered controversial, and its opponents claim it leads to volatile financial reporting. Consequently, harming the usefulness for decision-making in financial statements (Misund, 2018). In 2014 the Finance Supervisory Authority of Norway initiated a study to revise the practices of fair value accounting for Salmon Farmers listed at Oslo Stock Exchange. The main issue revealed a lack of standardization in the practices used to value the biomass.

To value salmon in stock, the practice is to separate the salmon into groups based on their growth phase. The youngest group consisting of roe, fry, and smolt is valued based on historical cost. The second group, which consist of alive salmon in the ocean weighing less than 1 kg, are also measured at historical costs. The third group consisting of salmon in the weight range from 1-4 kilogram are considered immature and not harvest-ready. Their quantity is estimated by using growth models and valued by using spot prices or forward prices at expected future harvest date. The last group contain salmon above the weight of 4 kilograms, these are considered harvest-ready, and their value is based on spot prices (FSA, 2015; Bakkafrost, 2018a)

The main issue according to FSA (2015) is that the fair value adjustment is made on an asset that is unobservable. Farmers cannot precisely say how much they have in their stock until harvest-day. Moreover, the forward-prices used in the fair value assessments can fluctuate significantly from period to period (FSA, 2015; Misund, 2018). Consequently, this leads to sizeable fair value adjustments in one period, which have to be 'bled back' as fair value gains or losses in subsequent periods, to use the words of Penman (2013). According to Misund (2018), this occurs frequently, and the fair value accounting that should increase information quality to stakeholders has the opposite effect. The models applied for estimating quantity and growth can be consistently different between firms. Moreover, the companies can choose which prices, i.e., spot price or forward prices with the different maturity to use in the fair value adjustment (FSA, 2015; Misund, 2018).

6.2 Property, plant and equipment

Firms systematically depreciate PPE over their useful lifetime, and management can themselves decide which scheme they perceive best fit to reflect the useful lifetime of the assets (Petersen and Plenborg, 2012). The salmon industry is capital intensive, and property, plant, and equipment consist of 20-30% of the firm's total

assets (FSA, 2015). The associated depreciation cost, therefore, contribute significantly to the cost composition of companies in the industry.

FSA (2015) points out that the line items on the balance sheet of the firms in the industry have varying practices regarding which items are included in the different classes of PPE. FSA (2015) argues for a system where broad classes of PPE, such as Machinery and Other equipment, is disaggregated and separated into narrower classes such as vessels, freight and other production equipment such as nets, cages, and supplies (FSA, 2015, p. 47). They argue this will improve transparency regarding depreciation of assets between the firms, and improve the accounting quality. Since the launch of FSA's report in 2015, an increase in the number and standardization of line items can be observed in the financial statements of the companies. However, in the years prior to that some judgment and aggregation had to be done in the reformulation of financial statements between peers in the analysis. However, it is not assumed that this will detriment the analysis in this paper significantly.

6.3 Accounting for leases

Leasing is a widely used source of financing for many companies (Penman, 2013). However, the current IAS 17 standard allows some groups of leased assets to be expensed directly in the income statement as an operating expense, without a corresponding operating asset and a financial obligation being capitalized in balance sheets (Petersen and Plenborg, 2012; IFRS, 2016). However, if such a lease in substance was a purchase, where the lessee is in control of the asset for most of its useful life, the lease should be capitalized on the lessee's balance sheet (IFRS, 2016). Otherwise, it would be a source of off-balance sheet financing (Penman, 2013). From January 1st, 2019 the new IFRS 16 will be implemented which requires most operating leases to be treated as finance leases. Subsequently, this entails that off-balance sheet leases associated with a straight-line expense, will be replaced with a depreciation charge and an interest expense allocated to financial items (IFRS, 2016).

In relation to the profitability analysis of Bakkafrost and their peers performed in section 8, some of the firms report having material amounts of operating leases. Moreover, they report that the implementation of IFRS 16 will have impacts on their financial statements. Bakkafrost (2018), NRS (2018) and Lerøy (2018) report that their amounts would not cause any material changes to the balance sheet after the implementation of IFRS 16. Salmar (2018) and Grieg Seafood (2018) report material amounts, however, it is not expected that capitalizing their leases would significantly enhance comparability. However, Marine Harvest' operating leases had a value that comprised 31% of total financial obligations (Appendix 2). Since MHG has such a significant portion of their leases classified as operating leases, it was decided to capitalize their leases in the reformulation.

7. Reformulation of financial statements

According to Penman (2013), published financial statements are better suited for credit-analysis by dividing items of the financial statements into current and non-current items. Therefore, according to Penman (2013), for equity valuation, the financial statements should be reformulated to distinctly separate operating and financial items instead. A separation of operating and financing is performed as inspired by the Modigliani-Miller proposition, that only the operating activities create value for the firm. The financing activities are considered a zero-sum game, except from the potential tax benefits that may arise from holding debt (Nissim and Penman, 2001). Moreover, the separation is performed due to a distinct feature of accounting-based valuation and the ReOI-model. Thus a separation of assets stated at market value, from those stated at book value (Nissim and Penman, 2001, p. 112). The importance of this separation is discussed further in section 11 explaining the Residual Operating Income Model.

The financial statements of Bakkafrost and their peers have been reformulated to establish a basis for discovering the drivers of ROCE, and for forecasting and valuation purposes. Also, it will provide comparability in the peer group analysis and the multiple valuation, as their financial statements will be reformulated according to the same principles, and isolate unusual earnings items from core. This section will discuss the reformulation process and the underlying assumptions for categorizing items in the balance sheets and income statements as operating or financing.

In the reformulation, operating assets are defined as the assets and liabilities that are involved in the business by selling goods and services. On the other hand, financing assets and liabilities are those that are involved in raising cash for operations, and distributing excess cash from operating activities (Penman 2013). The sections below will shortly discuss each line item in the balance sheet, and the assumptions underlying its classification. The characteristics determining whether a balance sheet item is financial or operating can vary slightly between academics. However, in this paper, we are taking an approach as outlined by Penman (2013). The reformulated financial statements of Bakkafrost and the companies in the peer group can be found in appendix 1-6.

7.1 Balance Sheet

7.1.1 Operating assets

Accounts receivable: The accounts receivable is an operating asset as it arises from Bakkafrost and its peers selling salmon as part of its core operations. Classified as an operating asset.

*Biological assets***:** This item in the balance sheet represents the fair value of the firms' current stock of living salmon: in the form of fry, fish in the sea and broodstock (Bakkafrost, 2017, 2018a, Grieg Seafood, 2017, 2018). However, as discussed in the Accounting Quality-section, there are issues related to how biological assets are accounted for in relation to valuation purposes. To encounter this, the reformulation has divided the biological assets into one line item on cost basis, and one item that represents the portion at fair value. This separation was based on additional information disclosed in the notes of the financial statements (Bakkafrost 2017, p. x). Biological assets are treated as an operational item.

*Inventory***:** According to the notes in the AR of Bakkafrost, this item is broken down to 'raw-materials and goods in-progress' and 'finished goods'. The first contains raw materials for Bakkafrost's FOF-production and spare parts. The 'finished goods' consist of products ready for sale such as Fish feed, fresh, frozen and processed salmon products (Bakkafrost, 2018a). This item is classified as operational on the reformulated balance sheet.

*Other receivables***:** This item consists of *receivables from associated companies; prepayments; Deposit for interest – and currency swaps; VAT;* and *other* which is not specified in more detail in the annual reports. All items are considered operational except *Deposit interest and currency swaps*, which is detached and presented as a separate line item under financial assets.

*Intangible assets***:** This item consists of the combined value of Bakkafrost's goodwill and the farming licenses they currently hold. Holding licenses is vital to legally producing salmon in the fjords of the Faroe Islands. A majority of Bakkafrost's growth and strategic success was achieved through mergers and acquisitions. Goodwill arises when one company acquires another with a price premium, as an effect of the acquired company's good reputation (Koller, Goedhart and Wessels, 2010; Penman, 2013), knowledge or other intangible competitive advantage. Intangible assets are classified as an operating asset.

*Property, Plant, and Equipment***:** The PPE-category covers five line items, which are the primary operating assets used for salmon production: 'Land buildings and other real estate; Plant machinery and operating equipment; other operating equipment; Vessels; and Prepayments of purchase of PPE. These items are all classified as operating assets.

Investments in associated companies: The investments comprise of investments in companies with ownership from 20% to 76%. Until 2016/17 these companies consist of P/F Pelagos and P/F salmon Proteins (Bakkafrost 2017). The investments in these companies are strategic and provide essential support to the operations of Bakkafrost. Therefore, it is considered an operational item.

Investments in stocks and shares: This item entail investments in stocks and shares. In the 2017annual report, it however not stated whether these investments relate to the operations or not. However, until 2011, the companies stated are disclosed as strategic investments, which could indicate a strategic motive of holding

these assets. Nevertheless, according to Penman (2013), investments in other firms are investments in these firm's operating and financing activities. Ideally, their financial statements should also be investigated to classify operational and financing activities. The workload of doing this would be too large, moreover these companies' financial statements are not public. However, if the stocks and shares were considered as 'short-term equity investments' temporarily used to "mop-up" superfluous cash, they would be classified as financial items (Penman, 2013). They are however listed as non-current and assumed to be long-term equity investments. Thus, classified as operating. Also, for residual earnings forecasting purposes, it should be stated that these items are classified at cost in the annual statements (Bakkafrost, 2018a)

Other non-current receivables and other long-term receivables: No additional information related to this item is provided in the notes, nor is there any information provided in the management discussion and analysis. Penman (2013) argues that if items are of a material amount, companies are required to disclose additional information in the annual report. However, since no other information is provided regarding these items, they are assumed to be operating.

7.1.2 Operating liabilities:

*Deferred taxes***:** This liability arises from tax differences in calculating the operating income component of taxable income and the reported book income(Penman, 2013, p. 297). This liability is classified as an operating liability.

*Current tax liabilities***:** Operating

Trade payables: Operating.

*Provision for onerous contracts***:** As a part of their routine operations, Bakkafrost enters into contracts to deliver VAP (Value Added Processed) products at predetermined price and quantity. They accentuate in their annual report that these contracts do not contain any built-in derivative elements. According to Bakkafrost these contracts obligates them to sell salmon products at a price less than production cost, including fair value adjustment of raw materials at the point of harvesting (Bakkafrost, 2018a). These contracts are therefore considered onerous or 'loss-making', and provisions for these are recognized in the statement of financial position. Since this item is regarded as part of operations, it is treated as an operating liability.

Other current liabilities: No additional disclosure is given of this item in the notes of the annual report. Penman (2013) argues that if nothing else is stated, items labeled as 'other' could be assumed as operating. Moreover, as mentioned, if this item had been of material significance, they would be required to disclose additional information.

7.2 Financial Items:

Cash and cash equivalent: It is not stated anywhere that they have any cash tied up to the operations. Therefore, the whole line item is classified as financial.

Short-term interest-bearing debt: Consist of derivatives and security account derivatives, hence, these items are classified as financial obligations.

Long-term interest-bearing debt: Consist of long-term interest-bearing debt and bonds. Classified as a financial obligation.

Derivatives: The firm holds derivatives, mainly in the form of currency forward contracts and interest rate swaps. According to Bakkafrost (2018a), these items are used to hedge the interest rate risk and currency risk connected to the group's multilateral operations.

Deposit interest and currency swaps: Originally a part of *Other Receivables*, however, due to its financial nature it is booked as a financial asset in the reformulated balance sheet.

7.3 Reformulation of the income statement

Similar to reformulating the balance sheet, the scope of the reformulation of the income statement is to separate income arising from operating income from the financial. In the reformulation of the income statements, the procedure outlined In Penman (Penman, 2013, p. 306) has been followed. The first distinction made in the analytical income statement is to recognize separate levels of operating income. The reformulated comprehensive income statement is separated into the margins*:*

Gross margin: presents operating revenue less purchase of goods and change in inventory at cost.

Core Operating income from sales after tax: Bakkafrost's ability to trade with its customers is illustrated by adding this margin. Items such as equity income from subsidiaries, which does not arise from sales are therefore not included (Penman, 2013). The *Purchase of goods*; *Change in inventory and biological assets at cost; salary and personnel expenses* and *depreciation* is deducted from revenue establishing operating income from sales. Moreover, the after-tax margin also illustrates the amount of tax generated by the operating activities.

Core Operating Income is derived by adding income from associates and the tax generated from that post.

Operating income after tax, is derived at by adding other before tax items and the tax generated by these posts. Also the after-tax items from the comprehensive income statement are added if deemed as operating.

Comprehensive income is derived by adding the net financial items.

According to Penman (2013), the tax expense should be allocated to the level in the reformulated income statement where the tax is generated. For instance, as shown in the income statement, the tax allocated to Core operating income from sales is derived by first taking the full amount of tax as reported. Then the tax arising from *core other operating income* and *unusual items,* are deducted. Lastly, the Net tax effect of financial benefit arising from financing activities is added back. By doing this, an approximation of the proportion of how much of the tax was generated from core operations, other operating activities, unusual items, and the tax effect from financing activities is made.

The tax regime in the Faroe Islands consists of a nominal tax rate of 18% (Bakkafrost, 2018a). It should be mentioned that Bakkafrost has a sales office in the UK where the tax rate is at 20%, and some sales operations in Norway where the tax rate is at 23%. However, since the material amount of Bakkafrost's core operations are located in the Faroe Islands, the nominal tax rate of 18% is used exclusively (Bakkafrost, 2018a). In addition to company tax, Bakkafrost also disclose an additional revenue tax of 4.5%, which was implemented in the Faroe Islands from 2016. This tax is only applicable for the revenue generated from farming activities. However, as they argue themselves, the special revenue tax falls outside the scope of IAS 12[14], and thus the revenue tax is recognized as a cost in their income statement (Bakkafrost, 2017, 2018a). In the reformulated income statement, the tax is added to the tax generated from the core operating income from sales. However, it assumed that the revenue tax does not have a tax effect on financial items, since Bakkafrost disclose the revenue tax as a cost in their financial statement (Bakkafrost 2017) (Appendix 1).

7.3.1 Unusual Items

With forecasting in mind, the only items of interest are those that takes a bearing in the future, and thus can assist in forecast future growth (Penman 2013, p. 396). Thus, the reformulated income statement was normalized by distinguishing core (persistent) from unusual (transitory) earnings. This section will further describe the assumptions underlying the items in the income statement that needed further judgment. Thus, on which basis the items are assumed financial or operational, and whether they are perceived to be persistent or transitory earnings. By looking at the reformulated income statement (appendix 1), it is clear that some of the items occur infrequently. The items *loss on sale of subsidiary; Acquisition costs; Listing cost; Badwill related to acquisitions; Currency translation differences; Adjustment on treasury shares; Fair value adjustment on purchased non-controlling interests; Profit and loss from discontinued operations;* and *Reversal of fair value*

[14] IAS 12 – International Accounting Standard 12 – Provides the outline for how to account for taxes.

adjustment on the interest rate swap, could according to Penman (2013, pp. 399–401) be considered transitory, and are therefore treated accordingly. All of these are considered as operational, except for, *Reversal of fair values adjustment on the interest rate swap* which is classified as an after-tax financial expense.

Regarding the item *Fair Value Adjustments on biological assets*, as elaborated in the above paragraph, the actual amount of biomass salmon producers has in stock cannot be ascertained until it has been harvested, and the price used for the valuation is fluctuating. As a result, the fair value adjustments from period to period can be substantial. The fair value adjustments of biological assets might at first glance appear as something that occurs annually. Nonetheless, Fair value adjustments are treated as a transitory item, in line with Penman (2013)

Concerning the item *provisions for onerous contracts*, as stated earlier, Bakkafrost records provisions in their financial statements to account for probable losses for onerous, 'loss-making' contracts. These contracts relate to long-term contracts for selling salmon both for wholesale and in VAP. Therefore, if there is a change in the assumptions of future losses linked to entering fixed-price contracts due to price changes, there will be a change in the provision. Penman (2013) argues that changes in such estimates be treated as unusual. This could also be in accordance with the argument of Koller, Goedhart & Wessel (2010), that these provisions could be argued to merely be *income-smoothing provisions*, which sole purpose is to smooth the income from one period to the other. In that regard, according to Koller, Goedhart & Wessel (2010), these provisions should be treated as non-operating or unusual.

8. Profitability Analysis

This section will investigate Bakkafrost's financial performance by analyzing its profitability. To study profitability, the analysis has been broken down into three levels, and the primary drivers will be discussed at each level. The first level will discuss the drivers of ROCE, hence RNOA, NBC, and FLEV. Secondly, the drivers of the RNOA, the Profit Margin (PM) and Asset Turnover Ratio (ATO). The third level is concerned with the drivers of the PM and ATO. Penman (2013) argues that the focus of analysis should be pointed to the three key drivers: Sales, the ATO and the Profit margins, which also is the aim of this profitability analysis. By doing this, an indication can be given of which factors drive operational profitability in the firm. A similar profitability analysis has also been performed for Bakkafrost's peer group. Thus, the scope is to examine where the drivers of profitability lie in the industry and offer an indication to the direction of the future. The graphs made for the analysis in this section is based on calculated ratios based on the reformulated statements, and can be found in appendix 1-6.

8.1 First level breakdown

The first level breakdown distinguishes the contribution to Return on Common Equity from the operating and financing activities. Here, in the first level breakdown, the ROCE has been broken down to its three drivers:

$$ROCE = RNOA + [FLEV * (RNOA - NBC]$$

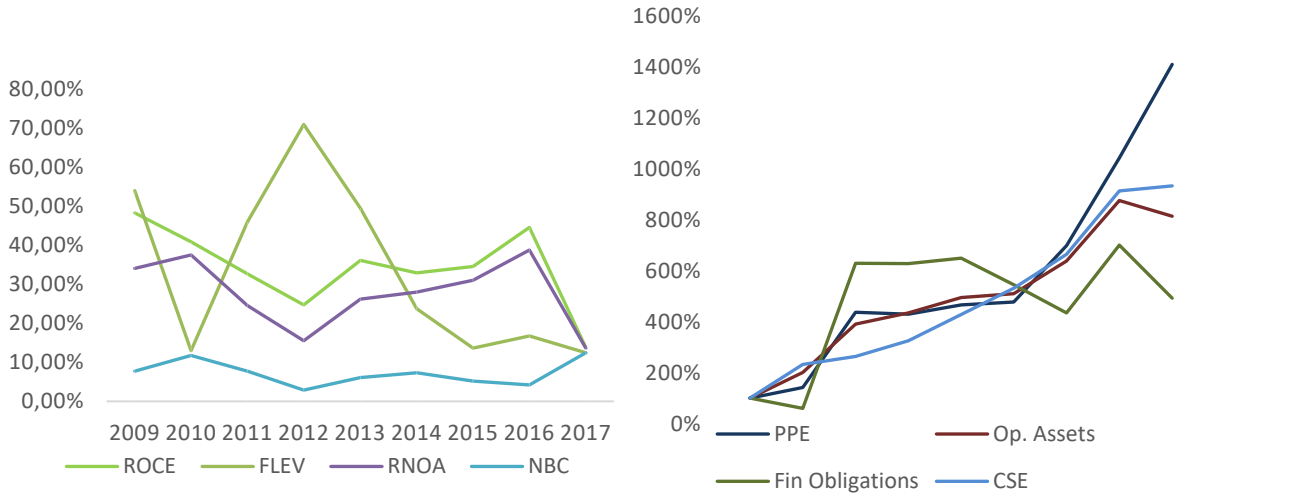
(1) *Return on Net Operating Assets*, which is obtained from dividing Operating Income by Net Operating Assets[15].

(2) *Financial leverage*: FLEV= NFO/CSE

(3) The operating *Spread*, which is the difference between the Return on Net Operating Assets and the Net Borrowing cost.

This formula implies that ROCE is levered up over the return from operations if the return from operations is greater than the borrowing cost. Thus, the level of gearing increases the ROCE in periods where the return to operating assets is high but hurts shareholder value in periods when the spread is low.

Figure 8.1 – First level breakdown
Source: Own contribution; Appendix 7)



[15] See Appendix 7 for calculations

Bakkafrost has been able to sustain a stable level of ROCE throughout the large parts of the trailing period, positioned in an interval of 25% in 2009 to 45% in 2016. However, during 2017 a dramatic drop occurs, which mainly appears to be a result of a substantial decrease in the RNOA.

The FLEV decreased sharply from 2009 towards 2010. The reason for this movement is that in 2009-2010 Bakkafrost was listed on Oslo Stock exchange, which mainly increased the common shareholder equity. From 2010 and onwards FLEV is again increasing rapidly. According to the trend-analysis (appendix 7) total financial obligations increased by 629% from 2012 compared to the level in 2009. The increase in financial obligations was an outcome of raising capital to execute a growth and integration strategy across the value chain with the acquisition of P/f Havsbrun during 2011. The acquisition was the largest acquisition ever to take place until that time on the Faroe Islands (Bakkafrost, 2012). From 2012 and onwards the FLEV has decreased gradually, as it has been in management's interest to decrease the debt-to-equity ratio (Bakkafrost, 2012, 2013).

During 2017, the development takes a dramatic turn, with a sharp decrease in RNOA and an increase in the NBC, the ROCE was affected negatively. As the graph shows, the adverse change in RNOA and increase of NBC affects the spread to converge close to zero. According to Bakkafrost (2018a) themselves, 2017 was a good year with satisfactory operational result; nevertheless, the RNOA suffers a considerable decline.

8.2 Second and third level breakdown

As the figure 8.1 illustrates, it is evident that the most influential factor affecting the ROCE for Bakkafrost is the RNOA. In the second level breakdown, the drivers that affect RNOA of Bakkafrost are examined, where it is broken down to the drivers PM and ATO.

$$RNOA = \text{PM} * \text{ATO}$$

The third level breakdown separates between the components of the Profit Margin and ATO in Bakkafrost:

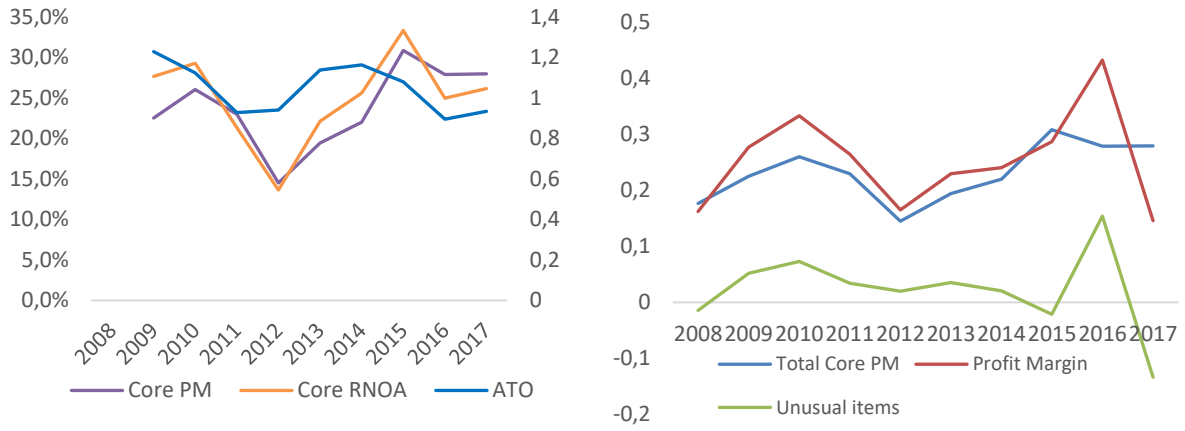
$$PM = \frac{Gross\ margin}{Sales} - \frac{Salary\ and\ Personnel\ Exp}{Sales} - \frac{Depreciation}{Sales} - \frac{Other\ Operating\ expenses}{Sales} + \cdots \cdot \frac{Other\ \ operating\ items}{Sales}$$

$$\frac{1}{ATO} = \frac{Accounts\ receivable}{Sales} + \frac{Biological\ assets}{Sales} + \frac{Inventory}{Sales} + \cdots - \frac{Provision\ for\ onerous\ contracts}{Sales} - \frac{Other\ current\ liabilities}{Sales}$$

In the breakdown the ATO-drivers are expressed in its inverse form thus representing the amount of net operating assets to support a dollar of sales (Penman 2013).

Profit Margin

Figure 8.2 – ATO, RNOA, Unusual Items and core PM developments
Source: Own contribution; Appendix 7)



As discussed in the reformulation (7.3), it was decided to distinguish a core profit margin to isolate the effects from the unusual items. Comparing the core PM with the PM to the development of unusual items, it is evident that unusual items affect profitability (figure 8.2). Historically, the *unusual items*' percentage of sales has not exceeded 7.2%, and in many years, it comprises approximately 2-3% of sales (Appendix 7). However, in 2016 and 2017 these percentages are at 15.4% and -13.4% of sales respectively, which has a substantial impact on the profit margins. According to Bakkafrost themselves, the reason for 2017's low RNOA, was that the profit margin was affected by a substantial downward fair value adjustment of Biological Assets.

In the third level breakdown, the Profit Margin and ATO are isolated and broken down into their drivers (appendix 7). Regarding the profit margin, as elaborated above, the normalization of earnings in the income statement separated between Profit Margins derived from operating income, and a Core PM is derived from core operating income, which excludes unusual items. The focus is therefore directed to the costs involved within the production. The common-size and trend analysis provide an indicator of how items in the income statement develop over time (Appendix 7). The below graphs show the development in the most significant cost pools as common-size to sales, and graph 8.3 depicts the historical trends.

Figure 8.3 – Common-size analysis percentage of sales
Source: Own contribution; Appendix 7

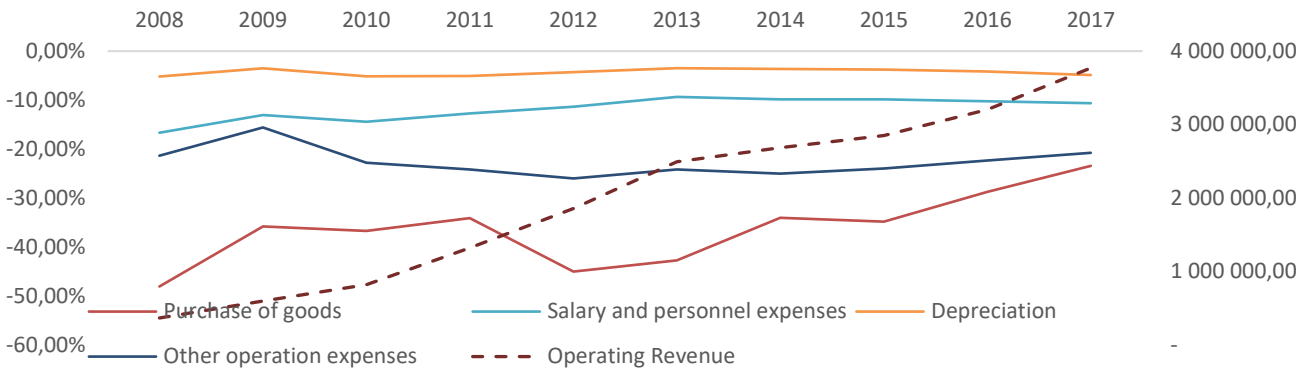
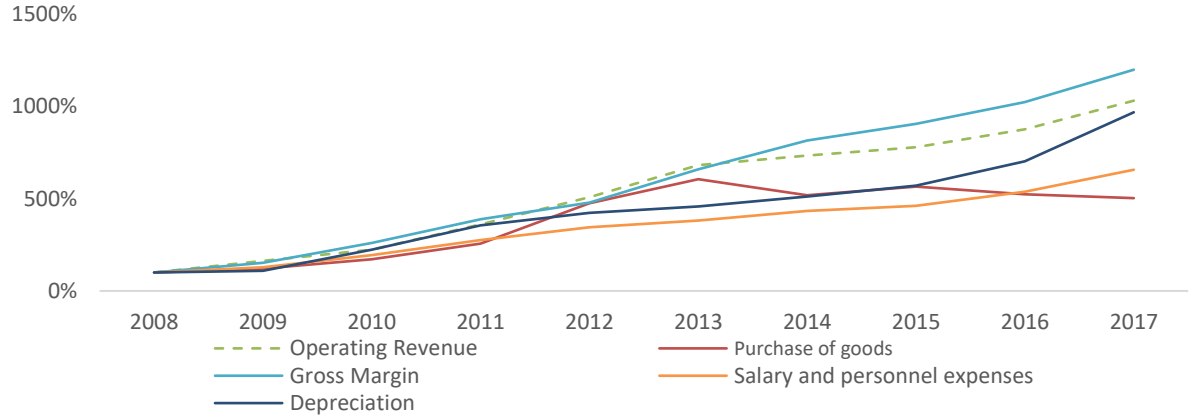


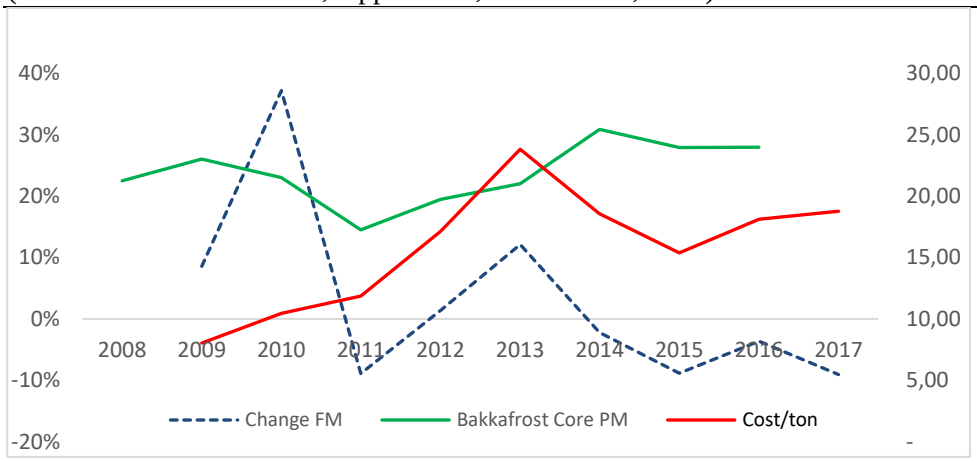
Figure 8.4 – Trend analysis
Source: Own contribution; Appendix 7



Figue 8.3 shows the various cost pool's development as a percentage of sales in comparison to the development of operating revenue. It seems that Bakkafrost has been able to keep the cost levels stable in pace with the rapid growth of revenue over the years. Especially interesting is it to observe the development of *Purchase of goods* in parallel to the development of sales and its trend. In 2008, the cost of purchasing goods was close to 50% of revenue; however, in 2017, it is at 23%. The trend-analysis in figure 8.4 also shows a decrease in purchase of goods since 2013, implying a decline in the growth of this cost item since 2013, even though both production quantity and sales have increased. Therefore, this could be an indicator that Bakkafrost's strategy of reducing costs and exploiting economies of scale by taking control of feed production has been successful. Bakkafrost (2018a) states that fish meal is the primary input in their fish feed. In that relation, Graph 8.5 below attempts to illustrate a relationship between the development in fishmeal price to the ratio of *Purchase of goods* to *Quantity produced*. The change in cost/ton represented by the red line seems to follow the pattern of the

change in FM, shown in the blue stapled line. This support what Bakkafrost's also states themselves: that input costs are tightly connected to the input prices which in turn affect profit margin (Bakkafrost 2017).

Figure 8.5 – Change in Fishmeal price to Cost/MT
(Source: Own contribution; Appendix 7; Indexmundi, 2018)



The second largest cost item is *other operation expense*, which covers roughly 20.78% of sales in 2017 (Appendix common-size). As the trend analysis illustrate (figure 8.4), in contrary to other operating expenses, this item has had a substantial increase in the later years. A substantial part of other operating costs relates to the initiatives relating to the health of salmon (Bakkafrost, 2018a). The health cost relates to the vaccines, antibiotics and delousing that opts to reduce salmon mortality (Bakkafrost, 2018a). Recently, considerable investments aimed at the development and acquiring equipment for mechanical delousing using lukewarm water. Bakkafrost (2018a) states that this cost item is likely to increase, as a result of increased focus on reducing biological issues in the future (Bakkafrost, 2018a).

Another trend that can be observed is the trend of increasing *depreciation costs*, which mainly is the result of profound capital investments in new smolt facilities and support vessels in the later years (Bakkafrost, 2018a). Salary and personnel expenses seem to have had a steady increase during the trailing period as indicated in Graph (x

ATO

Figure 8.6 – ATO drivers
(Source: Own contribution; Appendix 7)

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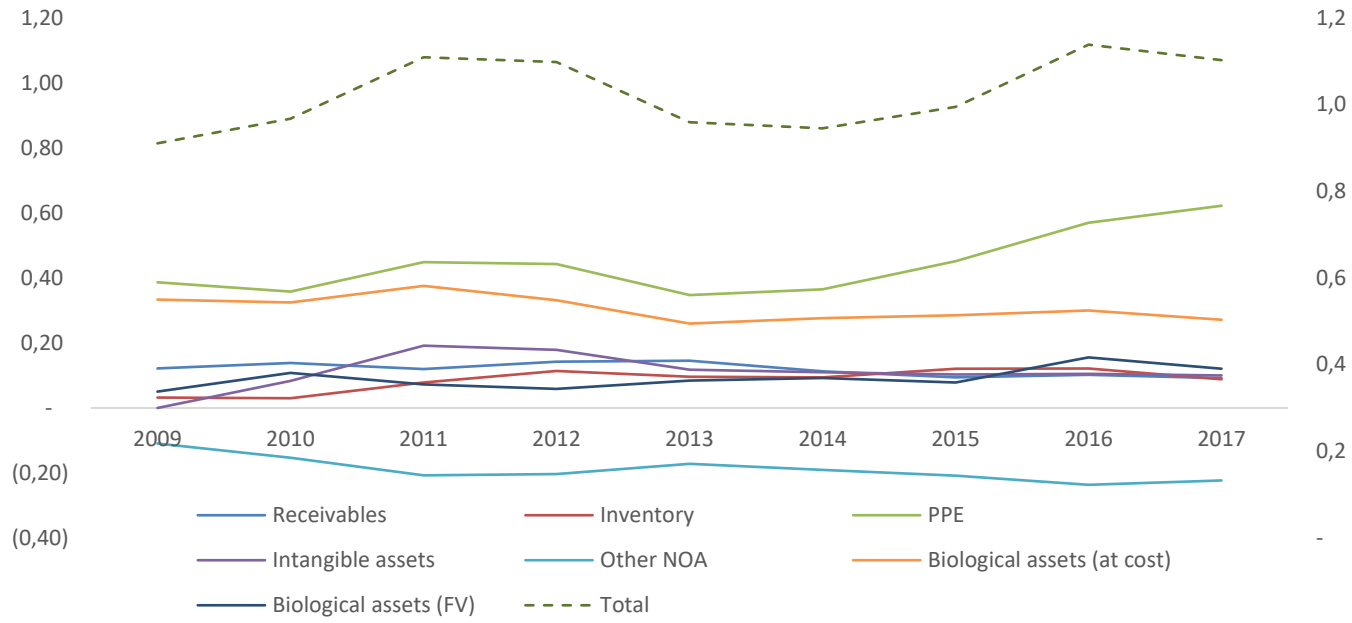


Figure 8.6 illustrates the developments of the inverse ATO[16] from selected items in the balance sheet. As can be observed, most of the items appear stable historically, and the most influential driver of changes in the ATO seems to be the changes in the inverse PPE Turnover. Thus, its deterioration mainly occurs due to management's action by substantial investments in PPE. In 2010-2011 the ATO deteriorated due to the acquisition of P/f Havsbrun which increased the total amount of property, plant and equipment. The effect can be observed in the graph above. Moreover, a steady the ATO is decreasing (Inverse increasing) due to further heavy investment in PPE from 2014 onwards (Bakkafrost, 2018a).

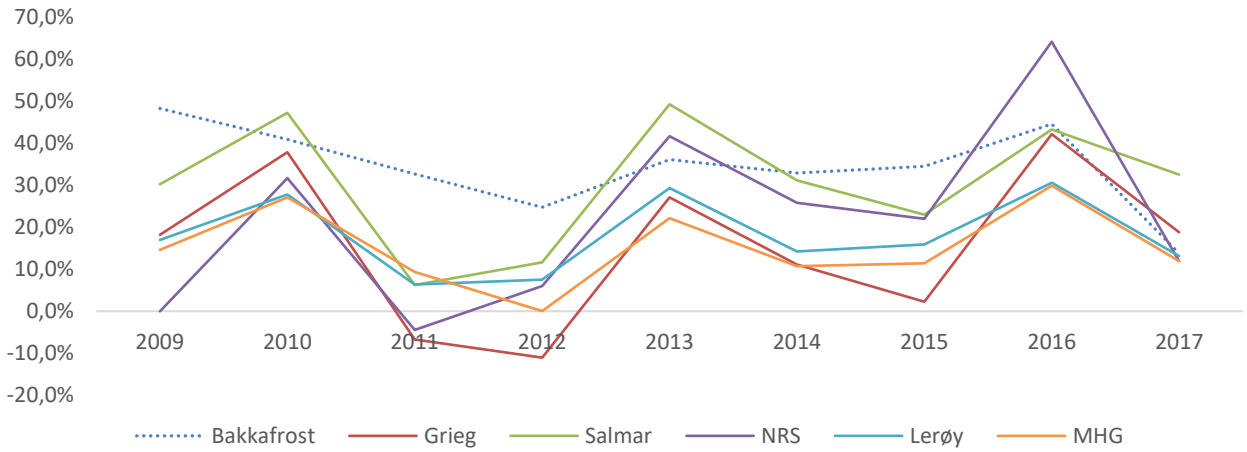
8.4 Peer Group profitability

To elaborate on Bakkafrost's profitability, comparing its performance to its peers can provide useful insights. According to Nissim & Penman (2002), the scope of the peer-group analysis is to establish a benchmark by comparable firms. The analysis was performed historically and in the present to acquire a sense of what is normal and abnormal in the sector. The similar methodology was applied in the reformulation of the financial statements of Bakkafrost's close peers, to create a basis for comparable reformulated financial statements. Petersen, Plenborg & Kinserdal (2017) argues that a pitfall during financial statement analysis is assuming that similar accounting policies have been applied over the period and between peers. Hence, the issues addressed to accounting quality in the section above. Items such as fair value adjustments and operational leases can be

[16] Inverse driver to avoid dividing by zero

detrimental to comparability in this industry as argued in Section 7 of Accounting Quality. Therefore, measures were taken to improve comparability by capitalizing operational leases for Marine Harvest and isolating fair value adjustments from core profit margins. In the analysis, the ratios ROCE, RNOA, PM, ATO and third level ratios were examined between the firms. See appendix 7 for reformulated financial statements and calculations.

Figure 8.7 – Return on Common Equity
(Source: Own contribution; Appendix 7-12)



The development of the ROCE since 2009 is depicted in figure 8.7 this clearly illustrate that the peers are affected by the same cyclicality. Bakkafrost has been the company of the peer group that has been able to provide the highest return to the shareholders' equity on average. The change in ROCE of Bakkafrost from year-to-year does also appear more stable compared to the peer group. SalMar follows Bakkafrost closely, and NRS ranks third. The weakest performers in the peer group are Marine Harvest and Grieg Seafood. The analysis of the peer group's ROCE shows that all firms to a large extent follow the same cycles. All companies have yielded a positive ROCE in all years except Grieg and NRS in 2011-2012.

Figure 8.8 – Development in core RNOA
(Source: Own contribution; Appendix 7-12)

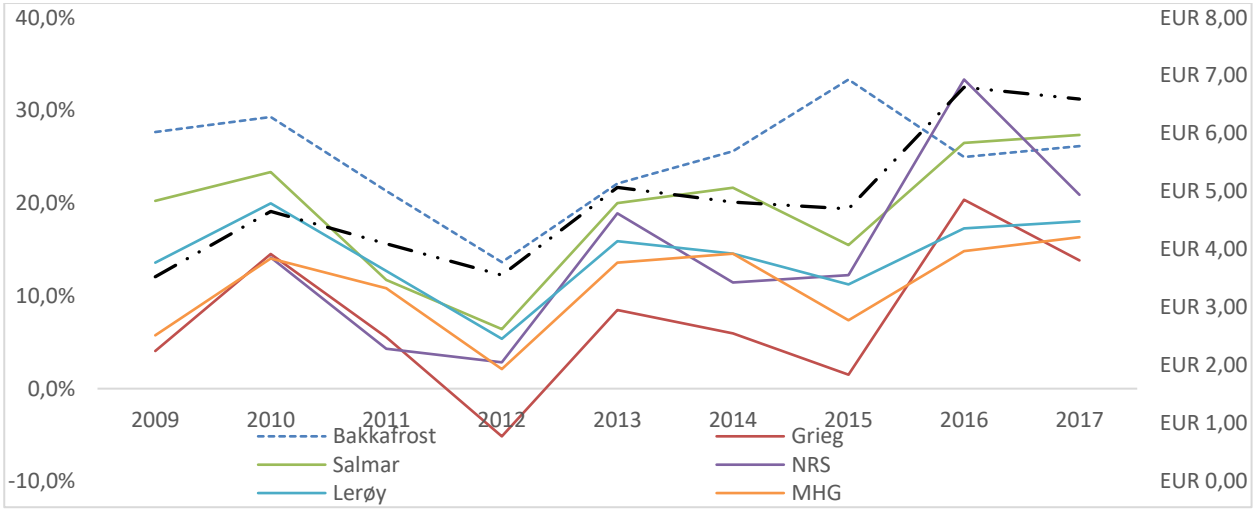


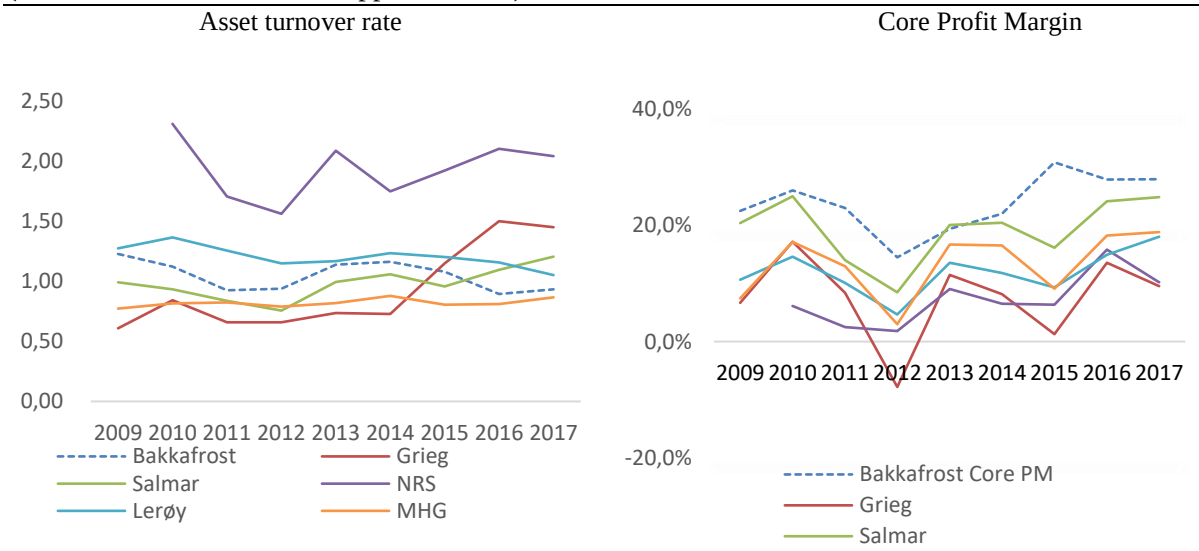
Figure 8.8 shows the Core RNOA development together with the historical development in salmon price per kilogram. The primary driver of profitability in the salmon industry is considered to be the salmon price (Zhang, Myrland and Xie, 2016; Asche, Sikveland and Zhang, 2018), which also can be observed with the core RNOA closely linked to the variations in salmon price, in many cases the movements are nearly identical.

Another observation is that the curves of the companies in the peer group tend to move in correlation. However, the curve of Bakkafrost appears less correlative than the rest of the peer group. It could be argued that the reason for this is the result of both firm-specific and macro factors based on instances pointed out in the PESTEL. First, Bakkafrost is unique regarding its level of vertical integration. With its self-sufficiency in fishmeal production and independent sourcing of raw material, makes it less exposed to input price fluctuations (Bakkafrost, 2018a). Moreover, it is believed that they are able to avoid the bargaining power of the companies in the highly consolidated feed production industry, which was pointed out in Porter's five forces (Sogn-Grundvåg and Young, 2013; Engle, Quagrainie and Dey, 2016; MarketLine, 2017). On the other end of the value chain, Bakkafrost also controls whether to sell fish on the spot market or whether the quality is better suited for VAP (Bakkafrost 2018a). In the VAP segment, prices are more stable as they are based on long-term contracts, which reduce price volatility as observed by Asche & Larsen (2011).

The macro factors affecting salmon price plays a role in this development as well. For instance, the peer group's Core RNOA experienced a significant downturn from 2010 to 2011 and stayed low until 2012. According to the annual reports of the companies in the peers, biological issues in Chile triggered the price drop. Initially, the biological issues considerably decreased global salmon supply, which caused rapidly increasing the prices. This led salmon farmers to prematurely harvest and rush their stock to the market (Asche *et al.*, 2010; Øglend, 2013; Zhang, Myrland and Xie, 2016). The effect was a supply shock, which largely decreased prices as the graph shows in medio 2011 (Grieg Seafood, 2012; Lerøy Seafood Group, 2012; Marine Harvest, 2012; Norway Royal Salmon, 2012; SalMar, 2012). As the core RNOA illustrates, Bakkafrost appears less affected by the sudden price drop, and Grieg was the company that was hit the hardest. According to Bakkafrost (2012), their involvement in the VAP-segment smoothened out price shocks described above, due to long-term supply contracts. Conversely, when the upswing in price came in 2012/13, Bakkafrost´s profitability did not increase at the same pace as other companies as Grieg and NRS which appear more spot price sensitive. With that said, Bakkafrost still were one of the top performers.

After 2013, a new drop in Core RNOA for all of peers occurred, except for Bakkafrost. The underlying reason was mainly political; as mentioned in the PESTEL, in 2014, trade sanctions were imposed on Russia due to its annexations of Crimea (Norwegian Seafood Council, 2017). This restricted Norwegian exports of Salmon to Russia, which left Bakkafrost in a remarkably favorable market position and rapidly increased their market share (Bakkafrost, 2014). This is the cause of Bakkafrost's increase in RNOA (Bakkafrost 2017). The rest of the peer group, which only consist of Norwegian companies, experienced a downturn of the Core RNOA until 2015, while Bakkafrost experienced an increase. From 2015 and onwards, the market experienced an exceptionally high salmon price, which is the likely source to have driven profitability in the entire Peer Group (Grieg Seafood, 2012; Lerøy Seafood Group, 2012; Marine Harvest, 2012; Norway Royal Salmon, 2012; SalMar, 2012). However, Bakkafrost's profitability does however not seem to react as positively to this increase in prices as its peers. Bakkafrost (2017) argue that this is due to the effect from being committed to long-term contracts, to a greater extent than their peers.

Figure 8.9 – ATO and Core PM development
(Source: Own contribution; Appendix 7-12)



The graphs above illustrate the peer group's ATOs' and Core Profit margins' development since 2009. As can be observed from graph 8.9, the development in the ATO appears relatively stable compared to the core PM. According to Penman (2013), there is usually a trade-off between profit margins and ATOs: firms with high PM's tend to have low ATOs, and firms with high ATO tend to have low profit margins. This effect is also observable here. In comparison to its peers, Bakkafrost is a company that operates with low ATOs and higher profit margins. For instance, in 2017, they had an ATO of 0.93 and a core PM of 27.97%. The trend has been that since 2011, substantial investments have been done, which has increased the NOA and in turn decreased ATO. On the other hand, the effect on the RNOA is offset by an increase in profit margins. It is believed that the negative trend of the ATO and the positive trend in profit margins is a result of management actions in implementing the vertical integration strategy. Thus leading to higher margins, but lower turnover rates as NOA increases. This effect can be observed conversely with NRS and Grieg with higher levels of ATO and low Core PM. NRS is the least vertically integrated into the peer group. Also, they have a strategy of reselling salmon with their sales organization. The reason for Grieg's sudden spike in ATO in 2014, was a consolidation of sales numbers with the sales company Ocean Quality, leading to higher sales (Grieg 2016).

The comparative common-size table of selected items from the income statement shown in appendix 1-6, illustrate that Bakkafrost is the cost efficiency leader among the peer group, with the lowest purchase of goods to sales ratio in the peer group. The belief, and as they imply themselves, is that this advantage is drawn from controlling feed production (Bakkafrost 2018a). On the other side, NRS and Lerøy have the highest levels of

purchase of goods, perceivably due to reselling of salmon sourced from other salmon producers, leading to higher cost of goods sold (NRS 2017; Lerøy 2017).

Figure 8.10 – Comparative common size analysis
(Source: Own contribution; Appendix 7-12)

	Grieg		MHG		Salmar		Bakka		NRS		Lerøy	
	2016	**2017**	**2016**	**2017**	**2016**	**2017**	**2016**	**2017**	**2016**	**2017**	**2016**	**2017**
Purchase of goods	-50%	-53%	-51%	-46%	-44%	-44%	-27%	-27%	-76%	-79%	-59%	-52%
Gross margin ratio	50%	47%	49%	54%	56%	56%	73%	73%	24%	21%	41%	48%
Salary & Personnel	-7%	-7%	-13%	-13%	-10%	-9%	-10%	-11%	-4%	-3%	-10%	-13%
Depreciation	-3%	-3%	-4%	-4%	-4%	-4%	-4%	-5%	-1%	-2%	-3%	-3%
Other expenses	-23%	-25%	-11%	-12%	-15%	-15%	-22%	-21%	-3%	-4%	-11%	-12%
Sales PM before tax	17%	13%	19%	22%	27%	29%	36%	37%	15%	13%	16%	20%
Tax expense	-3%	-3%	-2%	-4%	-5%	-6%	-9%	-9%	-1%	-3%	-3%	-4%
Sales PM	13%	10%	17%	18%	22%	23%	28%	28%	15%	9%	13%	16%
Other items	0%	0%	1%	1%	2%	1%	0%	0%	1%	1%	1%	1%
Total Core PM	14%	10%	18%	19%	24%	25%	28%	28%	16%	10%	15%	17%
Unusual items	5%	0%	7%	-12%	4%	-2%	15%	-13%	3%	-3%	5%	-7%
Profit Margin	19%	9%	25%	7%	28%	23%	43%	15%	19%	7%	20%	11%

To summarize the Profitability analysis, it is evident that specific elements drive the profitability for Bakkafrost. First of all, it was seen that the fair value adjustments had a significant impact on profit margins. Secondly, it was shown that *purchase of goods* which constitute a substantial amount of the costs, moves tightly together with changes in the market price for fish meal. Third, it was seen that ATO were reduced significantly with the increase in PPE (Figure 8.6). Regarding the peer group as a whole, it was shown that a fluctuating salmon price significantly affects the profit margins of all the companies in the Peer group - when the salmon price is high, the margins are high. As illustrated, however, Bakkafrost's, has been less affected by the fluctuating salmon price due to its integration. Moreover, it also showed that Bakkafrost has benefited from the trade sanctions the Norwegian companies has suffered under.

9. Quantitative Industry Analysis

Through the financial statement analysis, the current drivers of profitability in the peer group were examined and used as a benchmark to how Bakkafrost has performed compared to their peers. However, with a view to forecasting, the primary interest is not the level of current drivers of profitability; the attention should be focused on how these drivers will evolve in the future (Penman, 2013). As with the work of Nissim & Penman

(2001, p. 139), this section is concerned with whether drivers converge towards typical values over time. The part will complement the insight from the qualitative industry analysis and assist the forecast by indicating how typical drivers settle down to permanent levels. According to Penman (2013, p. 509), drivers tend towards the average over time; the drivers demonstrate mean reversion. Thus, drivers with high values tend to become lower over time, and drivers with low values tend to become higher.

The question this section will try to answer is for how long will abnormally high levels of profitability persist? Is it likely that firms can sustain these high levels, or will they revert towards an industry average, and if they revert, to which level? The underlying idea is that firms in an industry may possess temporary sources of competitive advantage such as unique technologies, processes, and innovations. However, the forces of competition are likely to decrease their competitive advantage over time(Nissim and Penman, 2001; Lundholm and Sloan, 2004; Penman, 2013).

The methodology outlined by Nissim and Penman (2002) was applied. Data was collected from Compustat Global IQ using SIC code 2092 –*prepared fresh or frozen fish* from 1992 to 2016. The final sample included 98 companies (Appendix 13) with operations worldwide in the aquaculture industry. When collecting the data, it became apparent that there was a trade-off between having a dataset of sufficient size and relevance to Bakkafrost's operations. Consequently, not all companies were farmers of salmonids; aquaculture relating to other species are also represented in the dataset. This could be a limitation to the analysis. However, it is still believed this would provide valuable information regarding the industry's development over time. The financial data collected were balance sheet and income statement figures necessary for reformulating and separating between operational and financial numbers, so that the ratios Core PM, ATO, RNOA and Sales growth could be derived (appendix 14).

For each driver, the companies were ranked from high to low ratio value in a base year 0; the first base year was 1996. The companies were divided into five portfolios based on the ranking in year 0. Thus, the highest ranked 20% of companies had the highest value drivers, the next 20% the second highest and so forth. The median driver rate for each portfolio was calculated and tracked for the five subsequent years. As emphasized by Nissim & Penman (2001) median values are preferred over averages in order to omit extreme driver values in the dataset. The first base year was 1996 (year 0), and the development in the driver rates was tracked from year 1 (1997) until year 5 (2001). The procedure was performed until 2016, and finally, ended up consisting of four 6-year periods including the base years (Appendix 13-15). As a final step, the averages of each group in each of the fade periods were calculated. Thus the graphs demonstrating the fade rates below in Figure 9.1,

9.2, 9.3 and 9.4, illustrates the average of the median. The result is a demonstration of how the typical ratios have developed in the industry over time. However, a quantification of the long-run levels and the speed of mean-reversion is also necessary to assist in the forecast of future driver rates. To quantify these industry-specific driver rates, or 'fade rates,' the following approach was followed as described by Christensen & Feltham (2009)

Given:

$$X_t - \alpha = \omega(X_{t-1} - \alpha) + \varepsilon_\tau$$

Where X_t is the time-series of the driver, α is the long-run level, and $\omega \in (-1, 1)$ is the persistence level or deviation from the long-run level, and ε_τ is the error term. Given the level of the driver at t, X_t, the expected level of the driver at a future year τ is

$$E[x_\tau - a|x_t] = a + \omega^{\tau - t}(x_t - a)$$

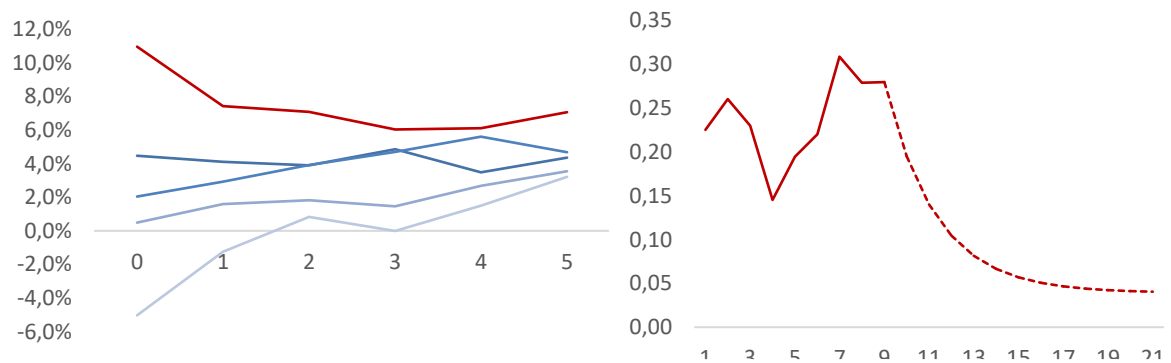
The residuals were calculated as:

$$Ui_\tau\ (\bar{\alpha}, \bar{\omega}) = (Xi_t - \bar{\alpha}) - \bar{\omega}(X_{i,\tau-1} - \bar{a})$$

Finally, the sum of the squared residuals was calculated and minimised providing values for α and ω:

$$SSR(\bar{\alpha}, \bar{\omega}) = \sum_{i=1}^{I} \sum_{\tau=T-t}^{t} (uit\ (\bar{\alpha}, \bar{\omega}))^2$$

Figure 9.1 – Change in Fishmeal price to Cost/MT
(Source: Own contribution; Compustat Capital IQ)



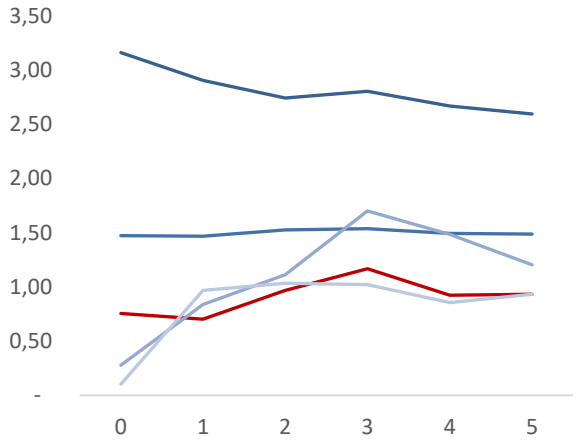
Graph 1 – Fade rates of profit margin

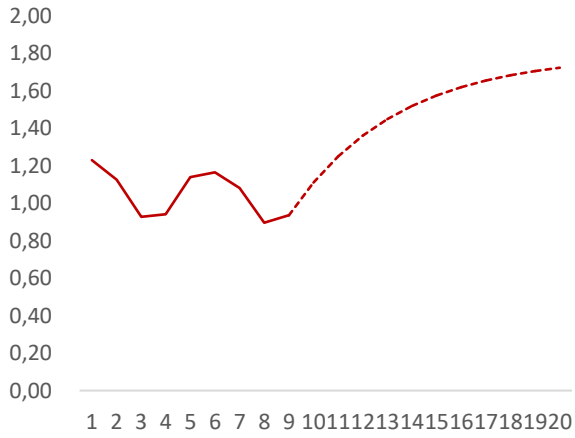
Graph 2 – Current level of Core PM vs. future.

Figue 9.1 shows the level of mean reversion of core PM in the industry. As illustrated, the movement of the highest and lowest ranked portfolios illustrate that core PM rapidly reverts towards a mean in the industry. The autoregression presented a long run Core Pm of 3.92, with a persistence level of 0.65. Thus indicating that the mean reversion is occurring quite rapidly. High profit margins in an industry are likely to attract new firms to the industry and increase competition. Hence current competitive advantage quickly erodes (Nissim and Penman, 2001; Penman, 2013). However, it does seem that the companies in the highest ranked portfolio are able to sustain a slightly higher core PM than the rest of the industry.

To graph to the right in figure 9.1 illustrates the expected future development of Bakkafrost core PM if applying the fade rate to Bakkafrost's current levels. The graph shows a steep decline in core PM from year nine towards the long run level of 3.92% ten years ahead. In the case of the profit margin, it is not currently believed that the decline in PM will be that severe regarding the current situation for salmon producers as shown in the profitability analysis (Section 7.3).

Figure 9.2 – ATO fade rate
(Source: Own contribution; Compustat Capital IQ)





Graph 3: ATO Fade rate

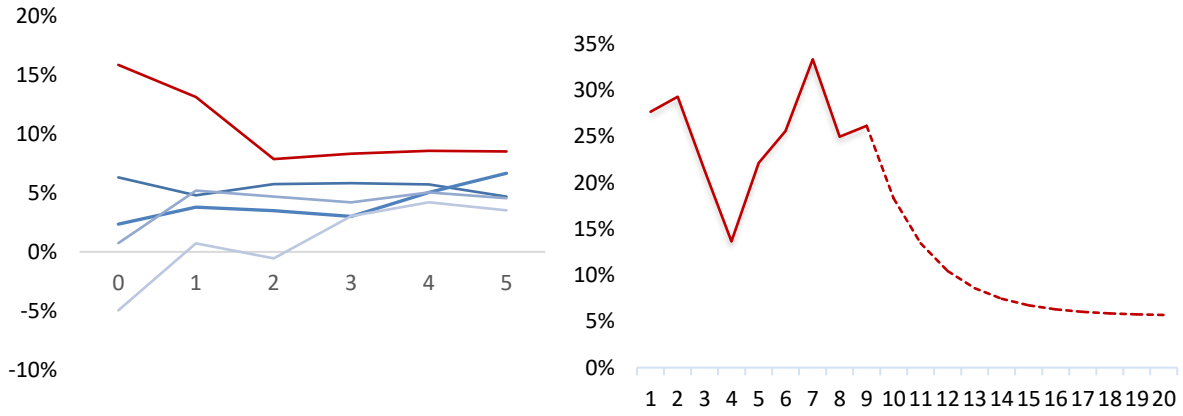
Graph 4: Expected future ATO

The development in ATO is increasingly persistent with w=0.80, implying that the speed toward mean reversion is lower here than in the profit margin. According to the autoregression, the long run level of the

ATO in the industry reverts towards 1.79. It seems that the two lower portfolios have a tendency of swiftly increasing from their lower values towards mean reversion. However, the top 3 portfolios seem to follow a more stable pattern.

Graph 4 (Figure 9.2) shows the development of Bakkafrost's ATO from year 9 and onwards assuming the long-run level of 1.79 and a persistence level of 0.80. In contrast to the core PM, this might make more sense for the current situation of Bakkafrost. Currently, the most significant producers of salmon in the world are approaching a maximum level of production, since licenses are acting as a bottleneck (Larsen and Asche, 2011). Thus, to grow sales, production efficiency has to increase. This is also the current strategy of Bakkafrost, by optimizing feed technology and increasing the average smolt size before releasing to the ocean has an effect of decreasing production cycle time (Christiansen and Jacobsen, 2017; Bakkafrost, 2018a).

Figure 9.3 – RNOA fade rate
(Source: Own contribution; Compustat Capital IQ)



Core RNOA FADE rate

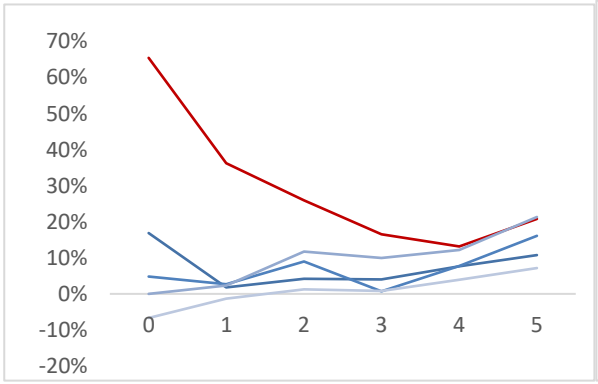
Expected long-run RNOA

Similar to the Core PM the Core RNOA seems to have a clear pattern towards mean-reversion. The autoregression yielded a result of a long run level of 5.59% and a ω at 0.62. As figure 9.3 to the left illustrates, the top performers quickly revert to industry levels during the two first years. However, as it appears, they have been able to sustain an above average RNOA level. In the peer group analysis, it was revealed that Bakkafrost historically has been able to sustain a high level RNOA compared to its peers. With its previous success, it seems unreasonable that the competitive advantage will be eroded away as the fade rates suggest. However, sustaining profitability levels higher that peers indefinitely would be unlikely, due to the inimitability of the competitive advantage as argued in the VRIO analysis. With Bakkafrost's current

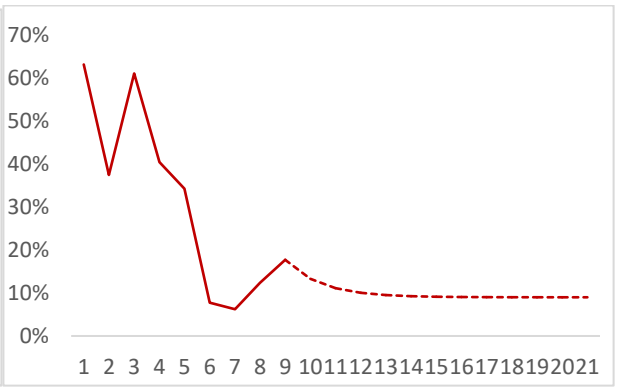
competitive advantage historically securing its position as an industry leader, it seems unreasonable that this will disappear as quickly as the fade rate anticipates. However, it is doubtful that Bakkafrost will be able to sustain the high level of profitability as they are currently holding compared to its peers in the long-term.

Figure 9.4 – Sales growth fade rate
(Source: Own contribution; Compustat Capital IQ)

Sales growth fade rate



Expected sales growth long run



As the figure 9.4 illustrates, the level of high sales growth as illustrated in the top portfolio quickly reverts towards the industry mean. On the other hand, a lower level of sales growth tends to increase steadily and slowly. The long-run average industry level *a* is at 9%, with a persistence *w* at 0.5. This could fit Bakkafrost's historical performance. The graph to the right in Figure 8 shows Bakkafrost historical sales growth level from year 1 (2009) to year 9 (2017), the unstapled line, and the dotted line from year 9 and onwards illustrate how Bakkafrost's sales growth would develop assuming that the fade rates hold. Historically, it appears as Bakkafrost mostly has followed the fade rates inflicted by the industry historically. In year 1 -3 experiencing a high sales growth at around 60%, it quickly faded to levels that are more common in the subsequent years.

10. Forecasting

The sections above have opted to complete steps 1 and 2 in the process of a fundamental analysis, hence 'Knowing the Business' and 'Analyzing information' both in and outside financial statements. The ensuing steps described in the following sections consist of 'Developing forecasts' and 'Converting forecasts into valuations' (Penman 2013, p. 85). Before proceeding to the forecast, a brief description will be given of the Residual Operating Income Model, so that an understanding is established of which inputs the model requires determined for the valuation.

10.1 The residual operating income model

Penman (2013) presents the residual operating income model as a modification to the simple residual earnings model. The simple residual earnings models involve anchoring the valuation of equity on the book value of equity, and then add the value for forecasted earnings in excess of the required earnings on book value (Penman 2013, p. 438)

$$Value\ of\ Equity\ (V_0^E) = CSE_0 + \frac{RE_1}{\rho_E} + \frac{RE_2}{\rho_E^2} + \cdots + \frac{RE_T}{\rho_E^T}$$

Where:

$$Residual\ earnings\ (RE_t) = Earnings_t - (\rho_E - 1) * CSE_{t-1}$$

Thus, the intuition of the model is if an asset has earnings at the same level as its required rate of return, the forecasted residual earnings will be zero, and the intrinsic asset value will be equal to the book value. Thus, if assets in the balance sheet were measured at market value, then their associated residual earnings would be equal to zero and does not have to be forecasted. Further, Penman (2013) states that the value of equity can be defined as:

$$V_0^E = \text{CSE}_0 + \text{Present value of forecasted residual earnings from NOA at not at fair market value}$$

To carry out such a valuation for a firm, the earnings from assets or liabilities at book values have to be distinguished from those that are not; this separation can be hard as assets usually generate operating income conjointly. However, operating income can usually be separated from the net financial expense, and net financial obligations are regularly measured at market value in the financial statements. Subsequently, two different book value components can be distinguished, the NOA and NFO. Each of which can be associated with each their earnings component: Operating Income for NOA; and Net financial expense with NFO. Each component is matched with a required cost of capital to obtain the residual earnings measure. The purpose of the cost of capital is to compensate for the risk associated with each activity. Residual operating income can then be defined as:

$$\text{ReOI} = \text{Operating income (after tax)} - \text{Required income on net operating assets}$$

Furthermore, when forecasts of ReOI and net financial expense are made, the values of NOA and NFO can be derived. However, since NFO is recognized at market value in the financial statements, the forecasted residual earnings on financial obligations must be equal to zero. Thus, the market value of NFO is equal to the book value of NFO. The value of the Net Operating Assets or the value of the firm can be expressed as:

$$V_0^{NOA} = NOA_0 + \frac{ReOI_1}{\rho_F} + \frac{ReOI_2}{\rho_F^2} + \cdots + \frac{ReOI_T}{\rho_F^T} + \frac{CV_T}{\rho_F^T}$$

The last sequence of the equation above represents the continuing value. If a firm is expected to grow at a constant growth rate g beyond the forecast horizon, by using the Gordon Growth formula the continuing value beyond the forecast horizon is given by (Penman 2013, p. 113):

$$CV_T = \frac{ReOI_{T+1}}{(\rho_F^T - g)}$$

As a final point, if NFO is recognized at market value, then the value of common equity can be expressed by:

$$Value\ of\ common\ equity\ (V_0^E) = V_0^{NOA} - V_0^{NFO} - V_0^{Minority\ interest}$$

Thus, to apply the ReOI-model, a separation between the assets and liabilities stated at book values and those stated at market value needs to be ascertained, which was performed in the reformulation. Furthermore, there is a need to establish future payoffs from pro-forma financial statements, a growth rate in the continuing value and an appropriate Cost of Capital. The following sections are concerned with the determination of these inputs in the model.

10.2 Pro-forma Financial Statement

A vital aspect of the fundamental valuation is the forecasting of line items so that future payoffs can be established. That is, how the future financial statements will become if expectations are met (Penman, 2013). The forecast horizon is separated into three parts as recommended by Koller, Goedhart & Wessel (2010): First, a detailed categorical forecast of complete financial statements in an explicit forecast period from the year 2018 to 2022. Second, a fade period with a simplified forecast of the drivers: sales growth, asset turnover rates

and profit margins from the year 2023 to 2027. Third, since it is assumed that the ReOI of Bakkafrost will grow in perpetuity with a constant growth rate g, a growth rate of residual operating income will also be determined in the forecast horizon, from 2027 and beyond.

10.3 Explicit forecast period: 2018-2022

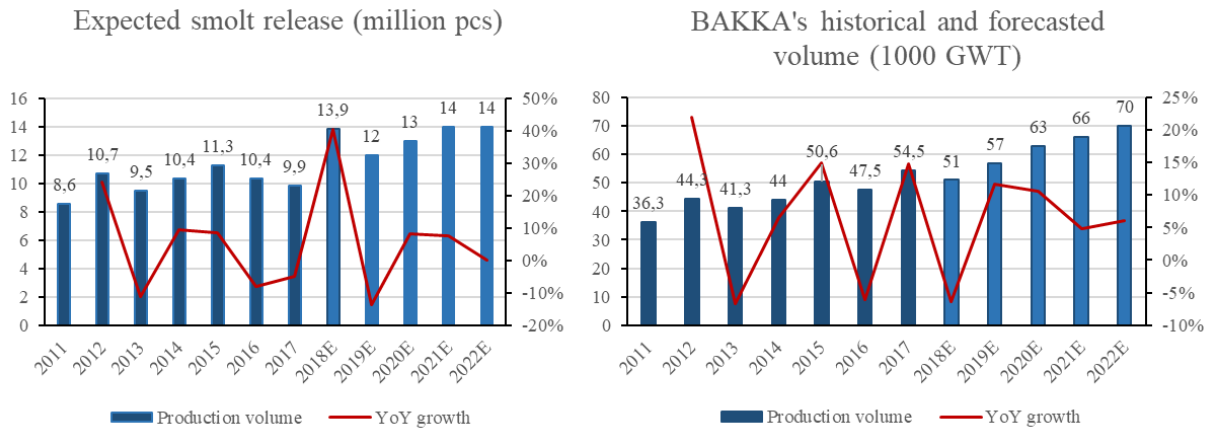
10.3.1 Sales as a product of price and quantity

Regarding the forecast of future sales of Bakkafrost, several approaches were considered and tested. In a broad sense, sales from operations in the salmon industry are the product of two factors: the number of kilograms produced multiplied by the salmon price per kilograms in the spot market. Therefore, to forecast future sales for the farming segments, approximations for future production quantities and future salmon price were made. The following sections also discuss how the forecast of the VAP and the FOF segment of Bakkafrost was performed.

10.3.2 Volume

As mentioned above, the expected volume in the forecast period is based on Bakkafrost's estimations gathered from the annual report of 2017. The estimated production volume in 2018 is 51.000 GWT, compared to 54.615 GWT in 2017. Due to the investments in post-smolt facilities, which allows an average smolt weight of 500 grams, Bakkafrost expects to increase the production volume substantially between 2019 and 2021. They state that this is possible, due to lower exposure to biological threats, as a result of lower production time in the sea (Bakkafrost, 2017, 2018a). Compared to the production model they now apply, Bakkafrost anticipates shortening the production time in the sea by ten months, from approximately 24 to 14 months (including fallowing period). Without the fallowing period, the production time in the sea is expected to be between 9-12 months, depending on the sea temperature (Bakkafrost, 2018a). Ultimately, this will this will shift the harvest cycle from every second year to every year when the expected impact of post-smolt is taking full effect. According to Bakkafrost's estimations, the production volume is expected to be 70.000 GWT in 2021. However, historically, management's long-term volume guiding has shown a slight trend of overestimating volume in prior periods as shown in (Bakkafrost, 2016, 2017, 2018a). As a result, the expected volume in E2021 is adjusted to 66.000 GWT, and the target volume of 70.000 GWT is postponed to E2022. The volume between E2019 and E2020 is expected to gradually increase from 51.000 GWT in 2018 towards 70.000 GWT in E2022. These assumptions are in line with the expected smolt release and lowered mortality rate announced by Bakkafrost (2018a). Figure 10.1. Displays Bakkafrost's historical and expected smolt release and production volume.

Figure 10.1 – Bakkafrost's smolt release and production volume
(Source: Own contribution; Bakkafrost, 2015, 2016, 2017, 2018)



Historically, the VAP segment's share of the total production volume has varied between 50% and 35% (Bakkafrost, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018a). The management's long-term target has been 40-50% VAP share, even though the share has been around 40% in most periods Bakkafrost (2018a). The average of the last five years is 40% VAP share, and this is assumed to stay constant throughout the forecast period.

10.3.3 Salmon price

When forecasting the future salmon price, several methods were considered and tested. First, a forecast was performed applying a Winter-Holt model with trend- and seasonality-corrected smoothing as described by Guttormsen (2008) and Chopra & Meindl (2007). Since salmon price both has a trend and seasonal factors, this model was first deemed appropriate. Its implementation was made by withdrawing historical monthly spot prices from the last six years. The cyclicality in salmon price was de-seasonalized, and a linear regression was run to obtain a level and trend, then the seasonal factors were obtained and averaged. Random smoothing variables (alpha for level, beta for trend and gamma for seasonal factors) were established, and the forecast was plotted for the subsequent periods. The sum of squared residuals (SSR) was calculated based on forecast error in the sample. Then the SSR was minimized so that the smoothing variables were adapted to yield the best fit for the model. See appendix 16 for the full approach. However, the issue with this model was that it proved better suited for forecasting short-term intervals, such as 12 months ahead. Moreover, according to Guttormsen (2008) when tested out of sample it performs poorly, especially in the long-term. Because of its difficulties in predicting long-term levels, it was decided not to focus on this model.

Secondly, an alternative approach considered to forecast future sales was to apply the fade rates derived from the quantitative industry analysis. However, this would assume that Bakkafrost's increase in sales levels would converge towards the derived long-run industry level at 9% with a persistence rate of 0.5 (Penman 2013). As discussed in the previous section, the historical changes in sales growth of Bakkafrost the last five years seem to have a surprisingly good fit with what was anticipated from the fade rates. However, as discussed in the PESTEL, it is believed that a long-term sales growth of 9% is too optimistic for Bakkafrost in the long run due to growth limits and what is anticipated for the industry. According to EY (2017), no more than a 5% annual growth expected for the industry as a whole in the years to come.

Third, it was also considered to use quoted forward prices provided by the Fish Pool index. The forward contracts provided by Fishpool are frequently used by salmon producers for risk management purposes (Bakkafrost, 2018a; Grieg Seafood, 2018; SalMar, 2018a). Therefore, using them as a proxy for future spot price could be a reasonable approximation, which (Asche, Misund and Øglend, 2016) is the case in other commodity markets. However, a study performed by Asche, Misund & Øglend (2016), set to examine whether the futures market has any predictive power over future spot prices. Their results indicated that the futures' prices provided by Fish pool performs poorly in terms predicting future spot price, as it on average tends to underestimate prices.

However, in order to determine future salmon price, inspiration was taken from the models analysts use to estimate price sensitivity towards changes in supply, as seen in DnB (2018), Pareto (2018) and Handelsbanken (2018). In the salmon industry, there is a tight relationship between supply and demand. Salmon is considered a scarce commodity with limited output due to maximum biomass restrictions (MAB) (Øglend, 2010). In combination with a long production cycle, this restricts farmers' flexibility to respond to market shifts. The little flexibility they have is however to decrease the level of their stock, which refer to harvesting more of the living salmon earlier than initially planned. On the other hand, the demand, which primarily is made up by large retailers who are dependent on having salmon available in their shelves at all times, is considered increasingly inelastic (Øglend, 2010; Zhang, Myrland and Xie, 2016). Moreover, according to Øglend (2010, 2013), the market for salmon is competitive, and there is little evidence of any market power. In such a market, the scarcity of the commodity would determine prices. Thus, when the commodity is scarce, the price will increase. A case that illustrates this effect is, for instance, the Chilean crisis in 2009. In 2009, a disease outbreak systematically reduced the Chilean salmon production, which consequently decreased global supply significantly. The global demand for salmon was still strong, and the following effect was initially a spike in

prices during 2009 and 2010. Since there is a substitutional effect of salmon in international trade (Zhang, Myrland and Xie, 2016), this led producers in other geographical areas to increase their supply by reducing their available stocks. As a result, the supply to the market increased again at a fast pace, which in sequence led to a substantial reduction in price. Eventually, the Chilean production came back on its feet, and the prices normalized. Hence, the intuition behind the model applied in this paper. The concept is simple and used by analysts to forecast short to medium term changes in price - that a change in the global supply of salmon will lead to changes in price; the demand, on the other hand, is assumed to be more inelastic (Zhang, Myrland and Xie, 2016).

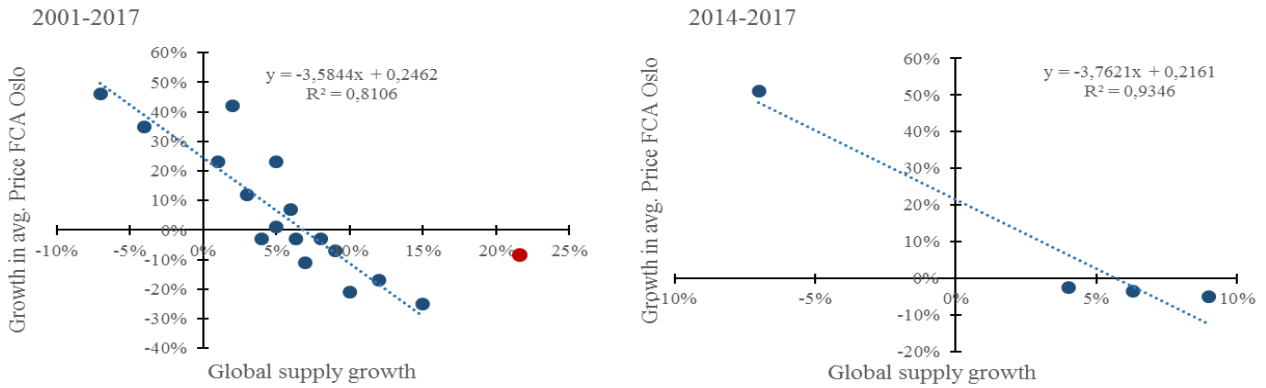
The data used in the forecast model was collected from Kontali (2017, cited in DnB, 2018), and provides figures of yearly growth in price FCA[17] Oslo and global supply. The main reason for using average Norwegian export prices is that this region accounts for approximately 50% of the global volume (Marine Harvest, 2017), and is therefore considered to be an appropriate proxy for the market price. Also, price information from this region is well documented compared to other regions, as all sizeable salmon farmers anonymously report various export-related statistics to third-party organizations, such as Kontali Analyse and Fish Pool. The regression is based on 16 observations from 2001 to 2017. Optimally, there should have been more observations, such as weekly or monthly, but due to limited data access, a yearly frequency was the only option.

When examining the regression, it became evident that 2012 could be considered statistical outlier[18], which is illustrated by the red marker in the left graph in figure 10.2. As recommended by Gujarati (2003, p. 541), this observation was omitted from the sample to obtain the best possible estimates. Consequently, the R-squared increased from 0.6464 to 0.8106, which indicates that the supply growth explains 81,06% of the variation in price growth. Since the maximum value of R-squared is 1, the observed value suggests that the regression line fits the data well, even though this is expected with few observations (Gujarati, 2003, p. 90). Furthermore, the p-value of the X-variable, supply growth, yields a value of 0,000003, which reflects that the variable is significant at a 1% significance level. All regression data can be found in Appendix 26.

[17] FCA = Free carrier. This means the cost of transport to Oslo is incorporated in the price, which adjusts for the geographical location of the producers and makes the export price from various local regions comparable.

[18] An outlier is a unususal or untyphical observation, which can substantially alter the regression results (Gujarati, 2003, p. 390)

Figure 10.2 – Regression of price sensitivity towards supply change
(Source: Own contribution; Kontali (Cited in DnB Markets, 2018))



In regressions involving time-series data, successive observations are likely to be interdependent, which could lead to biased estimates (Gujarati, 2003, 445). As this is an undesirable condition in the regression, it was deemed necessary to test for autocorrelation. As recommended by Gujarati (2003), the Durbin-Watson *d* test was performed, given as:

$$d = \frac{\sum_{t=2}^{t=n} (\hat{u}_t - \hat{u}_{t-1})^2}{\sum_{t=1}^{t=n} \hat{u}_t^2}$$

Where $\hat{u}_r$ denotes the residuals. This yields a *d* equal to 1,6708. The decision rule for the test is that there is no positive nor negative autocorrelation if $d_U < d < 4 - d_U$. At a 1% significance level with 16 observations and 1 regressor, the d_U amounts to *1,086*[19]. Hence, there is no autocorrelation present in the analyzed sample, since the decision hypothesis holds *1,086 < 1,6708 < 2,914*.

At the point where the regression line crosses the x-axis indicate the sensitivity of the salmon price on variations in supply growth (DNB Markets, 2018). In the regression discussed above, the regression line

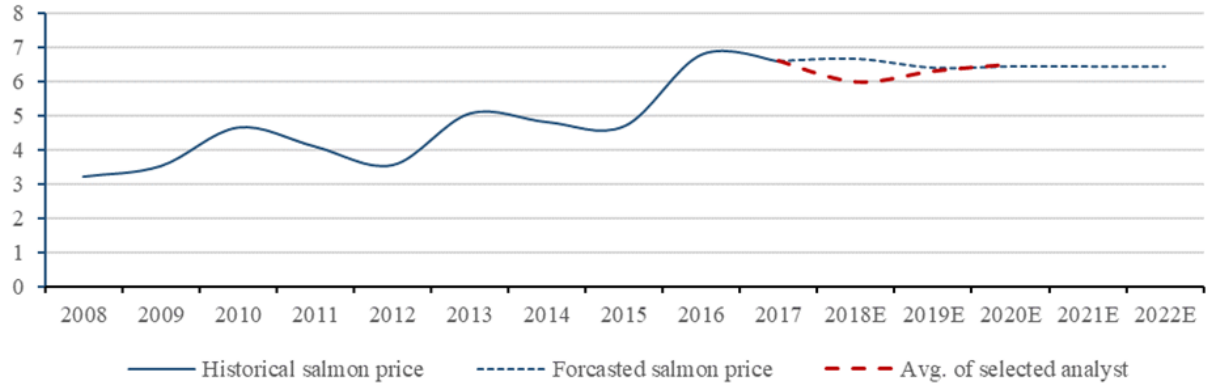
[19] These values were derived from a Durbin-Watson significance table (University of Notre Dame, 2018)

crosses the x-axis at approximately 7,5%. If the supply growth is above this level, the price should decrease, while the price should increase in case supply growth is lower than 7,5%. However, the price has increased substantially towards the end of the period compared to the average price, which might indicate that the price sensitivity to supply changes could be higher in present years (DNB Markets, 2018). In order to investigate this implication, a second regression was carried out, containing only the last four years (2014-2017). In this additional analysis, the regression line crosses the x-axis at around 5-6%, which is more in line with the expected supply growth of 4-7% going forward. The regression line is displayed in the right graph in figure 10.2. Ultimately, this model was applied for forecasting the price in the explicit forecast period, since the supply growth in the future is expected to remain stable (Kontali, cited in DnB Markets, 2018). It should be mentioned, that this model might not yield accurate estimates if supply changes rapidly. It is merely used to provide an understanding of how prices react to supply as argued in DnB Markets (2018), Pareto Security Reaseach (2018) and Handelsbanken Capital Markets (2018). Therefore, since future supply is assumed stable in the future (Kontali Analyse, Cited in DNB 2018), this approach was considered appropriate.

Figure 10.3 – Historical and expected global supply growth
(Source: Own contribution; Kontali (Cited in DnB Markets, 2018))

The expected supply growth is plugged into the regression equation, $\Delta P = -3{,}7621\Delta Q + 0{,}2161$, to estimate the expected price growth in the forecast period. The forecasted supply growth is based on estimates from Kontali (2018, cited in DNB Markets, 2018; Handelsbanken Capital Markets, 2018; Research, 2018). The historical and forecasted supply and growth rates are illustrated in Figure 10.3. Based on the expected supply growth, the salmon spot price is expected to increase to 49,6 DKK/kg in E2018, before it decreases to 47,8 DKK/kg in E2019. In E2020, the price is projected to increase to 48,1 DKK/kg and stabilize at this level, as the supply growth is assumed to stabilize on 5,75 % per year (EY, 2017; Pwc, 2017). The estimated salmon spot price development is illustrated in Figure 10.4., accompanied by a consensus average of selected analysts (Handelsbanken, DnB and Pareto).

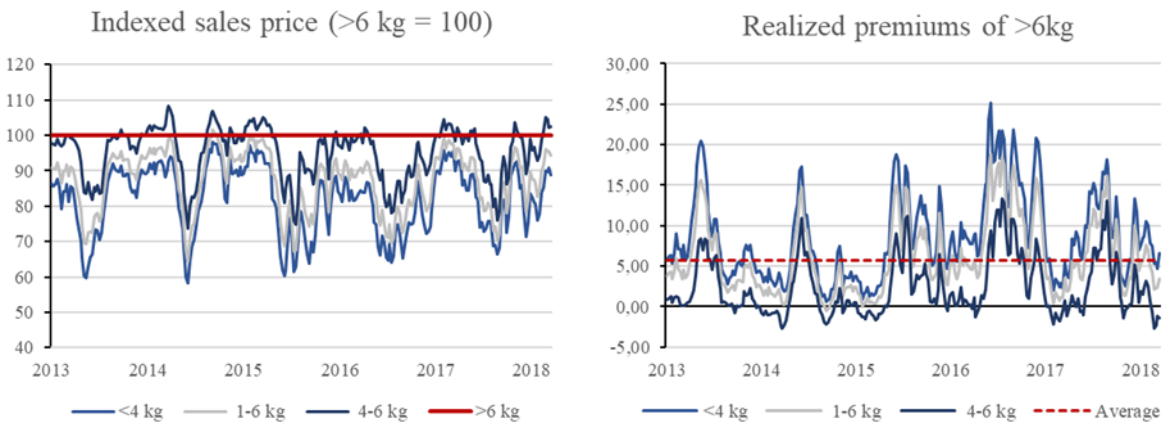
Figure 10.4 – Historical and forecasted salmon price development
(Source: Own contribution; DnB Markets, 2018 ;Kontali (Cited in DnB Markets, 2018))



Price premium

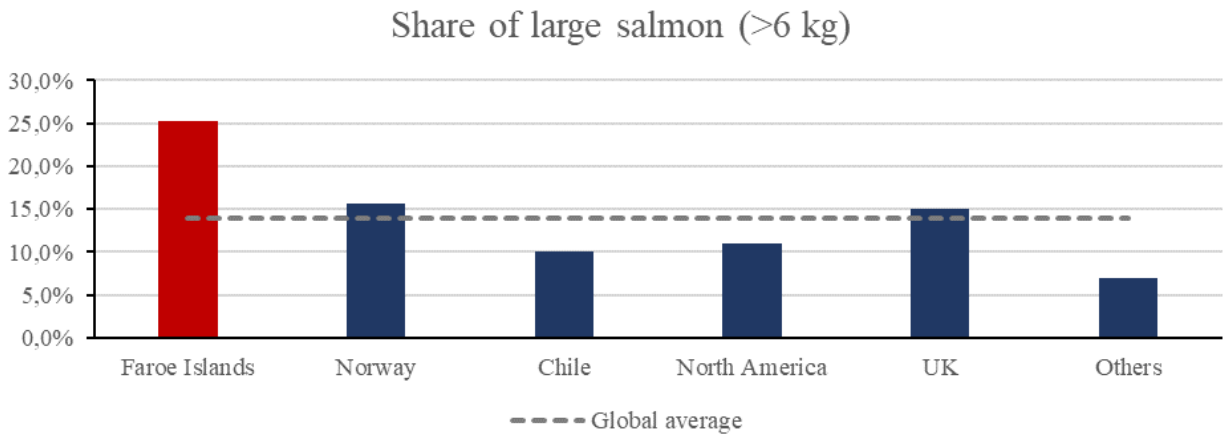
Due to the high demand for Faroese salmon, Bakkafrost has been able to sustain substantial price premiums for their products in comparison with the Norwegian salmon. The main reason behind the Faroese premium is the larger average size of the salmon produced in this region. As mentioned in the VRIO and PESEL analysis, the Faroese archipelago is optimal for producing large salmon, due to stable seawater temperatures and high currents. As a result, the Faroese salmon are on average ~1kg larger than the Norwegian, which in turn yields a premium as large salmon is in high demand (Kontali 2017; Bakkafrost AR 2017). Figure 10.5 displays the premium of large salmon (>6 kg) compared to smaller sizes (4-6 kg, 1-6 kg and <4 kg) between 2013 and 2018 (Nasdaq OMX, 2018b).

Figure 10.5 – Price comparison between large and small salmon
(Source: Own contribution; NASDAQ OMX, 2018a)



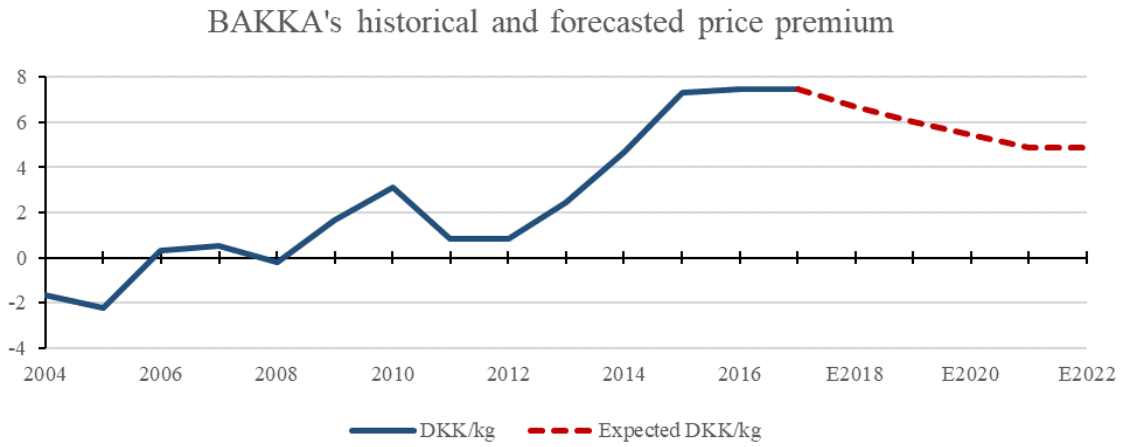
The average premium on large salmon was 5,73 DKK/kg between 2013 and 2018. Furthermore, compared to the smallest salmon class (<4 kg), the average price premium has been 8,63 DKK/kg in the same period. Figure 10.6, displays the global share of >6kg salmon of the main salmon farming regions. When considering that the Faroese share of the global production volume is around 3%, the Faroese share of 25% of larger sized salmon becomes substantial (Bakkafrost, 2018a, 2018c). Moreover, Bakkafrost's operational flexibility has allowed using the smaller salmon and the salmon with sub-optimal quality primarily for the VAP production, entailing that the farming segment's volume mainly consists of salmon sold at a high premium (Bakkafrost 2018a).

Figure 10.6 – Share of large salmon
(Source: Kontali 2018 (cited in Bakkafrost 2018b)



When estimating the premium for the HOG[20], which refers to salmon sold in the spot market through the farming segment. There was available information on price premiums and comparable spot prices. The information was based on historical estimations from Kontali Analyse (2017) and statements from Bakkafrost (2017, 2018a). As shown in figure 10.7., Bakkafrost and the other Faroese producers have received a premium of around 7,45 DKK/kg between 2015 and 2017 compared to Norwegian salmon. In the explicit forecast, this premium is assumed to decrease towards a level of 4,89 DKK/kg in E2021 and to remain constant at this level. One of the reasons for this is that other salmon producers are focused on developing post-smolt facilities, which can allow production of salmon at similar sizes as Bakkafrost (Grieg Seafood, 2018; Marine Harvest, 2018).

Figure 10.7– Share of large salmon
(Source: Nystøyl, 2017; Bakkafrost, 2018a; Kontali 2018 (cited in Bakkafrost 2018a)



VAP segment

When estimating prices for the VAP segment, a different approach was applied. The price per kg in this segment has been based on quoted forward prices provided by Fish Pool (2018). The reasoning is that all sales from this segment are sold at fixed-price contracts, which are based on forward-prices with 6-12 months maturity in addition to a premium (Bakkafrost, 2018a). Thus in the explicit forecast period, the revenue generated from the VAP was derived by multiplying the expected VAP-quantity with the average forward

[20] HOG – Head on gutted (equivalent to GWE).

price. In addition, the price premium for the VAP products had to be added. When estimating this premium, the historical VAP-revenue was divided by the VAP-output volume between 2009 and 2017 in order to approximate an effective price per kg VAP. Then the difference of the derived prices, and the forward price for HOG[21] in the same period is assumed to reflect a premium for the VAP. The estimation is shown in table 10.1.

Table 10.1 – VAP price premium estimation
(Source: Bakkafrost, 2009-2018a; Fishpool, 2018)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	*Average*
VAP, net sales (DKK)	358.709	473.142	507.241	526.257	666.172	913.406	736.657	880.945	998.778	
VAP, output (TGW)	15.451	9.154	11.295	10.668	15.120	17.805	15.285	15.221	16.016	
VAP, net sales per kg	23,22	51,69	44,91	49,33	44,06	51,30	48,20	57,88	62,36	
Historical forward price	27,54	36,54	23,79	29,96	35,09	35,88	36,44	56,28	42,34	
Estimated premium -	**4,33**	**15,15**	**21,12**	**19,37**	**8,97**	**15,42**	**11,75**	**1,60**	**20,02**	**12,12**

The average of the VAP price premium approximation amounted to 12,12 DKK per kg and is assumed to remain as the premium in 2018E. For the subsequent years in the forecast period, this premium is assumed to decrease towards a more sustainable level of ~7,45 DKK/kg. However, this is merely an estimation, as the reported revenues could include invoiced freight costs or other logistics related costs invoiced to the customers, and have discounts, commissions and credit deducted, which have not been accounted for (Marine Harvest, 2017, p. 47). This approximation was made due to limited data on prices and quantities related to VAP products supplied to the market.

FOF segment

The FOF segment produce fishmeal, fish oil and fish feed based on input from wild-capture fisheries and byproducts from production. BAKKA has used most of the produced fish feed for their salmon farming operations, while the remaining volume has been sold externally. The share used internally has increased from 80% in 2014 to 93% in 2017. As the production volume of the farming segment is expected to increase substantially in the forecast period, all fish feed is assumed to be used internally from E2018 (Bakkafrost, 2018a). Similarly, the majority of the fish oil has been used in their fish feed production. Compared to the total production volume of fish oil, the external sales accounted for 0,1% - 0,2% between 2015 and 2017 (Bakkafrost, 2017, 2018a). In the explicit forecast period, all fish oil is assumed to be used for the internal production of fish feed.

[21] HOG – Head on Gutted

For the fishmeal production, there has been another trend, as a considerable amount is sold externally. In 2015 and 2016, the external sales volume was stable; however, in 2017, this volume increased by 151,5%. This was due to high availability of raw material (Bakkafrost, 2018a). According to Bakkafrost (2018a), the availability is highly dependent on quotas for Atlantic pelagic fisheries, and they expect these quotas to increase in 2018. Furthermore, Bakkafrost is investing in new FOF facilities to enhance the production from offcuts from their operations, and to increase the overall capacity of fishmeal. Based on this, the high external sales volume is expected to sustain and further increase by 5% per year between E2018-E2021 as indicated by EY (2017), before it settles at a steady growth rate of 3% in E2022 (Bakkafrost 2018a). Table 10.2 illustrates the historical and forecasted external sales volume of fishmeal.

Table 10.2 – FOF external sales volume forecast
(Source: Own contribution; Bakkafrost, 2015-2018a; Indexmundi, 2018)

	2015	**2016**	**2017**	**E2018**	**E2019**	**E2020**	**E2021**	**E2022**
Historical sales volume	23.460	23.461	59.006					
Expected growth				5%	5%	5%	5%	3%
Expected volume				**61.956**	**65.054**	**68.307**	**71.722**	**73.874**

Futures were perceived as the most appropriate alternative for the approximation of future fishmeal spot price, as argued by Tomek (1997). However, unlike other protein-based commodities such as soy meal, there is not an existent market for this, as most sales contract are usually on a bilateral basis between producers and buyers. Due to the absence of fishmeal futures, there has been a propensity to cross-hedge with soy meal futures (Durand, 1998; Parcel *et al.*, 2008). Also, various studies have shown that there is a tight price relationship between these protein commodities (Asche and Tveterås, 2004; Kristoferson and Anderson, 2004). This relationship was investigated by estimating the correlation between soy meal and fishmeal prices for selected periods. The data is based on average monthly prices gathered from Indexmundi (2018), and the correlation coefficients are presented in table 10.3. It indicates an apparent correlation both on long-term and for recent years. Conclusively, this price relationship is assumed to continue in the forecast horizon.

Table 10.3 – Price correlation between soy meal and fishmeal
(Source: Own contribution; Indexmundi, 2018)

	30y	15y	5y	2y	1y
Price correlation	0,85	0,75	0,71	0,73	0,86

Table 10.4 displays the fishmeal price estimation. The average soy meal price in E2018 is the weighted average of the actual prices in Q1 and the futures prices in Q3 and Q4[22]. A yearly growth rate of the soy meal prices is computed and further applied to the average price of fishmeal in 2017. Together with the forecasted volume, this yield the expected external sales from the FOF segment in the pro forma statements.

Table 10.4 – Estimated fishmeal price (DKK/MT)
(Source: Own contribution; Indexmundi, 2018; Bloomberg terminal)

	2017	2018Q1	2018H2	E2018	E2019	E2020	E2021	E2022
Average soy meal price	2.365	2.790	2.724	2.743	2.566	2.483	2.483	2.483
YoY growth				15,99%	-6,46%	-3,23%	0,01%	0,00%
Estimated fish meal price	**9.005**			**10.445**	**9.770**	**9.455**	**9.456**	**9.456**

All revenue forecast assumptions for sales from the operating segments are summarized in table 10.5.

Table 10.5 – Estimated fishmeal price (DKK/MT)
(Source: Own contribution)

[22] The actual prices is weighted by 1/3 and the futures price by 2/3, based on months.

Pro forma revenue statement	2017A	2018E	2019E	2020E	2021E	2022E
Total harvest volume GWT	54.615	51.000	57.000	63.000	66.000	70.000
Farming segment share (GWT)	35.548	30.600	34.200	37.800	39.600	42.000
VAP harvest share (GWT)	19.067	20.400	22.800	25.200	26.400	28.000
VAP volume output (GWT)	16.016	17.136	19.152	21.168	22.176	23.520
FOF - external sales volume (MT)	59.006	61.956	65.054	68.307	71.722	73.874
Salmon spot price (DKK/kg)	49,14	49,59	47,81	48,07	48,06	48,05
salmon contract price (DKK/kg)	40,56	42,34	35,28	33,70	33,80	33,80
Spot price premium (DKK/kg)	7,45	6,70	6,03	5,43	4,89	4,89
Contract price premium (DKK/kg)	21,80	12,12	10,30	8,76	7,44	7,44
Estimated fish meal price (DKK/kg)	9.005	10.445	9.770	9.455	9.456	9.456
Net sales (tDKK)	**3.770.049**	**3.369.310**	**3.534.892**	**3.864.592**	**4.002.134**	**4.233.708**
Sales from Farming segment	2.150.939	1.722.703	1.841.517	2.022.421	2.096.875	2.223.592
Sales from VAP segment	998.778	933.226	872.986	898.723	914.639	969.965
Sales from FOF segment	620.332	647.164	635.604	645.828	678.177	698.522
Total sales growth	**13,4%**	**-6,6%**	**-6,5%**	**2,9%**	**1,8%**	**6,0%**

10.3.4 Income Statement Items

As elaborated in the financial statement analysis, the core items apprehensive in the forecast model consists of the purchase of goods; depreciation; salary and personnel expenses; other operating expenses; and income from associates. The following section will elaborate on their development in the pro-forma income statement.

10.3.4.1 Purchase of goods

The purchase of goods is by far the most significant cost item consisting of 43% of total production costs in 2017. As mentioned in the qualitative analysis, the majority of the purchase of goods consist of fish feed (Iversen *et al.*, 2015, 2017; Marine Harvest, 2017). In the profitability analysis, it was pointed out that in comparison to sales, the growth of input costs has decreased substantially relative to sales during the trailing period.

Iversen et al. (2015, 2017) points out a trend that has started to emerge in the recent years, is the increase in feed price. The leading cause of this has been an increased focus on the composition of ingredients in the feed. A necessity to sustain high salmon growth rates demands increasingly expensive ingredients for the production of higher quality feed. Moreover, as elaborated in Porter's five forces, the increased focus from consumers on health and environmental aspects, has led to an increased effort in assuring that the feed is sustainable. To meet these expectations, Bakkafrost has begun to clean the fish oil from environmental pollutants and replace

components that do not meet expectations (Bakkafrost, 2018a). Naturally, this has a cost, and the purchase of feed per ton is therefore expected to continue to grow in the future at an historic rate.

Purchase of goods could be forecasted as a percentage of revenue (Petersen and Plenborg, 2012; Koller, Goedhart and Wessel, 2010). However, in the case of the salmon industry, the output is close to fixed, and the salmon price highly volatile. Therefore it is assumed that budgeted production quantity, could be a superior indicator of future purchase of goods. Koller, Goedhart & Wessel (2010, p. 208) argues that in industries where prices are highly volatile, nonfinancial drivers should be incorporated instead. Historically, the average annual change has been an increase of 3.62%. The future levels are calculated by multiplying the cost per ton with the budgeted production as shown in the table below.

Table 10.6 – Purchase of goods forecast
(Source: Own contribution; Appendix 1)

	2017A	2018E	2019E	2020E	2021E	2022E
Production	54615	51000	57000	63,000.00	66,000.00	70,000.00
Purchase of goods	1,025,277.00	992,121.45	1,149,039.37	1,316,030.61	1,428,679.34	1,570,197.41
Cost per ton GW	18.77281	19.45	20.16	20.89	21.65	22.43
Average change (2013-2017)	4%					
Percentage of sales	27%	29%	31%	32%	32%	34%

10.3.4.2 Salary and personal expenses

As observed in the profitability analysis, the salary and personnel expenditures have had a stable development historically. According to Iversen et al. (2015, 2017), in relation to the significant increase in production and sales in the later years, the personnel expenses have not increased as much as might be anticipated in the industry. As elaborated on in the trend analysis, this is also evident for Bakkafrost (section 8). They argue that the underlying reason is larger-scale production units and re-innovation of production concepts. The tasks previously performed by the 'common' employee, are now becoming increasingly specialized (Bakkafrost, 2018a; Nofima 2015). Consequently, an increasing amount of these jobs, such as delousing and rigging has been, and will continue to be outsourced or automated in the future. Thus becoming a part of *other operating expenses* instead (Bakkafrost, 2017; Nofima, 2015, 2017). The common-size analysis discussed a trend where salary and personnel expenses are relatively stable; it is therefore believed that the development of this post

will behave similarly in the future. Likewise, for purchase of goods, the level of future cost is forecasted relative to future production quantity.

Table 10.7 – Salary and personnel forecast
(Source: Own contribution; Appendix 1)

	2017A	2018E	2019E	2020E	2021E	2022E
Tons GW	54615	51000	57000	63000	66000	70000
Avg. cost/ Ton GW, since 2012	6.0					
Avg increase per ton since 2012	8.5%					
Salary and personnel expenses	400267.0	333389.9	372612.2	411834.5	431445.7	457593.9

10.3.4.3 Other operating expenses

Other operating expense is one the cost items that have increased the most during the trailing period (Appendix 7). As mentioned in the profitability analysis, a large chunk of the other operating costs relates to salmon health. During the last two years, major projects have been initiated to increase the health of salmon with freshwater, delousing and lumpfish. Bakkafrost state in their annual report that this is likely to increase, as a result of increased regulatory requirements and consumer expectations, as mentioned in Porter's five forces. However, due to substantial investments, some efficiency gains are also anticipated.

Alike with the other cost items, other operating expenses are also deemed to be driven by quantity rather than sales. A likely issue, in this case, is that that chunks of other operating expenses could consist of fixed costs. Thus, when averaging historical other operating expenses per ton GW, and assuming this to represent future cost levels multiplied by future quantity, could lead to bias. If large chunks of the cost were fixed, such averaging would assume that the cost nature is variable (Zimmerman, 2011). Thus the unit cost could be determined too high when quantity increase, which eventually could lead to a conservative forecast of margins. However, Koller, Goedhart & Wessel (2010, p. 209) argues that in large firms the distinction between variable and fixed costs are immaterial, as most costs could be perceived as variable for valuation purposes. The table below shows the forecasted levels of *other operating expenses* net of the anticipated cost savings as a result from investing in new operating equipment I the recent years (Bakkafrost 2017)

Table 10.8 – Net Other Operating Cost forecast
(Source: Own contribution; Appendix 1)

	2017A	2018E	2019E	2020E	2021E	2022E
Quantity GW	54615	51000	57000	63000	66000	70000
Average Cost per ton GW since 2013	14.30					
Other Operating Cost	783,268.0	729,413.8	815,227.2	901,040.6	943,947.3	1,001,156.2
Cost reduction eff. Gains		20,000.0	20,000.0	50,000.0	80,000.0	80,000.0
Net other Operating Cost		709,413.8	795,227.2	851,040.6	863,947.3	921,156.2

10.3.4.4 Depreciation

The depreciation charge is assumed to stay fixed at the historic average of 9% since 2012. Table (xppe) shows the depreciation together with future development in PPE.

10.3.4.5 Tax

The Faroe Islands have a nominal tax rate of 18%; in addition to corporate taxes, they also have to pay an additional tax of 4.5% of revenues generated by the farming segment (Danmarks Nationalbank, 2017; Bakkafrost, 2018a). In the future, the marginal tax rate and the resource tax from Salmon farming of Bakkafrost are assumed to stay at the current level, since no indication of future changes has been found.

10.3.4.6 Other core operating income: Income from associates

The forecast of income from associates is a minor item. It constituted 0.46% of Bakkafrost's total revenue in 2016 and 2017. The associates are P/F Pelagos and P/F Salmon proteins, which both are producers of the raw material of fishmeal, of which Bakkafrost is a significant customer (Bakkafrost, 2018a) Bakkafrost have a 30% and 76% percentage of ownership in the companies respectively (Bakkafrost, 2018a). Due to a lack of information what may drive their profits, it is assumed that the income will be 0.46% of Bakkafrost's revenue in the future.

10.3.5 Forecast of Balance sheet items

10.3.5.1 Inventory (Fishmeal, Roe, Vet)

Petersen & Plenborg (2012) argues that in a simple forecast, working capital could increase as a percentage of revenue. The reasoning is that some line items are more likely to be driven by quantity rather than sales (Koller, Goedhart and Wessel, 2010). Likewise, it seems more appropriate to link inventory values to budgeted

quantity, through future levels of purchase of goods. Koller, Goedhart & Wessel (2010) suggest that a typical forecast ratio is *historical inventory/COGS*. The average inventory to purchase of goods-ratio has been 0.34 since 2012. Again, it is chosen to use averages since 2012 since there is a substantial increase in inventory levels after the acquisition of p/f Havsbrun in 2011 (Bakkafrost 2012-2018)

Table 10.9 – Inventory forecast
(Source: Own contribution; Appendix 1)

	2017A	2018E	2019E	2020E	2021E	2022E
Forecasted Purchase of goods		977,100	1,095,816	1,236,669	1,320,704	1,439,461
Avg. Inventory/Purchase since 2012	0.21					
Inventory	305,845.0	208,148.9	233,438.7	263,444.3	281,345.9	306,644.3

10.3.5.2 Biological assets

Biological assets constitute a substantial part of total operating assets, on average 30% since 2011 (Appendix 7). The item is stated at fair value and forecasting the value of Biological assets would be speculative. As argued earlier, it can change drastically between periods if the underlying assumptions are changed (FSA, 2015; Misund, 2018). As mentioned, the level of Biological assets are valued based on firm-specific models of biomass, anticipated mortality, spot-prices and expected spot-price at future harvest dates (Larsen and Asche, 2011; Bakkafrost, 2018a). Thus, forecasting the fair value of biological assets would be an estimate with many unknown variables and a daunting task.

However, according to Penman (2013), it is only the assets stated at book value that can generate residual earnings. If some items are stated at market value, and market value is equal to the intrinsic value, then their residual operating is zero (Penman 2013, p.438). Bakkafrost report that the biological assets are stated at fair value reduced of harvesting costs, Faroese revenue tax, and freight costs to the market. In addition quality grading is also reflected. Therefore, it is assumed that the biological assets' fair value equals its intrinsic value. Thus, the residual earnings associated with the asset does not need to be forecasted, since it is already incorporated in its value (Penman, 2013). Consequently, in the forecast of biological assets we are only concerned with the portion stated at cost. In the notes of Bakkafrost, the Biological assets have been disclosed at both cost and fair value. Therefore, in the Pro-Forma Balance sheets, there has been a separation between the fraction stated at cost and the fraction stated at fair value. Regarding the forecast, the amount stated at cost

could be argued to be a form of stock or inventory. The future level is forecasted with the average historical ratio of *Biological assets at cost* /*Purchase of goods* since 2012, in the same manner as *inventory.* The share stated at fair value is held fixed at 127.198 T DKK in the forecast.

Table 10.10 – Biological assets forecast
(Source: Own contribution; Appendix 1)

	2017A	2018E	2019E	2020E	2021E	2022E
Purchase of goods	1,025,277	977,100	1,095,816	1,236,669	1,320,704	1,439,461
Average ratio, after 2012	96%					
Biological assets at cost	969,466	933,500	1,046,919	1,181,487	1,261,772	1,375,229
Biological assets fair value	127,198	127,198	127,198	127,198	127,198	127,198
Total biological assets	1,096,664	1,060,698	1,174,117	1,308,685	1,388,970	1,502,427

10.3.5.3 Accounts receivable

In contrary to Biological assets at cost and Inventory, which was assumed to be driven by quantity, accounts receivable is considered to increase relative to sales. The intuition is that when sales are high, customers' total obligations to Bakkafrost will be higher. To forecast Account receivables, the item's average historical turnover rate since 2012 was used, as shown in the table below.

Table 10.11 – Accounts Receivable forecast
(Source: Own contribution; Appendix 1)

	2017A	2018E	2019E	2020E	2021E	2022E
Operating Revenue	3,770,049	3,303,093	3,350,108	3,566,973	3,689,691	3,892,080
Avg since 2012	12.4					
Forecasted Accounts receivable		267,281	271,086	288,634	298,564	314,941

10.3.5.4 PPE

Paramount in establishing future levels of ATO is to forecast the components of future NOA, which is comprised of future operating assets and operating liabilities (Penman 2013). A firm needs to upkeep investment to sustain future sales. However, investments cannot be continued at high levels indefinitely (Petersen and Plenborg, 2012). The question raised is, therefore, which assets need to be in place to generate sales in the future? Determining this requires knowledge of the production technology (Penman 2012). From the qualitative industry analysis, it was revealed that Bakkafrost had reached the maximum amount of production licenses they can hold (Iversen *et al.*, 2015, 2017; Danmarks Nationalbank, 2017; Bakkafrost, 2018a). Therefore, to grow, they have to expand and integrate into other areas of the value chain so that production can increase. The core of this strategy has already been implemented by investing in assets that allows an increase in smolt size. Subsequently, this leads to the salmon spending less time in the ocean, so that mortality can decrease (Bakkafrost, 2016, 2018a).

However, Bakkafrost (2018) issued an investment plan for 2018-2020 in their annual report, stating total investments of mDKK 360, 410, and 280 the next three years. In the pro-forma financial statements, these numbers will be used until 2020, as argued by Sloan & Lundgren (2004). As indicated in the qualitative analysis, however, the growth opportunities of Bakkafrost if they do not expand beyond the Faroe Islands are limited. From the trend analysis (appendix 7), it seems as capital investment peaked in 2016, and will decline annually towards 2020. From 2020 and beyond, the future investments would depend on their strategic path. From 2021 onwards, it is assumed that the level of investment will stay constant at the level of 280,000, which at the current deprecation rate will keep future PPE at a stable level.

Table 10.12 – PPE forecast
(Source: Own contribution; Appendix 1)

	2017A	2018E	2019E	2020E	2021E	2022E
PPE, primo	2,118,471	2,570,430	2,677,371	2,820,759	2,832,991	2,844,166
Investments	618,686	360,000	410,000	280,000	280,000	280,000
Depreciation	166,727	253,059	266,612	267,768	268,824	269,790
		9%	9%	9%	9%	9%
PPE, post	2,570,430	2,677,371	2,820,759	2,832,991	2,844,166	2,854,377

10.3.5.5 Other Net Operating Assets

The minor items of operating assets and liabilities mentioned in the table below are aggregated in the category of other net operating assets, in accordance with Penman (2013). As observed in the profitability analysis, other NOA has not been a significant driver of ATO during the trailing period and has since 2011 remained stable at a level between 0.17 and 0.22. Since these items did not have a considerable effect on ATO historically, it is assumed that these items also will remain stable in the future. The average of the inverse other NOA value since 2012 has been used to calculate an average rate. The future levels of Other NOA are derived by multiplying the inverse ATO with the level of net sales. The post-2012 numbers were used since Bakkafrost did not have the same level of integration in the value chain before that. Thus, it is assumed that these numbers can reflect the future levels. However, a limitation here is assuming that all items below are driven by sales, which might not be the case. However, due to their relatively small size, and stable nature, it is assumed that this also will hold in the future.

Alternatively, regarding the Deferred Tax liability, which is the largest item aggregated into Other NOA. Sloan & Lundgren (2004) argues that deferred taxes could be forecasted as a constant percentage of PPE. If the firm maintains their assets at a fixed level in the future, then the Deferred tax liability would also remain constant. However, it was decided to follow the approach as shown below.

Table 10.13 – Inverse other NOA driver
(Source: Own contribution; Appendix 1)

Inverse other NOA	**2012A**	**2013A**	**2014A**	**2015A**	**2016A**	**2017A**	**2018E**
Investments in stocks and shares	-0.00	0.00	0.01	0.01	0.01	0.01	
Investments in associated companies	0.03	0.04	0.04	0.04	0.02	0.01	
Deferred taxes	0.14	0.11	0.14	0.13	0.14	0.13	

Current tax liabilities	-	0.01	0.03	0.05	0.05	0.05	
Trade Payables	0.10	0.07	0.05	0.06	0.05	0.04	
Provisions for onerous contracts	-	-	-	0.01	0.02	0.01	
Other current liabilities	-	0.02	0.02	0.00	0.01	0.01	
	-	-	-	-	-	-	-
Average Inverse NOA	**0.21**	**0.17**	**0.19**	**0.21**	**0.24**	**0.22**	**0.21**

10.3.5.6 Intangible assets

The intangible assets of Bakkafrost consist of farming licenses and goodwill. The goodwill derives from purchases of subsidiaries or associates when the purchase has been higher than the summed fair values of individual assets (Bakkafrost, 2018a). Goodwill is not depreciated but tested for impairment annually. The historical levels in intangibles have been steady since 2012, reductions or increases have mostly been as a result of acquisitions or divestments. Koller, Goedhart & Wessel (2010) argues for not forecasting the level of intangibles but instead keeping them at a stable level, due to the issues of forecasting the value of synergies of which goodwill arise.

The farming licenses in the Faroe Islands entail the right to control and farm salmon at particular geographical areas in the Faroes. The licenses are issued with a nominal lifespan of 12 years (Bakkafrost, 2018a). Every 12 years the licenses are renewed on a rolling basis unless there are specific conditions linked to the veterinarian, environmental or area planning circumstances. Bakkafrost has reached the maximum amount of farming licenses they possibly can acquire with current regulatory requirements. In consideration to this, intangible assets are held constant at its current level of 376.675 in the explicit forecast horizon.

Table 10.14 – Pro-forma statement
(Source: Own contribution)

Pro forma financial statements	2017A	2018E	2019E	2020E	2021E	2022E
Income statement						
Sales from Farming activities	2,150,939	1,722,703	1,841,517	2,022,421	2,096,875	2,223,592
Sales from VAP segment	998,778	933,226	872,986	898,723	914,639	969,965
Sales from FOF segment	620,332	647,164	635,605	645,828	678,177	698,523
Net Sales	**3,770,049**	**3,303,093**	**3,350,108**	**3,566,973**	**3,689,691**	**3,892,080**
Cost of sales	-1,025,277	-992,121	-1,149,039	-1,316,031	-1,428,679	-1,570,197
Gross margin	**2,744,772**	**2,310,971**	**2,201,068**	**2,250,942**	**2,261,012**	**2,321,882**
Salary and personnel expenses	-400,267	-333,390	-372,612	-411,835	-431,446	-457,594
Depreciation	-183,590	-253,059	-266,612	-267,768	-268,824	-269,790
Other operation expenses	-783,268	-709,414	-795,227	-851,041	-863,947	-921,156
Core operating income before tax	**1,377,647**	**1,015,108**	**766,617**	**720,299**	**696,794**	**673,343**
Taxes	-217,538	-182,719	-137,991	-129,654	-125,423	-121,202
Revenue tax (4,50%)	-119,681	-77,522	-82,868	-91,009	-94,359	-100,062
Core operating income from sales after tax	**1,040,428**	**754,867**	**545,758**	**499,636**	**477,012**	**452,079**
Income from associates	17,302	15,194	15,410	16,408	16,973	17,904
Taxes	-3,114	-2,735	-2,774	-2,953	-3,055	-3,223
Core operating income after tax	**1,054,616**	**767,326**	**558,394**	**513,091**	**490,929**	**466,760**
Unusual items	-504,287	0	0	0	0	0
Operating income (OI)	**550,329**	**767,326**	**558,394**	**513,091**	**490,929**	**466,760**
Balance sheet						
Account receivable	335,019	267,281	271,086	288,634	298,564	314,941
Biological Assets at cost	969,466	933,500	1,046,919	1,181,487	1,261,772	1,375,229
Inventory	305,845	329,335	369,348	416,823	445,147	485,177
Property, plant and equipment	2,570,430	2,677,371	2,820,759	2,832,991	2,844,166	2,854,377
Intangible assets	376,675	376,675	376,675	376,675	376,675	376,675
Other NOA	-494,289	-732,355	-673,825	-703,313	-746,867	-779,686
Net operating assets (NOA)	**3,757,301**	**3,851,806**	**4,210,962**	**4,393,297**	**4,479,457**	**4,626,713**
Biological asssets at Market value	127,198	127,198	127,198	127,198	127,198	127,198
NFO	258,070	0	0	0	0	0
CSE	3,626,429	3,979,004	4,338,160	4,520,495	4,606,655	4,753,911

10.4 Fade Period: 2023-2027

In the fade period from 2022 to 2027, it has been chosen to focus on the forecast of sales growth, profit margins, and asset turnover rates. The quantitative industry analysis provided insights into the typical driver patterns for the industry (Section 9). It was demonstrated that high levels of profit margins and RNOA quickly reverted towards an industry mean. Simultaneously, it was observed that the companies with the highest ratios were able to sustain some competitive advantage by maintaining a higher RNOA in the long run. The analysis suggested that core profit margins had a long run sustainable level of 3.92% with a persistence rate of 0.65. The ATO a long run level at 1.79 with a persistence rate of 0.80. The RNOA a long run rate of 5.59% with persistence of 0.62. Lastly, the sales growth a long run level at 9% with persistence of 0.49. As Penman (2013, p.512) argues, assuming these are the typical driver rates for the industry, and that the tendencies also will hold in the future, it has to be assessed how a company's drivers are likely to be different from the industry pattern. As argued in the section covering the fade rates, it was deemed that the long run levels obtained were unlikely in the case of Bakkafrost and their peers, as they were too low. However, an essential lesson from the analysis was that abnormally high profits tend to revert towards a mean in the future within in the aquacultural industry. Moreover, those companies with the highest performance also seemed able to sustain a higher RNOA than the average in the long-run (Section 9). Therefore, in the fade period, it is assumed that these deductions will continue to hold. However, instead of applying the exact fade rates from the quantitative industry analysis, it is assumed more likely that Bakkafrost will revert towards the average Core PM and ATO levels to those of the close peer group obtained from the profitability analysís (Table 10.14 and Table 10.15). Accordingly, the core profit margin will revert towards an average of 14%, and the ATO towards a level of 1.20. The same persistence rates obtained from the quantitative industry analysis are used in the fade period. Regarding sales growth, due to stalling salmon prices and limited room for expansion of production on the Faroe Islands (Iversen *et al.*, 2015, 2017), the future sales growth is assumed to revert towards a steady state level at 3.8%.

Table 10.14 – Peer group core PM
(Source: Own contribution; Appendix 1)

Core PM	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Bakkafrost	26.0%	23.0%	14.5%	19.4%	22.0%	30.9%	27.9%	28.0%
Grieg	17.2%	8.4%	-7.8%	11.5%	8.2%	1.3%	13.6%	9.5%
Salmar	25.0%	14.0%	8.5%	20.1%	20.5%	16.2%	24.2%	24.9%
NRS	6.1%	2.5%	1.8%	9.0%	6.5%	6.4%	15.8%	10.2%
Lerøy	14.6%	10.1%	4.7%	13.6%	11.8%	9.3%	14.9%	18.1%
MHG	17.2%	13.0%	3.0%	16.7%	16.6%	9.1%	18.3%	18.9%
Avg.	**17.7%**	**11.8%**	**4.1%**	**15.1%**	**14.3%**	**12.2%**	**19.1%**	**18.3%**
Avg. Period	**14.1%**							

Table 10.15 – Peer Group ATO
(Source: Own contribution; Appendix 1)

ATO	2010	2011	2012	2013	2014	2015	2016	2017
Bakkafrost	1.1	0.9	0.9	1.1	1.2	1.1	0.9	0.9
Grieg	0.8	0.7	0.7	0.7	0.7	1.1	1.5	1.5
Salmar	0.9	0.8	0.8	1.0	1.1	1.0	1.1	1.2
NRS	2.3	1.7	1.6	2.1	1.7	1.9	2.1	2.0
Lerøy	1.4	1.3	1.2	1.2	1.2	1.2	1.2	1.1
MHG	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.9
Average	**1.2**	**1.0**	**1.0**	**1.2**	**1.1**	**1.2**	**1.3**	**1.3**
Avg. Period	**1.2**							

Table 10.16 – Fade pro-forma
(Source: Own contribution; Appendix 1)

Pro forma financial statements	2022E	2023F	2024F	2025F	2026F	2027F
Income statement						
Net Sales	**3,892,080**	**4,072,328**	**4,243,771**	**4,413,614**	**4,585,732**	**4,759,990**
Operating income (OI)	**466,760**	**516,989**	**558,135**	**593,574**	**625,570**	**649,342**
Balance sheet						
Net operating assets (NOA)	**4,626,713**	**4,407,959**	**4,334,419**	**4,313,248**	**4,331,821**	**4,496,430**
Biological asssets at Market value	127,198	127,198	127,198	127,198	127,198	127,198
NFO	0	0	0	0	0	0
CSE	4,753,911	4,535,157	4,461,617	4,440,446	4,459,019	4,623,628

10.5 Continuing value

Since it is assumed that Bakkafrost's residual operating income will continue to grow perpetually beyond the forecast horizon, an appropriate growth rate has to be derived. Penman (2013) suggests that an estimated long-term GPD growth rate could be used in the continuing value. Brealey, Myers and Allen (2014) argues nominal rates should be used for consistency, if the remainder of the forecast also is performed in nominal terms. Therefore, it was chosen to use an expected future nominal GDP growth rate as a proxy for the growth of ReOI in the continuing value. Moreover, since the forecast is performed in DKK, the expected future nominal GDP growth of Denmark were used, also for consistency. Two alternatives were considered when determining a rate: (1) to use a growth rate of 3.7% as forecasted by OECD (2018), or (2) use an historical average growth rate. According to Norges Bank (2016), using historic averages of nominal GDP in forecasts, tend to outperform forecast-models when back tested. Therefore, the average growth rate was calculated back to 1978 with data provided from *Danmark Statistik* and amounted 3.8%. Ultimately, the rate of 3.8% were used as the growth rate for the continuing value.

The assumption of which growth rate to use is crucial, as the continuing value beyond the forecast horizon constitutes a large part of the firm's intrinsic value (Koller, Goedhart and Wessels, 2010; Petersen and

Plenborg, 2012; Penman, 2013). The sensitivities linked to changes in ReOI long-term growth rates will be demonstrated in the sensitivity analysis in section 15.

11. Term structure of interest rates

In valuations, the future value is usually discounted for time and risk by the cost of capital to get to the value of today (Christensen and Feltham, 2009). While the whole concept of cost of capital will be elaborated and discussed in section 13, one of the critical inputs in the traditional asset pricing model will be discussed in this section, namely the risk-free rate. According to Koller, Goedhart & Wessel (2010), the most common proxy for the risk-free rate in valuations is treasury bills or long-term government bonds. These are typically assumed to remain constant over the estimation period. However, as risk-free rates vary over time, the assumption of static risk-free rates might be a poor reflection of reality, and the equity estimations could be biased. Alternatively, the risk-free rate can be estimated based on the term structure of interest rates, as suggested by Christensen & Feltham (2009). The term structure will incorporate a non-static element in the cost of capital, which ultimately should increase the accuracy of the estimates.

The term structure of interests can be estimated by deriving the yield to the maturity (YTM) of zero-coupon bonds for the maturities that match the time frame of the future values that should be discounted. However, as zero-coupon bonds are not traded directly, it is not possible to observe the zero-coupon yields of the different maturities. An alternative approach is to estimate the zero-coupon yields from actively traded swap-rates or default-free coupon bonds (Christensen & Feltham, 2009). Furthermore, the zero-coupon yields should be denoted in the same currency as the underlying cash flow, as this ensures consistency and handles issues with inflation (Petersen and Plenborg, 2012). Hence, local bonds and swap rates denoted in DKK was examined.

After assessing the Danish government bullet bonds, it became evident that there were few bonds actively traded, especially on long-term (Nasdaq OMX, 2018a). Since more observations increase the accuracy of the term-structure, variable-for-fixed swap rates in DKK were chosen instead[23]. With interest swap rates, credit risk is in principle no issue, since the principal is never exchanged – only the interest payments are exchanged (Ron, 2000; Christensen and Feltham, 2009; Hull, 2012).

[23] Ticker: DKSW

Since there are limited observations of swap rates in the estimation period (30 years), there was a need for a model to estimate the implied interest rates for the years without YTM. Consequently, the curve-fitting model of Nelson & Siegel (1987) was applied, but with the Svensson (1994) extension, as this tends to fit the curve in the term structure more easily. Furthermore, the Nelson-Siegel term structure variations are the most commonly applied by central banks (De Pooter, 2007; Gilli, Große and Schumann, 2010). Moreover, according to Bliss (1996), the framework yields high estimation accuracy, both on short- and long-term.

11.1 Estimation of the term structure

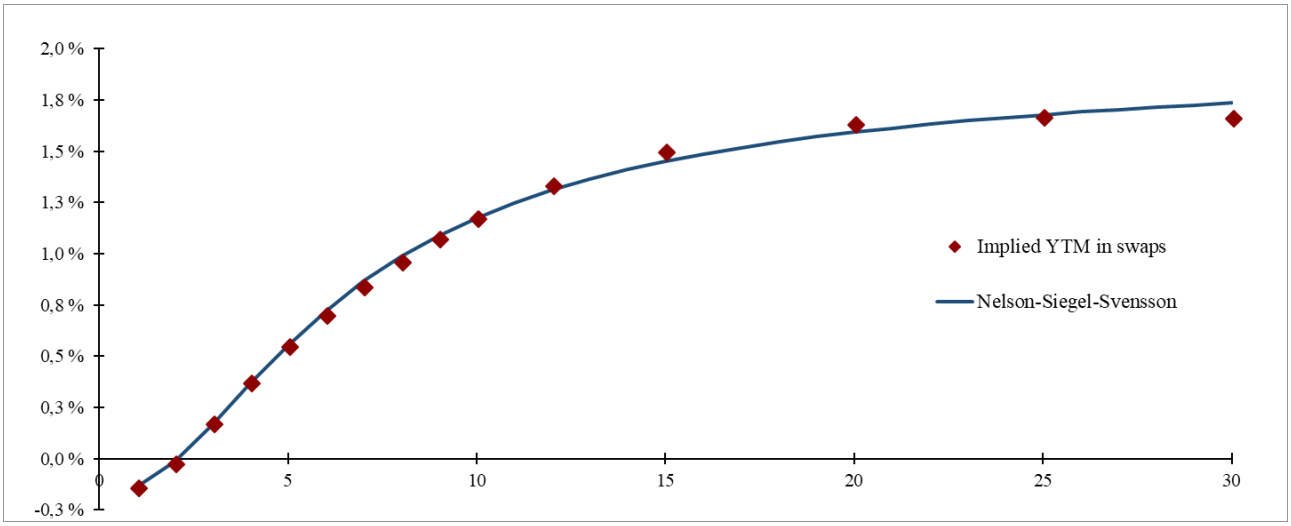
The fixed leg of a DKK interest rate swap traded against the CIBOR is quoted daily for maturities 1-10, 12, 15, 20, 25 and 30 years. All data is compiled from the Bloomberg terminal. The functional form of the Nelson-Siegel-Svensson model can be formulated as:

$$g(m,\tau,\theta) = \beta_0 + \beta_1\left[\frac{1-e^{-\frac{m}{\tau_1}}}{\frac{m}{\tau_1}}\right] + \beta_2\left[\frac{1-e^{-\frac{m}{\tau_2}}}{\frac{m}{\tau_2}} - e^{-\frac{m}{\tau_2}}\right] + \beta_3\left[\frac{1-e^{-\frac{m}{\tau_2}}}{\frac{m}{\tau_2}} - e^{-\frac{m}{\tau_2}}\right]$$

Where $g(m, \tau, \theta)$ is a function of time-to-maturity and a set of parameters $\theta = (\beta_0, \beta_1, \beta_2, \beta_3, \tau_1, \tau_2)$. The term structure is estimated by minimizing the sum of squared residuals between the implied Nelson-Siegel-Svensson rates and the observed market priced swap rates, by varying the parameters. As a result, the yield curve is calibrated to best fit the observed swap rates, as displayed in figure 11.1. The β_0 is estimated to 2,02%, which implies that the interest rates will converge towards this value in the long run.

Parameters:	β[0]	β[1]	β[2]	β[3]	τ[1]	τ[2]
Value:	0,0202	-0,0212	0,2927	-0,3242	1,4641	1,4900

Figure 11.1 – Term structure of interest rates
(Source: Own contribution; Bloomberg terminal)



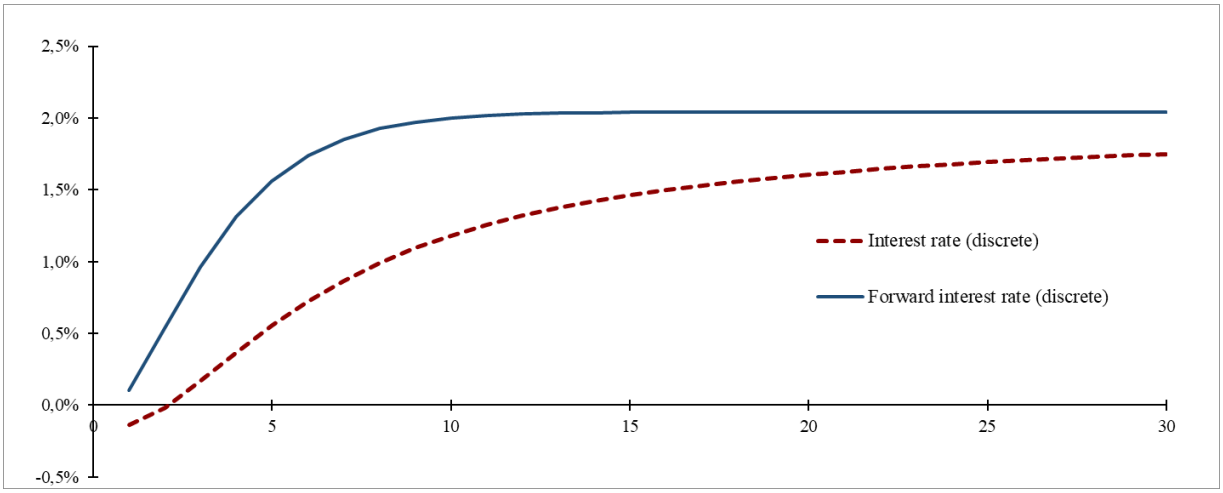
The term structure estimates are continuously compounded. Since the implied zero-coupon yields should be used for discounting future values, all yields are converted to discretely compounded by the following formula:

$$i_{t\tau} = e^{r_{t\tau}} - 1$$

Furthermore, when estimating the expected residual operating income in the forecast and fade period, the forward rate should be applied instead of the future spot rate (Christensen and Feltham, 2009). The forward rate can be estimated according to the following relation:

$$f_{t\,\tau}^{\tau+1} = \frac{(1 + i_{t\,\tau+1})^{\tau+1}}{(1 + i_{t\,\tau})^{\tau}}$$

Figure 11.2 – Implied risk-free rate and forward rate
(Source: Own contribution)



12. Cost of capital

12.1 Cost of capital for operations

The residual operating income valuation model requires the cost of capital for operations (ρ_F) to estimate and discount residual earnings in the forecast period. This measure is also referred to as cost of capital to the firm or the weighted average cost of capital (WACC), and it is given by (Penman, 2013):

$$\rho_F = \frac{V_0^E}{V_0^{NOA}} \cdot \rho_E + \frac{V_0^D}{V_0^{NOA}} \cdot \rho_D$$

Where,

V_0^E = Value of equity
V_0^D = Value of debt
V_0^{NOA} = Value of operations
ρ_E = Cost of capital for equity
ρ_D = Cost of capital for debt after tax

To complete the relationship formulated above, the cost of debt and equity must be estimated, as well as the capital structure to weight the respective rates. The cost of debt should be measured on an after-tax basis to capture the value of interest tax shields (Brealey, Myers and Allen, 2014). At the cut-off date, that is 6th of April 2018, the value of equity and value of debt amounted to 98,5% and 1,5%, respectively. However, when applying weights to the WACC, Koller, Goedhart & Wessel (2010) recommends applying target debt ratio instead of current ratio. The current ratio might be inadequate as it could be under- or overestimated and therefore poorly reflect the actual debt-ratio over the estimation period. In order to determine a possible target

debt-ratio for Bakkafrost, management's announcements regarding future investments and financing have been assessed.

In the first quarter of 2018, Bakkafrost made a new financing agreement with their current lender, Nordea, regarding a senior secured five-year 200 mEUR credit facility (BAKKA 2017; p.120). The management has stated that the strong financial position and flexibility enables the group to fulfill its dividend policy and to carry out potential M&A activity (Bakkafrost, 2018a, p.9). However, as there are no announcements about M&A targets, it would be highly speculative from an external analyst's point of view to forecast this, and it would call for a different thesis approach. Moreover, after the investment plan is completed in E2020, there are no apparent investment alternatives, at least from this analysis's standpoint.

In the forecast period, the change in NFO has been assumed to be determined by the residual free cash flow (FCF), after net financial expenses (NFE). Since this amount exceeds the NFO in the first forecast year, Bakkafrost has been assumed to be purely equity financed from E2018 and onwards. In the subsequent periods, all FCF/FCFE has been assumed to be paid out as dividends to the equity holders to prevent a substantial build-up of financial assets (FA), as discussed by Penman (2013). Since Bakkafrost is expected to be purely equity financed, cost of debt is not taken into consideration, which results in $\rho_F = \rho_E$.

12.2 Cost of equity

The estimation of the cost of equity has been based on the CAPM framework (Black, Jensen and Scholes, 1972), but as mentioned, allowing the risk-free to vary with the term structure, yielding different ρ_E each period in the forecast and fade period. CAPM can be given as:

$$\rho_E - 1 = r_E = 1 + r_F + \beta_E \cdot MRP$$

where,

r_F = Risk-free interest rate
β_E = Systematic risk on equity
MRP = Market risk premium

The principle of CAPM is that by holding a sufficiently broad portfolio, an investor will only pay for the risk that cannot be diversified away. Hence, it is only the systematic risk, namely β_E, which is priced (Penman, 2013, p. 649; Petersen and Plenborg, 2012, p. 249). Stocks with a beta value between 0 and 1.0 tend to move in the same direction as the market, but to a lesser extent. In contrary, a beta coefficient below zero tends to

move in the opposite direction of the market. A typical example of this is gold. Furthermore, stocks with beta values higher than 1.0 tend to amplify the overall movements of the market (Brealey, Myers and Allen, 2014). The beta is usually estimated by regressing the stock returns towards an index that represents the market portfolio, or by applying an industry beta based on overall industry average or an average of close peers' beta (Koller, Goedhart and Wessel. 2010). Both procedures have been conducted in this thesis.

There are other means of estimating the cost of equity, with the most well-known being Fama-French Three-Factor Model and the Arbitrage Pricing Theory. Koller, Goedhart & Wessel (2010), amsong others (Penman, 2013; Brealey, Myers and Allen, 2014; Petersen and Plenborg, 2012), recommends applying the CAPM, as the alternative models do not necessarily improve the precision of the estimates.

12.2.1 Market risk premium

The market risk premium (MRP) reflects the spread between the market's expected return and the risk-free rate (Petersen and Plenborg, 2012, pp. 263-264). According to Koller, Goedhart & Wessel (2010), this is arguably one of the most debated topics is finance, as no single model has gained universal acceptance. There are different techniques to estimate the future MRP, such as regression of various market factors and estimations based on historical returns. However, there has been extensive research on this topic, resulting in a variety of reports and articles with suggestions for MRP, both nationally and globally. Due to the magnitude of this research, there is no reason to believe that an estimation in this thesis will be more accurate. Consequently, the proxy for MRP will be determined by analyzing the results of the research in the field.

According to Damodaran (2014), the risk premium should be based on the point of view of a marginal investor. That is the investor that most likely would trade the stock at any point in time. The country of origin of the major stakeholders is relatively varied and is mainly made up by diversified institutional investment funds, as shown in section 4.2.2[24]. Taking this into consideration, one could argue to apply a global marginal investor perspective. However, since the MRP is estimated as the difference between risk-free rate and the expected market return, this would be inconsistent regarding the risk-free rate and cash flow. The reason behind this is that these are denominated in DKK. Conclusively, a Danish MRP has been applied.

[24] Top 20 shareholders can be seen in Appendix 39

Koller, Goedhart & Wessel (2010, p. 242) suggests applying an MRP of between 4,5% and 5,5%, based on historical risk premium development. Compared to the results from Fernandez et al.'s (2018) survey, this seems to be quite low in the current market. According to the survey, the applied MRP for Denmark in 2018 is on average 6%. This estimate is based on response from 59 participants, which consist of Danish finance and economics professors, analyst and managers. Moreover, this is also in line with Kinserdal's (2017) recommendation of 6-7% MRP in the current market. Other research (Dimson, Marsh and Staunton, 2000) and literature (Penman, 2013; Petersen and Plenborg, 2012) were also considered. However, since the research of Fernadez et al. is the most recent, it was perceived to provide the most accurate MRP and ultimately chosen as the proxy.

12.2.2 Equity beta based on regression

The equity beta can be estimated as the slope of a time-series regression of equity returns towards returns on a stock index that operates as a proxy for the market portfolio (Black, Jensen and Scholes, 1972). Furthermore, as recommended by Christensen & Feltham (2009) excess returns will be applied instead of raw returns. These excess returns are estimated based on riskless rates that vary over the estimation period, and the relation is given as:

$$RE_\tau - R_\tau = \alpha_t^E + \beta_t^E (RM_\tau - R_\tau) + \varepsilon_\tau$$

Where R_τ reflects the varying riskless rate and RE_τ and RM_τ are the observed returns on the stock and the stock index, respectively. The data used for the estimations is compiled from Bloomberg and consist MSCI World, MSCI Europe, MSCI ACWI, OSEBX and Bakkafrost's stock. According to Koller, Goedhart & Wessel (2010), the MSCI indices are well-diversified and therefore should be suitable to use as proxies for the market. The OSEBX was added to the analysis as well since Bakkafrost and all peers are listed on this stock exchange. Moreover, LIBOR 3m, EURIBOR 3m, NIBOR 3m and CIBOR 3m were used as proxies for the varying riskless rates in the respective markets, denoted in USD, EUR, NOK, and DKK. The regressions were made towards the mentioned indices based upon weekly and monthly returns over 2, 3, 5 and 8-year periods. Hence, 32 regressions in total.

By allowing the risk-free rate to be non-static over the estimation period, tests for the validity of CAPM are made directly for each regression. That is, the alpha should be insignificant (Black, Jensen and Scholes, 1972; Christensen and Feltham, 2009). These tests are made at a 5% significance level, and the results are presented in Figure 12.1 (Appendix 30-38), together with the beta coefficients. All 8 and 5-years violate the CAPM

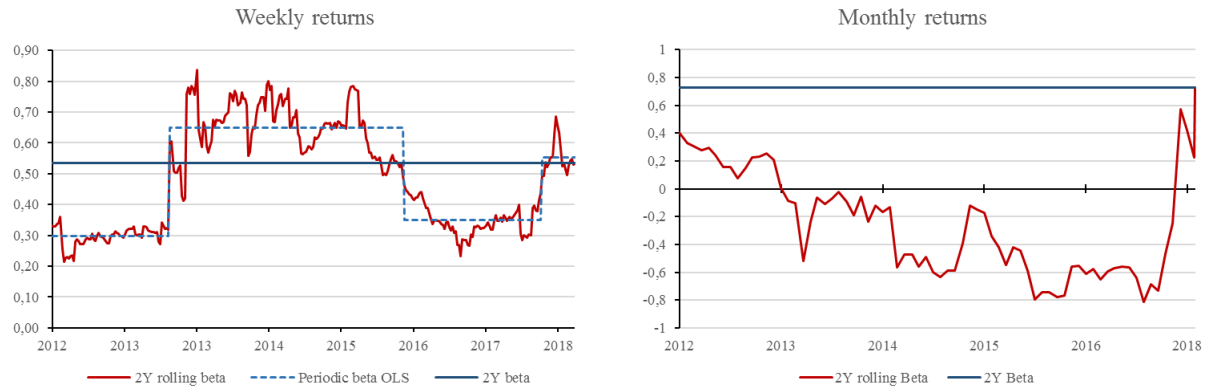
assumptions as the alpha values are significant. This trend is also evident for the 3-year regressions, except against OSEBX and MSCI EUR (monthly). Ultimately, these estimations are rejected, resulting in the 2-year regressions, both monthly and weekly, as being the only potential alternatives. As can be seen in the figure, all beta estimations on a monthly basis are showing negative values for the MSCI indices, while the same indices yield opposite results on a weekly basis. Also, the latter is showing relatively low beta levels, which would result in an abnormally low cost of capital (Kinserdal, 2017). As a result, the 2-year regressions towards OSEBX, both weekly and monthly, was regarded as a possible equity beta. Further approximations were conducted to derive at an appropriate solution.

Figure 12.1 – Regression summary
(Source: Own contribution)

Valid CAPM?	2Y		3Y		5Y		Beta	2Y		3Y		5Y	
	M	W	M	W	M	W		M	W	M	W	M	W
OSEBX	YES	YES	YES	YES	NO	NO	OSEBX	0,73	0,54	-0,32	0,43	-0,42	0,51
MSCI world	YES	YES	NO	NO	NO	NO	MSCI world	-2,44	0,12	-1,02	0,28	-0,50	0,43
MSCI EUR	YES	YES	YES	NO	NO	NO	MSCI EUR	-1,07	0,20	-0,63	0,26	-0,52	0,39
MSCI ACWI	YES	YES	NO	NO	NO	NO	MSCI ACWI	-2,51	0,12	-1,06	0,26	-0,52	0,42

As recommended by Koller, Goedhart & Wessel (2010), a rolling window has been applied for both regressions to visually inspect for structural changes and short-term deviations, which is displayed in figure 12.2. It became evident that the 2-year regression based on monthly returns have been abnormally high recently compared to earlier periods. Due to the high degree of variation of the beta coefficients over the estimation period, this regression is perceived to be a weak prediction of the beta in the future periods and ultimately rejected.

Figure 12.2 – 2Y rolling beta OLS
(Source: Own contribution)

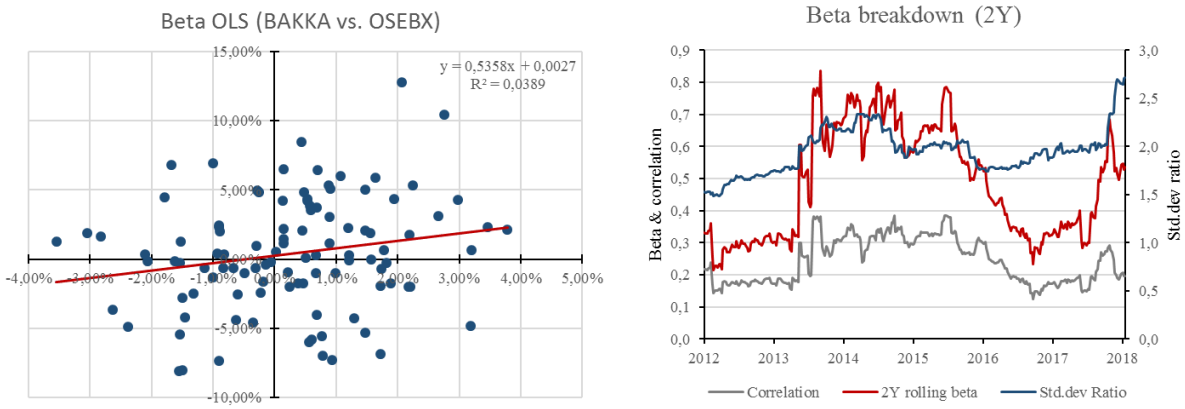


The 2-year rolling beta based on weekly returns is somewhat more consistent regarding the beta coefficients, but structural changes are evident, which is highlighted by the blue dotted line in figure 12.2. As the CAPM assumes constant beta in the estimation period (Christen and Feltham, 2009), the results from this regression model are troublesome due to to the high variability. To examine the behavior of the beta further; a breakdown of the beta was analyzed according to the following equation (Christensen and Feltham, 2009):

$$\beta_T^E = \frac{Cov_T[RE_T, RM_T]}{Var_T[RM_T]} = Corr_T[RE_T, RM_T] \cdot \frac{Var_T[RE_T]^{½}}{Var_T[RM_T]^{½}}$$

The breakdown is displayed in figure 12.3., and it shows that the correlation between Bakkafrost's stock and OSEBX has been relatively stable throughout the estimation period, while the std.dev ratio has increased substantially towards the end. Furthermore, the correlation has been rather low, varying between 0,12 and 0,39 in the estimation period. Subsequently, this could imply that the index might not be optimal to predict the future beta value. Hence, the industry beta has also been examined before concluding this section.

Figure 12.3 – Regression diagram and beta breakdown
(Source: Own contribution)



12.2.3 Equity beta based on industry

A strong argument for applying industry beta rather than company-specific betas is that firms with the same operational risk exposure should consider the same operating beta. Also, if the errors across companies are uncorrelated, the extreme values of individual beta coefficients tend to be canceled (Koller, Goedhart and Wessel, 2010). The beta should be adjusted to strip out the effect of leverage, to make the beta estimates

comparable across firms. This is commonly known as unlevering the beta and is typically carried out by the average debt ratio of the sample. When re-levering the beta to get to the equity beta, the following relation can be applied (Koller, Goedhart and Wessel, 2010):

$$\beta_L = \beta_E = \beta_U(1 + (1 - t)(D/E)$$

where

β_L	= Levered beta for equity in the firm
β_U	= Unlevered beta of the firm
t	= Tax rate
NFO/MVE	= Debt-ratio (market values)

In this relation, the beta for debt is assumed to be zero, and equity holders bear all the risk. This assumption might not hold in reality, but it is a common approximation in practice (Koller, Goedhart and Wessels, 2010; Damodaran, 2014). Since Bakkafrost is assumed to be purely equity financed in the valuation period, the adjustment above was not necessary. The unlevered industry beta can be directly applied in the CAPM, as the effect of leverage already is stripped out.

The data used for the estimations is compiled from Damodaran's dataset (2018) for European industry betas and is based on the food processing industry. Alternatively, an industry average could be made by computing the average of the regressed betas for a close peer group, but as this would decrease the sample size substantially, it has been ruled out as an alternative. Also, all firms in the peer group, except for NRS, are included in the dataset used for the estimations. Damodaran (2014) suggest adjusting the unlevered beta for cash and securities, as the beta for these items is close to zero. This is given as:

$$Unlevered\ beta\ corrected\ for\ cast = \frac{Unlevered\ beta}{(1 - Cash/firm\ value)}$$

Given the relationship, and with an average cash share of firm value in the sample amounting to 3,01%, the unlevered beta corrected for cash amounted to 0,73 for the industry.

Koller, Goedhart & Wessel (2010) and Damodaran (2014) are advocates of the industry beta estimation in comparison to the company-specific. For Bakkafrost, the regressed beta seems to be too variable over the estimation period to be a good predictor of future systematic risk for Bakkafrost. As a result, the beta based on the industry has been applied in CAPM.

12.2.4 Blume adjustment

According to Blume (1971, 1975), all betas tend to revert towards the grand mean of all betas over time, namely 1. Blume shows that securities have a consistent tendency of more extreme beta coefficients in one period compared to the subsequent period. Blume suggests adjusting the beta according to the following relation:

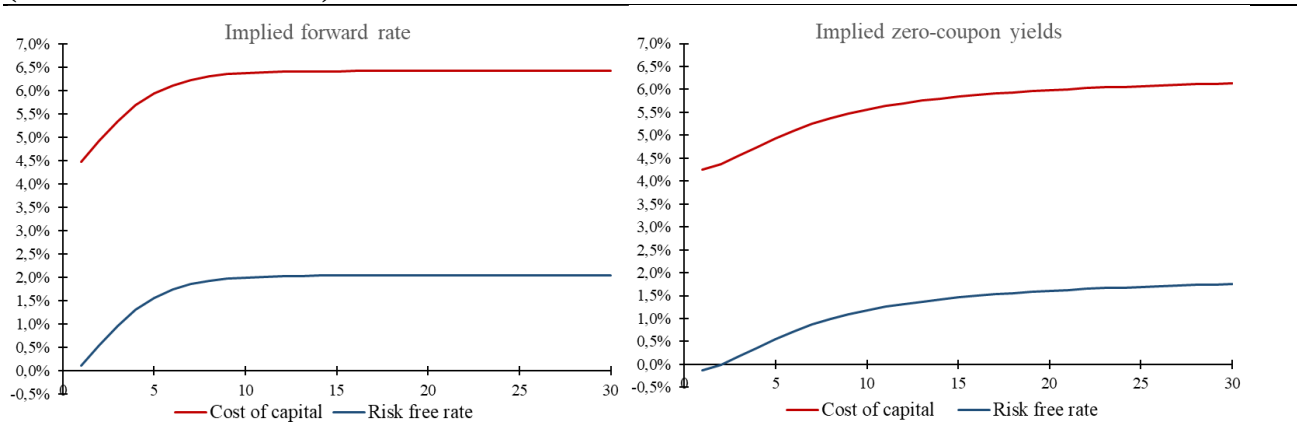
$$\beta_{Adjusted} = \beta_{raw} \cdot \frac{2}{3} + \beta_{mean} \cdot \frac{1}{3}$$

Koller, Goedhart & Wessel (2010) also discuss this smoothing technique, as it could improve the industry beta estimates if there are few observations in the sample. However, for industry betas based on more extensive samples, this adjustment is not necessary. As there were 150 observations in the sample used in this analysis, the Blume adjustment was not made.

12.3 Cost of capital term structure

The cost of capital is estimated by adding a constant risk premium, which consists of the market risk premium adjusted for systematic risk, on top of the varying risk-free rate. Figure 12.4 illustrates this, where the cost of capital, based on the implied continuously compounded forward rate and zero-coupon rate, converge towards a long-term cost of capital of 6,40%. As mentioned in section 11., the forward rate plus the risk premium has been applied to estimate the residual earnings, while the zero-coupon rate plus risk premium is used for discounting the future value.

Figure 12.4 – 2Y rolling beta OLS
(Source: Own contribution)



13. Valuation

13.1 Clean-Surplus Relation

According to Christensen & Feltham (2009), a balance in the so-called clean-surplus relation is a pre-requisite when performing a valuation with the ReOI-model. Furthermore, since past financial statements are used in the forecast of the future, this relation should also hold in the past for consistency. Accordingly, this entails that net dividends are equal to comprehensive income minus the change in the book value of common equity (Nissim and Penman, 2001, p. 113). The clean-surplus relation holds in all future and past periods of Bakkafrost. The relation is given by:

$$CSE_t = CSE_{t-1} + CI_t - d_t$$

Moreover, if there are expected equity transactions in the future, such as those arising from outstanding stock-options granted to employees, these would also have to be adjusted for to avoid hidden-dirty surplus items (Christensen and Feltham, 2009). Bakkafrost reports having share-based remuneration, however, employees are given shares which the company buys from the market. No stock-options are granted (Bakkafrost 2016). These transactions are booked through the income statement and are not a source of hidden dirty surplus (Penman, 2013).

13.2 Valuation of Bakkafrost

Figure 13.1 – ReOI valuation
(Source: Own contribution; Appendix 17-21)

		Explicit forecast				
Numbers in mDKK	**2017A**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**
Time period (*t*)	*Actual*	**1**	**2**	**3**	**4**	**5**
Net sales	3 770	3 303	3 350	3 567	3 690	3 892
Operating Income	550	767	558	513	491	467
NOA	3 757	3 852	4 211	4 393	4 479	4 627
RNOA	20,50 %	20,17 %	13,85 %	11,93 %	11,07 %	10,25 %
WACC		4,24 %	4,36 %	4,55 %	4,75 %	4,94 %
Residual operating income (ReOI)		589	344	277	236	193
PV of ReOI		**565**	**316**	**243**	**196**	**152**

Valuation estimates	
$NOA_{t=0}$ (primo)	3 757
PV - Explicit forecast (2018 - 2022)	1 472
PV - Fade period (2023-2027)	1 024
PV - Continuing Value (2027-)	7 804
Value of operations (V_NOA)	**14 057**
$NFO_{t=0}$	-258
BIO $MV_{t=0}$	127
Intrinsic value of CSE	**13 926**
Number of shares outstanding at AR date	49
Value per share	**286,4**
Value per share adjusted (92 days)	**289,7**
Value per share adjusted (NOK)	**372,8**
Current stock price (06.04.2018)	454,6
Market pricing error (Downside)	-18 %

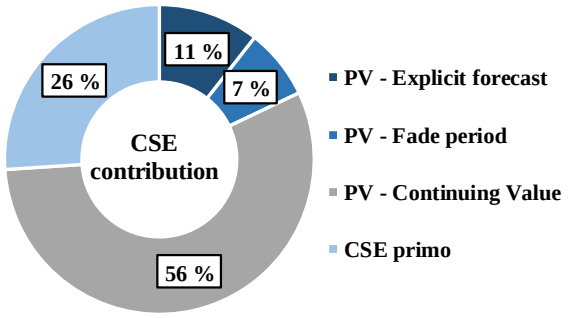


Table 13.1 – Continuing value
(Source: Own contribution; Appendix 1)

Continuing Value (tDKK)	
Growth in ReOI in CV	3.80%
CV in year 2027	14,511,940
WACC (long term)	6.40%
PV of CV	**7,803,645**

As the model illustrate, the pro-forma financial statements established in the forecast provide the present values of residual earnings generated from E2018-E2022. These are added to the present values of ReOI generated in the fade period from E2023-E2027, and the Present Value of ReOI generated in the continuing value from 2027 and beyond. The sum of these, together with the book value of net operating assets at t = 0, constitute the

total value of Bakkafrost's operations. To derive at an intrinsic value of common shareholder equity, the Net Financial Obligations are deducted from NOA, and the share of Biological assets stated at fair value in the financial statements are added back. This yields an intrinsic value of CSE at 13.926 Mio DKK. At the cut-off date, ~49 million shares were outstanding. Hence, the value per share was 286,4 DKK.

However, the present value calculations were based on the most recent financial statements of Bakkafrost, as at 31.12.2017. According to Lundholm & Sloan (2004, p. 202), the present value calculation would then represent the share price at that date. However, wealth is created throughout the year. Then as time passes from the financial statement date to the cut-off-date, one gets closer to estimated future values. Hence the present value would increase, and a correction is required (Lundholm and Sloan, 2004) Since the cut-off-date 06.04 comprise 26.7% of the following fiscal year, the value is multiplied by $(1+r_E*27,6\%)$ which brings the present value to the cut-off date. The estimated value yields a theoretical stock price of 372,8 NOK (289,7 DKK), which implies that Bakkafrost's stock is overpriced in the market. We state the currency in NOK since it is listed in the OSE and quoted in NOK.

14. Multiple valuation

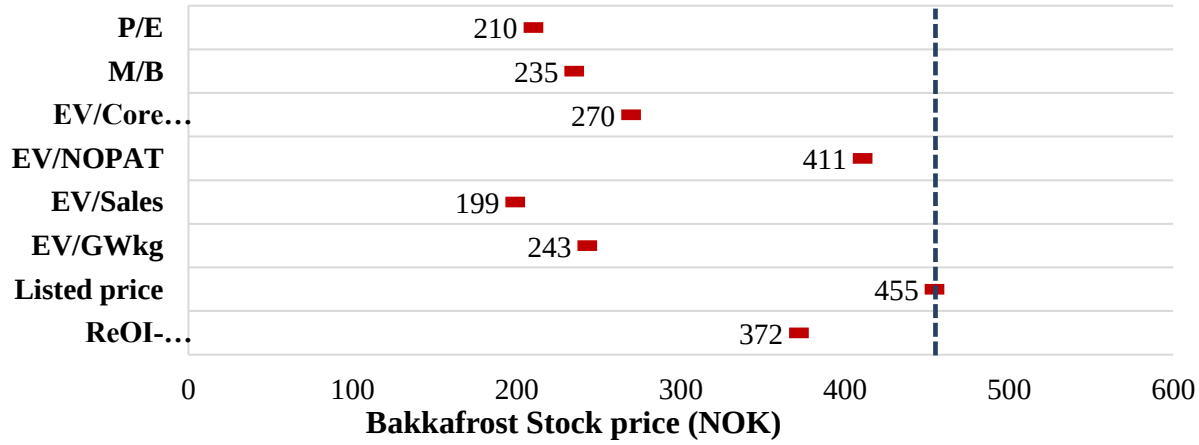
According to Petersen & Plenborg (2012), a relative valuation based on multiples can be a useful complement to the fundamental valuation as a sanity check. A fundamental valuation relies substantially on the analyst's assumptions and estimates of the future, which can be biased (Penman 2012). In contrary, multiples rely on relative prices, which can provide useful information of the consensus in the market (Petersen and Plenborg, 2012). However, multiples do not have an anchor in fundamentals that indicates value independently from the market (Penman, 2013). Therefore, a multiple valuation could itself be exposed to several limitations. First, a multiple valuation relies heavily on the confidence that the comparable firms actually are comparable. Thus, they need to share economic characteristics, outlooks and a similar risk profile, which in reality seldom is the case (Penman, 2013). Nevertheless, a multiple valuation is easy to conduct and entails little complexity.

In order to value Bakkafrost with multiples, the reformulated financial statements were used (Appendix 1-6), in addition to stock prices at the cut-off date collected from Oslo Stock Exchange. Two equity-based ratios, P/E and M/B; and three Enterprise-value-based multiples: EV/E, EV/Revenue and EV/GWkg was applied. EV/GWkg is an industry-specific multiple, often applied by analysts for the salmon industry (DNB Markets, 2018; Handelsbanken Capital Markets, 2018; Nordea Markets, 2018; Pareto Securities Research, 2018). P/E was calculated using the quoted stock price at the cut-off-date (06-04-2018), and the (E) earnings per share

from the financial statements. The M/B-multiple shows the relationship between the market value of equity to the book value of equity. The market value of equity was obtained by calculating the number of outstanding shares with the stock price at the cut-off date. The enterprise values were calculated by adding the market value of equity with the book values of debt; and the core operating income before tax were collected from the reformulated financial statements as at 31.12.2017 (Appendix 1-6). In the calculation of the Earnings-based multiples, the core operating earnings before tax were used. This was due to different tax regimes (Petersen and Plenborg, 2012) in Norway and the Faroes, moreover, in respect of the highly fluctuating unusual items which could distort comparability.

The valuation was completed by using the harmonic means of the multiples from the peer group, as pointed out by Petersen & Plenborg (2012). The result was that all multiples indicate a current relative overvaluation of Bakkafrost, as figure 14.1 below illustrate. The conclusion from the fundamental valuation is therefore supported by the multiple valuation: that Bakkafrost's current stock price is overvalued.

Figure 14.1 – Multiple valuation
(Source: Own contribution; Appendix 1-7, 40; Oslo Stock Exchange)



15. Sensitivity analysis

The fundamental valuation performed in this paper has opted to obtain as accurate information as achievable regarding the business environment and the outlook of salmon aquaculture. A limitation, however, is that numerous assumptions have been laid forward in the forecast, which could contain error. The issue with present value models is that small changes in underlying assumptions can affect value substantially (Koller, Goedhart and Wessel, 2010). The purpose of the sensitivity analysis is therefore to examine the consequences of how changes in underlying assumptions will inflict on stock price (Penman, 2013). The sensitivity analysis is based

on the pro forma financial statements, and focus on how sensitive the valuation is to changes in key drivers settled in the explicit forecast, fade period and the terminal period.

15.1 Sensitivity in the explicit forecast

In the explicit forecast, the stock price would be sensitive to changes in output prices, the produced quantity and input prices of the production. The model forecasting the salmon price in this paper might be prone to bias; the managements' forecast of future production quantity might be inaccurate, and the assumptions regarding input price development might be erroneous. The table below illustrates the sensitivities related to possible changes in the cost of purchased goods and change in the salmon price. Inferring a possible change of 5% in the *purchase of goods* in the explicit forecast, and 5% change in salmon price in the explicit forecast, which is a possible scenario. The sensitivities are the following as in the right table in figure 15.1. A 5% decrease in salmon price reduce stock value from 373 to 360, a 5% increase in Purchase of goods decrease stock price from 373 to 357.

Figure 15.1 – Sensitivity in the explicit forecast
(Source: Own contribution)

%VAP of harvest	Budgeted production realised				
	90%	**95%**	**100%**	**105%**	**110%**
30 %	313	358	403	448	493
35 %	300	344	388	432	476
40 %	286	330	**373**	416	460
45 %	273	315	358	400	443
50 %	260	301	343	385	427

% of Level SP	Percentage of level purchase of goods				
	110%	**105%**	**100%**	**95%**	**90%**
90 %	426	400	373	346	319
95 %	426	400	373	346	319
100 %	426	400	**373**	346	319
105 %	426	400	373	346	319
110 %	426	400	373	346	319

Another critical assumption in the valuation model is that Bakkafrost can produce as much as they anticipate in the future. As reasoned in the forecast, the management's budgeted production was used to predict future quantity from the farming operations, since they are likely to have the best estimates. However, as mentioned, salmon is a living organism and is vastly exposed to biological risks (Asche *et al.*, 2010). Therefore, predicting future levels of quantity is an estimate that may comprise numerous uncertainties, and can be challenging even for Bakkafrost themselves. The table below illustrates the sensitivity to the stock price if the level of quantity should change by 5%. These are possible situations, since such deviations have been shown in Bakkafrost's (2017) reports before. The infliction on stock price can be quite substantial, for instance when standing in the current cell with production at 100%. With all else constant, if the realized harvest is 5% lower than planned on average each year, then the stock price would lead to a decrease in share value from 373 to 330.

Moreover, the amount of harvested fish that is transferred from farming to VAP (Value Added Processing) is also an assumption that would affect share price. As elaborated in the forecast, Bakkafrost has stated a long-term goal of processing 40% of harvested quantity in the VAP segment. However, the ratio of the harvest to VAP has also varied during the trailing period, and the left table in figure 15.1 presents possible sensitivities. The VAP-segment is typically less profitable than selling fresh salmon at spot price in the market, as it entails further processing and lower prices (FSA, 2015; Bakkafrost, 2018a). Usually, fish that are smaller, or of lower quality are transferred to that segment. Thus if the farming processes somehow fail to produce fish less fit for selling in spot markets, this ratio may increase. As the table shows, when the ratio of fish to VAP increases, the stock price decrease as well.

15.2 Sensitivity in the fade period

Figure 15.2 shows the sensitivities to changes in the sales growth and profit margins in the fade period. The quantitative industry analysis illustrated how sales growth in the industry reverted towards a mean in the long run. The table below shows how changes in sales growth and profit margins affect the stock price during the fade period. As illustrated, at the current level, with a sales growth of 3,8% and a PM at 14%, the stock is valued at 373 DKK. However, the rates do not have to vary by a significant amount before the stock price fluctuates substantially.

Figure 15.2 – Sensitivity in the fade period
(Source: Own contribution)

		Sales growth				
		1,0%	2,0%	3,8%	4,0%	5,0%
PM	12 %	308	314	323	324	329
	13 %	332	337	348	349	355
	14 %	355	361	**373**	374	381
	15 %	378	385	398	399	406
	16 %	402	409	423	424	432

		Profit margin				
		10,0%	12,0%	14,0%	16,0%	18,0%
ATO	1,0	251	300	350	399	449
	1,1	263	312	362	412	461
	1,2	273	323	**373**	423	473
	1,3	282	333	383	433	483
	1,3	282	333	383	433	483

The right table in figure 15.2 illustrates how stock price varies with the drivers of RNOA, the PM, and ATO in the fade period. As observed, at the current level with a PM of 14% and ATO 1.2 Bakkafrost's stock price is at 373 per share. However, in this case, small changes in the assumptions of the fade period changes stock price substantially. For instance, if the Profit margin decreased by 2%, the share price drops from 373 to 323. Given that there is a decrease in ATO by 0.1, the share price drops from 373 to 362.

15.3 Sensitivity in the cost of capital

As discussed by Penman (2013, p. 650), minor changes in the input factors of CAPM might impose substantial changes in the estimated cost of capital. In particular, the estimated beta and market risk premium (MRP). As discussed in the section 12, the accuracy of the beta estimates varies to a great extent. Regardless if this is mitigated by applying an industry beta, the beta estimate is prone to a great deal of uncertainty. Furthermore, the MRP is no exception when it comes to uncertainty. As Penman (2013, p. 650) points out, "*Let's be honest with ourselves: No one knows what the market risk premium is*". The left table in Figure 15.3 illustrates the stock price's sensitivity to the underlying assumptions of the CAPM. For instance, a 0,08 increase in the beta estimate reduce the share price from 373 NOK to 223 NOK, assuming MRP stays constant. The changes in MRP also affects Bakkafrost's share price to a great extent, as a 0,5% increase lowers the implied share price to 329 DKK. However, the magnitude of combining the changes is substantial, which is illustrated by the range in the table from 965 NOK to 221 NOK.

Figure 15.3 – Sensitivity in the cost of capital and in the continuing value
(Source: Own contribution)

cOc in CV \ ReOI Growth in CV	3,2%	3,5%	3,8%	4,1%	4,4%
5,5%	420	459	512	588	705
6,0%	364	389	420	462	519
6,4%	333	351	**373**	401	437
7,0%	298	310	324	342	363
7,5%	277	286	296	308	323

Equity Beta \ Risk premium	5,0%	5,5%	6,0%	6,5%	7,0%
0,55	965	757	624	531	463
0,65	644	531	453	395	351
0,73	511	431	**373**	329	295
0,80	433	370	323	287	259
0,90	357	309	272	244	221

16.4 Sensitivity in the continuing value

Since the continuing value constitutes a large part of the fundamental value of Bakkafrost's equity, the long-term assumptions in the Gordon growth model have been tested for sensitivity. More specifically, the growth in residual operating income and the implied long-term cost of capital. The cost of capital, as discussed in the last section, is prone to various uncertainties and a small difference could have a considerable impact on the theoretical share value (Penman, 2013). Furthermore, the long-term growth rate in ReOI in the continuing value is the historical average of the Danish GDP growth since 1978. As shown in the left table in figure 15.3 the fundamental value of Bakkafrost's equity increase from 373 NOK to 401 NOK by a 0,3% rise in long-term growth, ceteris paribus. Given that all else is constant, a reduction of 0,4% in the long-term cost of capital, increase the implied share value 420 NOK.

16. Scenario Analysis

The valuation carried out in this paper reflects one possible scenario based on indicators provided by the industry trends and the strategic analysis of Bakkafrost. However, as illustrated above in the sensitivity analysis, the valuation model is notably sensitive to changes in the underlying assumptions. Thus, the scope of the scenario analysis is to examine how Bakkafrost's share price would react to specific scenarios. The scenarios will be related to insights obtained from the PESTEL analysis.

16.1 Scenario 1: ISA outbreak in the Faroe Islands

As mentioned in the PESTEL Analysis, biological issues can be a great risk to the produced quantities in salmon farming, and as illustrated in the sensitivity analysis, the stock price is sensitive to a reduction in quantity. One of the greatest vulnerabilities to salmon farming is the ISA-virus (Infectious Salmon Anemia) (Asche *et al.*, 2010; Øglend, 2013; OECD-FAO, 2017a, 2018). Historically, outbreaks of ISA have had devastating consequences to aquaculture in entire geographical areas. For instance, the outbreak of ISA in Chile in 2007 had an estimated annual production setback from 379 000 TGW in 2007, to a total production 98 000 TGW in 2010 (Asche *et al.*, 2010). Similar outbreaks have also occurred in the Faroes historically. The most recent outbreak occurred in the early 2000's, which was the most substantial in relative terms ever to occur. The incident reduced production from 47 000TGW in 2004 to 12 000 TGW in 2006 - a reduction of 75%. Kibenge et al. (2012) point out that the ISA-virus can cause mortality rates up to 90% in the infected locations.

Even though risk management practices and the understanding of epidemiology relating to salmon aquaculture might have improved since then (Iversen *et al.*, 2016; Bakkafrost, 2018a; iLaks, 2018), there is no guarantee that this could not occur again, as long open pens are used in aquaculture (Asche *et al.*, 2010). According to Iversen et al. (2015, 2017), the production in the fjords of the Faroe Islands is close to a maximum limit to what is responsible in terms of biological risk. The fjords in the Faroes are highly interlinked with regard to water flows, and an outbreak of a contagious disease could spread quickly and have devastating effects (Iversen *et al.*, 2017). The first scenario will, therefore, entail how the intrinsic value would react to an epidemic in the Faroes. The worst-case scenario would reflect a production decrease of 75% as in the outbreak of 2004, lasting for two years. However, Bakkafrost (2018a, 2018c) has announced that the post-smolt will reduce the production cycle in the sea towards less than 12 months when investments in the post-smolt facilities take full effect in E2020. This has been taken into consideration when estimating the impact of the ISA-outbreak.

In this scenario, two cases have been tested to examine the effect of a substantial outbreak compared to a milder event. Both outbreaks are assumed to hit during E2018 and to decrease volume output in the subsequent periods. The mild outbreak is anticipated to reduce the volume by 30% and 15% in E2019 and 2020E, respectively. In E2021, the production is expected to rebound to the forecasted volumes applied in the pro forma statements in section 10.3. Assuming that the assumptions laid forward in this model holds, the effect on share value this scenario implies an intrinsic value of 341,94 NOK per share. Thus indicating a downside of 25%. The downside is 6 % lower than the value from the fundamental valuation. This indicates that Bakkafrost could handle an ISA outbreak of a smaller scale, given the underlying assumptions (Appendix 41).

In the second case, where a more decisive outbreak is modeled, the mortality rate is assumed to be 75% and 50% in E2019 and E2020, respectively. The rate is anticipated to decrease to a level of 25% in E2021 before it further decreases to 20% in E2022. During E2021, the outbreak is expected to be contained, but the effects carry over to the subsequent year. As this outbreak is more severe than the other case, Bakkafrost presumably needs to take on debt to cover the losses. The capital structure and beta will have to be adjusted. The target capital structure is assumed to be 10,4%, based on the share of debt over the period, and the market value of equity at the cut-off date. Accordingly, the equity beta is levered by applying the relation in section 12.2.2 and incorporated in the term structure from the fundamental analysis. For simplicity, the group's average interest rate has been applied as a proxy for the cost of debt before tax, where the rate of 4,73% + CIBOR 3m is switched to 4,73% + the varying riskless rate from the term structure. As in the last case, the dividends are assumed to be suspended. The estimated share value amounts to 145,62 NOK, implying a -68% downside. However, a substantial outbreak like this would probably call for a restructuring of the whole firm. The assumptions laid out here might therefore be overly simplified. Nevertheless its limitations, the scenario shows that an ISA-outbreak of this magnitude could cause immense difficulties for Bakkafrost (Appendix 42).

16.2 Scenario 2: Investment in offshore production rig

As mentioned, growth opportunities in the Faroe Islands are limited, as issuing new licenses for conventional production would not be responsible concerning sustainability aspects (Iversen *et al.*, 2015, 2017). In Norway, this is also the case, which is one of the countries with the world's strictest regulation. Here, the industry has been forced to consider new means of production, of which the most promising appear to be massive offshore production pens. SalMar ASA has been a frontrunner in the development of such a rig and is the world's first producer to build and initiate a project of this magnitude. The second scenario will, therefore, entail that Bakkafrost follows suit and initiates a similar project as Salmar. The size of the investment was reported by SalMar (2018b, 2018a) to be the equivalent of approximately 536 million DKK and with a production capacity

of 1.500.000 salmon. Further, it is assumed that other operating costs and purchase of goods will increase with production quantity in the explicit forecast, which it has done historically. Salary and personnel expense has been assumed to stay constant, as SalMar (2018a) points out that the rig only requires 3-4 employees to operate.

Given that the mortality rate (6,3%) and the average harvest weight (5,02 GWE) is equivalent to the current rates, and that the released smolt is 500g on average, 1.500.000 salmon would yield a production volume of approximately 7.000 TGW per year. Furthermore, Bakkafrost is assumed to receive the rig in E2019 and to harvest from the following year. Hence, the quantity produced by the offshore rig is added to the expected production volume in E2020-E2022. The new asset is depreciated according to the depreciation scheme applied in section 10.3.4.4 Regarding financing, the investment is assumed to be financed by debt from their current lender, Nordea, and the cost of debt has been incorporated in the same fashion as in scenario 1. Moreover, as Bakkafrost (2018a) has announced that it is important to maintain their current dividend policy. Therefore a 50% payout ratio has been applied. The change of NFO will be the residual claimant after NFE and dividends. Lastly, as the maximum capacity of the VAP segment is approximately 25.000 TGW, this will be the maximum volume allocated to this segment.

When estimating the share value in this scenario, two different cases were tested. The first was investing in one rig and the second was investing in three. The implied share value from the acquisition of one rig amounted to 434,15 NOK, showing a downside of 4%. In comparison with the implied value from the fundamental valuation with a 19% downside, the intrinsic value appears to increase. Moreover, if assuming that Bakkafrost invests in three rigs simultaneously, the intrinsic value increases further to 471,19 NOK. This value is indicating an upside of 4% compared to the traded stock price at the cut-off date. With the given assumptions, investing in offshore salmon farms seems to be a good alternative for expansion in the future (Appendix 43-44).

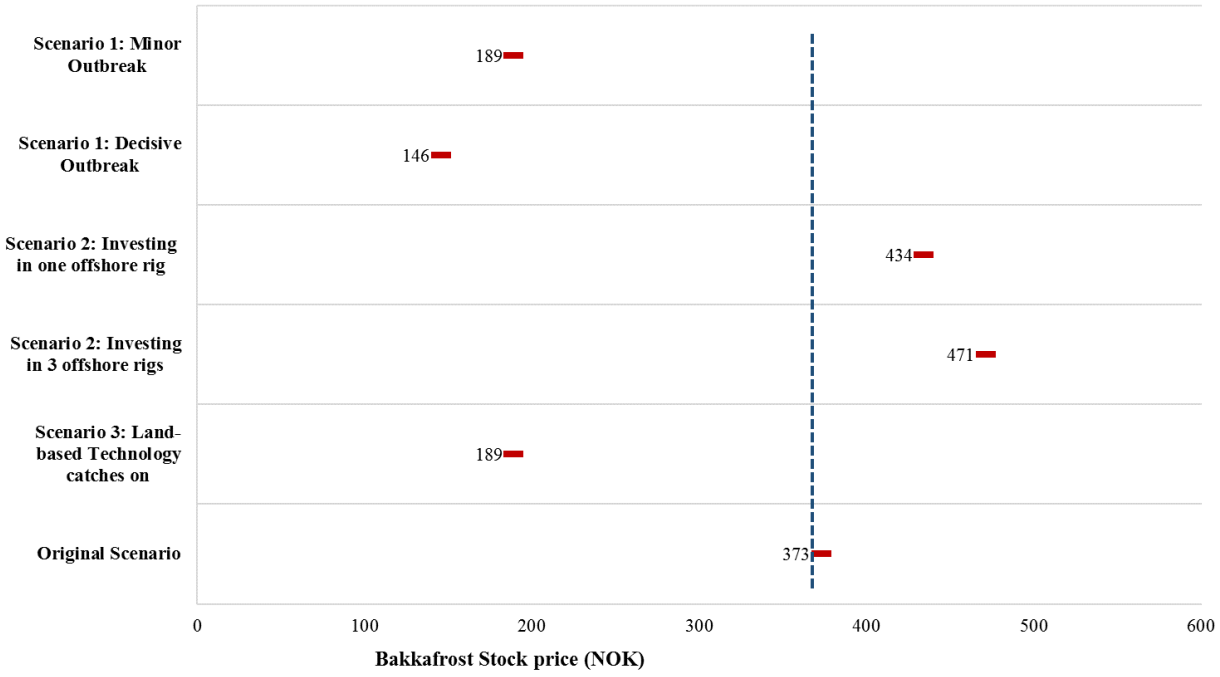
16.3 Scenario 3: Land-based technology catches on

The PESTEL-Analysis also discussed the scenario where new land-based technology disrupts conventional ocean-based production. In the recent years, new firms, such as Nordic Aquafarms, have established in the industry focusing on full-cycle land-based salmon production (Dagens Næringsliv, 2018b). Studies performed by Liu et al. (2016) and Bjørndal & Tusvik (2017), suggest that such production is on the way of becoming economically viable with today's salmon and feed prices. Compared to production in the ocean, the land-based production offers three advantages in particular: Production facilities can be built closer to the market, lowering

freight costs and CO2 emissions (Liu *et al.*, 2016). Secondly, the isolation land-based water tanks offer would decrease biological risk (Bjørndal and Tusvik, 2017). Thirdly, an issue with today's production is seafloor pollution from the sludge of ONP. The land-based production offers control of waste, which subsequently can be reused for biogas production and agricultural fertilizer, thus increasing the sustainability aspect (del Campo *et al.*, 2010). Therefore, in the third scenario, it is assumed that the increase of land-based production succeeds conventional ocean-based production and decrease global salmon price. Land-based production is not restricted by quotas, and the case entails that supply greatly increases due to land-based production, as argued by DnB Markets (2018)

When estimating the effect the increase in global supply might have on the salmon price, the expected supply used for the price forecast in section x, has been changed to possible scenarios pointed out by DnB Markets (2018). In the first forecast year, the supply growth is expected to remain the same as in the pro forma statements (6,3%). However, from E2019 and onwards, the additional volume from the land-based facilities is assumed to affect the global supply. In subsequent periods, the supply growth is assumed to increase towards 7,5% in E2020 before it declines towards a level of 6,5% in E2022. The price forecast implies a decrease towards a level of 41 DKK per kg. Additionally, the long-term PM and ATO in the fade period is assumed to decrease to 10% (14%) and 1,0 (1,2), respectively, to reflect the new state of the industry. Ultimately, the implied share value amounts to 189 NOK, which indicates a downside of 58%. This example exemplifies the threat of new entrants penetrating the market with new production technologies, as argued in Porter's five forces (Appendix 44).

Figure 16.1 – Summary of scenario outcomes
(Source: Own contribution)



17. Discussion

Damodaran (2017) argues that when assessing an investment opportunity, the investor needs to consider both the numbers and the story of the firm. However, an issue is that there usually is a gap between these two, and caution should be taken if focusing too much on one over the other. Numbers can let the analyst to be self-controlled in assessments, but without a story to back the numbers, they can quickly lead to bias. Likewise, stories alone without any link to numbers, can with no trouble lead the investor into fantasy land (Damodaran, 2017, p.5). Damodaran (2017) reasons that valuation is the bridge that closes the gap between the numbers and the story. Hence the valuation permits each of which to draw on each other: the numbers could provide a reality check to a far-fetched story. On the other hand, when numbers imply a storyline that does not make sense, storytelling can provide guiding input. Thus, in order to adapt the story to the numbers in this valuation, we have followed the approach of a fundamental analysis.

The qualitative assessments covered in the sections: Company history, The processes of salmon farming, and the topics discussed in the VRIO, PESTEL and Porter's 5 forces, has provided us with the story – 'a narrative

of an efficiency leader in salmon farming, settled where the Norwegian Ocean meets the North-Atlantic, on the weathered Faroe Islands'. On the other hand, the quantitative assessment in this paper, covered in the sections of the profitability analysis; the quantitative industry analysis; Term structure and Cost of Capital, has provided us with the numbers. Henceforth, the combined insights of the story and the numbers assisted in creating a forecast, which eventually provided a theoretical value of Bakkafrost's stock at 06.04.2018.

The analysis in this paper has revealed that Bakkafrost has been the most profitable company on average compared to its close peers. As put forward in the VRIO, Value Chain analysis, PESTEL and Porter's five forces analysis, Bakkafrost posit idiosyncrasies that historically has allowed it to sustain high margins. Probably, the most decisive factor relates to the full integration across the whole value chain, and most notably, its high involvement in fish feed production. Subsequently, this has endorsed a safer supply of fish feed, and at a lower cost than what the close peers can procure (Peer group analysis). Moreover, as accentuated in the PESTEL and profitability analysis, Bakkafrost is favorably positioned both politically and regulatory, in comparison to its peers. During the trailing period, Bakkafrost reaped benefits of operating in a country that evaded the consequences of political turmoil. As Bakkafrost's profitability surged when the consequences of trade sanctions affected its competitors in Norway. Moreover, salmon prices and the premium on Faroese salmon, has also added to the profitability of Bakkafrost. It is believed that these are the primary drivers that historically has supported a large extent of Bakkafrost's success.

However, the caveat this valuation opts to express is whether Bakkafrost can sustain their competitive advantage and continue to generate the substantial returns to common equity in the future. The line of reasoning this paper would like to express is that they might not. As argued, Bakkafrost's competitive advantage discussed above is thought to be the source to Bakkafrost's relatively high returns. However, as illustrated in the quantitative industry analysis, high levels of Core RNOA, Core PM and sales growth tend to decrease over time, most likely as a result of competition (Nissim and Penman, 2001; Lundholm and Sloan, 2004; Penman, 2013). Furthermore, it has also been argued throughout the strategic analysis, that several of the sources assumed to facilitate Bakkafrost's competitive advantage, are unlikely to be imitable to competitors in the long-term. For instance, as argued in the VRIO analysis, the only inimitable competitive advantage they might have, is their advantageous location on the Faroe Islands relating to the climate.

The trend in the recent years has been that peers has started to follow suit by vertically expanding across the value chain similarly to Bakkafrost. It has also been argued that the competitors in the close peer group, has had an increased focus on innovation of new offshore and land-based production systems (Iversen *et al.*, 2015,

2017; Marine Harvest, 2018; SalMar, 2018a)). These might eventually yield higher capacity and scale than the conventional open-net production in the ocean (Liu *et al.*, 2016). As argued, Bakkafrost does not indicate anything of such initiatives as part of their strategy, which could indicate an ominous signal. The reality is that the limit to responsible production is approaching in the Faroe Islands (Danmarks Nationalbank, 2017; Iversen *et al.*, 2017). Therefore, it is argued that their current production growth is likely to stall shortly unless they expand beyond country borders or implement new technology.

To close the argument, the factors discussed above has led to the reasoning that Bakkafrost's abnormally high profits will revert toward industry averages in the near future. These considerations were reflected in the forecast, which eventually led to a valuation of 372,8 NOK per share. It should however not go without accentuating that the tools and frameworks applied in this valuation might be prone to limitations and bias. For instance, it was illustrated in the sensitivity analysis how sensitive the valuation model was to small changes in the underlying assumptions. Probably, one of the most considerable uncertainties relates to the expectations of future salmon price and development of future cost items, which was argued to be the primary drivers of profitability in section 8. Changes in these estimates could radically alter the result of the valuation as seen in the sensitivity analysis. Moreover, the valuation primarily only represents one possible scenario where Bakkafrost is continuing on the same path as it has done historically. Thus as seen in the scenario analysis, the stock price could greatly improve if alternative strategic paths were followed.

18. Conclusion

The problem statement formulated for this thesis was to derive at an intrinsic value of Bakkafrost's stock and assess if it is currently over- or underpriced in the market. To conclude, according to the fundamental valuation performed in this thesis, the theoretical value of Bakkafrost's stock as at the cut-off date 06-04 2018 is 372,8 NOK per share. Accordingly, the listed price at Oslo Stock Exchange at the cut-off date was 454.6, which implies a current overvaluation in the market of 18%.

To answer the research question, Penman's (2013) steps of a fundamental valuation were used to construct and answer a set of sub-questions in each section. These related to knowing the business; analyzing strategic information, analyzing the financial information, developing forecasts and lastly, a valuation applying the ReOI-model. The model was critically assessed with the application of a sensitivity- and scenario-analysis to assess the assumptions laid forward in the construction of the model. The valuation was also sanity-checked

by applying a multiple-valuation, which supported the conclusion from the fundamental analysis that the stock is currently over-priced.

References

Akram, Q. F. (2000) *Department of Economics Discussion Paper Series*.

Asche, F. *et al.* (2010) 'The Salmon Disease Crisis in Chile', *Journal of Agricultural and Resource Economics*, 24(4), pp. 405–411.

Asche, F. *et al.* (2013) 'Salmon aquaculture: larger companies and increased production', pp. 322–339. doi: 10.1080/13657305.2013.812156.

Asche, F., Misund, B. and Øglend, A. (2016) 'The spot-forward relationship in the Atlantic salmon market', *Aquaculture Economics and Management*, 20(2), pp. 222–234. doi: 10.1080/13657305.2016.1156192.

Asche, F., Sikveland, M. and Zhang, D. (2018) 'Profitability in Norwegian salmon farming: The impact of firm size and price variability', *Aquaculture Economics and Management*. Taylor & Francis, 0(0), pp. 1–12. doi: 10.1080/13657305.2018.1385659.

Asche, F. and Tveterås, S. (2004) 'On the Relationship Between Aquaculture and Reduction Fisheries', *Journal of Agricultural Economics*, 55(2), pp. 245–265. doi: 10.1111/j.1477-9552.2004.tb00095.x.

Bailey, J. (2014) 'Looking for Sustainable solutions in salmon aquaculture', *Nordic Journal of Applied Ethics*, 9(1), pp. 22–40.

Bakkafrost (2010) *Annual Report 2009*.

Bakkafrost (2011) *Annual Report 2010*.

Bakkafrost (2012) *Annual Report 2011*.

Bakkafrost (2013) *Annual Report 2012*.

Bakkafrost (2014) *Annual Report 2013*.

Bakkafrost (2015) *Annual Report 2014*.

Bakkafrost (2016) *Annual Report 2015*.

Bakkafrost (2017) *Annual Report 2016*.

Bakkafrost (2018a) *Annual report 2017*.

Bakkafrost (2018b) *Bakkafrost History*. Available at: http://www.bakkafrost.com/en/bakkafrost_about-us/bakkafrost_about-us/bakkafrost_bakkafrost-history/ (Accessed: 11 March 2018).

Bakkafrost (2018c) ‘INTERIM REPORT Q4 - 2017’.

Bakkafrost (2018d) *Major Shareholders*. Available at: http://www.bakkafrost.com/en/investor-relations/share-information/major-shareholders/ (Accessed: 6 April 2018).

Barney, J. B. (1995) ‘Looking inside for Competitive Advantage Looking inside for competitive advantage’, 9(4), pp. 49–61.

Barney, J. B. and Clark, D. N. (2007) *Resource-based theory: Creating and sustaining competitive advantage*. Oxford University Press on Demand.

Bjørndal, T. and Tusvik, A. (2017) ‘Land Based Farming of Salmon: Economic Analysis’, p. 159.

Black, F., Jensen, M. C. and Scholes, M. (1972) *The Capital Asset Pricing Model : Some Empirical Tests*.

Bliss, R. R. (1996) *Testing term structure estimation methods*.

Bloomberg (2018) *China Vows to Fight Trump Tariffs ‘to the End’ as Tension Rises*. Available at: https://www.bloomberg.com/news/articles/2018-04-05/trump-orders-consideration-of-100-billion-in-new-china-tariffs (Accessed: 6 April 2018).

Blume, M. E. (1971) ‘On the Assessment of Risk’, *The Journal of Finance*, 26(1), pp. 1–10.

Blume, M. E. (1975) ‘Betas and Their Regression Tendencies’, *The Journal of Finance*, 30(3), pp. 785–795.

Bodirsky, B. L. *et al.* (2015) ‘Global Food Demand Scenarios for the 21 st Century’, pp. 1–27.

Brealey, R. A., Myers, S. C. and Allen, F. (2014) *Principles of Corporate Finance, McGraw-Hill/Irwin*.

Bremnes Seashore (2018) *About us*. Available at: http://www.seashore.no/en/om-oss/ (Accessed: 22 March 2018).

del Campo, L. M. *et al.* (2010) *Utilization of sludge from recirculation aquaculture systems, Rapport 9/2010*. doi: 10.1017/CBO9781107415324.004.

Cappelen, Å., Eika, T. and Prestmo, J. B. (2014) ‘Virkninger på norsk økonomi av et kraftig fall i oljeprisen’, *Økonomiske analyser*, 3.

Carlucci, D. *et al.* (2015) ‘Consumer purchasing behaviour towards fish and seafood products . Patterns and insights from a sample of international studies ☆’, *Appetite*. Elsevier Ltd, 84, pp. 212–227. doi: 10.1016/j.appet.2014.10.008.

Chen, X. and Garcia, R. J. (2016) ‘Economic sanctions and trade diplomacy: Sanction-busting strategies, market distortion and efficacy of China’s restrictions on Norwegian salmon imports’, *China Information*,

30(1), pp. 29–57. doi: 10.1177/0920203X15625061.

Chopra, S. and Meindl, P. (2007) *Supply chain management-strategy, planning and operation*. New Jersey (USA): Person Education.

Christensen, P. O. and Feltham, G. A. (2009) *Equity Valuation, Foundations and Trends in Accounting*. doi: 10.1561/1400000008.

Christiansen, E. A. N. and Jacobsen, S.-E. (2017) 'Diversity in narratives to green the Norwegian salmon farming industry', *Marine Policy*. Elsevier, 75(November 2016), pp. 156–164. doi: 10.1016/j.marpol.2016.10.020.

Claret, A. *et al.* (2012) 'Consumer preferences for sea fish using conjoint analysis : Exploratory study of the importance of country of origin , obtaining method , storage conditions and purchasing price', *Food Quality and Preference*. Elsevier Ltd, 26(2), pp. 259–266. doi: 10.1016/j.foodqual.2012.05.006.

Dagens Næringsliv (2018a) *Lakseoppdretter vil øke inntektene fra 17,8 millioner til 2,2 milliarder på fem år*. Available at: https://www.dn.no/nyheter/2017/11/28/1443/Havbruk/lakseoppdretter-vil-oke-inntektene-fra-178-millioner-til-22-milliarder-pa-fem-ar (Accessed: 9 March 2018).

Dagens Næringsliv (2018b) *Norsk laksegigant bruker 4 milliarder på kjempeanlegg i USA*. Available at: https://www.dn.no/nyheter/2018/01/30/1600/Havbruk/norsk-laksegigant-bruker-4-milliarder-pa-kjempeanlegg-i-usa (Accessed: 9 March 2018).

Damodaran, A. (2014) *Applied Corporate Finance*. Hoboken/NJ: John Wiley& Sons.

Damodaran, A. (2017) *Narrative and Numbers: The Value of Stories in Business*. Columbia University Press.

Damodaran, A. (2018) *Data: Current*. Available at: http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datacurrent.h (Accessed: 1 April 2018).

Danmarks Nationalbank (2014) 'Fixed Exchange Rate Policy in Denmark', *Monetary Review*, (1st Quarter), pp. 49–60.

Danmarks Nationalbank (2017) *THE FAROESE ECONOMY: Boom and labour market pressure*.

Dimson, E., Marsh, P. and Staunton, M. (2000) 'Risk and Return in the 20th and 21st Centuries', 11(2), pp. 1–18.

DNB Markets (2017a) *Land-based farming*.

DNB Markets (2017b) 'Seafood – Special Report: Deep dive into land-based farming', (February), p. 61.

DNB Markets (2018) *Lifting our long-term assumptions*.

Durand, M. H. (1998) 'Fishmeal price behaviour: Global dynamics and short-term changes', pp. 465–480.

Engle, C. R., Quagrainie, K. K. and Dey, M. M. . (2016) *Seafood and aquaculture marketing handbook*. John Wiley & Sons.

EY (2017) *The Norwegian Aquaculture Analysis 2016*.

Faroe Fish Farmers Association (2013) *The history of aquaculture in the Faroe Islands*. Available at: http://salmon-from-the-faroe-islands.com/history.html.

FAROEISLANDS.FO (2018) *Faroese Salmon Renowned Around the World*. Available at: https://www.faroeislands.fo/economy-business/aquaculture/ (Accessed: 17 February 2018).

Fernandez, P., Pershin, V. and Achin, I. F. (2018) 'Market Risk Premium and Risk-Free Rate used for 59 countries in 2018 : a survey'.

Fischer, C., Guttormsen, A. G. and Smith, M. D. (2017) 'Disease Risk and Market Structure in Salmon Aquaculture', *Water Economics and Policy*, 03(02), p. 1650015. doi: 10.1142/S2382624X16500156.

Fishpool (2018) *Forward Prices*. Available at: http://fishpool.eu/price-information/forward-prices-3/ (Accessed: 7 June 2018).

Føroya landsstýri (2018a) *Foreign Trade*. Available at: http://www.government.fo/en/foreign-relations/foreign-trade/ (Accessed: 15 February 2018).

Føroya landsstýri (2018b) *The constitutional status of the Faroe Islands*. Available at: http://www.government.fo/en/foreign-relations/constitutional-status/ (Accessed: 1 February 2018).

Føroya landsstýri (2018c) *The Faroe Islands and the European Union*. Available at: http://www.government.fo/en/foreign-relations/missions-of-the-faroe-islands-abroad/the-mission-of-the-faroes-to-the-european-union/the-faroe-islands-and-the-european-union/ (Accessed: 15 February 2018).

Gilli, M., Große, S. and Schumann, E. (2010) 'Calibrating the Nelson Siegel Svensson model', *Comisef Working Papers Series*, (March), pp. 1–22.

Government.no (2015a) *Enklere med landbasert oppdrett*. Available at: https://www.regjeringen.no/no/aktuelt/enklere-med-landbasert-oppdrett/id2466724/ (Accessed: 17 March 2018).

Government.no (2015b) *Nye konsesjoner skal utvikle framtidens oppdrett*. Available at: https://www.regjeringen.no/no/aktuelt/nye-konsesjoner-skal-utvikle-framtidens-oppdrett/id2462544/

(Accessed: 17 March 2018).

Grant, R. M. (2016) *Contemporary strategy analysis: Text and cases edition*. John Wiley & Sons.

Grieg Seafood (2009) *Annual Report 2008, Building*.

Grieg Seafood (2010) *Annual Report 2009*. doi: 10.2499/9780896297852.

Grieg Seafood (2011) *Annual Report 2010*.

Grieg Seafood (2012) *Annual Report 2011*.

Grieg Seafood (2013) 'Annual report 2012'.

Grieg Seafood (2014) *Annual report 2013*.

Grieg Seafood (2015) *Annual Report 2014*.

Grieg Seafood (2016) *Annual Report 2015*.

Grieg Seafood (2017) *Annual Report 2016*. doi: 10.1017/CBO9781107415324.004.

Grieg Seafood (2018) *Annual Report 2017*.

Gujarati, D. N. (2003) *Basic Econometrics*. 4th edn. Westpoint (USA): McGraw Hill.

Hagstova (2018) *Statbank*. Available at: http://statbank.hagstova.fo/pxweb/en/H2/H2__VV/ (Accessed: 14 April 2018).

Handelsbanken Capital Markets (2018) *Bakkafrost*.

House of Industry (2018) *The Fish Farming Industry on the Faroe islands*. Available at: http://www.industry.fo/international-edition/branch-associations/the-faroese-fish-farmers-association/the-fish-farming-industry-in-the-faroes (Accessed: 17 February 2018).

Hull, J. C. (2012) *OPTIONS, FUTURES, AND OTHER DERIVATIVES*. Boston (USA): Prentice Hall.

IFRS (2016) 'IFRS 16 Leases', *International Financial Reporting Bulletin*, (January), p. 104.

iLaks (2015) - *Siden jeg var 16 år har mitt liv vært preget av jobb og studier*. Available at: https://ilaks.no/siden-jeg-var-16-ar-har-mitt-liv-vaert-preget-av-jobb-og-studier/ (Accessed: 5 March 2018).

iLaks (2018) *Færøyene smadrer Norge i lakseproduksjon sammenlikning*. Available at: https://ilaks.no/faeroyene-smadrer-norge-i-lakseproduksjon-sammenlikning/ (Accessed: 17 February 2018).

ILaks (2018) *Lanserer første laksefôr basert på insektmel*. Available at: https://ilaks.no/lanserer-forste-laksefor-basert-pa-insektmel/ (Accessed: 9 April 2018).

IMF (2018) *Real GDP growth - Annual Percentage Change*. Available at: http://www.imf.org/external/datamapper/NGDP_RPCH@WEO/OEMDC/ADVEC/WEOWORLD (Accessed: 4 April 2018).

Indexmundi (2018) *Commodity Prices*. Available at: https://www.indexmundi.com/commodities/ (Accessed: 11 April 2018).

Intrafish (2018) *Land-based salmon farming 'can't be stopped'*. Available at: http://www.intrafish.com/aquaculture/1430202/land-based-salmon-farming-cant-be-stopped (Accessed: 24 March 2018).

IntraFish (2017) *Intrafish seafood investor forum: Is diversification key for attracting investments?* Available at: http://www.intrafish.com/events/1339882/intrafish-seafood-investor-forum-is-diversification-key-for-attracting-investments (Accessed: 27 February 2018).

Iversen, A. *et al.* (2015) *Kostnadsdrivere i lakseoppdrett*. NOFIMA.

Iversen, A. *et al.* (2016) *Kostnader for lakseoppdrett i konkurrentland Drivkrefter og betydning for konkurransesituasjonen (Nofima rapport 40/2016)*.

Iversen, A. *et al.* (2017) *Kostnadsutvikling i lakseoppdrett*.

Johnson, G., Scholes, K. and Whittington, R. (2008) *Exploring Corporate Strategy, Pearson Education Limited*. doi: 10.1108/10662240510629493.

Kaplinsky, R. and Morris, M. (2001) *A handbook for value chain research*. Ottawa.

Kibenge, F. S. B. *et al.* (2012) 'Countermeasures against viral diseases of farmed fish', *Antiviral Research*. Elsevier B.V., 95(3), pp. 257–281. doi: 10.1016/j.antiviral.2012.06.003.

Kinserdal, F. (2017) 'Hva blir avkastningskrav og vekstforventninger når renten er lav?', *MAGMA*, 3, pp. 16–19.

Koller, T., Goedhart, M. and Wessels, D. (2010) 'Measuring and Managing the Value of Companies', *John Wiley & Sons*.

KPMG (2018) *Corporate tax rates table*. Available at: https://home.kpmg.com/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html (Accessed: 6 April 2018).

Kristoferson, D. and Anderson, J. L. (2004) *STRUCTURAL BREAKS IN THE FISHMEAL - SOYBEAN MEAL PRICE RELATIONSHIP*.

Kullgren, A. *et al.* (2012) 'Part A: The impact of temperature on the metabolome and endocrine metabolic

signals in Atlantic salmon (Salmo salar)', *Elsevier*.

Kvaløy, O. and Tveterås, R. (2008) 'Cost structure and vertical integration between farming and processing', *Journal of Agricultural Economics*, 59(2), pp. 296–311. doi: 10.1111/j.1477-9552.2007.00149.x.

Larsen, T. a. and Asche, F. (2011) 'Contracts in the salmon aquaculture industry: An analysis of Norwegian salmon exports', *Marine Resource Economics*, 26(2), pp. 141–150. doi: 10.5950/0738-1360-26.2.141.

Lerøy Seafood Group (2010) *Annual Report 2009*.

Lerøy Seafood Group (2011) *Annual Report 2010*. doi: 10.1017/CBO9781107415324.004.

Lerøy Seafood Group (2012) *Annual Report 2011*.

Lerøy Seafood Group (2013) *Annual Report 2012*.

Lerøy Seafood Group (2014) *Annual Report 2013*.

Lerøy Seafood Group (2015) *Annual Report 2014*.

Lerøy Seafood Group (2016) *Annual Report 2015*. doi: 10.2821/11216.

Lerøy Seafood Group (2017) *Annual Report 2016*. doi: 10.1017/CBO9781107415324.004.

Lerøy Seafood Group (2018) *Annual Report 2017*.

Liu, Y. *et al.* (2016) 'Comparative economic performance and carbon footprint of two farming models for producing Atlantic salmon (Salmo salar): Land-based closed containment system in freshwater and open net pen in seawater', *Aquacultural Engineering*. Elsevier B.V., 71, pp. 1–12. doi: 10.1016/j.aquaeng.2016.01.001.

Lock, E. R., Arsiwalla, T. and Waagbø, R. (2016) 'Insect larvae meal as an alternative source of nutrients in the diet of Atlantic salmon (Salmo salar) postsmolt', *Aquaculture Nutrition*, 22(6), pp. 1202–1213. doi: 10.1111/anu.12343.

Lundholm, R. J. and Sloan, R. G. (2004) *Equity Valuation and Analysis with eVal*. McGraw-Hill/Irwin.

Mankiw, N. G. (2014) *Principles of macroeconomics*. Cengage Learning.

Marine Harvest (2009) *Annual report 2008*. doi: 10.1038/labinvest.3700698.

Marine Harvest (2010) *Annual Report 2009*. doi: 10.1017/CBO9781107415324.004.

Marine Harvest (2011) *Annual Report 2010*.

Marine Harvest (2012) *Annual Report 2011*.

Marine Harvest (2013) *Salmon Farming Industry Handbook*.

Marine Harvest (2015) *Annual report 2014*.

Marine Harvest (2016a) *Annual Report 2015*.

Marine Harvest (2016b) *Annual Report 2016*.

Marine Harvest (2017) *Salmon Farming Industry handbook*.

Marine Harvest (2018) *Annual Report 2017*.

MarketLine (2017) 'Global Aquaculture', (November), pp. 1–38.

Misund, B. (2018) 'Valuation of salmon farming companies', *Aquaculture Economics and Management*. Taylor & Francis, 22(1), pp. 94–111. doi: 10.1080/13657305.2016.1228712.

NASCO (2010) *Aquaculture, Introductions and Transfers and Transgenics: Focus Area Report - Faroe Islands*.

Nasdaq OMX (2018a) *Bonds Denmark*. Available at: http://www.nasdaqomxnordic.com/obligationer/danmark/?languageId=1 (Accessed: 6 April 2018).

Nasdaq OMX (2018b) *Nasdaq Salmon Index*. Available at: https://salmonprice.nasdaqomxtrader.com/public/report;jsessionid=A3502A636F4D1845C06A96D3BC20237A?0 (Accessed: 6 April 2018).

Nelson, C. R. and Siegel, A. F. (1987) 'Parsimonious Modeling of Yield Curves', *The Journal of Business*, 60(4), p. 473. doi: 10.1086/296409.

NIFES (2015) *Insects as salmon feed*. Available at: https://nifes.hi.no/en/prosjekt/insects-salmon-feed/ (Accessed: 5 April 2018).

Nissim, D. and Penman, S. (2001) 'Ratio analysis and equity valuation: From research to practice', *Review of Accounting Studies*, 6, pp. 109–154. doi: 10.1023/A:1011338221623.

Nofima (2015) *Optimalisert postsmoltproduksjon (OPP)*. Available at: https://nofima.no/prosjekt/optimalisert-postsmoltproduksjon-opp/.

Nordea Markets (2018) *Bakkafrost*.

Norway Royal Salmon (2011) *Annual Report 2010*.

Norway Royal Salmon (2012) *Annual Report 2011*.

Norway Royal Salmon (2013) *Annual Report 2012*.

Norway Royal Salmon (2014) *Annual Report 2013*.

Norway Royal Salmon (2015) *Annual Report 2014*.

Norway Royal Salmon (2016) *Annual Report 2015*. doi: 10.1017/CBO9781107415324.004.

Norway Royal Salmon (2017) 'Annual Report 2016'.

Norway Royal Salmon (2018a) 'Annual report 2017'.

Norway Royal Salmon (2018b) *Interim Report Q4-17*.

Norwegian Seafood Council (2016) *Norsk Havbrukshistorie*. Available at: https://laksefakta.no/.

Norwegian Seafood Council (2017) *Hva skjer når Russland ikke har norsk laks?* Available at: https://seafood.no/aktuelt/Fisketanker/hva-skjer-nar-russland-ikke-har-norsk-laks/ (Accessed: 22 February 2018).

Nystøyl, R. (2017) 'Trender – Produksjon & Marked Atlantisk Laks - 2017', in *Havbrukskonferansen 2017*. Torshavn.

Ocean Quality (2014) *Our History*. Available at: http://www.oceanquality.com/index.php?pageID=46&openLevel=84 (Accessed: 15 March 2018).

OECD-FAO (2011) *Demand and supply of feed ingredients for farmed fish and crustaceans*.

OECD-FAO (2014) 'GLOBEFISH HIGHLIGHTS: A Quarterly Update on the World Seafood Market', (4).

OECD-FAO (2016a) *Algal bloom mortalities in Chile have salmon prices climbing even higher*. Available at: http://www.fao.org/in-action/globefish/market-reports/resource-detail/en/c/415527/ (Accessed: 15 April 2018).

OECD-FAO (2016b) *Global per capita fish consumption rises above 20 kilograms a year*. Available at: http://www.fao.org/news/story/en/item/421871/icode/ (Accessed: 27 March 2018).

OECD-FAO (2017a) *Agricultural Outlook 2017-2026*.

OECD-FAO (2017b) *GLOBEFISH HIGHLIGHTS: A Quarterly Report on World Seafood Markets*.

OECD-FAO (2017c) 'GLOBEFISH HIGHLIGHTS: Special Issue 2017', (April).

OECD-FAO (2018) *Salmo Salar*. Available at: http://www.fao.org/fishery/culturedspecies/Salmo_salar/en (Accessed: 13 March 2018).

OECD (2018) *Nominal GDP Forecast*. Available at: https://data.oecd.org/gdp/nominal-gdp-forecast.htm (Accessed: 6 April 2018).

OECD - FAO (2016) *Aquaculture - definitions*. Available at: http://www.fao.org/docrep/003/x6941e/x6941e04.htm (Accessed: 20 February 2018).

Øglend, A. (2010) 'An analysis of commodity price dynamics with focus on the price of salmon'.

Øglend, A. (2013) 'Recent Trends in Salmon Price Volatility', *Aquaculture Economics and Management*, 17(3), pp. 281–299. doi: 10.1080/13657305.2013.812155.

Oslo Stock Exchange (2018) *2017: Most Traded Security*. Available at: https://www.oslobors.no/ob_eng/Oslo-Boers/Statistics/Annual-statistics/Equities/2017-Most-traded-security (Accessed: 4 March 2018).

Parcel, J. *et al.* (2008) 'Cross-Hedging Fishmeal: Exploring Corn and Soybean Meal Futures Contracts', *Southern Agricultural Economics Association*. doi: 10.1016/j.fishres.2012.12.009.

Pareto Securities Research (2018) *Earnings growth to continue*.

Penman, S. H. (2013) *Financial Statement Analysis and Security Valuation*, *McGraw-Hill Education*. doi: 10.1016/j.intacc.2007.09.003.

Petersen, C. V. and Plenborg, T. (2012) *Financial Statement Analysis*. Pearson Education Limited.

Petersen, C. V., Plenborg, T. and Kinserdal, F. (2017) *Financial Statement Analysis*. Fagbok Forlaget.

De Pooter, M. (2007) 'Examining the Nelson-Siegel class of term structure models: In-sample fit versus out-of-sample forecasting performance', *Tinbergen Institute Discussion Paper*. doi: 10.2139/ssrn.992748.

Porter, M. E. (2008) 'The five competitive forces that shape strategy', *Harvard Business Review*. doi: Article.

Pwc (2017) 'Sustainable growth towards 2050'.

Reuters (2015) *BRIEF - Salmon farmer Bakkafrost flags tax changes in Faroe islands*. Available at: https://www.reuters.com/article/idUSASM0000WW20151222.

Reuters (2018) *China hits U.S. goods with tariffs as 'sparks' of trade war fly*. Available at: https://www.reuters.com/article/us-usa-trade-china/china-hits-u-s-goods-with-tariffs-as-sparks-of-trade-war-fly-idUSKCN1H81J3 (Accessed: 4 April 2018).

Ron, U. (2000) 'A practical guide to swap curve construction', *Bank of Canada Working Paper*, 17, pp. 1–32. doi: doi-not-found.

SalMar (2011) *Annual Report 2010*.

SalMar (2012) *Annual Report 2011*.

SalMar (2013) *Annual Report 2012*.

SalMar (2014) *Annual Report 2013*.

SalMar (2015) *Annual Report 2014*.

SalMar (2016) *Annual Report 2015*.

SalMar (2017) *Annual Report 2016*.

SalMar (2018a) *Annual Report 2017*.

SalMar (2018b) 'Quarterly Report: Fourth quarter 2017'.

Shepherd, C. J., Monroig, O. and Tocher, D. R. (2016) 'Future availability of raw materials for salmon feeds and supply chain implications: The case of Scottish farmed salmon', *Aquaculture*. Elsevier B.V., 467, pp. 49–62. doi: 10.1016/j.aquaculture.2016.08.021.

Skærbæk, P. (2005) 'Annual reports as interaction devices: The hidden constructions of mediated communication', *Financial Accountability & Management*, 21(4), pp. 385–411. doi: 10.1111/j.0267-4424.2005.00226.x.

Sogn-Grundvåg, G. and Young, J. A. (2013) 'Commoditization in Food Retailing: Is Differentiation a Futile Strategy?', *Journal of Food Products Marketing*, 19(3), pp. 139–152. doi: 10.1080/10454446.2013.797947.

Statistics Norway (2018) *Åttedoblet lakseeksport til Kina*. Available at: https://www.ssb.no/utenriksokonomi/artikler-og-publikasjoner/attedoblet-lakseeksport-til-kina (Accessed: 15 March 2018).

Stefansson, S., Björnsson, B. and Ebbesson, L. (2008) *Smoltification, Fish larval physiology*.

Svensson, L. E. O. (1994) 'Estimating and Interpreting Forward Interest Rates: Sweden 1992-1994'.

Taylor, P. and Guttormsen, A. G. (2008) 'Aquaculture Economics & Management Forecasting weekly salmon prices : Risk management in fish farming Forecasting weekly salmon prices : risk management in fish farming', 7305(May 2012), pp. 37–41.

The Financial Supervisory Autority of Norway (2015) 'Rapport fra Tematilsyn - Oppdrettsforetak', pp. 1–50.

Thurstan, R. H. and Roberts, C. M. (2014) 'The past and future of fish consumption : Can supplies meet healthy eating recommendations ?', *Marine Pollution Bulletin*. Elsevier Ltd, 89(1–2), pp. 5–11. doi:

10.1016/j.marpolbul.2014.09.016.

Tomek, W. G. (1997) ‘Commodity Futures Prices as Forecasts’, 19(1), pp. 23–44.

Torrissen, J. K. and Onozaka, Y. (2017) ‘Comparing fish to meat: Perceived qualities by food lifestyle segments’, *Aquaculture Economics & Management*, 21(1), pp. 44–70.

United Nations, Department of Economic and Social Affairs, P. D. (2017) ‘World Population Prospects The 2017 Revision Key Findings and Advance Tables’, *World Population Prospects The 2017*, pp. 1–46. doi: 10.1017/CBO9781107415324.004.

University of Notre Dame (2018) *Durbin-Watson Significance Tables*. Available at: https://www3.nd.edu/~wevans1/econ30331/Durbin_Watson_tables.pdf (Accessed: 19 April 2018).

World Bank (2013) ‘FISH TO 2030 Prospects for Fisheries and Aquaculture’, (83177–GLB). doi: 83177-GLB.

World Sea Temperature (2018) *World Sea Water Temperatures*. Available at: https://www.seatemperature.org/ (Accessed: 29 March 2018).

Zhang, D., Myrland, Ø. and Xie, J. (2016) ‘Firm Size , Commodity Price , and Interdependence Between Firm-Level Stock Prices : The Case of Norwegian Salmon Industry’, 3(4), pp. 179–189. doi: 10.11114/aef.v3i4.1864.

Zimmerman, J. (2011) *Accounting for Decision Making and Control*. McGraw-Hill Education.

Reformulated Financial Statements

1. Appendix: Bakkafrost Reformulated Income Statement

Reformulated Income Statement (TDKK)	2008	2009	2010	2011	2012
Operating Revenue	**365,634**	**596,565**	**820,212**	**1,321,092**	**1,855,544**
Purchase of goods	- 175,799	- 213,606	- 301,446	- 450,815	- 835,494
Change in inventory	39,104	- 32,724	75,501	19,796	75,990
Gross Margin	**228,939**	**350,235**	**594,267**	**890,073**	**1,096,040**
Salary and personnel expenses	- 60,944	- 78,014	- 118,409	- 168,144	- 210,115
Depreciation	- 18,963	- 20,797	- 42,257	- 67,325	- 80,244
Other operation expenses	- 78,132	- 93,025	- 186,813	- 319,458	- 482,641
Core Operating income from sales (Before tax)	**70,900**	**158,399**	**246,788**	**335,146**	**323,040**
Tax as reported	- 7,810	- 32,509	- 47,548	- 46,779	- 55,806
Less tax on core other operating income	20	- 61	- 92	364	1,160
Less tax allocated to unusual items	1,374	- 6,058	- 12,290	- 12,163	- 4,846
Add tax benefit from financing activities	3,062	2,008	1,498	5,490	3,571
Tax on operating activities	**- 6,142**	**- 24,382**	**- 33,668**	**- 29,489**	**- 48,549**
Revenue tax (Recognised as cost in income statement)	-	-	-	-	-
Core operating income from sales (after tax)	**64,758**	**134,017**	**213,120**	**305,657**	**274,491**
Core other operating income/expense					
Income from associates	- 111	340	- 512	- 2,021	- 6,442
Tax on other operating income	**20**	**- 61**	**- 92**	**364**	**1,160**
Core Operating income	**64,667**	**134,296**	**213,540**	**304,000**	**269,209**
Unusual items operating items (after tax items)					
Fair value adjustments on biological assets	- 7,632	33,655	- 83,926	- 45,882	90,546
Provision for onerous contracts	-	-	- 2,856	2,856	- 46,078
Loss from sale of subsidiary	-	-	-	-	- 17,546
Acquisition costs	-	-	-	- 16,019	-
Listing costs	-	-	- 12,790	-	-
Badwill related to aquisitions	-	-	-	126,618	-
Tax on unusual items	**1,374**	**- 6,058**	**- 12,290**	**- 12,163**	**- 4,846**
Fair value adjustment on securities available for sale net tax	967	3,509	- 5,830	- 12,831	-
Deferred tax on securities available for saleIncome tax	-	-	- 1,594	3,024	-
Income tax effect					-
Currency translation differences (from equity statement)	-	-	-	-	-
Adjustment on treasury shares	-	-	-	-	-
Fair value adjustment on purchased non-controlling interests	-	-	-	-	1,634
Profit or loss from discontinued operations, after tax	-	-	-	-	13,462
Reserve to share based payment	-	-	-	-	-
Operating income after tax	**59,376**	**165,402**	**273,766**	**349,602**	**306,381**
Financing income (expense)					
Financial income	1,505	2,915	1,051	2,835	3,436
Net interest expenses	- 17,794	- 13,065	- 8,180	- 30,830	- 20,924
Net currency effects	- 44	- 630	819	- 609	- 145
Other financial expenses	- 677	- 377	- 2,011	- 1,898	- 2,206
Net interst income (expense)	- 17,010	- 11,157	- 8,321	- 30,502	- 19,839
Tax effect at (Below %)	- 3,062	- 2,008	- 1,498	- 5,490	- 3,571
Net interest income (expense)	- 20,072	- 13,165	- 9,819	- 35,992	- 23,410
Fair value adjustment on Financial Instruments (after tax item)				1,589	-
Net Financial Expense	**- 20,072**	**- 13,165**	**- 9,819**	**- 34,403**	**- 23,410**
Comprehensive income	**39,304**	**152,237**	**263,947**	**315,199**	**282,971**

Fiscal year	**2008**	**2009**	**2010**	**2011**	**2012**
Nominal tax rate	18%	18%	18%	18%	18%

Reformulated Income Statement (TDKK)	2013	2014	2015	2016	2017
Operating Revenue	**2,491,081**	**2,683,319**	**2,850,363**	**3,202,686**	**3,770,049**
Purchase of goods	- 1,064,666	- 913,130	- 992,497	- 920,148	- 883,871
Change in inventory	81,924	96,560	215,432	58,874	- 141,406
Gross Margin	**1,508,339**	**1,866,749**	**2,073,298**	**2,341,412**	**2,744,772**
Salary and personnel expenses	- 232,871	- 263,897	- 281,085	- 327,825	- 400,267
Depreciation	- 86,659	- 97,169	- 108,098	- 133,261	- 183,590
Other operation expenses	- 601,799	- 671,908	- 683,532	- 715,373	- 783,268
Core Operating income from sales (Before tax)	**587,010**	**833,775**	**1,000,583**	**1,164,953**	**1,377,647**
Tax as reported	- 138,133	- 252,086	- 114,296	- 293,727	- 112,482
Less tax on core other operating income	- 4,282	152	- 1,216	- 2,668	- 3,114
Less tax allocated to unusual items	- 16,294	- 10,685	14,145	- 108,407	112,710
Add tax benefit from financing activities	- 4,686	- 1,242	772	7,375	4,540
Tax on operating activities	**- 122,243**	**- 242,795**	**- 126,453**	**- 175,277**	**- 217,538**
Revenue tax (Recognised as cost in income statement)	-	-	-	- 108,450	- 119,681
Core operating income from sales (after tax)	**464,767**	**590,980**	**874,130**	**881,226**	**1,040,428**
Core other operating income/expense					
Income from associates	23,788	- 845	6,757	14,821	17,302
Tax on other operating income	**- 4,282**	**152**	**- 1,216**	**- 2,668**	**- 3,114**
Core Operating income	**484,273**	**590,287**	**879,671**	**893,379**	**1,054,616**
Unusual items operating items (after tax items)					
Fair value adjustments on biological assets	115,352	- 11,547	27,578	608,195	- 693,540
Provision for onerous contracts	- 24,830	70,908	- 51,004	- 16,372	67,376
Loss from sale of subsidiary	-	-	-	-	
Acquisition costs	-	-	-	-	
Listing costs	-	-	-	-	
Badwill related to aquisitions	-	-	-	10,440	-
Tax on unusual items	**- 16,294**	**- 10,685**	**14,145**	**- 108,407**	**112,710**
Fair value adjustment on securities available for sale net tax					
Deferred tax on securities available for saleIncome tax					
Income tax effect	13,480	6,205	1,753	- 4,364	4,644
Currency translation differences (from equity statement)	1,109	349	576	3,822	415
Adjustment on treasury shares	-	-	-	- 1,366	2,885
Fair value adjustment on purchased non-controlling interests	-	-	-	-	
Profit or loss from discontinued operations, after tax	-	-	-	-	
Reserve to share based payment	-	161	924	1,566	1,223
Operating income after tax	**573,090**	**645,678**	**818,487**	**1,386,893**	**550,329**
Financing income (expense)					
Financial income	6,239	4,575	3,599	1,524	1,395
Net interest expenses	- 28,929	- 32,376	- 24,622	- 25,983	- 26,365
Net currency effects	53,151	40,448	23,350	- 12,355	4,173
Other financial expenses	- 4,430	- 5,747	- 6,614	- 4,159	- 4,423
Net interst income (expense)	26,031	6,900	- 4,287	- 40,973	- 25,220
Tax effect at (Below %)	4,686	1,242	- 772	- 7,375	- 4,540
Net interest income (expense)	30,717	8,142	- 5,059	- 48,348	- 29,760
Fair value adjustment on Financial Instruments (after tax ite	- 74,889	- 40,678	- 11,492	26,789	- 25,799
Net Financial Expense	**- 44,172**	**- 32,536**	**- 16,551**	**- 21,559**	**- 55,559**
Comprehensive income	**528,918**	**613,142**	**801,936**	**1,365,334**	**494,770**

Fiscal year	2013	2014	2015	2016	2017
Nominal tax rate	18%	18%	18%	18%	18%

Bakkafrost

Reformulated Balance Sheet (TDKK)	2008	2009	2010	2011	2012
Operating Assets					
Accounts receivable	42,469	66,644	125,619	154,496	212,357
Biological assets at cost	216,509	180,630	351,299	640,621	589,797
Biological assets fair value	13,211	46,867	130,792	59,715	157,161
(Other) Inventory	17,373	20,527	28,501	179,179	242,898
Other receivables	14,839	13,304	19,890	16,562	145,998
Intangible assets	0	0	136,245	369,955	293,675
Land buildings and other real estate (PPE)	80,292	83,985	119,170	366,468	360,451
Plant machinery and operating equipment	141,129	137,461	223,009	446,403	413,189
Other operating equipment	9,234	9,556	14,240	15,652	22,448
Vessels	0	0	0	0	0
Prepayments for purchase of PP&E	0	0	0	0	16,680
Long term receivables	0	0	0	0	0
Other non-current receivables	6,986	478	796	0	
Investments in stocks and shares	7,598	23,539	19,983	2,220	2,345
Investments in associated companies	2,417	2,723	5,984	33,635	88,867
Total Operating Assets	**552,057**	**585,714**	**1,175,528**	**2,284,906**	**2,545,866**
Operating Liabilities					
Deferred taxes	23,801	57,083	120,010	256,023	258,441
Current tax liabilities					
Trade Payables	43,382	42,451	83,039	151,047	217,610
Provisions for onerous contracts					
Other current liabilities					
Total Operating Liabilities	**67,183**	**99,534**	**203,049**	**407,070**	**476,051**
Net Operating assets (NOA)	**484,874**	**486,180**	**972,479**	**1,877,836**	**2,069,815**
Financial assets					
Cash and cash equivalents	471	35,319	9,128	16,868	25,045
Other receivables (Deposit interest and currency s	0	0	0	0	0
Total Financial Assets	**471**	**35,319**	**9,128**	**16,868**	**25,045**
Financial obligations					
Short-term interest bearing debt	156,313	98,262	41,961	100,000	100,000
Long-term interest bearing debts	87,382	34,350	37,357	733,693	731,948
Derivatives					
Total Financial Obligations	**243,695**	**132,612**	**79,318**	**833,693**	**831,948**
Net Financial Obligations (NFO)	**243,224**	**97,293**	**70,190**	**816,825**	**806,903**
Common Equity (CSE)	**241,650**	**388,887**	**902,289**	**1,026,454**	**1,262,912**
Minority interest	34,557		0	34,557	0
Total Equity (CSE + Minority interest)	**241,650**	**388,887**	**902,289**	**1,061,011**	**1,262,912**
Net Operating Assets (NOA)	**484,874**	**486,180**	**972,479**	**1,877,836**	**2,069,815**

Bakkafrost

Reformulated Balance Sheet (TDKK)	2013	2014	2015	2016	2017
Operating Assets					
Accounts receivable	278,432	172,360	199,263	292,009	262,493
Biological assets at cost	703,231	780,446	846,220	1,076,429	969,466
Biological assets fair value	262,665	233,513	214,053	782,006	127,198
(Other) Inventory	235,489	266,960	421,966	355,604	305,845
Other receivables	85,893	67,432	96,931	51,520	72,526
Intangible assets	294,675	294,675	294,675	376,675	376,675
Land buildings and other real estate (PPE)	390,997	400,271	585,741	874,907	1,183,286
Plant machinery and operating equipment	465,247	491,462	797,450	906,046	881,572
Other operating equipment	25,839	35,002	44,093	58,999	139,225
Vessels	0	0	0	278,518	366,347
Prepayments for purchase of PP&E	34,613	114,513	104,209	0	
Long term receivables	1,504	1,291	0	12,660	-
Other non-current receivables					
Investments in stocks and shares	1,593	25,289	25,108	25,296	25,296
Investments in associated companies	113,711	100,130	105,785	34,111	51,406
Total Operating Assets	**2,893,889**	**2,983,344**	**3,735,494**	**5,124,780**	**4,761,335**
Operating Liabilities					
Deferred taxes	310,925	414,014	349,546	545,699	455,448
Current tax liabilities	57241	124,765	155,359	142,016	198,141
Trade Payables	140104	127,720	195,223	138,873	189,548
Provisions for onerous contracts			51,004	67,378	
Other current liabilities	78639	10,460	12,409	46,513	33,699
Total Operating Liabilities	**586,909**	**676,959**	**763,541**	**940,479**	**876,836**
Net Operating assets (NOA)	**2,306,980**	**2,306,385**	**2,971,953**	**4,184,301**	**3,884,499**
Financial assets					
Cash and cash equivalents	182,077	405,109	101,852	234,996	309,551
Other receivables (Deposit interest and currency s	36,260	74,480	83,040	58,340	84,630
Total Financial Assets	**218,337**	**479,589**	**184,892**	**293,336**	**394,181**
Financial obligations					
Short-term interest bearing debt	100,000	100000			378,300
Long-term interest bearing debts	685,151	505,393	447,559	827,146	146,696
Derivatives	74,889	116,928	128,804	101,456	127,255
Total Financial Obligations	**860,040**	**722,321**	**576,363**	**928,602**	**652,251**
Net Financial Obligations (NFO)	**641,703**	**242,732**	**391,471**	**635,266**	**258,070**
Common Equity (CSE)	**1,665,277**	**2,063,653**	**2,580,482**	**3,549,035**	**3,626,429**
Minority interest	0				
Total Equity (CSE + Minority interest)	**1,665,277**	**2,063,653**	**2,580,482**	**3,549,035**	**3,626,429**
Net Operating Assets (NOA)	**2,306,980**	**2,306,385**	**2,971,953**	**4,184,301**	**3,884,499**

2. Appendix 2: MHG Reformulated Financial Statements

Marine Harvest Group	NOK Million					
Reformulated Income Statement	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Net sales	**13124.6**	**14619.5**	**15281.2**	**16132.8**	**15463.6**	**19199.4**
Purchase of goods (cost of materials)	-8504.5	-8796.6	-7780.7	-8398.6	-9666.5	-9998.5
Gross Margin	**4620.1**	**5822.9**	**7500.5**	**7734.2**	**5797.1**	**9200.9**
Salary and personnel expenses	-2139.8	-2167.4	-2202.5	-2177.8	-2418.6	-2674.3
Depreciation and amortisation	-685.3	-687.7	-653.1	-666.7	-677.2	-762.5
Depreciation operational leases	-25.2	-21.8	-17.8	-182.1	-122.7	-187.9
Other operating expenses	-1365.5	-1412.9	-1422.4	-1854.5	-1987.7	-2280.8
Operating income from sales (Before tax)	**404.3**	**1533.1**	**3204.7**	**2853.1**	**590.9**	**3295.4**
Tax as reported	409.3	-358.3	-1143.9	-261.7	-376.5	-1026.8
Add tax benefit from financing activities	440.2	-83.8	62.3	-41.1	65.1	368.9
Less tax on core other operating income	1.6	19.5	56.6	-2.4	24.7	62.1
Less tax on unusual items	-587.8	-67.6	299.0	-450.4	96.0	352.2
Tax on operating activities	263.4	-490.2	-726.0	-755.6	-190.6	-243.6
Core Operating income from sales (after tax)	**667.6**	**1042.9**	**2478.8**	**2097.5**	**400.2**	**3051.7**
Other operating income/expense						
Income from associates	5.8	69.5	202.0	-8.5	88.3	221.8
Tax on other operating income	-1.6	-19.5	-56.6	2.4	-24.7	-62.1
Core operating income after tax	671.8	1092.9	2624.2	2091.3	463.8	3211.4
Other operating items (after tax items)						
Fair value adjustments on biological assets	-278.8	301.2	1091.7	1736.6	1926.0	6118.3
Fair value uplift on harvested fish				-3250.6	-1575.8	-4323.7
Provision for onerous contracts	0.0	0.0	-14.3	-5.8	-6.1	-124.7
Restructuring cost	-241.0	-169.5	-4.4	-21.8	-0.8	-272.8
Non-operational items (legal issues)				0.0	0.0	-74.4
Impairment losses	-1579.4	-373.1	-5.0	-67.0	-0.5	-65.0
Tax on unusual items	587.8	67.6	-299.0	450.4	-96.0	-352.2
Unusual after tax items						
Deferred tax on securities available for saleIncome tax 2013/14	338.7	-379.8	-61.8	38.5	31.1	18.8
Currency translation differences	858.7	-762.3	-3.4	86.7	-325.8	628.8
Currency translation differences ass. Companies						
Fair value adjustment related to non-controlling interests	10.1	-6.3	-3.2	-8.3	-0.5	4.9
Profit from discontinued operations, net of tax				0.0	0.0	91.9
Acturial gains and losses						
Other gains and losses on comprehensive income	69.2	58.7	0.0			
Operating income after tax	**437.1**	**-170.6**	**3324.8**	**1050.1**	**415.4**	**4861.4**
Financing income (expense)						
Financial income						
Implicit interest operational leases	-3.1	-13.5	-13.6	-26.6	-53.2	-113.2
Net interest expenses	-485.4	-404.3	-367.8	-405.8	-382.8	-640.2
Net currency effects	-632.2	682.0	366.8	236.4	523.3	-311.7
Other financial items	-451.5	35.1	-207.9	342.9	-320.0	-252.4
Net interst income (expense)	-1572.2	299.3	-222.5	146.9	-232.7	-1317.5
Tax effect financing activities at (Below %)	-440.2	83.8	-62.3	41.1	-65.1	-368.9
Net interest income (expense)	-2012.4	383.1	-284.9	188.0	-297.8	-1686.4
Fair value adjustment on (Cash flow hedges)	-1279.4	1326.6	216.6	-141.1	-113.5	-71.3
Net financial expense	-3291.8	1709.7	-68.3	46.9	-411.3	-1757.7
Comprehensive income	**-2854.7**	**1539.1**	**3256.5**	**1097.0**	**4.1**	**3103.7**

Fiscal year	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Nominal tax rate	28%	28%	28%	28%	28%	28%

Marine Harvest Group	EUR Million				
Reformulated Income Statement	**2013EUR**	**2014**	**2015**	**2016**	**2017**
Net sales	**2,297**	**3,053**	**3,112**	**3,510**	**3,649**
Purchase of goods (cost of materials)	-1,196	-1,636	-1,770	-1,782	-1,689
Gross Margin	**1,101**	**1,418**	**1,342**	**1,728**	**1,961**
Salary and personnel expenses	-320	-397	-427	-440	-478
Depreciation and amortisation	-91	-116	-140	-143	-150
Depreciation operational leases	-22	26	-58	-78	-80
Other operating expenses	-237	-405	-388	-391	-453
Operating income from sales (Before tax)	**394**	**526**	**330**	**676**	**800**
Tax as reported	-123	-90	-92	-220	-60
Add tax benefit from financing activities	44	75	25	59	-4
Less tax on core other operating income	7	5	6	16	8
Less tax on unusual items	42	-24	-3	64	-78
Tax on operating activities	-29	-33	-63	-81	-134
Core Operating income from sales (after tax)	**365**	**493**	**267**	**595**	**666**
Other operating income/expense	0				
Income from associates	27	18	23	63	34
Tax on other operating income	-7	-5	-6	-16	-8
Core operating income after tax	384	506	284	642	692
Other operating items (after tax items)					
Fair value adjustments on biological assets	732	-660	468	1,256	-340
Fair value uplift on harvested fish	-517	599	-458	-870	
Provision for onerous contracts	-15	3	-1	-109	120
Restructuring cost	-33	-6	-15	-5	-3
Non-operational items (legal issues)	-9	-20	2	1	0
Impairment losses	-8	-3	-7	-18	-104
Tax on unusual items	-42	24	3	-64	78
Unusual after tax items					
Deferred tax on securities available for saleIncome tax 2013/14	2	3			
Currency translation differences	75	83	45	49	-193
Currency translation differences ass. Companies	0			7	-12
Fair value adjustment related to non-controlling interests	1				
Profit from discontinued operations, net of tax	11	24	0	0	
Acturial gains and losses	0		-1	-3	5
Other gains and losses on comprehensive income	0		2	1	-1
Operating income after tax	**582**	**551**	**322**	**887**	**243**
Financing income (expense)					
Financial income					
Implicit interest operational leases	-14	-22	2	-3	-22
Net interest expenses	-77	-65	-46	-48	-47
Net currency effects	-37	-46	4	27	-9
Other financial items	-30	-145	-53	-211	93
Net interst income (expense)	-158	-279	-93	-235	16
Tax effect financing activities at (Below %)	-44	-75	-25	-59	4
Net interest income (expense)	-202	-354	-118	-294	19
Fair value adjustment on (Cash flow hedges)	-9	-4	-3		
Net financial expense	-210	-358	-121	-294	19
Comprehensive income	**371**	**193**	**201**	**593**	**263**

Fiscal year	**2013**	**2014**	**2015**	**2016**	**2017**
Nominal tax rate	27%	27%	27%	25%	24%

Marine Harvest Group	Denominated in NOK Million					
Reformulated Balance Sheet	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Operating Assets						
Accounts receivable	1903.4	1672.1	1844.9	1914.9	1782	3,191.4
Biological assets	5620.6	5351.1	7278.1	6285.2	6207.9	9,536.6
Inventory	1074.5	742.7	775.8	783	819.7	1,751.1
Other Receivables	532.4	551.6	814.7	609.8	592.7	1,086.5
Licenses	5766.6	5409.5	5442.5	5577.5	5435.4	6,036.1
Goodwill	2239.9	2142.6	2111.6	2146.1	2115.5	2,374.9
Other intangible assets	160	136	132.9	123.1	114.2	188.4
Property, plant & equipment	4243.6	3518.1	3885.1	4167.5	4111.9	6,677.2
Assets from operational leases	151.4	130.8	124.3	910.5	736.4	939.6
Investments in associated companies	513.5	520.1	678.9	624.4	647.3	900.4
Other shares and other non-current assets	78.9	118.8	126.8	117.9	1081.8	140.9
Deferred tax asset	230.5	54.5	118.6	160.1	73.9	178.8
Total Operating Assets	22,515.3	20,347.9	23,334.2	23,420.0	23,718.7	33,001.9
Operating Liabilities						
Deferred tax	732.9	1142.6	2237.9	2351.9	2543.7	3,365.0
Current tax liabilities	69.9	50.8	49.7	86.6	26.2	252.6
Trade payables	1729.2	1339.8	1450.2	1481.8	1452.5	2,232.6
Other non-current liabilities						
Other current liabilities						
Provision for onerous contracts						
Total Operating Liabilities	2,532.0	2,533.2	3,737.8	3,920.3	4,022.4	5,850.2
Net Operating assets (NOA)	19,983.3	17,814.7	19,596.4	19,499.7	19,696.3	27,151.7
Financial assets						
Cash	372.6	172.2	318.9	279.1	246	439.1
Restricted cash (Financial activity)					89.3	167.1
Assets held for sale						1,059.1
Other current financial assets						
Other non-current financial assets						
Total Financial Assets	372.6	172.2	318.9	279.1	335.3	1,665.3
Financial obligations						
Current interest-bearing debt	1365.5	130.3	429.7	157	377.8	686.7
Other current financial liabilities	2349.9	1048.6	1112.2	1180.3	1475.4	1,967.7
Liabilities held for sale						190.5
Non-current interest-bearing debt	6747.7	5116.9	5107.3	6589.4	5338.5	7,710.2
Capitalised operating leases	151.4	130.8	124.26661	910.54164	736.43281	939.6
Other non-current liabilities	116.7	99.8	571.1	99.3	414.7	976.2
Total Financial Obligations	10731.209	6526.3567	7344.5666	8936.5416	8342.8	12470.9
Net Financial Obligations (NFO)	10,358.6	6,354.2	7,025.7	8,657.4	8,007.5	10805.6
Common Equity (CSE)	9579.5	11415.5	12500.2	10766.3	11619.7	16318.5
Minority interest	45.1	45	70.5	75.8	69	27.80
Total Equity (CSE + Minority interest)	9624.6	11460.5	12570.7	10842.1	11688.7	16346.3
Net Operating Assets	19,983.2	17,814.7	19,596.4	19,499.5	19,696.2	27,151.9

Marine Harvest Group	Denominated in EUR Million				
Reformulated Balance Sheet	**2013EUR**	**2014**	**2015**	**2016**	**2017**
Operating Assets					
Accounts receivable	381.8	498.1	569.8	625.1	477.6
Biological assets	1,140.9	1,115.8	1,140.2	1,573.8	1200.5
Inventory	209.5	267.5	277.7	248.2	306.9
Other Receivables	130.0				99.1
Licenses	722.1	725.9	746.6	764.3	615.2
Goodwill	284.1	269.3	259.0	268.0	255.7
Other intangible assets	22.5	18.6	27.6	32.4	26.1
Property, plant & equipment	798.8	920.0	963.7	1,008.1	1082.7
Assets from operational leases	112.4	131.9	288.9	390.1	481.3
Investments in associated companies	107.7	109.0	123.9	175.0	170.7
Other shares and other non-current assets	16.9	20.1	2.5	5.4	2.9
Deferred tax asset	21.4	16.4	11.5	2.6	13.1
Total Operating Assets	3,948.1	4,092.6	4,411.5	5,093.0	4,731.8
Operating Liabilities	0				
Deferred tax	402.6	397.6	391.8	453.5	353.9
Current tax liabilities	30.2				90.8
Trade payables	267.1				280.9
Other non-current liabilities	0.0				12
Other current liabilities	0.0				196.5
Provision for onerous contracts	0.0				9.4
Total Operating Liabilities	699.9	397.6	391.8	453.5	943.5
	0				
Net Operating assets (NOA)	3,248.2	3,695.0	4,019.7	4,639.5	3,788.3
	0				
Financial assets	0				
Cash	52.5	156.9	71.8	103.9	59.1
Restricted cash (Financial activity)	20.0				12.6
Assets held for sale	126.7	2.1	1.8	3.5	
Other current financial assets	0.0				7.2
Other non-current financial assets	0.0				0.4
Total Financial Assets	199.2	159.0	73.6	107.5	79.3
Financial obligations	0				
Current interest-bearing debt	82.2	0.8	0.2	0.1	130.3
Other current financial liabilities	235.4	632.5	615.7	843.1	91.8
Liabilities held for sale	22.8	0	0	0	
Non-current interest-bearing debt	922.4	1,188.8	1,071.4	993.4	773.3
Capitalised operating leases	112.4	131.9	288.9	390.1	481.3
Other non-current liabilities	116.8	260.1	221.5	451.1	75.9
Total Financial Obligations	1491.9	2214.1	2197.7	2677.7	1552.6
Net Financial Obligations (NFO)	1292.7	2055.1	2124.1	2570.2	1473.3
	0				
Common Equity (CSE)	1952.2	1638.1	1894.6	2068.4	2314.2
Minority interest	3.33	1.79	0.93	0.93	1.2
Total Equity (CSE + Minority interest)	1955.5	1639.9	1895.6	2069.3	2315.4
	0				
Net Operating Assets	3,248.2	3,695.0	4,019.7	4,639.6	3,788.7

3. Appendix: Lerøy Seafood Group Reformulated Financial statements

Lerøy Seafood Group

Reformulated Income Statement	**2008**	**2009**	**2010**	**2011**	**2012**
Net sales	**6057053**	**7473807**	**8887671**	**9176873**	**9102941**
Purchase of goods	-4455703	-5177492	-5479869	-6184793	-6499768
Change in inventory and biological assets (at cost)	176551	135068	-132291	318613	57449
Gross Margin	**1777901**	**2431383**	**3275511**	**3310693**	**2660622**
Salary and personnel expenses	-664377	-690477	-777845	-967789	-1031872
Depreciation	-197023	-204007	-219624	-271899	-291768
Other operation expenses	-579295	-586743	-691791	-858107	-853884
Operating income from sales (Before tax)	**337206**	**950156**	**1586251**	**1212898**	**483098**
Tax as reported	-36994	-257137	-510952	-156311	-182749
Add tax benefit from financing activities	-42142	-24109	-18556	-22928	-26643
Less tax on core other operating income	3840	17568	34162	5527	6953
Less tax on unusual items	-10183	16935	83591	-172415	73286
Tax on operating activities	-85479	-246743	-411756	-346126	-129153
Operating income from sales (after tax)	**251727**	**703413**	**1174495**	**866772**	**353945**
Core other operating income/expense					
Income from associates	13716	62744	122006	19741	24831
Tax on core other operating income	-3840	-17568	-34162	-5527	-6953
Core operating income after tax	**261603**	**748589**	**1262339**	**880986**	**371823**
Unusual operating items					
Fair value adjustments on biological assets	-36369	60483	298538	-615767	294735
Impairment loss					-33000
Tax on unusual items	10183	-16935	-83591	172415	-73286
Unusual operating items					
Fair value adjustment on securities available for sale net tax					-7200
Currency translation differences	-16226	-44675	2619	1492	-13826
Change in value from associated companies				126	-1847
Acturial adjustments					
Operating income after tax	**219191**	**747462**	**1479906**	**439251**	**537399**
Financing income (expense)					
Financial income					
Net interest expenses					
Net currency effects					
Other financial expenses					
Net interst income (expense)	-150507	-86105	-66272	-81884	-95153
Tax effect at (Below %)	42142	24109	18556	22928	26643
Net interest income (expense)	-108365	-61996	-47716	-58956	-68510
Reversal of fair value adjustment on interest rate swap (CF Hedge)				-5161	-27086
Net financial expense	-108365	-61996	-47716	-64117	-95596
Comprehensive income	**110826**	**685466**	**1432190**	**375134**	**441803**

Fiscal year	**2008**	**2009**	**2010**	**2011**	**2012**
Nominal tax rate	28%	28%	28%	28%	28%

Lerøy Seafood Group

Reformulated Income Statement	**2013**	**2014**	**2015**	**2016**	**2017**
Net sales	**10818519**	**12696874**	**13484931**	**17269735**	**18619588**
Purchase of goods	-7039813	-8450392	-9278374	-10561407	-9916876
Change in inventory and biological assets (at cost)	258380	447053	465960	296387	262665
Gross Margin	**4037086**	**4693535**	**4672517**	**7004715**	**8965377**
Salary and personnel expenses	-1094464	-1270880	-1411024	-1785537	-2438259
Depreciation	-307175	-369480	-433916	-511621	-583265
Other operation expenses	-1004148	-1262518	-1447625	-1864088	-2227105
Operating income from sales (Before tax)	**1631299**	**1790657**	**1379952**	**2843469**	**3716748**
Tax as reported	-593981	-328939	-268226	-926691	-343984
Add tax benefit from financing activities	-28515	-32343	-34757	-32873	-50310
Less tax on core other operating income	53813	24824	16572	65696	72636
Less tax on unusual items	212444	-88937	50897	367640	-411914
Tax on operating activities	-356239	-425396	-235514	-526228	-733571
Operating income from sales (after tax)	**1275060**	**1365261**	**1144438**	**2317241**	**2983177**
Core other operating income/expense					
Income from associates	192188	91939	61376	262783	302651
Tax on core other operating income	-53813	-24824	-16572	-65696	-72636
Core operating income after tax	**1413435**	**1432377**	**1189243**	**2514329**	**3213191**
Unusual operating items					
Fair value adjustments on biological assets	764229	-327414	188508	1470561	-1716309
Impairment loss	-5500	-1982			
Tax on unusual items	-212444	88937	-50897	-367640	411914
Unusual operating items					
Fair value adjustment on securities available for sale net tax	-487				
Currency translation differences	85118	22302	100840	-157052	74097
Change in value from associated companies	-75	-16	-2	-2842	-2772
Acturial adjustments	2477	-3231	1502	4346	1176
Operating income after tax	**2046753**	**1210973**	**1429193**	**3461701**	**1981297**
Financing income (expense)					
Financial income					
Net interest expenses					
Net currency effects					
Other financial expenses					
Net interst income (expense)	-101840	-119790	-128728	-131491	-209623
Tax effect at (Below %)	28515	32343	34757	32873	50310
Net interest income (expense)	-73325	-87447	-93971	-98618	-159313
Reversal of fair value adjustment on interest rate swap (CF Hedge)	8785	-12871	4829	40934	20338
Net financial expense	-64540	-100318	-89142	-57684	-138975
Comprehensive income	**1982213**	**1110655**	**1340051**	**3404017**	**1842322**

Fiscal year	**2013**	**2014**	**2015**	**2016**	**2017**
Nominal tax rate	28%	27%	27%	25%	24%

Reformulated Balance Sheet (TNOK)	2008	2009	2010	2011	2012
Operating Assets					
Accounts receivable	772,440.00	876,127.00	1,013,932.00	934,443.00	995,289.00
Biological assets (biomass)	1,676,164.00	1,858,562.00	2,706,733.00	2,370,938.00	2,724,941.00
(Other) Inventory	223,158.00	236,311.00	290,379.00	328,045.00	326,225.00
Other receivables	159,844.00	130,734.00	147,944.00	132,795.00	199,083.00
Other non-current receivables (long term rec)	6,743.00	11,928.00			8,607.00
Intangible assets (licences rights and goodwill)	2,959,927.00	2,959,611.00	3,847,760.00	3,878,873.00	3,972,053.00
Land buildings and other real estate	1,294,818.00	1,225,399.00	1,586,334.00	1,836,384.00	2,094,539.00
Plant machinery and other operating equipment	-	-	-	-	-
Other operating equipment	-	-	-	-	-
Vessels	-	-	-	-	-
Prepayments for purchase of PP&E	-	-	-	-	-
Investments in associated companies	277,455.00	272,970.00	338,864.00	329,168.00	331,056.00
Deferred tax assets		4,461.00	3,697.00	6,546.00	21,545.00
Total Operating Assets	7,370,549.00	7,576,103.00	9,935,643.00	9,817,192.00	10,673,338.00
Operating Liabilities					
Deferred taxes	669,327.00	834,877.00	1,260,028.00	1,083,693.00	1,230,458.00
Accounts payable and other debt					
Trade Payables	544,757.00	615,996.00	638,213.00	705,165.00	826,677.00
Current tax liabilities (Taxes payable)	16,631.00	93,551.00	395,233.00	322,105.00	88,925.00
Pension obligations	13,211.00	14,990.00	9,025.00	7,812.00	7,646.00
Public duties payable	49,014.00	55,671.00	74,312.00	62,386.00	66,915.00
Provisions for onerous contracts					
Other current liabilities (short term)	137,564.00	212,359.00	323,976.00	285,410.00	
Total Operating Liabilities	1,430,504.00	1,827,444.00	2,700,787.00	2,466,571.00	2,220,621.00
Net Operating assets (NOA)	5,940,045.00	5,748,659.00	7,234,856.00	7,350,621.00	8,452,717.00
Financial assets					
Cash and cash equivalents	388,486.00	707,989.00	1,357,096.00	1,597,429.00	1,082,797.00
Other receivables (Deposit interest and currency swaps)			28,338.00	15,600.00	
Share available for sale	23,161.00	23,115.00	22,989.00	23,173.00	18,281.00
Long term receivables			8,129.00	8,453.00	
Total Financial Assets	411,647.00	731,104.00	1,416,552.00	1,644,655.00	1,101,078.00
Financial obligations					
Short-term interest bearing debt	841,921.00	646,105.00	434,121.00	760,977.00	911,887.00
Long-term interest bearing debts	1,672,761.00	1,504,707.00	2,221,701.00	2,429,365.00	2,402,770.00
Other long term liabilities			-	7,168.00	44,788.00
Other long term debt	4,150.00	826.00	1,312.00	-	
Other short term liabilities	68,517.00	27,869.00			230,400.00
Derivatives					
Total Financial Obligations	2,587,349.00	2,179,507.00	2,657,134.00	3,197,510.00	3,589,845.00
Net Financial Obligations (NFO)	2,175,702.00	1,448,403.00	1,240,582.00	1,552,855.00	2,488,767.00
Common Equity (CSE)	3,743,685.00	4,281,688.00	5,445,710.00	5,262,835.00	5,314,569.00
Minority interest	20,658.00	18,568.00	548,564.00	534,931.00	649,381.00
Total Equity (CSE + Minority interest)	3,764,343.00	4,300,256.00	5,994,274.00	5,797,766.00	5,963,950.00
Net Operating Assets (NOA)	5,940,045.00	5,748,659.00	7,234,856.00	7,350,621.00	8,452,717.00

Reformulated Balance Sheet (TNOK)	2013	2014	2015	2016	2017
Operating Assets					
Accounts receivable	1,486,428	1,427,796	1,568,820	2,209,281	1,972,438
Biological assets (biomass)	3,727,361	3,681,993	4,320,830	6,418,313	4,458,095
(Other) Inventory	358,482	524,947	552,065	721,803	991,186
Other receivables	316,192	302,692	307,798	421,302	122,836
Other non-current receivables (long term rec)	26,171	32,263	17,246	76,679	436,590
Intangible assets (licences rights and goodwill)	3,987,141	4,234,391	4,349,916	8,018,448	8,019,627
Land buildings and other real estate	2,377,012	2,676,716	2,899,633	4,209,108	5,148,271
Plant machinery and other operating equipment	-	-	-	-	
Other operating equipment	-	-	-	-	
Vessels	-	-	-	-	
Prepayments for purchase of PP&E	-	-	-	-	
Investments in associated companies	735,071	566,965	670,952	730,875	960,587
Deferred tax assets	11,807	42,263	41,536	31,059	28,852
Total Operating Assets	13,025,665	13,490,026	14,728,796	22,836,868	22,138,482
Operating Liabilities					
Deferred taxes	1,486,972	1,531,262	1,567,973	2,802,271	2,313,950
Accounts payable and other debt					1,310,098
Trade Payables	1,059,434	1,053,524	915,981	1,366,634	
Current tax liabilities (Taxes payable)	320,344	335,062	200,151	477,842	819,884
Pension obligations	3,227	6,878	3,765	5,219	3,113
Public duties payable	103,656	70,073	123,457	263,991	233,982
Provisions for onerous contracts					
Other current liabilities (short term)					
Total Operating Liabilities	2,973,633	2,996,799	2,811,327	4,915,957	4,681,027
Net Operating assets (NOA)	10,052,032	10,493,227	11,917,469	17,920,911	17,457,455
Financial assets					
Cash and cash equivalents	872,513	1,360,272	1,247,614	2,233,700	3,514,096
Other receivables (Deposit interest and currency swaps)					
Share available for sale	5,553	8,066	7,293	8,019	5,534
Long term receivables					
Total Financial Assets	878,066	1,368,338	1,254,907	2,241,719	3,519,630
Financial obligations					
Short-term interest bearing debt	682,574	469,276	1,465,144	1,094,089	830,009
Long-term interest bearing debts	2,356,803	2,767,118	2,377,123	4,541,276	4,946,254
Other long term liabilities	36,700	131,980	126,674	121,958	96,202
Other long term debt					
Other short term liabilities	305,074	413,595	439,383	929,881	622,498
Derivatives					
Total Financial Obligations	3,381,151	3,781,969	4,408,324	6,687,204	6,494,963
Net Financial Obligations (NFO)	2,503,085	2,413,631	3,153,417	4,445,485	2,975,333
Common Equity (CSE)	6,755,200	7,262,314	7,885,695	12,539,948	13,607,294
Minority interest	793,747	817,282	878,357	935,478	874,828
Total Equity (CSE + Minority interest)	7,548,947	8,079,596	8,764,052	13,475,426	14,482,122
Net Operating Assets (NOA)	10,052,032	10,493,227	11,917,469	17,920,911	17,457,455

4. Appendix 4: Norwegian Royal Salmon – Reformulated Financial Statements

Norwgian Royal Salmon

Reformulated Income Statement (TNOK)	2009	2010	2011	2012	2013
Net sales	1,602,502	2,002,085	1,734,022	1,744,266	2,603,712
Purchase of goods	-1,478,884	-1,748,681	-1,549,263	-1,540,290	-2,137,934
Change in inventory and biological assets (at cost)					
Gross Margin	123,618	253,404	184,759	203,976	465,778
Salary and personnel expenses	-33,980	-47,443	-60,595	-71,764	-85,627
Depreciation	-12,475	-18,555	-26,043	-30,449	-33,728
Other operating expenses	-37,810	-51,765	-50,865	-71,428	-90,422
Operating income from sales (Before tax)	39,353	135,641	47,256	30,335	256,001
Tax as reported	-4,189	-36,798	15,548	-9,130	-80,487
Add tax benefit from financing activities	-2,337	7	2,910	-11,077	4,685
Less tax on core other operating income	1,721	5,536	-473	2,930	8,074
Less tax on unusual items	12,200	3,777	-20,476	11,063	26,523
Tax on operating activities	7,395	-27,478	-2,490	-6,214	-41,206
Operating income from sales (after tax)	46,748	108,163	44,766	24,121	214,795
Other operating income/expense					
Income from associates	6,145	19,772	-1,689	10,464	28,834
Tax on other operating income	-1,721	-5,536	473	-2,930	-8,074
Core operating income after tax	51,173	122,398	43,549	31,655	235,556
Unusual items					
Fair value adjustments on biological assets	43,573	26,339	-70,627	49,428	94,725
Listing costs			-2,500		
Non recurring items (lis**ting cos**ts and extraordinary mortality)				-9,919	
Impairment losses	-	-12,851	-	-	-
Tax on unusual items	-12,200	-3,777	20,476	-11,063	-26,523
Core other operating items (after tax items)					
Currency translation differences					
Acturial gains and losses					-798
Operating income after tax	82,545	132,110	-9,102	60,101	302,960
Financing income (expense)					
Financial income	10,097	3,295	1,407	244	88
Net interest expenses					
Interest income	2,047	704	338	422	338
Net currency effects					
Other financial expenses					
Net interst income (expense)	-8,345	24	10,393	-39,560	16,732
Tax effect at (Below %)	2,337	-7	-2,910	11,077	-4,685
Net interest income (expense)	-6,008	17	7,483	-28,483	12,047
Available-for-sale financial assets (net	-	23,132	-23,132	1,985	-1,985
Change in fair value of hedging instruments (reclassification of hedging inst.)			-	588	-5,340
Net financial expense	-6,008	23,149	-15,649	-25,910	4,722
Comprehensive income	76,537	155,259	-24,751	34,191	307,682

Fiscal year	2009	2010	2011	2012	2013
Nominal tax rate	28%	28%	28%	28%	28%

Norwgian Royal Salmon

Reformulated Income Statement (TNOK)	2014	2015	2016	2017
Net sales	2,599,799	3,210,548	4,224,340	4,937,798
Purchase of goods	-2,175,278	-2,707,071	-3,230,927	-3,889,102
Change in inventory and biological assets (at cost)				
Gross Margin	424,521	503,477	993,413	1,048,696
Salary and personnel expenses	-104,557	-113,268	-155,468	-138,596
Depreciation	-41,412	-53,697	-61,063	-82,063
Other operating expenses	-120,488	-134,618	-136,269	-200,178
Operating income from sales (Before tax)	158,064	201,894	640,613	627,859
Tax as reported	-52,422	-32,498	-167,707	-86,180
Add tax benefit from financing activities	21,854	5,675	79,864	-40,781
Less tax on core other operating income	7,327	5,689	19,404	13,164
Less tax on unusual items	15,513	6,104	44,321	-48,700
Tax on operating activities	-7,728	-15,031	-24,119	-162,496
Operating income from sales (after tax)	150,336	186,863	616,494	465,363
Other operating income/expense				
Income from associates	27,136	22,754	71,865	52,657
Tax on other operating income	-7,327	-5,689	-19,404	-13,164
Core operating income after tax	170,145	203,929	668,956	504,856
Unusual items				
Fair value adjustments on biological assets	57,456	24,416	164,151	-194,799
Listing costs				
Non recurring items (lis**ting cos**ts and extraordinary mortality)				
Impairment losses	-	-	-	
Tax on unusual items	-15,513	-6,104	-44,321	48,700
Core other operating items (after tax items)				
Currency translation differences		-	12,896	8,194
Acturial gains and losses	-6,665	4,749	-1,361	-4,623
Operating income after tax	205,423	226,990	800,321	362,328
Financing income (expense)				
Financial income	418	26	165	
Net interest expenses				-142,185
Interest income	935	882	1,803	
Net currency effects				
Other financial expenses				-20,937
Net interst income (expense)	78,051	21,017	295,792	-163,122
Tax effect at (Below %)	-21,854	-5,675	-79,864	40,781
Net interest income (expense)	56,197	15,342	215,928	-122,342
Available-for-sale financial assets (net	-			
Change in fair value of hedging instruments (reclassification of hedging inst.)	-18,306	-362	21,429	-7,334
Net financial expense	37,891	14,980	237,357	-129,676
Comprehensive income	243,314	241,970	1,037,678	232,652

Norwegian Royal Salmon

Reformulated Balance Sheet (TNOK)	**2009**	**2010**	**2011**	**2012**	**2013**
Operating Assets					
Accounts receivable	213,397	253,912	227,901	286,918	412,148
Biological assets (biomass)	256,142	385,975	387,880	525,739	639,238
Inventory (other)	9,614	15,219	18,851	20,816	27,038
Other receivables	20,539	40,811	43,021	31,545	68,735
Other non-current receivables	10,782	3,760	3,766	4,673	3,127
Intangible assets (licenses and goodwill)	397,543	498,287	502,887	502,887	502,887
Land buildings and other real estate	6,850	3,392	4,021	4,103	5,474
Plant machinery and other operating equipment	33,251	56,154	89,013	95,457	115,370
Other operating equipment	3,892	5,683	8,187	6,853	5,235
Vessels	15,075	48,708	76,089	72,486	84,475
Investments in associated companies	105,013	114,136	96,087	110,860	132,758
Total Operating Assets	1,072,098	1,426,037	1,457,703	1,662,337	1,996,485
Operating Liabilities					
Deferred taxes	107,352	173,610	153,784	161,981	231,640
Trade Payables	180,726	254,338	219,868	292,655	382,944
Current tax liabilities (tax payable)	-	1,136	-	780	8,313
Other current liabilities (accrued holiday pay and other costs)	16,189	17,499	14,560	27,371	41,792
Pension liabilities	8,130	7,719	8,480	9,040	10,320
Total Operating Liabilities	312,397	454,302	396,692	491,827	675,009
Net Operating assets (NOA)	759,701	971,735	1,061,011	1,170,510	1,321,476
Financial assets					
Cash and cash equivalents	1,810	4,748	6,205	9,854	53,732
Investments in stocks and shares	9,121	34,053	3,385	3,335	1,395
Assets held for sale					
Total Financial Assets	10,931	38,801	9,590	13,189	55,127
Financial obligations					
Short-term interest bearing debt	179,582	148,259	217,054	247,637	184,530
Long-term interest bearing debts (Debt to credit inst)	190,730	282,481	320,884	328,292	323,084
Derivatives					
Leasing liabilities					
Total Financial Obligations	370,312	430,740	537,938	575,929	507,614
Net Financial Obligations (NFO)	359,381	391,939	528,348	562,740	452,487
Common Equity (CSE)	365,588	537,934	495,433	566,785	814,634
Minority interest	34,732	41,862	37,229	40,984	54,355
Total Equity (CSE + Minority interest)	400,320	579,796	532,662	607,769	868,989
Net Operating Assets (NOA)	759,701	971,735	1,061,010	1,170,509	1,321,476

Norwegian Royal Salmon

Reformulated Balance Sheet (TNOK)	2014	2015	2016	2017
Operating Assets				
Accounts receivable	421,691	500,689	478,214	619,970
Biological assets (biomass)	808,674	829,928	1,205,399	1,277,004
Inventory (other)	40,270	40,630	101,635	
Other receivables	174,344	100,438	244,596	
Other non-current receivables	3,000	20,000	16,000	
Intangible assets (licenses and goodwill)	648,887	648,887	648,887	648,887
Land buildings and other real estate	12,746	12,866	19,579	544,006
Plant machinery and other operating equipment	164,139	168,641	182,110	
Other operating equipment	6,868	12,742	18,521	
Vessels	105,299	163,698	197,285	
Investments in associated companies	150,155	169,991	531,504	613,517
Total Operating Assets	2,536,073	2,668,510	3,643,730	3,703,384
Operating Liabilities				
Deferred taxes	272,742	303,485	394,786	364,557
Trade Payables	426,331	530,430	646,515	549,526
Current tax liabilities (tax payable)	2,031	3,180	79,350	113,485
Other current liabilities (accrued holiday pay and other costs)	164,842	134,271	182,916	155,980
Pension liabilities	18,733	12,480	11,383	16,728
Total Operating Liabilities	884,679	983,846	1,314,950	1,200,276
Net Operating assets (NOA)	1,651,394	1,684,664	2,328,780	2,503,108
Financial assets				
Cash and cash equivalents	61,494	201,339	69,257	151,779
Investments in stocks and shares	1,895			
Assets held for sale		395	395	
Total Financial Assets	63,389	201,734	69,652	151,779
Financial obligations				
Short-term interest bearing debt	182,089	46,519	47,635	342,617
Long-term interest bearing debts (Debt to credit inst)	518,788	653,361	303,781	461,241
Derivatives				
Leasing liabilities				
Total Financial Obligations	700,877	699,880	351,416	803,858
Net Financial Obligations (NFO)	637,488	498,146	281,764	652,079
Common Equity (CSE)	949,123	1,113,789	2,013,983	1,813,268
Minority interest	64,781	72,730	33,034	37,762
Total Equity (CSE + Minority interest)	1,013,904	1,186,519	2,047,017	1,851,030
Net Operating Assets (NOA)	1,651,392	1,684,665	2,328,781	2,503,109

5. Appendix 5: Grieg Seafood ASA – Reformulated financial Statements

Grieg Seafood ASA

Reformulated Income Statement (TNOK)	**2008**	**2009**	**2010**	**2011**	**2012**
Net sales	1,477,029	1,612,619	2,446,490	2,046,991	2,050,065
Expenses to generate sales	-852,041	-742,496	-942,530	-889,677	-1,202,314
Gross profit	**624,988**	**870,123**	**1,503,960**	**1,157,314**	**847,751**
Salaries and personnel expenses	-165,148	-193,300	-238,409	-238,382	-276,103
Depreciation	-148,534	-121,582	-119,574	-140,206	-161,345
Other operating expenses	-332,645	-410,541	-592,752	-603,585	-642,374
Operating income from sales before tax (EBIT)	**-21,339**	**144,700**	**553,225**	**175,141**	**-232,071**
Tax as reported	97,461	-86,640	-226,727	72,064	55,170
+ Tax benefit from NFE	-65,510	13,084	782	-8,630	-30,337
+ Tax on other income	196	556	3,454	10,883	3,313
+ Tax on unusual items	-52,534	34,749	81,035	-105,955	35,344
Total tax from core operating activities	-20,387	-38,252	-141,455	-31,638	63,489
Core Operating income from sales after tax	**-41,726**	**106,448**	**411,770**	**143,503**	**-168,582**
Share of profit/loss from associated companies	0	0	0	25,165	-913
Share of profit from associated companies	700	1,985	12,337	13,704	12,744
Tax on other income	-196	-556	-3,454	-10,883	-3,313
Core operating income after tax	**-41,222**	**107,877**	**420,652**	**171,489**	**-160,064**
Fair value adjustment of biological assets	-35,747	115,276	207,629	-395,180	98,063
Impairment and reversals of PPE and intangibles	-161,988	0	72,385	0	0
Other income	2,175	8,746	10,161	16,568	28,217
Other gains and losses	7,938	80	-763	201	-53
Tax on unusual items	52,534	-34,749	-81,035	105,955	-35,344
After tax items					
Currency effect of net investments	0	0	0	0	-19,352
Tax effect	0	0	0	0	5,418
Currency translation differences, subsidiaries	5,107	-21,360	4,476	-1,059	-15,803
Change in value of available-for-sale assets	0	0	-24	678	5
Operating income (OI after tax)	**-171,203**	**175,871**	**633,481**	**-101,348**	**-98,912**
Net Financial expenses (NFE)					
Financial income	18,258	136,333	54,675	31,141	3,173
Financial expenses	-252,223	-89,606	-51,882	-61,963	-111,520
Net interest expense	**-233,965**	**46,727**	**2,793**	**-30,822**	**-108,347**
Tax effect at marginal tax rate	**65,510**	**-13,084**	**-782**	**8,630**	**30,337**
Fair value adjustment of cash flow hedging after tax	0	0	0	0	0
Net Financial Expense (NFE after tax)	**-168,455**	**33,643**	**2,011**	**-22,192**	**-78,010**
Comprehensive Income	-339,658	209,514	635,492	-123,540	-176,922
- CI to Minority interests					
Comprehensive Income to Common shareholder	**-339,658**	**209,514**	**635,492**	**-123,540**	**-176,922**
Fiscal year	**2008**	**2009**	**2010**	**2011**	**2012**
Nominal tax rate	28%	28%	28%	28%	28%

Grieg Seafood ASA

Reformulated Income Statement (TNOK)	**2013**	**2014**	**2015**	**2016**	**2017**
Net sales	2,404,215	2,665,284	4,608,667	6,545,187	7,017,456
Expenses to generate sales	-968,978	-1,153,526	-2,738,926	-3,287,159	-3,724,200
Gross profit	**1,435,237**	**1,511,758**	**1,869,741**	**3,258,028**	**3,293,256**
Salaries and personnel expenses	-302,223	-339,592	-409,432	-483,473	-482,827
Depreciation	-136,037	-140,609	-167,374	-180,388	-196,237
Other operating expenses	-675,156	-774,460	-1,235,695	-1,491,867	-1,724,604
Operating income from sales before tax (EBIT)	**321,821**	**257,097**	**57,240**	**1,102,300**	**889,588**
Tax as reported	-113,945	-22,806	13,574	-338,505	-197,581
+ Tax benefit from NFE	-20,456	-15,045	-25,191	-33,684	-3,469
+ Tax on other income	2,209	3,474	2,737	3,163	-132
+ Tax on unusual items	80,718	-14,405	4,514	145,155	-18,264
Total tax from core operating activities	-51,474	-48,781	-4,367	-223,871	-219,447
Core Operating income from sales after tax	**270,347**	**208,316**	**52,873**	**878,429**	**670,141**
Share of profit/loss from associated companies	2,244	2,865	3,142	12,083	0
Share of profit from associated companies	5,645	10,002	6,994	569	-550
Tax on other income	-2,209	-3,474	-2,737	-3,163	132
Core operating income after tax	**276,027**	**217,709**	**60,272**	**887,918**	**669,723**
Fair value adjustment of biological assets	267,450	-127,108	33,209	515,741	-91,463
Impairment and reversals of PPE and intangibles	0	0	-46,195	6,472	-4,895
Other income	20,041	9,943	44,921	41,019	21,771
Other gains and losses	786	63,815	-15,218	17,386	-1,514
Tax on unusual items	-80,718	14,405	-4,514	-145,155	18,264
After tax items					
Currency effect of net investments	43,424	78,912	54,134	*-90,228*	*22,333*
Tax effect	-11,724	-21,306	-13,533	20,203	409
Currency translation differences, subsidiaries	12,614	37,644	6,266	-10,389	16,729
Change in value of available-for-sale assets	28	26	31	19	-295
Operating income (OI after tax)	**527,928**	**274,039**	**119,374**	**1,242,987**	**651,063**
Net Financial expenses (NFE)					
Financial income	33,381	50,758	38,056	20,479	42,333
Financial expenses	-106,437	-106,480	-131,357	-155,213	-56,789
Net interest expense	**-73,056**	**-55,722**	**-93,301**	**-134,734**	**-14,456**
Tax effect at marginal tax rate	**20,456**	**15,045**	**25,191**	**33,684**	**3,469**
Fair value adjustment of cash flow hedging after tax	0	0	0	*6,052*	*-24,822*
Net Financial Expense (NFE after tax)	**-52,600**	**-40,677**	**-68,110**	**-94,999**	**-35,809**
Comprehensive Income	475,328	233,362	51,264	1,147,988	615,254
- CI to Minority interests			10,992	38,850	19,922
Comprehensive Income to Common shareholder	**475,328**	**233,362**	**40,272**	**1,109,138**	**595,332**
Fiscal year	**2013**	**2014**	**2015**	**2016**	**2017**
Nominal tax rate	28%	27%	27%	25%	24%

Grieg Seafood ASA

Reformulated Balance Sheet (TNOK)	**2008**	**2009**	**2010**	**2011**	**2012**
Operating Assets					
Investments in associated companies	11,579	13,619	33,456	33,803	46,558
Accounts receivable	157,876	188,052	265,350	223,682	124,657
Other current receivables	45,295	57,051	43,265	61,016	44,506
Inventories	44,592	49,180	58,409	67,355	65,692
Biological assets	1,073,341	1,367,061	1,564,041	1,404,934	1,310,142
Other non-current receivables	1,790	-	1,958	311	53
Deferred tax assets	-	-	-	-	-
Licenses	831,921	818,340	926,170	987,596	976,740
Other intangible assets	8,205	5,578	3,160	4,618	3,800
Property, plant and equipment	794,346	819,110	923,546	1,126,699	1,141,317
Goodwill	87,665	87,583	90,540	105,373	105,108
Investments in associated companies	-	-	-	3,584	2,671
Total Operating Assets	**3,056,610**	**3,405,574**	**3,909,895**	**4,018,971**	**3,821,244**
Operating Liabilities					
Accounts payable	214,687	233,443	253,305	303,196	246,119
Tax payable	-	-	-	-	-
Deferred tax liabilities	251,069	331,995	531,498	486,702	426,781
Accrued salary expense and public tax payable	13,611	13,869	25,104	22,514	19,720
Other non-current liabilities	5,882	691	3,292	-	-
Other current liabilities	23,702	72,400	41,674	48,452	53,982
Pension obligations	4,161	1,927	2,051	1,557	1,110
Cash settled share options					
Cash-settled share option provision	-	1,351	5,845	194	9,267
Total Operating Liabilities	**513,112**	**655,676**	**862,769**	**862,615**	**756,979**
Net Operating assets (NOA)	**2,543,498**	**2,749,898**	**3,047,126**	**3,156,356**	**3,064,265**
Financial Obligations					
Factoring liabilities	-	-	-	-	-
Short-term loan facilities	496,702	482,989	260,000	700,000	500,000
Current portion of long-term borrowings	807,827	85,295	79,000	79,983	109,542
Current portion of finance leasing liabilities	35,305	37,383	41,726	44,662	44,730
Derivatives and other financial instruments	122,532	9,672	1,605	7,887	13,805
Finance leasing liabilities	213,117	198,167	168,856	179,670	156,150
Loan	8,065	711,419	646,686	613,673	951,043
Other long-term borrowings	-	-	-	-	24,801
Subordinated loan	13,517	13,548	14,581	-	-
Total Financial Obligations	**1,697,065**	**1,538,473**	**1,212,454**	**1,625,875**	**1,800,071**
Financial Assets					
Oth. Curr. Receivables (Insurance claims)	3,193	-	-	3,565	6,793
Cash and cash equivalents	68,146	139,778	143,727	152,622	239,885
Loans to Associated companies	2,410	1,923	3,449	996	1,020
Available-for-sale financial assets	178	945	557	1,307	1,337
Derivatives and other financial instruments	8,243	20,350	-	1,178	-
Total Financial Assets	**82,170**	**162,996**	**147,733**	**159,668**	**249,035**
Net Financial Obligations (NFO)	**1,614,895**	**1,375,477**	**1,064,721**	**1,466,207**	**1,551,036**
Common Equity (CSE)	**928,603**	**1,374,421**	**1,982,405**	**1,690,149**	**1,513,229**
Minority interest					
Total Equity (CSE + Minority interest)	**928,603**	**1,374,421**	**1,982,405**	**1,690,149**	**1,513,229**
NOA	**2,543,498**	**2,749,898**	**3,047,126**	**3,156,356**	**3,064,265**
BALANCE CHECK:					
Total Assets	3,138,780	3,568,570	4,057,628	4,178,639	4,070,279
Total Liabilities + Equity	3,138,780	3,568,570	4,057,628	4,178,639	4,070,279

Grieg Seafood ASA

Reformulated Balance Sheet (TNOK)	**2013**	**2014**	**2015**	**2016**	**2017**
Operating Assets					
Investments in associated companies	36,275	34,157	15,025	-	
Accounts receivable	177,814	254,043	581,904	800,591	761,407
Other current receivables	50,466	57,287	123,530	127,337	198,864
Inventories	74,015	88,250	90,867	89,164	92,262
Biological assets	1,766,332	1,844,097	1,929,115	2,459,625	2,698,352
Other non-current receivables	255	-	2,667	4,167	
Deferred tax assets	-	-	10,317	-	3,574
Licenses	994,066	1,066,184	1,093,338	1,060,622	1,068,552
Other intangible assets	4,545	11,517	16,993	17,598	18,384
Property, plant and equipment	1,204,207	1,424,562	1,534,770	1,510,379	1,871,804
Goodwill	107,310	108,708	110,647	108,595	109,038
Investments in associated companies	4,915	7,780	10,922	-	9,450
Total Operating Assets	**4,420,200**	**4,896,585**	**5,520,095**	**6,178,078**	**6,831,687**
Operating Liabilities					
Accounts payable	317,753	300,521	653,083	493,534	585,378
Tax payable	1,471	50,645	24,545	172,057	157,244
Deferred tax liabilities	557,350	559,542	539,040	674,684	721,689
Accrued salary expense and public tax payable	21,731	13,013	12,134	48,819	16,486
Other non-current liabilities	-	-	-	-	167
Other current liabilities	54,761	109,803	122,795	222,213	212,717
Pension obligations	610	198	109	-	
Cash settled share options					6,746
Cash-settled share option provision	9,567	3,263	5,639	11,360	8,848
Total Operating Liabilities	**963,243**	**1,036,985**	**1,357,345**	**1,622,667**	**1,709,275**
Net Operating assets (NOA)	**3,456,957**	**3,859,600**	**4,162,750**	**4,555,411**	**5,122,412**
Financial Obligations					
Factoring liabilities	-	-	338,231	502,535	500,976
Short-term loan facilities	425,000	-	-	-	
Current portion of long-term borrowings	111,060	487,664	101,922	98,490	98,873
Current portion of finance leasing liabilities	46,149	53,231	61,008	67,116	58,353
Derivatives and other financial instruments	11,631	23,475	27,104	23,990	28,462
Finance leasing liabilities	170,251	236,430	272,968	250,452	201,899
Loan	850,646	958,828	1,518,261	979,874	1,191,688
Other long-term borrowings	24,056	23,640	21,425	15,963	15,353
Subordinated loan	-	-	-	-	
Total Financial Obligations	**1,638,793**	**1,783,268**	**2,340,919**	**1,938,420**	**2,095,604**
Financial Assets					
Oth. Curr. Receivables (Insurance claims)	3,549	-	22,237	35,909	
Cash and cash equivalents	163,913	144,003	392,020	503,613	271,715
Loans to Associated companies	1,020	67	-	-	
Available-for-sale financial assets	1,392	1,518	1,426	1,445	1,150
Derivatives and other financial instruments	518	-	-	48,994	48,232
Total Financial Assets	**170,392**	**145,588**	**415,683**	**589,961**	**321,097**
Net Financial Obligations (NFO)	**1,468,401**	**1,637,680**	**1,925,236**	**1,348,459**	**1,774,507**
Common Equity (CSE)	**1,988,556**	**2,221,920**	**2,207,147**	**3,150,664**	**3,304,364**
Minority interest			*30,367*	*56,288*	43,541
Total Equity (CSE + Minority interest)	**1,988,556**	**2,221,920**	**2,237,514**	**3,206,952**	3,347,905
NOA	**3,456,957**	**3,859,600**	**4,162,750**	**4,555,411**	**5,122,412**

6. Appendix 6: Salmar Group - Reformulated Financial Statements

SalMar ASA

Reformulated Income Statement (TNOK)	**2008**	**2009**	**2010**	**2011**	**2012**
Net sales	**1,714,256**	**2,377,304**	**3,429,432**	**3,829,045**	**4,204,791**
Purchase of goods	-922,016	-1,162,445	-1,898,698	-2,373,168	-2,715,056
Change in inventory and biological assets (at cost)	103,844	25,567	401,629	395,900	390,297
Gross Margin	**896,084**	**1,240,426**	**1,932,363**	**1,851,777**	**1,880,032**
Salary and personnel expenses	-240,393	-265,517	-313,290	-391,745	-483,215
Depreciation	-55,225	-66,578	-93,962	-132,000	-169,621
Other operation expenses (and excess value of inventory from a	-263,004	-311,973	-550,654	-726,150	-885,983
Operating income from sales (Before tax)	**337,462**	**596,358**	**974,457**	**601,882**	**341,213**
Tax as reported	-65,874	-163,217	-302,667	-13,106	-127,062
Add tax benefit from financing activities	-22,963	-784	-11,310	-35,205	-34,794
Less tax on other operating income	3,429	15,895	41,262	27,440	26,295
Less tax on unusual items	-9,239	-4,543	50,219	-115,828	83,341
Tax on operating activities	-94,647	-152,649	-222,496	-136,699	-52,221
Operating income from sales (after tax)	242,815	443,709	751,961	465,183	288,992
Core other operating income/expense					
Income from associates	12,248	56,769	147,365	97,999	93,909
Tax on core other operating income	-3,429	-15,895	-41,262	-27,440	-26,295
Core operating income after tax	**251,634**	**484,583**	**858,064**	**535,742**	**356,607**
Unusual items					
Fair value adjustments on biological assets	-32,996	-4,624	184,658	-356,693	290,417
Provision for onerous contracts			-3,635	3,635	
Acquisition gains (non recurring)					62,390
Particular biological events				-60,070	-54,614
Impairment losses	-	-11,600	-1,668	-543	-547
Tax on unusual items	9,239	4,543	-50,219	115,828	-83,341
Other operating items (after tax items)					
Equity transactions in associated companies	-3,121	4,076	158	-3,063	
Currency translation differences	-14,930	-21,042	-27,130	1,942	-42,763
Acturial gains and losses					-
Operating income after tax	209,826	455,936	960,228	236,778	528,149
Financing income (expense)					
Financial income	364	30,066	18,495	2,774	50,177
Net interest expenses	-68,693	-31,748	-43,958	-93,515	-166,128
Net currency effects					
Other financial expenses	-13,683	-1,119	-14,931	-34,992	-8,313
Net interst income (expense)	-82,012	-2,801	-40,394	-125,733	-124,264
Tax effect at (Below %)	22,963	784	11,310	35,205	34,794
Net interest income (expense)	-59,049	-2,017	-29,084	-90,528	-89,470
Change in fair value of hedging instruments (reclassification of h	-	2,205	-6,899	-	
Net financial expense	-59,049	188	-35,983	-90,528	-89,470
Comprehensive income	150,777	456,124	924,245	146,250	438,679

Fiscal year	**2008**	**2009**	**2010**	**2011**	**2012**
Nominal tax rate	28%	28%	28%	28%	28%

SalMar ASA

Reformulated Income Statement (TNOK)	**2013**	**2014**	**2015**	**2016**	**2017**
Net sales	**6,245,860**	**7,185,887**	**7,326,202**	**9,029,814**	**10,817,238**
Purchase of goods	-3,376,109	-3,337,411	-3,809,523	-4,396,689	-4,722,474
Change in inventory and biological assets (at cost)	324,914	162,119	246,712	395,871	
Gross Margin	**3,194,665**	**4,010,595**	**3,763,391**	**5,028,996**	**6,094,764**
Salary and personnel expenses	-623,053	-710,430	-765,881	-861,534	-929,100
Depreciation	-220,820	-275,765	-307,280	-358,020	-414,686
Other operation expenses (and excess value of inventory from a	-1,086,299	-1,142,953	-1,272,186	-1,377,795	-1,584,825
Operating income from sales (Before tax)	**1,264,493**	**1,881,447**	**1,418,044**	**2,431,647**	**3,166,153**
Tax as reported	-418,695	-413,364	-254,891	-691,090	-558,400
Add tax benefit from financing activities	60,106	-30,778	-27,098	-7,591	-34,781
Less tax on other operating income	44,234	25,957	10,865	71,711	50,146
Less tax on unusual items	191,781	-63,382	6,956	163,489	-89,746
Tax on operating activities	-122,573	-481,568	-264,167	-463,482	-632,781
Operating income from sales (after tax)	1,141,920	1,399,879	1,153,877	1,968,166	2,533,372
Core other operating income/expense					
Income from associates	157,980	96,136	40,242	286,844	208,941
Tax on core other operating income	-44,234	-25,957	-10,865	-71,711	-50,146
Core operating income after tax	**1,255,665**	**1,470,059**	**1,183,253**	**2,183,299**	**2,692,167**
Unusual items					
Fair value adjustments on biological assets	528,176	-201,720	131,864	969,940	-370,015
Provision for onerous contracts		-30,629	-91,932	-315,985	
Acquisition gains (non recurring)	161,755				
Particular biological events					
Impairment losses	-5,000	-2,399	-14,169	-	-3,926
Tax on unusual items	-191,781	63,382	-6,956	-163,489	89,746
Other operating items (after tax items)					
Equity transactions in associated companies					
Currency translation differences	74,403	62,063	63,180	-107,381	45,283
Acturial gains and losses	242				
Operating income after tax	1,823,460	1,360,756	1,265,240	2,566,384	2,453,255
Financing income (expense)					
Financial income	374,357	2,044	685	78,142	11,109
Net interest expenses	-158,095	-115,136	-95,303	-101,314	-106,930
Net currency effects					
Other financial expenses	-1,596	-902	-5,744	-7,193	-49,100
Net interst income (expense)	214,666	-113,994	-100,362	-30,365	-144,921
Tax effect at (Below %)	-60,106	30,778	27,098	7,591	34,781
Net interest income (expense)	154,560	-83,216	-73,264	-22,774	-110,140
Change in fair value of hedging instruments (reclassification of hedging inst.)				11,516	-11,515
Net financial expense	154,560	-83,216	-73,264	-11,258	-121,655
Comprehensive income	1,978,020	1,277,540	1,191,976	2,555,126	2,331,600

Fiscal year	**2013**	**2014**	**2015**	**2016**	**2017**
Nominal tax rate	28%	27%	27%	25%	24%

SalMar ASA

Reformulated Balance Sheet (TNOK)	2012	2015	2014	2016	2017
Operating Assets					
Accounts receivable	660,944	815,540	888,219	595,773	501,112
Biological assets (biomass)	1,986,213	3,306,052	3,114,684	4,997,001	4,135,523
Inventory (other)	303,682	328,216	206,454	224,783	259,050
Other receivables	245,501	258,288	292,644	302,078	242,866
Other non-current receivables	4,029	6,840	13,403	49,949	55,284
Parent company receivables					
Intangible assets (licenses and goodwill)	2,135,500	2,913,542	2,898,643	2,910,797	2,924,975
Land buildings and other real estate	233,732	617,182	489,496	882,066	1,030,052
Plant machinery and other operating equipment	947,824	1,554,914	1,336,126	1,981,840	2,314,523
Other operating equipment (Vessels, Vehicles etc)					
Vessels	87,247	239,863	191,953	273,616	260,195
Pension fund assets	2,492	1,397	1,592	1,379	1,379
Investments in associated companies	948,575	627,681	523,711	908,400	1,023,796
Total Operating Assets	7,555,739	10,669,515	9,956,925	13,127,682	12,748,755
Operating Liabilities					
Deferred taxes	872,398	1,230,815	1,262,594	1,495,301	1,362,222
Accounts payable and other debt					
Trade Payables	762,765	649,274	409,485	1,199,402	1,248,975
Current tax liabilities (tax payable)	7,008	292,320	321,839	423,223	672,448
Provisions for onerous contracts					
Public charges payable	43,192	153,262	143,757	189,136	170,716
Other current liabilities (accrued holiday pay and other costs)	153,515	488,996	381,226	775,622	404,125
Total Operating Liabilities	1,838,878	2,814,667	2,518,901	4,082,684	3,858,486
Net Operating assets (NOA)	5,716,861	7,854,848	7,438,024	9,044,998	8,890,269
Financial assets					
Cash and cash equivalents	55,336	273,696	166,963	273,715	177,098
Investments in stocks and shares	15,760	289	519	289	393
Other receivables (Deposit interest and currency swaps)					
Long term receivables					
Total Financial Assets	71,096	273,985	167,482	274,004	177,491
Financial obligations					
Short-term interest bearing debt	596,288	140,421	276,667	198,613	243,633
Long-term interest bearing debts (Debt to credit inst)	2,098,240	2,371,338	1,780,174	2,079,000	811,027
Derivatives					
Pension liabilities	528				
Leasing liabilities	125,188	390,035	411,388	360,556	344,972
Total Financial Obligations	**2,820,244**	**2,901,794**	**2,468,229**	**2,638,169**	**1,399,632**
Net Financial Obligations (NFO)	**2,749,148**	**2,627,809**	**2,300,747**	**2,364,165**	**1,222,141**
Common Equity (CSE)	2,831,413	5,147,355	5,076,655	6,598,401	7,580,059
Minority interest	136,300	79,684	60,622	82,432	88,069
Total Equity (CSE + Minority interest)	2,967,713	5,227,039	5,137,277	6,680,833	7,668,128
Net Operating Assets (NOA)	5,716,861	7,854,848	7,438,024	9,044,998	8,890,269

SalMar ASA

Reformulated Balance Sheet (TNOK)	2012	2015	2014	2016	2017
Operating Assets					
Accounts receivable	660,944	815,540	888,219	595,773	501,112
Biological assets (biomass)	1,986,213	3,306,052	3,114,684	4,997,001	4,135,523
Inventory (other)	303,682	328,216	206,454	224,783	259,050
Other receivables	245,501	258,288	292,644	302,078	242,866
Other non-current receivables	4,029	6,840	13,403	49,949	55,284
Parent company receivables					
Intangible assets (licenses and goodwill)	2,135,500	2,913,542	2,898,643	2,910,797	2,924,975
Land buildings and other real estate	233,732	617,182	489,496	882,066	1,030,052
Plant machinery and other operating equipment	947,824	1,554,914	1,336,126	1,981,840	2,314,523
Other operating equipment (Vessels, Vehicles etc)					
Vessels	87,247	239,863	191,953	273,616	260,195
Pension fund assets	2,492	1,397	1,592	1,379	1,379
Investments in associated companies	948,575	627,681	523,711	908,400	1,023,796
Total Operating Assets	7,555,739	10,669,515	9,956,925	13,127,682	12,748,755
Operating Liabilities					
Deferred taxes	872,398	1,230,815	1,262,594	1,495,301	1,362,222
Accounts payable and other debt					
Trade Payables	762,765	649,274	409,485	1,199,402	1,248,975
Current tax liabilities (tax payable)	7,008	292,320	321,839	423,223	672,448
Provisions for onerous contracts					
Public charges payable	43,192	153,262	143,757	189,136	170,716
Other current liabilities (accrued holiday pay and other costs)	153,515	488,996	381,226	775,622	404,125
Total Operating Liabilities	1,838,878	2,814,667	2,518,901	4,082,684	3,858,486
Net Operating assets (NOA)	5,716,861	7,854,848	7,438,024	9,044,998	8,890,269
Financial assets					
Cash and cash equivalents	55,336	273,696	166,963	273,715	177,098
Investments in stocks and shares	15,760	289	519	289	393
Other receivables (Deposit interest and currency swaps)					
Long term receivables					
Total Financial Assets	71,096	273,985	167,482	274,004	177,491
Financial obligations					
Short-term interest bearing debt	596,288	140,421	276,667	198,613	243,633
Long-term interest bearing debts (Debt to credit inst)	2,098,240	2,371,338	1,780,174	2,079,000	811,027
Derivatives					
Pension liabilities	528				
Leasing liabilities	125,188	390,035	411,388	360,556	344,972
Total Financial Obligations	**2,820,244**	**2,901,794**	**2,468,229**	**2,638,169**	**1,399,632**
Net Financial Obligations (NFO)	**2,749,148**	**2,627,809**	**2,300,747**	**2,364,165**	**1,222,141**
Common Equity (CSE)	2,831,413	5,147,355	5,076,655	6,598,401	7,580,059
Minority interest	136,300	79,684	60,622	82,432	88,069
Total Equity (CSE + Minority interest)	2,967,713	5,227,039	5,137,277	6,680,833	7,668,128
Net Operating Assets (NOA)	5,716,861	7,854,848	7,438,024	9,044,998	8,890,269

Profitability analysis

7. Appendix 7: Bakkafrost – Three-level breakdown

First level breakdown	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
ROCE	N/A	48.29%	40.88%	32.68%	24.72%	36.13%	32.89%	34.54%	44.55%	13.79%
FLEV		54.00%	12.97%	45.99%	70.92%	49.47%	23.72%	13.66%	16.75%	12.45%
RNOA		34.07%	37.54%	24.53%	15.52%	26.19%	27.99%	31.01%	38.76%	13.64%
NBC		7.73%	11.73%	7.76%	2.88%	6.10%	7.36%	5.22%	4.20%	12.44%
Core RNOA		27.66%	29.28%	21.33%	13.64%	22.13%	25.59%	33.33%	24.97%	26.14%

Second level breakdown										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
RNOA		34%	38%	25%	16%	26%	28%	31%	39%	14%
PM		28%	33%	26%	17%	23%	24%	29%	43%	15%
ATO		1.23	1.12	0.93	0.94	1.14	1.16	1.08	0.90	0.93
Core PM		0.23	0.26	0.23	0.15	0.19	0.22	0.31	0.28	0.28

Third level										
Profit Margin drivers	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Sales	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Purchase of goods	-37.4%	-41.3%	-27.5%	-32.6%	-40.9%	-39.5%	-30.4%	-27.3%	-26.9%	-27.2%
Gross margin ratio	62.6 %	58.7 %	72.5 %	67.4 %	59.1 %	60.5 %	69.6 %	72.7 %	73.1 %	72.8 %
Salary & Personell ratio	-16.7 %	-13.1 %	-14.4 %	-12.7 %	-11.3 %	-9.3 %	-9.8 %	-9.9 %	-10.2 %	-10.6 %
Depreciation expense ratio	-5.2 %	-3.5 %	-5.2 %	-5.1 %	-4.3 %	-3.5 %	-3.6 %	-3.8 %	-4.2 %	-4.9 %
Other expense ratio	-21.4 %	-15.6 %	-22.8 %	-24.2 %	-26.0 %	-24.2 %	-25.0 %	-24.0 %	-22.3 %	-20.8 %
Sales PM before tax	**19.4 %**	**26.6 %**	**30.1 %**	**25.4 %**	**17.4 %**	**23.6 %**	**31.1 %**	**35.1 %**	**36.4 %**	**36.5 %**
Tax expense ratio	-1.7 %	-4.1 %	-4.1 %	-2.2 %	-2.6 %	-4.9 %	-9.0 %	-4.4 %	-8.9 %	-8.9 %
Sales PM after tax	**17.711 %**	**22.5 %**	**26.0 %**	**23.1 %**	**14.8 %**	**18.7 %**	**22.0 %**	**30.7 %**	**27.5 %**	**27.6 %**
Other items PM	-0.02%	0.05%	0.05%	-0.13%	-0.28%	0.78%	-0.03%	0.19%	0.38%	0.38%
Total Core PM	**17.69%**	**22.5 %**	**26.0 %**	**23.0 %**	**14.5 %**	**19.4 %**	**22.0 %**	**30.9 %**	**27.9 %**	**28.0 %**
Unusual items	-1.4 %	5.2 %	7.3 %	3.5 %	2.0 %	3.6 %	2.1 %	-2.1 %	15.4 %	-13.4 %
Profit Margin	**16.2 %**	**27.73%**	**33.38%**	**26.46%**	**16.51%**	**23.01%**	**24.06%**	**28.72%**	**43.30%**	**14.60%**

Third level

Inverse Asset turnover (Average Numbers)	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Accounts receivable	0.09	0.12	0.11	0.10	0.10	0.08	0.07	0.08	0.07
Biological assets (at cost)	0.33	0.32	0.38	0.33	0.26	0.28	0.29	0.30	0.27
Biological assets (FV)	0.05	0.11	0.07	0.06	0.08	0.09	0.08	0.16	0.12
(Other) Inventory	0.03	0.03	0.08	0.11	0.10	0.09	0.12	0.12	0.09
Other receivables	0.02	0.02	0.01	0.04	0.05	0.03	0.03	0.02	0.02
Intangible assets	-	0.08	0.19	0.18	0.12	0.11	0.10	0.10	0.10
Land buildings and other real estate (PPE)	0.14	0.12	0.18	0.20	0.15	0.15	0.17	0.23	0.27
Plant machinery and operating equipment	0.23	0.22	0.25	0.23	0.18	0.18	0.23	0.27	0.24
Other operating equipment	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.03
Vessels	-	-	-	-	-	-	-	0.04	0.09
Prepayments for purchase of PP&E	-	-	-	0.00	0.01	0.03	0.04	0.02	-
Long term receivables	-	-	-	-	0.00	0.00	0.00	0.00	0.00
Other non-current receivables	0.01	0.00	0.00	-	-	-	-	-	-
Investments in stocks and shares	0.03	0.03	0.01	0.00	0.00	0.01	0.01	0.01	0.01
Investments in associated companies	0.00	0.01	0.01	0.03	0.04	0.04	0.04	0.02	0.01
Operating Assets Turnover	**0.95**	**1.07**	**1.31**	**1.30**	**1.09**	**1.10**	**1.18**	**1.38**	**1.31**
Deferred taxes	0.07	0.11	0.14	0.14	0.11	0.14	0.13	0.14	0.13
Current tax liabilities	-	-	-	-	0.01	0.03	0.05	0.05	0.05
Trade Payables	0.07	0.08	0.09	0.10	0.07	0.05	0.06	0.05	0.04
Provisions for onerous contracts	-	-	-	-	-	-	0.01	0.02	0.01
Other current liabilities	-	-	-	-	0.02	0.02	0.00	0.01	0.01
Liability turnover	0.14	0.18	0.23	0.24	0.21	0.24	0.25	0.27	0.24
Total Inverse ATO	**0.814**	**0.889**	**1.079**	**1.064**	**0.878**	**0.860**	**0.926**	**1.117**	**1.070**

Trend Analysis	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Operating Revenue	100%	163%	224%	361%	507%	681%	734%	780%	876%	1031%
Purchase of goods	100%	122%	171%	256%	475%	606%	519%	565%	523%	503%
Change in inventory	100%	-84%	193%	51%	194%	210%	247%	551%	151%	-362%
Net purchase of goods	100%	180%	165%	315%	556%	719%	597%	568%	630%	750%
Gross Margin	100%	153%	260%	389%	479%	659%	815%	906%	1023%	1199%
Salary and personnel expenses	100%	128%	194%	276%	345%	382%	433%	461%	538%	657%
Depreciation	100%	110%	223%	355%	423%	457%	512%	570%	703%	968%
Other operation expenses	100%	119%	239%	409%	618%	770%	860%	875%	916%	1002%
Core Operating income from sales (Before tax)	100%	223%	348%	473%	456%	828%	1176%	1411%	1643%	1943%
Tax as reported	100%	416%	609%	599%	715%	1769%	3228%	1463%	3761%	1440%
Add tax benefit from financing activities	100%	66%	49%	179%	117%	-153%	-41%	25%	241%	148%
Less tax on core other operating income	100%	-306%	-461%	1821%	5804%	-21431%	761%	-6087%	-13352%	-15587%
Less tax allocated to unusual items	100%	-441%	-895%	-885%	-353%	-1186%	-778%	1030%	-7891%	8204%

8. Appendix 8: MHG – Three level breakdown

First level breakdown

	2009	2010	2011	2012	2013	2014	2015	2016	2017
ROCE	14.60%	27.10%	9.37%	0.04%	22.14%	10.76%	11.40%	29.90%	11.97%
FLEV	79.26%	55.68%	66.99%	73.97%	67.11%	93.11%	118.21%	118.40%	92.22%
RNOA	-0.90%	17.77%	5.37%	2.12%	20.75%	15.88%	8.35%	20.49%	5.77%
NBC	20.46%	-1.02%	0.60%	-4.94%	-18.69%	-21.38%	-5.77%	-12.54%	0.95%
Core RNOA	5.78%	14.03%	10.70%	2.37%	13.71%	14.56%	7.36%	14.82%	16.41%

Second level breakdown

	2009	2010	2011	2012	2013	2014	2015	2016	2017
RNOA	-0.90%	17.77%	5.37%	2.12%	20.75%	15.88%	8.35%	20.49%	5.77%
PM	-1.17%	21.76%	6.51%	2.69%	25.32%	18.06%	10.35%	25.27%	6.67%
ATO	0.77	0.82	0.83	0.79	0.82	0.88	0.81	0.81	0.87
Core PM	7.5%	17.2%	13.0%	3.0%	16.7%	16.6%	9.1%	18.3%	19.0%

Third level	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Profit Margin drivers										
Purchase of goods	**-64.8 %**	**-60.2 %**	**-50.9 %**	**-52.1 %**	**-62.5 %**	**-52.1 %**	**-53.6 %**	**-56.9 %**	**-51%**	**-46%**
Gross margin ratio	35.2 %	39.8 %	49.1 %	47.9 %	37.5 %	47.9 %	46.4 %	43.1 %	49%	54%
Salary & Personell ratio	-16.3 %	-14.8 %	-14.4 %	-13.5 %	-15.6 %	-13.9 %	-13.0 %	-13.7 %	-13%	-13%
Depreciation expense ratio	-5.2 %	-4.7 %	-4.3 %	-4.1 %	-4.4 %	-4.0 %	-3.8 %	-4.5 %	-4%	-4%
Other expense ratio	-10.4 %	-9.7 %	-9.3 %	-11.5 %	-12.9 %	-11.9 %	-13.3 %	-12.5 %	-11%	-12%
Sales PM before tax	**3.1 %**	**10.5 %**	**21.0 %**	**17.7 %**	**3.8 %**	**17.2 %**	**17.2 %**	**10.6 %**	**19%**	**22%**
Tax expense ratio	2.0 %	-3.4 %	-4.8 %	-4.7 %	-1.2 %	-1.3 %	-1.1 %	-2.0 %	-2%	-4%
Sales PM	5.1 %	7.1 %	16.2 %	13.0 %	2.6 %	15.9 %	16.1 %	8.6 %	17%	18%
Other items PM	0.0 %	0.3 %	1.0 %	0.0 %	0.4 %	0.8 %	0.4 %	0.5 %	1%	1%
Total Core PM	**5.1 %**	**7.5 %**	**17.2 %**	**13.0 %**	**3.0 %**	**16.7 %**	**16.6 %**	**9.1 %**	**18%**	**19%**
Unusual items	-1.8 %	-8.6 %	4.6 %	-6.5 %	-0.3 %	8.6 %	1.5 %	1.2 %	7%	-12%
Profit Margin	**3.3 %**	**-1.2 %**	**21.8 %**	**6.5 %**	**2.7 %**	**25.3 %**	**18.1 %**	**10.3 %**	**25%**	**7%**

9. Appendix 9: Lerøy seafood Group – Three-level breakdown

First level breakdown

	2009	2010	2011	2012	2013	2014	2015	2016	2017
ROCE	17.1%	29.4%	7.0%	8.4%	32.8%	15.8%	17.7%	33.3%	14.1%
FLEV	45.2%	27.6%	26.1%	38.2%	41.4%	35.1%	36.8%	37.2%	28.4%
RNOA	12.8%	22.8%	6.0%	6.8%	22.1%	11.8%	12.8%	23.2%	11.2%
NBC	3.4%	3.5%	4.6%	4.7%	2.6%	4.1%	3.2%	1.5%	3.7%
Core RNOA	12.8%	19.4%	12.1%	4.7%	15.3%	13.9%	10.6%	16.9%	18.2%

Second level breakdown

	2009	2010	2011	2012	2013	2014	2015	2016	2017
RNOA	12.8%	22.8%	6.0%	6.8%	22.1%	11.8%	12.8%	23.2%	11.2%
PM	10.0%	16.7%	4.8%	5.9%	18.9%	9.5%	10.6%	20.0%	10.6%
ATO	1.28	1.37	1.26	1.15	1.17	1.24	1.20	1.16	1.05
Core PM	10.0%	14.2%	9.6%	4.1%	13.1%	11.3%	8.8%	14.6%	17.3%

Third level

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Profit Margin drivers										
Purchase of goods -	0.71	-67.5%	-63.1%	-63.9%	-70.8%	-62.7%	-63.0%	-65.4%	-59.4%	-51.8%
Gross margin ratio	**29.4 %**	**32.5%**	**36.9%**	**36.1%**	**29.2%**	**37.3%**	**37.0%**	**34.6%**	**40.6%**	**48.2%**
Salary & Personell ra	-11.0 %	-9.2%	-8.8%	-10.5%	-11.3%	-10.1%	-10.0%	-10.5%	-10.3%	-13.1%
Depreciation expense	-3.3 %	-2.7%	-2.5%	-3.0%	-3.2%	-2.8%	-2.9%	-3.2%	-3.0%	-3.1%
Other expense ratio	-9.6 %	-7.9%	-7.8%	-9.4%	-9.4%	-9.3%	-9.9%	-10.7%	-10.8%	-12.0%
Sales PM before tax	**5.6 %**	**12.7%**	**17.8%**	**13.2%**	**5.3%**	**15.1%**	**14.1%**	**10.2%**	**16.5%**	**20.0%**
Tax expense ratio	-1.41%	-3.3%	-4.6%	-3.8%	-1.4%	-3.3%	-3.4%	-1.7%	-3.0%	-3.9%
Sales PM	4.2 %	9.4%	13.2%	9.4%	3.9%	11.8%	10.8%	8.5%	13.4%	16.0%
Other items PM	0.2 %	0.6%	1.0%	0.2%	0.2%	1.3%	0.5%	0.3%	1.1%	1.2%
Total Core PM	**4.3 %**	**10.0%**	**14.2%**	**9.6%**	**4.1%**	**13.1%**	**11.3%**	**8.8%**	**14.6%**	**17.3%**
Unusual items	-0.7 %	0.0%	2.4%	-4.8%	1.8%	5.9%	-1.7%	1.8%	5.5%	-6.6%
Profit Margin	**3.6 %**	**10.0%**	**16.7%**	**4.8%**	**5.9%**	**18.9%**	**9.5%**	**10.6%**	**20.0%**	**10.6%**

Asset turnover (Inverse)	2009	2010	2011	2012	2013	2014	2015	2016	2017
Operating Assets									
Accounts receivable	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Biological assets (biomass)	0.24	0.26	0.28	0.28	0.30	0.29	0.30	0.31	0.29
(Other) Inventory	0.03	0.03	0.03	0.04	0.03	0.03	0.04	0.04	0.05
Other receivables	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01
Other non-current receivables (l	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.01
Intangible assets (licences rights	0.40	0.38	0.42	0.43	0.37	0.32	0.32	0.36	0.43
Land buildings and other real est	0.17	0.16	0.19	0.22	0.21	0.20	0.21	0.21	0.25
Plant machinery and other opera	-	-	-	-	-	-	-	-	-
Other operating equipment	-	-	-	-	-	-	-	-	-
Vessels	-	-	-	-	-	-	-	-	-
Prepayments for purchase of PI	-	-	-	-	-	-	-	-	-
Investments in associated comp	0.04	0.03	0.04	0.04	0.05	0.05	0.05	0.04	0.05
Deferred tax assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Operating Assets	1.00	0.99	1.08	1.13	1.10	1.04	1.05	1.09	1.21
Operating Liabilities	-	-	-	-	-	-	-	-	-
Deferred taxes	0.10	0.12	0.13	0.13	0.13	0.12	0.11	0.13	0.14
Accounts payable and other deb	-	-	-	-	-	-	-	-	0.04
Trade Payables	0.08	0.07	0.07	0.08	0.09	0.08	0.07	0.07	0.04
Current tax liabilities (Taxes pay	0.01	0.03	0.04	0.02	0.02	0.03	0.02	0.02	0.03
Public duties payable	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Provisions for onerous contracts	-	-	-	-	-	-	-	-	-
Other current liabilities (short te	0.02	0.03	0.03	0.02	-	-	-	-	-
Operating Liabilities	0.22	0.25	0.28	0.26	0.24	0.24	0.22	0.22	0.26
	-	-	-	-	-	-	-	-	-
Total Inverse ATO	0.78	0.73	0.79	0.87	0.86	0.81	0.83	0.86	0.95

10. Appendix 10: Norwegian Royal Salmon – Three-level breakdown

First level breakdown									
	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
ROCE	N/A	31.7%	-4.4%	6.0%	41.7%	25.8%	22.0%	64.2%	11.9%
FLEV	N/A	76.7%	82.7%	95.7%	68.7%	57.9%	51.6%	24.1%	24.0%
RNOA	N/A	15.3%	-0.9%	5.4%	24.3%	13.8%	13.6%	39.9%	15.0%
NBC	N/A	6.2%	-3.4%	-4.7%	0.9%	7.0%	2.6%	60.9%	-27.8%
Core RNOA		14.1%	4.3%	2.8%	18.9%	11.4%	12.2%	33.3%	20.9%

Second level breakdown

RNOA	15.3%	-0.9%	5.4%	24.3%	13.8%	13.6%	39.9%	15.0%
PM	6.6%	-0.5%	3.4%	11.6%	7.9%	7.1%	18.9%	7.3%
ATO	2.31	1.71	1.56	2.09	1.75	1.92	2.11	2.04
Core PM	6.1%	2.5%	1.8%	9.0%	6.5%	6.4%	15.8%	10.2%

Third-level breakdown

Profit Margin drivers

	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Purchase of goods	-92%	-87%	-89%	-88%	-82%	-84%	-84%	-76%	-79%
Gross margin ratio	**7.7 %**	**12.7 %**	**10.7 %**	**11.7 %**	**17.9 %**	**16.3 %**	**15.7 %**	**23.5 %**	**21.2 %**
Salary & Personell ratic	-2.1 %	-2.4 %	-3.5 %	-4.1 %	-3.3 %	-4.0 %	-3.5 %	-3.7 %	-2.8 %
Depreciation expense r	-0.8 %	-0.9 %	-1.5 %	-1.7 %	-1.3 %	-1.6 %	-1.7 %	-1.4 %	-1.7 %
Other expense ratio	-2.4 %	-2.6 %	-2.9 %	-4.1 %	-3.5 %	-4.6 %	-4.2 %	-3.2 %	-4.1 %
Sales PM before tax	**2.5 %**	**6.8 %**	**2.7 %**	**1.7 %**	**9.8 %**	**6.1 %**	**6.3 %**	**15.2 %**	**12.7 %**
Tax expense ratio	0.5 %	-1.4 %	-0.1 %	-0.4 %	-1.6 %	-0.3 %	-0.5 %	-0.6 %	-3.3 %
Sales PM	2.9 %	5.4 %	2.6 %	1.4 %	8.2 %	5.8 %	5.8 %	14.6 %	9.4 %
Other items PM	0.3 %	0.7 %	-0.1 %	0.4 %	0.8 %	0.8 %	0.5 %	1.2 %	0.8 %
Total Core PM	**3.2 %**	**6.1 %**	**2.5 %**	**1.8 %**	**9.0 %**	**6.5 %**	**6.4 %**	**15.8 %**	**10.2 %**
Unusual items	2.0 %	0.5 %	-3.0 %	1.6 %	2.6 %	1.4 %	0.7 %	3.1 %	-2.9 %
Profit Margin	**5.2 %**	**6.6 %**	**-0.5 %**	**3.4 %**	**11.6 %**	**7.9 %**	**7.1 %**	**18.9 %**	**7.3 %**

Asset turnover (Inverse)								
Accounts receivable	0.15	0.12	0.15	0.20	0.16	0.18	0.15	0.13
Biological assets (biomass)	0.20	0.19	0.26	0.33	0.28	0.32	0.32	0.29
Inventory (other)	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01
Other receivables	0.02	0.02	0.02	0.03	0.05	0.05	0.05	0.03
Other non-current receivables	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Intangible assets (licenses and goodw	0.28	0.25	0.29	0.29	0.22	0.25	0.20	0.15
Land buildings and other real estate	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07
Plant machinery and other operating	0.03	0.04	0.05	0.06	0.05	0.06	0.05	0.02
Other operating equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vessels	0.02	0.03	0.04	0.04	0.04	0.05	0.06	0.02
Investments in associated companies	0.07	0.05	0.06	0.07	0.05	0.06	0.11	0.14
Inverse Operating Turnover	**0.78**	**0.72**	**0.90**	**1.05**	**0.87**	**1.00**	**0.98**	**0.87**
Deferred taxes	0.09	0.08	0.09	0.11	0.10	0.11	0.11	0.09
Trade Payables	0.14	0.12	0.15	0.19	0.16	0.18	0.18	0.14
Current tax liabilities (tax payable)	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02
Other current liabilities (accrued holi	0.01	0.01	0.01	0.02	0.04	0.06	0.05	0.04
Pension liabilities	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00
Total Operating Liabilities	**0.24**	**0.21**	**0.26**	**0.33**	**0.30**	**0.36**	**0.36**	**0.30**
Total Inverse ATO	**0.54**	**0.51**	**0.64**	**0.71**	**0.57**	**0.64**	**0.63**	**0.57**

11. Appendix 11: Grieg Seafood ASA

First level breakdown

	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
ROCE	18.2%	37.9%	-6.7%	-11.0%	27.1%	11.1%	2.3%	42.2%	18.8%
FLEV	129.8%	72.7%	68.9%	94.2%	86.2%	73.8%	79.9%	60.1%	47.6%
RNOA	6.6%	21.9%	-3.3%	-3.2%	16.2%	7.5%	3.0%	28.5%	13.5%
NBC	2.3%	0.2%	-1.8%	-5.2%	-3.5%	-2.6%	-3.8%	-5.8%	-2.3%
Core RNOA	4.1%	14.5%	5.5%	-5.1%	8.5%	6.0%	1.5%	20.4%	13.8%

Second level breakdown

RNOA	6.6%	21.9%	-3.3%	-3.2%	16.2%	7.5%	3.0%	28.5%	13.5%
PM	10.9%	25.9%	-5.0%	-4.8%	22.0%	10.3%	2.6%	19.0%	9.3%
ATO	60.9%	84.4%	66.0%	65.9%	73.7%	72.9%	114.9%	150.2%	145.0%
Core PM	6.7%	17.2%	8.4%	-7.8%	11.5%	8.2%	1.3%	13.6%	9.5%

Third level

	2009	2010	2011	2012	2013	2014	2015	2016	2017
Profit Margin drivers									
Purchase of goc	-46.0 %	-38.5 %	-43.5 %	-58.6 %	-40.3 %	-43.3 %	-59.4 %	-50.2 %	-53.1 %
Gross margin	54.0 %	61.5 %	56.5 %	41.4 %	59.7 %	56.7 %	40.6 %	49.8 %	46.9 %
Salary & Pers	-12.0 %	-9.7 %	-11.6 %	-13.5 %	-12.6 %	-12.7 %	-8.9 %	-7.4 %	-6.9 %
Depreciation	-7.5 %	-4.9 %	-6.8 %	-7.9 %	-5.7 %	-5.3 %	-3.6 %	-2.8 %	-2.8 %
Other expens	-25.5 %	-24.2 %	-29.5 %	-31.3 %	-28.1 %	-29.1 %	-26.8 %	-22.8 %	-24.6 %
Sales PM befo	9.0 %	22.6 %	8.6 %	-11.3 %	13.4 %	9.6 %	1.2 %	16.8 %	12.7 %
Tax expense r	-2.4 %	-5.8 %	-1.5 %	3.1 %	-2.1 %	-1.8 %	-0.1 %	-3.4 %	-3.1 %
Sales PM	6.6 %	16.8 %	7.0 %	-8.2 %	11.2 %	7.8 %	1.1 %	13.4 %	9.5 %
Other items P	0.1 %	0.4 %	1.4 %	0.4 %	0.2 %	0.4 %	0.2 %	0.1 %	0.0 %
Total Core PM	**6.7 %**	**17.2 %**	**8.4 %**	**-7.8 %**	**11.5 %**	**8.2 %**	**1.3 %**	**13.6 %**	**9.5 %**
Unusual items	4.2 %	8.7 %	-13.3 %	3.0 %	10.5 %	2.1 %	1.3 %	5.4 %	-0.3 %
Profit Margin	**10.9 %**	**25.9 %**	**-5.0 %**	**-4.8 %**	**22.0 %**	**10.3 %**	**2.6 %**	**19.0 %**	**9.3 %**

Asset turnover (Inverse)

Operating Assets	2009	2010	2011	2012	2013	2014	2015	2016	2017
Investments in associated companie	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.00	-
Accounts receivable	0.11	0.09	0.12	0.08	0.06	0.08	0.09	0.11	0.11
Other current receivables	0.03	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.02
Inventories	0.03	0.02	0.03	0.03	0.03	0.03	0.02	0.01	0.01
Biological assets	0.76	0.60	0.73	0.66	0.64	0.68	0.41	0.34	0.37
Other non-current receivables	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Deferred tax assets	-	-	-	-	-	-	0.00	0.00	0.00
Licenses	0.51	0.36	0.47	0.48	0.41	0.39	0.23	0.16	0.15
Other intangible assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Property, plant and equipment	0.50	0.36	0.50	0.55	0.49	0.49	0.32	0.23	0.24
Goodwill	0.05	0.04	0.05	0.05	0.04	0.04	0.02	0.02	0.02
Investments in associated companie	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Operating Assets	**2.00**	**1.50**	**1.94**	**1.91**	**1.71**	**1.75**	**1.13**	**0.89**	**0.93**
Operating Liabilities									
Accounts payable	0.14	0.10	0.14	0.13	0.12	0.12	0.10	0.09	0.08
Tax payable	-	-	-	-	0.00	0.01	0.01	0.02	0.02
Deferred tax liabilities	0.18	0.18	0.25	0.22	0.20	0.21	0.12	0.09	0.10
Accrued salary expense and public t	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
Other non-current liabilities	0.00	0.00	0.00	-	-	-	-	-	0.00
Other current liabilities	0.03	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03
Pension obligations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
Cash settled share options	-	-	-	-	-	-	-	-	0.00
Cash-settled share option provision	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Operating Liabilities	0.36	0.31	0.42	0.40	0.36	0.38	0.26	0.23	0.24
Total inverse ATO	1.64	**1.18**	**1.52**	**1.52**	**1.36**	**1.37**	**0.87**	**0.67**	**0.69**

12. Appendix 12: Salmar ASA

First level breakdown

	2009	2010	2011	2012	2013	2014	2015	2016	2017
ROCE	30.3%	47.2%	6.2%	11.7%	49.3%	31.2%	23.0%	43.2%	32.5%
FLEV	58.9%	88.0%	95.4%	47.6%	56.3%	65.6%	47.6%	39.5%	25.0%
RNOA	19.0%	26.1%	5.2%	9.5%	29.1%	20.1%	16.5%	31.1%	27.4%
NBC	0.0%	2.1%	4.1%	5.0%	-6.8%	3.1%	3.0%	0.5%	6.8%
Core RNOA	20.2%	23.3%	11.7%	6.4%	20.0%	21.7%	15.5%	26.5%	30.0%
Second level breakdown									
RNOA	19.0%	26.1%	5.2%	9.5%	29.1%	20.1%	16.5%	31.1%	27.4%
PM	19.2%	28.0%	6.2%	12.6%	29.2%	18.9%	17.3%	28.4%	22.7%
ATO	0.99	0.93	0.84	0.76	1.00	1.06	0.96	1.10	1.21
Core PM	20.4%	25.0%	14.0%	8.5%	20.1%	20.5%	16.2%	24.2%	24.9%

Third level

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Profit Margin drivers										
Purchase of goods	**-53.8 %**	**-48.9 %**	**-55.4 %**	**-62.0 %**	**-64.6 %**	**-54.1 %**	**-46.4 %**	**-52.0 %**	**-48.7 %**	**-43.7 %**
Change in inventory and	**6.1 %**	**1.1 %**	**11.7 %**	**10.3 %**	**9.3 %**	**5.2 %**	**2.3 %**	**3.4 %**	**4.4 %**	**0.0 %**
Gross margin ratio	**52.3 %**	**52.2 %**	**56.3 %**	**48.4 %**	**44.7 %**	**51.1 %**	**55.8 %**	**51.4 %**	**55.7 %**	**56.3 %**
Salary & Personell rati	-14.0 %	-11.2 %	-9.1 %	-10.2 %	-11.5 %	-10.0 %	-9.9 %	-10.5 %	-9.5 %	-8.6 %
Depreciation expense r	-3.2 %	-2.8 %	-2.7 %	-3.4 %	-4.0 %	-3.5 %	-3.8 %	-4.2 %	-4.0 %	-3.8 %
Other expense ratio	-15.3 %	-13.1 %	-16.1 %	-19.0 %	-21.1 %	-17.4 %	-15.9 %	-17.4 %	-15.3 %	-14.7 %
Sales PM before tax	**19.7 %**	**25.1 %**	**28.4 %**	**15.7 %**	**8.1 %**	**20.2 %**	**26.2 %**	**19.4 %**	**26.9 %**	**29.3 %**
Tax expense ratio	-5.5 %	-6.4 %	-6.5 %	-3.6 %	-1.2 %	-2.0 %	-6.7 %	-3.6 %	-5.1 %	-5.8 %
Sales PM	14.2 %	18.7 %	21.9 %	12.1 %	6.9 %	18.3 %	19.5 %	15.7 %	21.8 %	23.4 %
Other items PM	0.5 %	1.7 %	3.1 %	1.8 %	1.6 %	1.8 %	1.0 %	0.4 %	2.4 %	1.5 %
Total Core PM	**14.7 %**	**20.4 %**	**25.0 %**	**14.0 %**	**8.5 %**	**20.1 %**	**20.5 %**	**16.2 %**	**24.2 %**	**24.9 %**
Unusual items	-2.4 %	-1.2 %	3.0 %	-7.8 %	4.1 %	9.1 %	-1.5 %	1.1 %	4.2 %	-2.2 %
Profit Margin	**12.2 %**	**19.18%**	**28.0 %**	**6.2 %**	**12.6 %**	**29.2 %**	**18.9 %**	**17.3 %**	**28.4 %**	**22.7 %**

Operating Assets	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Accounts receivable	0.08	0.11	0.12	0.13	0.11	0.10	0.12	0.08	0.05
Biological assets (biomass)	0.42	0.35	0.39	0.55	0.41	0.37	0.44	0.45	0.42
Inventory (other)	0.04	0.05	0.05	0.04	0.04	0.04	0.04	0.02	0.02
Other receivables	0.02	0.03	0.04	0.04	0.04	0.04	0.04	0.03	0.03
Other non-current receivables	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parent company receivables	0.00	0.00	-	-	-	-	-	-	-
Intangible assets (licenses and goodwill)	0.47	0.45	0.47	0.49	0.37	0.35	0.40	0.32	0.27
Land buildings and other real estate	0.04	0.05	0.05	0.08	0.06	0.06	0.08	0.08	0.09
Plant machinery and other operating equipment	0.15	0.18	0.19	0.22	0.18	0.17	0.20	0.18	0.20
Other operating equipment (Vessels, Vehicles etc)	-	-	-	-	-	-	-	-	-
Vessels	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.03	0.02
Pension fund assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Investments in associated companies	0.11	0.17	0.23	0.15	0.11	0.11	0.08	0.08	0.09
Total Operating Assets	**1.36**	**1.41**	**1.56**	**1.73**	**1.31**	**1.27**	**1.41**	**1.28**	**1.20**
Operating Liabilities									
Deferred taxes	0.21	0.18	0.20	0.23	0.17	0.15	0.17	0.15	0.13
Accounts payable and other debt	-	-	-	-	-	-	-	-	-
Trade Payables	0.07	0.09	0.10	0.10	0.10	0.10	0.07	0.09	0.11
Current tax liabilities (tax payable)	0.04	0.03	0.03	0.02	0.00	0.02	0.04	0.04	0.05
Provisions for onerous contracts	-	-	-	-	-	-	-	-	-
Public charges payable	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.02	0.02
Other current liabilities (accrued holiday pay and other costs)	0.02	0.02	0.03	0.04	0.03	0.04	0.06	0.06	0.05
Total Operating Liabilities	**0.35**	**0.34**	**0.37**	**0.41**	**0.31**	**0.32**	**0.36**	**0.37**	**0.37**
Net Operating assets (NOA)	**1.01**	**1.07**	**1.20**	**1.32**	**1.00**	**0.94**	**1.04**	**0.91**	**0.83**

Quantitative Industry Analysis

13. Appendix: Group of Companies used in fade rate estimations

NAKHODKA ACTIVE MARINE FISH	SILLA SG CO LTD
ICELANDIC GROUP HF	LEINER PAK GELATINE LTD
INVERMAR S.A.	HABIB ADM LTD
SHANGHAI KAICHUANG MARINE	GLAVTORGPRODUCT JSC
COLAND PHARMACEUTICAL CO LTD	OCEANA GROUP LTD
CNFC OVERSEAS FISHERY CO LTD	ELLAH LAKES PLC
P/F BAKKAFROST HOLDING	ZEAL AQUA LTD
VILLA ORGANIC AS	CADOVIMEX SEAFOOD IMPORT
SHANDONG ZONGLU OCEANIC FISH	HUON AQUACULTURE GROUP
KIANG HUAT SEAGULL TRDG FROZ	DARDANEL ONENTAS GIDA SANAYI
CUULONG FISH JSC	SAJO SEAFOOD CO LTD
HUNG HAU AGRICULTURAL CORP	INTERNATIONAL CAVIAR CORP
NORWAY ROYAL SALMON AS	PESCANOVA SA
HUNG VUONG JSC	PACIFIC ANDES INTL HLDGS LTD

SAO TA FOODS JSC
VINH HOAN CORP
NAMVIET CORP
HANSUNG ENTERPRISE
MARINE HARVEST ASA
KARSUSAN KARADENIZ SU URUNLE
GRIEG SEAFOOD AS
DONGWON FISHERIES
SANFORD LTD
HB GRANDI HF
INTERNATIONAL HOLDING CO
TRANG SEAFOOD PRODUCTS PCL
DOMSTEIN ASA
I.D.I INTERNATIONAL DEVELOP
HAIXIN FOODS CO LTD
HIGASHIMARU CO LTD
NATIONAL FOODS
DIAS AQUA CULTURE SA
THAI UNION GROUP PCL
NICHIMO CO LTD
INVESTMENT COMMERCE
SAJODAERIM CORPORATION
SHANDONG HOMEY AQUATIC DEV
GALAXIDI MARINE FARM SA
GO DANG SEAFOOD JSC
NIPPON SUISAN KAISHA LTD
LEROY SEAFOOD GROUP ASA
SEAFRESH IND (THAI) PCL
AUSTEVOLL SEAFOOD ASA
MINH PHU SEAFOOD
DALIAN TIANBAO GREEN FOODS
SHANDONG ORIENTAL OCEAN SCI-
RAFHAN MAIZE PRODUCTS CO LTD
DUA PUTRA UTAMA MAKMUR PT
MORPOL ASA
WILBO SA
BKV INDUSTRIES LTD
NORWAY PELAGIC AS
TASSAL GROUP
GEMINI SEA FOOD
SEAFOOD JSC NO.4
SAPMER SA
FROSTA AG
OMAN FISHERIES CO
ZHANJIANG GUOLIAN AQUATIC
CLEAN SEAS SEAFOOD LTD
AQUACHILE SA
SALMAR ASA
WATERBASE
MULTIEXPORT FOODS SA
HAIKUI SEAFOOD AG
DHARMA SAMUDERA FISHING INDS
RUSSIAN AQUACULTURE PJSC
THE SCOTTISH SALMON CO LTD
BLUE ISLAND PLC
HAVFISK ASA
COMPANIA PESQUERA CAMANCHACA
VIET NHAT SEAFOOD CORP
BLUMAR SA
SEKO SA
GRAAL SA
SURAPON FOODS PCL
DANAH AL SAFAT FOODSTUFF CO
CHINA FISHERY GROUP
UNIROYAL MARINE EXPORTS LTD
PREMIA FOODS AS
DE MASTER BLENDERS 1753 NV
SAUDI FISHERIES CO
BENTRE AQUAPRODUCT
CHINA OCEAN RESOURCES CO LTD
BIOMAR HOLDING A/S

14. Appendix: Portfolio Driver Rankings

PM fade periods

Year (Period 1: 1996-2001)

Group #	Base	1	2	3	4	5
1	11.05%	3.71%	4.39%	5.60%	4.58%	4.85%
2	3.80%	5.27%	1.48%	3.88%	2.50%	1.72%
3	0.13%	0.79%	1.18%	6.16%	5.63%	0.28%
4	-0.19%	0.04%	0.88%	0.23%	2.13%	0.73%
5	-0.89%	0.42%	1.50%	1.49%	1.24%	3.29%

Year (Period 2: 2001-2006)

Group #	Base	1	2	3	4	5
1	6.12%	5.06%	4.12%	3.26%	4.68%	3.65%
2	1.03%	1.12%	0.97%	2.14%	1.11%	3.11%
3	0.00%	3.87%	5.88%	3.72%	6.55%	7.29%
4	0.00%	1.08%	0.30%	1.18%	4.13%	6.88%
5	-2.31%	-1.04%	2.95%	-0.15%	3.45%	7.26%

Year (Period 3: 2006-2011)

Group #	Base	1	2	3	4	5
1	12%	11%	9%	4%	4%	7%
2	7%	6%	9%	9%	7%	9%
3	4%	4%	5%	4%	7%	3%
4	1%	4%	5%	3%	2%	4%
5	-10%	-3%	-1%	-2%	1%	1%

Year (Period 4: 2011-2016)

Group #	Base	1	2	3	4	5
1	14.43%	10.02%	10.83%	11.46%	11.26%	13.17%
2	6.55%	3.75%	4.45%	4.87%	3.81%	3.92%
3	4.41%	3.11%	3.80%	4.83%	3.71%	8.30%
4	1.58%	1.34%	1.38%	1.91%	2.10%	3.01%
5	-6.43%	-1.72%	0.04%	0.21%	0.46%	0.85%

Average

Group #	0	1	2	3	4	5
1	11.0%	7.4%	7.1%	6.0%	6.1%	7.1%
2	4.5%	4.1%	3.9%	4.9%	3.5%	4.3%
3	2.0%	2.9%	3.9%	4.7%	5.6%	4.7%
4	0.5%	1.6%	1.8%	1.5%	2.7%	3.5%
5	-5.0%	-1.2%	0.8%	0.0%	1.5%	3.2%

ATO fade periods

Year (Period 1: 1996-2001)

Group #	Base	1	2	3	4	5
1	3.40	3.18	2.99	3.20	3.22	2.82
2	1.27	1.38	1.42	1.30	1.28	1.23
3	0.39	0.43	1.45	2.23	1.11	0.96
4	-	1.98	1.74	1.00	1.52	1.34
5	-	1.14	1.41	1.57	1.05	1.19

Year (Period 2: 2001-2006)

Group #	Base	1	2	3	4	5
1	2.83	2.92	2.76	2.89	2.72	2.57
2	1.23	1.14	1.22	1.38	1.31	1.23
3	0.50	0.55	0.58	0.61	0.66	0.74
4	-	0.01	1.27	4.08	2.53	1.94
5	-	1.15	1.03	0.89	0.90	0.88

Year (Period 3: 2006-2011)

Group #	Base	1	2	3	4	5
1	3.02	2.61	2.41	2.42	2.54	2.80
2	1.62	1.49	1.39	1.38	1.52	1.41
3	0.94	0.80	0.73	0.69	0.79	0.80
4	0.41	0.58	0.74	0.99	1.04	0.75
5	-	1.16	1.29	1.32	1.10	1.19

Year (Period 4: 2011-2016)

Group #	Base	1	2	3	4	5
1	3.40	2.92	2.80	2.71	2.19	2.20
2	1.77	1.86	2.06	2.09	1.87	2.08
3	1.19	1.03	1.10	1.15	1.13	1.24
4	0.70	0.78	0.71	0.73	0.84	0.79
5	0.41	0.42	0.41	0.31	0.36	0.47

Average

Rank	0	1	2	3	4	5
1	3.16	2.91	2.74	2.80	2.67	2.59
2	1.47	1.47	1.52	1.54	1.49	1.49
3	0.75	0.70	0.97	1.17	0.92	0.93
4	0.28	0.84	1.11	1.70	1.48	1.20
5	0.10	0.97	1.03	1.02	0.85	0.93

RNOA fade periods

Year (Period 1: 1996-2001)

Group #	Base	1	2	3	4	5
1	10.6%	12.2%	8.8%	7.9%	8.9%	8.9%
2	2.9%	1.4%	2.7%	2.2%	4.0%	0.2%
3	0.0%	4.9%	2.4%	0.7%	1.4%	4.2%
4	0.0%	9.1%	2.0%	2.8%	12.8%	6.9%
5	-2.7%	3.1%	3.1%	4.8%	3.4%	4.1%

Year (Period 2: 2001-2006)

Group #	Base	1	2	3	4	5
1	13.1%	13.0%	9.0%	7.7%	7.8%	8.9%
2	4.2%	2.8%	3.9%	7.0%	3.6%	5.1%
3	0.5%	2.1%	0.8%	2.0%	6.5%	8.9%
4	0.0%	0.0%	3.0%	2.5%	2.7%	3.4%
5	-2.4%	0.8%	1.7%	4.4%	1.5%	3.4%

Year (Period 3: 2006-2011)

Group #	Base	1	2	3	4	5
1	16.2%	11.8%	8.4%	10.7%	8.1%	6.0%
2	7.5%	6.4%	9.5%	8.4%	9.1%	7.4%
3	2.9%	3.1%	4.1%	4.7%	4.6%	7.6%
4	0.0%	9.2%	11.8%	9.6%	2.2%	5.2%
5	-10.2%	-0.8%	-3.9%	-1.0%	7.7%	5.8%

Year (Period 4: 2011-2016)

Group #	Base	1	2	3	4	5
1	23%	16%	5%	7%	9%	10%
2	11%	9%	7%	6%	6%	6%
3	0.06	5%	7%	5%	8%	6%
4	3%	2%	2%	2%	2%	3%
5	-5%	0%	-3%	4%	4%	1%

Average

Group #	0	1	2	3	4	5
1	16%	13%	8%	8%	9%	9%
2	6%	5%	6%	6%	6%	5%
3	2%	4%	3%	3%	5%	7%
4	1%	5%	5%	4%	5%	5%
5	-5%	1%	-1%	3%	4%	4%

Sales Growth fade periods

Year (Period 1: 1996-2001)

Group #	Base	1	2	3	4	5
PF1	45.41%	64.55%	54.31%	-0.31%	-2.29%	20.77%
PF2	6.08%	-10.40%	5.05%	-3.27%	0.00%	4.15%
PF3	0.00%	6.28%	3.99%	5.92%	20.90%	9.83%
PF4	0.00%	0.00%	0.00%	0.00%	16.79%	15.66%
PF5	-0.24%	1.19%	6.66%	4.58%	-0.91%	0.00%

Year (Period 2: 2001-2006)

Group #	Base	1	2	3	4	5
PF1	67%	29%	14%	13%	16%	27%
PF2	10%	1%	-5%	2%	7%	21%
PF3	0%	0%	16%	0%	0%	38%
PF4	0%	0%	0%	19%	11%	22%
PF5	-10%	-5%	-7%	0%	0%	3%

Year (Period 3: 2006-2011)

Group #	Base	1	2	3	4	5
PF1	77%	31%	18%	32%	31%	27%
PF2	23%	13%	13%	5%	25%	7%
PF3	6%	0%	15%	0%	9%	10%
PF4	0%	9%	31%	3%	13%	18%
PF5	-9%	0%	2%	-8%	7%	14%

Year (Period 4: 2011-2016)

Group #	Base	1	2	3	4	5
PF1	73%	20%	18%	22%	8%	8%
PF2	29%	3%	4%	13%	-2%	11%
PF3	13%	4%	1%	-3%	1%	7%
PF4	0%	0%	16%	17%	9%	30%
PF5	-8%	-2%	4%	6%	9%	12%

Average

Group #	0	1	2	3	4	5
PF1	65%	36%	26%	17%	13%	21%
PF2	17%	2%	4%	4%	8%	11%
PF3	5%	3%	9%	1%	8%	16%
PF4	0%	2%	12%	10%	12%	21%
PF5	-7%	-1%	1%	1%	4%	7%

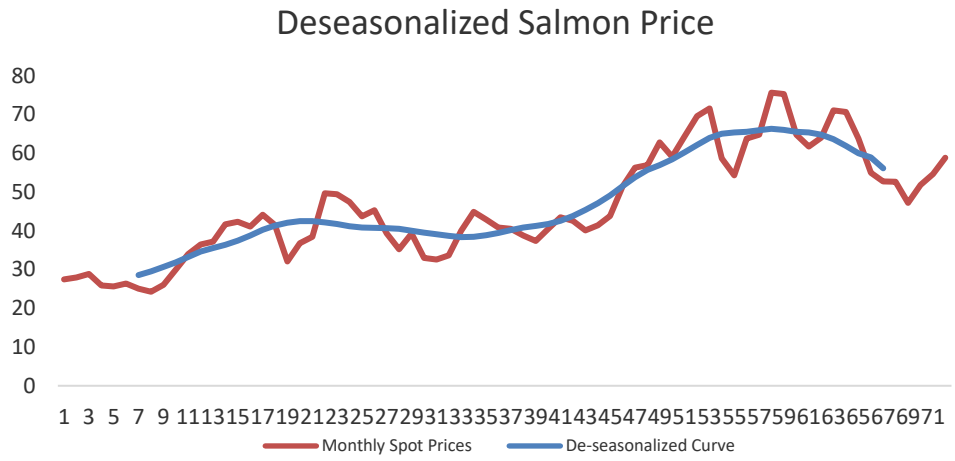
15. List of Variables from Compustat Global IQ:

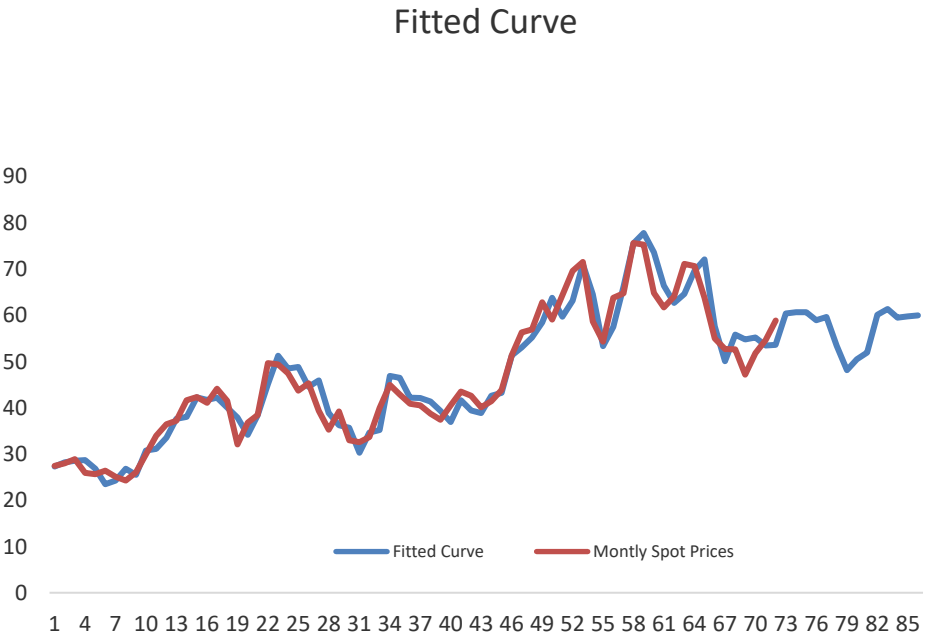
- Assets - Total
- Common/Ordinary Equity - Total
- Cash and Short-Term Investments
- Debt in Current Liabilities - Total
- Long-Term Debt - Total
- Dividends - Preferred/Preference
- Earnings Before Interest and Taxes
- Equity in Earnings - After-Tax
- Income Before Extraordinary Items
- Income before Extraordinary Items and Noncontrolling Interests
- Interest and Related Income - Total
- Investment and Advances - Other
- Noncontrolling Interests - Total - Balance Sheet
- Noncontrolling Interest (Income Account)
- Nonoperating Income (Expense)
- Preferred/Preference Stock (Capital) - Total
- Revenue - Total
- Special Items
- Cumulative Translation Adjustment
- Treasury Stock - Total (All Capital)
- Income Taxes - Total
- Extraordinary Items and Discontinued Operations
- Interest and Related Expense - Total
- Net income
- Net Income (Loss) - Consolidated

Winter-Holt Model

16. Monthly average salmon prices

	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	Forecast E2018/2019
March	27.442	37.21	43.695	40.51	62.782	61.688	60.36406643
April	27.965	41.64	45.322	38.732	59.0725	64.045	60.68325909
May	28.855	42.278	39.3525	37.3775	64.3425	71.07	60.64173157
June	25.89	41.0875	35.2225	40.515	69.594	70.6075	58.93836432
July	25.6175	44.098	39.216	43.456	71.525	63.755	59.62603916
August	26.38	41.5075	32.9925	42.5875	58.63	54.962	53.35467306
Septembe	25.07	32.035	32.5375	40.108	54.2925	52.695	48.10169894
October	24.2575	36.742	33.642	41.44	63.7425	52.655	50.46051476
November	26.026	38.4275	39.99	43.835	64.734	47.166	51.95397768
December	29.895	49.6325	44.91	51.375	75.615	51.7725	60.11052897
January	33.964	49.386	42.895	56.275	75.2775	54.632	61.32874604
February	36.4275	47.45	40.85	56.9125	64.795	58.8375	59.44402564





Pro-forma Financial Statements

17. Pro-forma: Explicit forecast period 2018-2022

Pro forma financial statements	2017A	2018E	2019E	2020E	2021E	2022E
Income statement						
Sales from Farming activities	2,150,939	1,722,703	1,841,517	2,022,421	2,096,875	2,223,592
Sales from VAP segment	998,778	933,226	872,986	898,723	914,639	969,965
Sales from FOF segment	620,332	647,164	635,605	645,828	678,177	698,523
Net Sales	**3,770,049**	**3,303,093**	**3,350,108**	**3,566,973**	**3,689,691**	**3,892,080**
Cost of sales	-1,025,277	-992,121	-1,149,039	-1,316,031	-1,428,679	-1,570,197
Gross margin	**2,744,772**	**2,310,971**	**2,201,068**	**2,250,942**	**2,261,012**	**2,321,882**
Salary and personnel expenses	-400,267	-333,390	-372,612	-411,835	-431,446	-457,594
Depreciation	-183,590	-253,059	-266,612	-267,768	-268,824	-269,790
Other operation expenses	-783,268	-709,414	-795,227	-851,041	-863,947	-921,156
Core operating income before tax	**1,377,647**	**1,015,108**	**766,617**	**720,299**	**696,794**	**673,343**
Taxes	-217,538	-182,719	-137,991	-129,654	-125,423	-121,202
Revenue tax (4,50%)	-119,681	-77,522	-82,868	-91,009	-94,359	-100,062
Core operating income from sales after tax	**1,040,428**	**754,867**	**545,758**	**499,636**	**477,012**	**452,079**
Income from associates	17,302	15,194	15,410	16,408	16,973	17,904
Taxes	-3,114	-2,735	-2,774	-2,953	-3,055	-3,223
Core operating income after tax	**1,054,616**	**767,326**	**558,394**	**513,091**	**490,929**	**466,760**
Unusual items	-504,287	0	0	0	0	0
Operating income (OI)	**550,329**	**767,326**	**558,394**	**513,091**	**490,929**	**466,760**
Balance sheet						
Account receivable	335,019	267,281	271,086	288,634	298,564	314,941
Biological Assets at cost	969,466	933,500	1,046,919	1,181,487	1,261,772	1,375,229
Inventory	305,845	329,335	369,348	416,823	445,147	485,177
Property, plant and equipment	2,570,430	2,677,371	2,820,759	2,832,991	2,844,166	2,854,377
Intangible assets	376,675	376,675	376,675	376,675	376,675	376,675
Other NOA	-494,289	-732,355	-673,825	-703,313	-746,867	-779,686
Net operating assets (NOA)	**3,757,301**	**3,851,806**	**4,210,962**	**4,393,297**	**4,479,457**	**4,626,713**
Biological asssets at Market value	127,198	127,198	127,198	127,198	127,198	127,198
NFO	258,070	0	0	0	0	0
CSE	3,626,429	3,979,004	4,338,160	4,520,495	4,606,655	4,753,911

18. Pro-forma: Fade Period 2022-2027

Pro forma financial statements	2023F	2024F	2025F	2026F	2027F
Income statement					
Sales from Farming activities					
Sales from VAP segment					
Sales from FOF segment					
Net Sales	**4,072,328**	**4,243,771**	**4,413,614**	**4,585,732**	**4,759,990**
Cost of sales					
Gross margin					
Salary and personnel expenses					
Depreciation					
Other operation expenses					
Core operating income before tax					
Taxes					
Revenue tax (4,50%)					
Core operating income from sales after tax					
Income from associates					
Taxes					
Core operating income after tax					
Unusual items					
Operating income (OI)	**516,989**	**558,135**	**593,574**	**625,570**	**649,342**
Balance sheet					
Account receivable					
Biological Assets at cost					
Inventory					
Property, plant and equipment					
Intangible assets					
Other NOA					
Net operating assets (NOA)	**4,407,959**	**4,334,419**	**4,313,248**	**4,331,821**	**4,496,430**
Biological asssets at Market value	127,198	127,198	127,198	127,198	127,198
NFO	0	0	0	0	0
CSE	4,535,157	4,461,617	4,440,446	4,459,019	4,623,628

19. Future Core PM, Sales Growth and RNOA

	2018E	2019E	2020E	2021E	2022E	2023F	2024F	2025F	2026F	2027F
PM (current year)	23.2%	16.7%	14.4%	13.3%	12.0%	12.7%	13.2%	13.4%	13.6%	13.6%
Sales growth	-12.4%	1.4%	6.5%	3.4%	5.5%	4.6%	4.2%	4.0%	3.9%	3.8%
ATO	0.86	0.80	0.81	0.82	0.84	0.92	0.98	1.02	1.06	1.10
RNOA (current NOA)	19.92%	13.26%	11.68%	10.96%	10.09%	11.73%	12.88%	13.76%	14.44%	14.99%

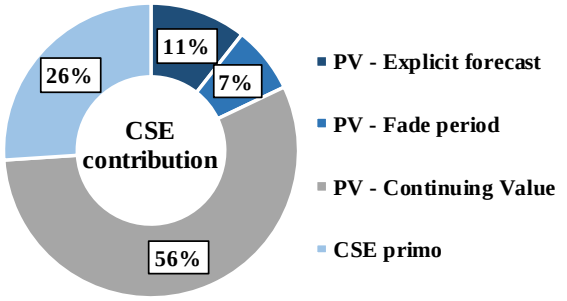
20. Present Value of Future Residual Operating Income

	2017A	2018E	2019E	2020E	2021E	2022E	2023F	2024F	2025F	2026F	2027F
		1	2	3	4	5	6	7	8	9	10
RNOA (avg NOA)	15.4%	20.2%	13.9%	11.9%	11.1%	10.3%	11.4%	12.8%	13.7%	14.5%	14.7%
ReOI	370,458	589,292	344,073	277,152	236,170	192,966	246,434	288,070	321,668	350,229	363,538
Growth in ReOI	-66.9%	*59.1%*	*-41.6%*	*-19.4%*	*-14.8%*	*-18.3%*	*27.7%*	*16.9%*	*11.7%*	*8.9%*	*3.8%*
Cost of Capital		*4.2%*	*4.4%*	*4.5%*	*4.7%*	*4.9%*	*5.1%*	*5.2%*	*5.4%*	*5.5%*	*5.6%*
FWD		*4.5%*	*4.9%*	*5.3%*	*5.7%*	*5.9%*	*6.1%*	*6.2%*	*6.3%*	*6.4%*	*6.4%*
		95.9%	*91.8%*	*87.5%*	*83.1%*	*78.6%*	*74.2%*	*69.9%*	*65.8%*	*61.9%*	*58.2%*
PV ReOI		565,297	315,896	242,527	196,180	151,662	182,819	201,386	211,680	216,802	211,599

21. ReOI-Valuation

		Explicit forecast				
Numbers in mDKK	**2017A**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**
Time period (*t*)	*Actual*	**1**	**2**	**3**	**4**	**5**
Net sales	3,770	3,303	3,350	3,567	3,690	3,892
Operating Income	550	767	558	513	491	467
NOA	3,757	3,852	4,211	4,393	4,479	4,627
RNOA	20.50%	20.17%	13.85%	11.93%	11.07%	10.25%
WACC		4.24%	4.36%	4.55%	4.75%	4.94%
Residual operating income (ReOI)		589	344	277	236	193
PV of ReOI		**565**	**316**	**243**	**196**	**152**

Valuation estimates	
$NOA_{t=0}$ (primo)	3,757
PV - Explicit forecast (2018 - 2022)	1,472
PV - Fade period (2023-2027)	1,024
PV - Continuing Value (2027-)	7,804
Value of operations (V_NOA)	**14,057**
$NFO_{t=0}$	-258
BIO $MV_{t=0}$	127
Intrinsic value of CSE	**13,926**
Number of shares outstanding at AR date	49
Value per share	**286.4**
Value per share adjusted (92 days)	**289.7**
Value per share adjusted (NOK)	**372.8**
Current stock price (03.04.2018)	454.6
Market pricing error (Downside)	-18%



Salmon Price forecast

22. Historical and forecasted change in supply and price

Year	Global supply growth YoY	Change in avg. Price FCA Oslo
2001	15 %	-25 %
2002	8 %	-3 %
2003	7 %	-11 %
2004	6 %	7 %
2005	5 %	23 %
2006	1 %	23 %
2007	10 %	-21 %
2008	5 %	1 %
2009	3 %	12 %
2010	-4 %	35 %
2011	12 %	-17 %
2012	22 %	-10 %
2013	2 %	42 %
2014	9 %	-7 %
2015	4 %	-3 %
2016	-7 %	46 %
2017	6,3%	-3,00 %
E2018	6,3%	0,92 %
E2019	6,7%	-3,59 %
E2020	5,6%	0,55 %
E2021	5,8%	-0,02 %
E2022	5,8%	-0,02 %

Forecasted salmon price		
	EUR	DKK
2016	6,80	50,7
2017	6,60	49,1
2018E	6,66	49,6
2019E	6,42	47,8
2020E	6,45	48,1
2021E	6,45	48,1
2022E	6,45	48,1

23. Price/supply Regressions

Before omitting the statistical outlier (2001 – 2017):

Regression Statistics	
Multiple R	0,81388649
R Square	0,66241123
Adjusted R Square	0,63990531
Standard Error	0,13029331
Observations	17

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,499661	0,499661	29,43275713	7,02674E-05
Residual	15	0,254645	0,016976		
Total	16	0,754306			

	Coefficients	*andard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,21311119	0,04332	4,919426	0,000185202	0,120776087	0,30544629	0,12077609	0,30544629
X Variable 1	-2,6202208	0,482973	-5,425197	7,02674E-05	-3,649652281	-1,59078922	-3,64965228	-1,59078922

After omitting the statistical outlier (2001 – 2017):

Regression Statistics	
Multiple R	0,90035662
R Square	0,81064203
Adjusted R Square	0,810597
Standard Error	0,09934207
Observations	16

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,59148	0,59148	59,93404309	2,00238E-06
Residual	14	0,138164	0,009869		
Total	15	0,729644			

	Coefficients	*andard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,24624971	0,034409	7,156506	4,88514E-06	0,172449297	0,32005012	0,1724493	0,32005012
X Variable 1	-3,5844415	0,463004	-7,741708	2,00238E-06	-4,577486242	-2,59139676	-4,57748624	-2,59139676

Only containing the four last periods (2014 – 2017)

Regression Statistics	
Multiple R	0,96673321
R Square	0,9345731
Adjusted R Square	0,90185965
Standard Error	0,08559113
Observations	4

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,209288	0,209288	28,56846553	0,033266791
Residual	2	0,014652	0,007326		
Total	3	0,22394			

	Coefficients	*andard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,21614192	0,047958	4,506946	0,045869826	0,009797387	0,42248645	0,00979739	0,42248645
X Variable 1	-3,7621478	0,70387	-5,344948	0,033266791	-6,790655635	-0,73364004	-6,79065564	-0,73364004

24. Price premium

VAP segment

	2009	2010	2011	2012	2013	2014	2015	2016	2017	*Average*
VAP, net sales (DKK)	358.709	473.142	507.241	526.257	666.172	913.406	736.657	880.945	998.778	
VAP, output (TGW)	15.451	9.154	11.295	10.668	15.120	17.805	15.285	15.221	16.016	
VAP, net sales per kg	23,22	51,69	44,91	49,33	44,06	51,30	48,20	57,88	62,36	
Historical forward price	27,54	36,54	23,79	29,96	35,09	35,88	36,44	56,28	42,34	
Estimated premium -	**4,33**	**15,15**	**21,12**	**19,37**	**8,97**	**15,42**	**11,75**	**1,60**	**20,02**	**12,12**

Farming segment

	2014	**2015**	**2016**	**2017**	**E2018**	**E2019**	**E2020**	**E2021**	**E2022**
DKK/kg	4,69	7,30	7,45	7,45					
Expected DKK/kg				7,45	6,70	6,03	5,43	4,89	4,89

Term Structure

25. Swap rates from gathered from Bloomberg

Bloomberg swaps			
Ticker	**X**	**Bid**	**Ask**
DSKW1	-0,136	-0,145	-0,127
DSKW2	-0,019	-0,034	-0,004
DSKW3	0,177	0,162	0,192
DSKW4	0,375	0,360	0,390
DSKW5	0,554	0,543	0,564
DSKW6	0,706	0,691	0,721
DSKW7	0,843	0,828	0,858
DSKW8	0,967	0,952	0,982
DSKW9	1,079	1,064	1,094
DSKW10	1,178	1,163	1,193
DKSW12	1,336	1,321	1,351
DKSW15	1,503	1,487	1,520
DKSW20	1,635	1,620	1,650
DKSW25	1,670	1,655	1,685
DKSW30	1,666	1,651	1,681

26. Nelson-Seigel-Svensson parameters

Parameters	
β[0]	2,020%
β[1]	-2,12 %
β[2]	29,27 %
β[3]	-32,42 %
τ[1]	146,41 %
τ[2]	149,00 %

27. Estimated swap rates

T (Years)	Implied YTM in swaps	Nelson-Siegel-Svensson	Squared Residuals
1	-0,14 %	-0,14 %	0,00000000
2	-0,02 %	-0,02 %	0,00000000
3	0,18 %	0,17 %	0,00000001
4	0,37 %	0,37 %	0,00000001
5	0,55 %	0,55 %	0,00000000
6	0,71 %	0,72 %	0,00000002
7	0,84 %	0,86 %	0,00000004
8	0,97 %	0,98 %	0,00000003
9	1,08 %	1,09 %	0,00000001
10	1,18 %	1,17 %	0,00000000
11		1,25 %	
12	1,34 %	1,31 %	0,00000007
13		1,36 %	
14		1,41 %	
15	1,50 %	1,45 %	0,00000028
16		1,49 %	
17		1,52 %	
18		1,55 %	
19		1,57 %	
20	1,64 %	1,59 %	0,00000018
21		1,61 %	
22		1,63 %	
23		1,65 %	
24		1,66 %	
25	1,67 %	1,68 %	0,00000001
26		1,69 %	
27		1,70 %	
28		1,71 %	
29		1,73 %	
30	1,67 %	1,74 %	0,00000048
		Sum	0,00000114

Cost of capital estimation

28. Cost of capital for operations

Assumptions

Risk-free rate (t1)	-0,14 %	*1-year DKK SWAP forward*
Market risk premium (rm-rf)	6,0%	*From Fernandez 2018 report*
Tax rate	18,00 %	*Marginal tax rate 2017*
CIBOR 3m	-0,2975%	
R_d (before tax)	4,43 %	*4,73+CIBOR 3m (Bakkafrost, 2018a)*
R_d (after tax)	3,63 %	

Capital structure	DKK	NOK	
BAKKA's close price (06.03.2018) (DKK)	kr 353,18	kr 454,60	
NOK/DKK	1,2872		*From Danske Nationalbank (06.04.2018)*
Number of shares outstanding	48.858.065		
Market value of equity (MVE)	kr 17.255.629.836		
Net Financial Obligation (NFO)	kr 258.070.000		
Enterprise Value (EV)	17.513.699.836		
MVE/EV	98,5%		
NFO/EV	1,5%		

Target capital structure

MVE/EV	100,0%
NFO/EV	0,0%

Beta estimates

Unlevered beta	0,71	*Unlevered industry beta*
Average Cash/firm in sample	3,01 %	
Unlevered beta corrected for Cash	0,73	*(Unlevered beta / (1-Cash/firm value)*

Cost of capital (t1)

R_e (t1)	4,24 %
Cost of Capital for operations (t1)	**4,24 %**

Risk adjustment (premium over risk free)

Risk adjustment (Beta_equity*MRP)	4,25 %

29. Cost of capital and forward rate varying with the term structure

Estimated interest and forward rates			Estimated cost of capital (Discount rate)		Estimated cost of capital forward rate	
t	**Interest rate (discrete)**	**Forward interest rate (discrete)**	**r_Equity**	**Cost of capital**	**r_Equity**	**Cost of capital**
1	-0,1%	0,1%	4,24 %	4,24 %	4,48 %	4,48 %
2	0,0%	0,5%	4,36 %	4,36 %	4,92 %	4,92 %
3	0,2%	1,0%	4,55 %	4,55 %	5,34 %	5,34 %
4	0,4%	1,3%	4,75 %	4,75 %	5,69 %	5,69 %
5	0,6%	1,6%	4,94 %	4,94 %	5,94 %	5,94 %
6	0,7%	1,7%	5,10 %	5,10 %	6,12 %	6,12 %
7	0,9%	1,9%	5,25 %	5,25 %	6,23 %	6,23 %
8	1,0%	1,9%	5,37 %	5,37 %	6,31 %	6,31 %
9	1,1%	2,0%	5,47 %	5,47 %	6,35 %	6,35 %
10	1,2%	2,0%	5,56 %	5,56 %	6,38 %	6,38 %
11	1,3%	2,0%	5,64 %	5,64 %	6,40 %	6,40 %
12	1,3%	2,0%	5,70 %	5,70 %	6,41 %	6,41 %
13	1,4%	2,0%	5,75 %	5,75 %	6,41 %	6,41 %
14	1,4%	2,0%	5,80 %	5,80 %	6,42 %	6,42 %
15	1,5%	2,0%	5,84 %	5,84 %	6,42 %	6,42 %
16	1,5%	2,0%	5,88 %	5,88 %	6,42 %	6,42 %
17	1,5%	2,0%	5,91 %	5,91 %	6,42 %	6,42 %
18	1,6%	2,0%	5,94 %	5,94 %	6,42 %	6,42 %
19	1,6%	2,0%	5,96 %	5,96 %	6,42 %	6,42 %
20	1,6%	2,0%	5,99 %	5,99 %	6,42 %	6,42 %
21	1,6%	2,0%	6,01 %	6,01 %	6,42 %	6,42 %
22	1,6%	2,0%	6,02 %	6,02 %	6,42 %	6,42 %
23	1,7%	2,0%	6,04 %	6,04 %	6,42 %	6,42 %
24	1,7%	2,0%	6,06 %	6,06 %	6,42 %	6,42 %
25	1,7%	2,0%	6,07 %	6,07 %	6,42 %	6,42 %
26	1,7%	2,0%	6,09 %	6,09 %	6,42 %	6,42 %
27	1,7%	2,0%	6,10 %	6,10 %	6,42 %	6,42 %
28	1,7%	2,0%	6,11 %	6,11 %	6,42 %	6,42 %
29	1,7%	2,0%	6,12 %	6,12 %	6,42 %	6,42 %
30	1,8%	2,0%	6,13 %	6,13 %	6,42 %	6,42 %
β[0]	**2,02 %**	**2,02 %**	**6,40 %**	**6,40 %**	**6,40 %**	**6,40 %**

30. Beta regression – OSEBX (Monthly)

SUMMARY OUTPUT 2Y

Regression Statistics	
Multiple R	0,150038
R Square	0,022512
Adjusted R Square	-0,02192
Standard Error	0,101033
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,005171827	0,005172	0,506659	0,484068869
Residual	22	0,22456936	0,010208		
Total	23	0,229741187			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,017471	0,022674101	0,770529	0,449182	-0,029552151	0,064494263	-0,029552151	0,064494263
X Variable 1	0,72809	1,022885705	0,7118	0,484069	-1,393244925	2,849425307	-1,393244925	2,849425307

SUMMARY OUTPUT 3Y

Regression Statistics	
Multiple R	0,098826
R Square	0,009767
Adjusted R Square	-0,019358
Standard Error	0,098935
Observations	36

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,003282377	0,003282	0,335342	0,56634761
Residual	34	0,332797277	0,009788		
Total	35	0,336079654			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,032299	0,016609019	1,944683	0,060123	-0,001454307	0,066052868	-0,001454307	0,066052868
X Variable 1	-0,318005	0,549148881	-0,579087	0,566348	-1,434009772	0,797999824	-1,434009772	0,797999824

SUMMARY OUTPUT 5Y

Regression Statistics	
Multiple R	0,14286
R Square	0,020409
Adjusted R Square	0,00352
Standard Error	0,087294
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,009208305	0,009208	1,208387	0,276193815
Residual	58	0,441978939	0,00762		
Total	59	0,451187244			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,036431	0,011429515	3,187408	0,002314	0,013551871	0,05930919	0,013551871	0,05930919
X Variable 1	-0,424046	0,385753564	-1,099267	0,276194	-1,196215677	0,348123629	-1,196215677	0,348123629

SUMMARY OUTPUT 8Y

Regression Statistics	
Multiple R	0,0628
R Square	0,003944
Adjusted R Square	-0,006541
Standard Error	0,089626
Observations	97

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,003021553	0,003022	0,376151	0,541135796
Residual	95	0,763116984	0,008033		
Total	96	0,766138537			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,028461	0,009125236	3,118978	0,002403	0,010345524	0,046577293	0,010345524	0,046577293
X Variable 1	0,14204	0,231595755	0,613312	0,541136	-0,317735283	0,601816127	-0,317735283	0,601816127

31. Beta regression – MSCI World (Monthly)

SUMMARY OUTPUT 2Y

Regression Statistics	
Multiple R	0,517906336
R Square	0,268226973
Adjusted R Square	0,234964562
Standard Error	0,087417079
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,061622783	0,061622783	8,063966805	0,009533809
Residual	22	0,168118404	0,007641746		
Total	23	0,229741187			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,035770755	0,018304936	1,954158974	0,063510924	-0,002191359	0,073732868	-0,002191359	0,073732868
X Variable 1	-2,435577124	0,857684419	-2,839712451	0,009533809	-4,214305741	-0,65684851	-4,214305741	-0,656848506

SUMMARY OUTPUT 3Y

Regression Statistics	
Multiple R	0,318286171
R Square	0,101306086
Adjusted R Square	0,074873912
Standard Error	0,094251344
Observations	36

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,034046914	0,034046914	3,832680831	0,058510793
Residual	34	0,30203274	0,008883316		
Total	35	0,336079654			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,032445534	0,015722576	2,063627068	0,046753291	0,000493415	0,064397654	0,000493415	0,064397654
X Variable 1	-1,019810429	0,520916509	-1,95772338	0,058510793	-2,078440144	0,038819287	-2,078440144	0,038819287

SUMMARY OUTPUT 5Y

Regression Statistics	
Multiple R	0,1691981
R Square	0,028627997
Adjusted R Square	0,011880204
Standard Error	0,086927502
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,012916587	0,012916587	1,709359371	0,196227716
Residual	58	0,438270656	0,007556391		
Total	59	0,451187244			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,036199182	0,011312354	3,199969118	0,002229743	0,013555046	0,058843318	0,013555046	0,058843318
X Variable 1	-0,503623744	0,385202865	-1,307424709	0,196227716	-1,274691054	0,267443566	-1,274691054	0,267443566

SUMMARY OUTPUT 8Y

Regression Statistics	
Multiple R	0,026293081
R Square	0,000691326
Adjusted R Square	-0,009827713
Standard Error	0,089772161
Observations	97

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,000529652	0,000529652	0,065721415	0,798225756
Residual	95	0,765608886	0,008059041		
Total	96	0,766138537			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,028600384	0,00917827	3,116097568	0,002423979	0,010379215	0,046821554	0,010379215	0,046821554
X Variable 1	0,062946862	0,245539085	0,256361883	0,798225756	-0,424509852	0,550403576	-0,424509852	0,550403576

32. Beta regression – MSCI Europe (Monthly)

SUMMARY OUTPUT 2Y

Regression Statistics	
Multiple R	0,265143787
R Square	0,070301228
Adjusted R Square	0,028042192
Standard Error	0,098532436
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,016151087	0,016151087	1,663578627	0,210515255
Residual	22	0,213590099	0,009708641		
Total	23	0,229741187			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,029066349	0,020466768	1,420172905	0,169574553	-0,01337913	0,071511828	-0,01337913	0,071511828
X Variable 1	-1,06745434	0,827613643	-1,289797902	0,210515255	-2,783819985	0,648911305	-2,783819985	0,648911305

SUMMARY OUTPUT 5Y

Regression Statistics	
Multiple R	0,1999434
R Square	0,039977363
Adjusted R Square	0,023425249
Standard Error	0,086418186
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,018037276	0,018037276	2,415242087	0,125599546
Residual	58	0,433149967	0,007468103		
Total	59	0,451187244			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,036491083	0,011242341	3,245861655	0,00194696	0,013987093	0,058995073	0,013987093	0,058995073
X Variable 1	-0,523917505	0,337118492	-1,554104915	0,125599546	-1,198733484	0,150898474	-1,198733484	0,150898474

SUMMARY OUTPUT 3Y

Regression Statistics	
Multiple R	0,22553917
R Square	0,050867917
Adjusted R Square	0,022952268
Standard Error	0,096860115
Observations	36

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,017095672	0,017095672	1,822200749	0,185970659
Residual	34	0,318983982	0,009381882		
Total	35	0,336079654			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,03064704	0,016147583	1,897933501	0,066221797	-0,002168798	0,063462878	-0,002168798	0,063462878
X Variable 1	-0,630988555	0,467437307	-1,349889162	0,185970659	-1,580935456	0,318958346	-1,580935456	0,318958346

SUMMARY OUTPUT 8Y

Regression Statistics	
Multiple R	0,033218806
R Square	0,001103489
Adjusted R Square	-0,009411211
Standard Error	0,089753646
Observations	97

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,000845425	0,000845425	0,104947267	0,746683749
Residual	95	0,765293112	0,008055717		
Total	96	0,766138537			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,029116137	0,009143143	3,184477783	0,001961549	0,010964702	0,047267571	0,010964702	0,047267571
X Variable 1	-0,085578101	0,264166097	-0,323955657	0,746683749	-0,610014111	0,438857908	-0,610014111	0,438857908

33. Beta regression – MSCI ACWI (Monthly)

SUMMARY OUTPUT 2Y

Regression Statistics	
Multiple R	0,536468258
R Square	0,287798192
Adjusted R Square	0,255425383
Standard Error	0,086240174
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,066119098	0,066119098	8,890120977	0,006881172
Residual	22	0,163622089	0,007437368		
Total	23	0,229741187			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,037653734	0,018174592	2,071778805	0,05021235	-3,80624E-05	0,07534553	-3,80624E-05	0,07534553
X Variable 1	-2,505450592	0,840295441	-2,98163059	0,006881172	-4,248116676	-0,76278451	-4,248116676	-0,762784508

SUMMARY OUTPUT 3Y

Regression Statistics	
Multiple R	0,336508628
R Square	0,113238057
Adjusted R Square	0,087156823
Standard Error	0,093623565
Observations	36

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,038057007	0,038057007	4,341744666	0,044776528
Residual	34	0,298022647	0,008765372		
Total	35	0,336079654			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,032470092	0,015616862	2,079168842	0,045215098	0,000732811	0,064207373	0,000732811	0,064207373
X Variable 1	-1,05819101	0,507845874	-2,083685357	0,044776528	-2,090257999	-0,02612402	-2,090257999	-0,026124022

SUMMARY OUTPUT 5Y

Regression Statistics	
Multiple R	0,177342035
R Square	0,031450197
Adjusted R Square	0,014751063
Standard Error	0,086801132
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,014189928	0,014189928	1,883342951	0,175238837
Residual	58	0,436997316	0,007534436		
Total	59	0,451187244			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,036081961	0,011277916	3,199346378	0,002233834	0,013506758	0,058657163	0,013506758	0,058657163
X Variable 1	-0,520378194	0,379187825	-1,372349427	0,175238837	-1,279405093	0,238648705	-1,279405093	0,238648705

SUMMARY OUTPUT 8Y

Regression Statistics	
Multiple R	0,019031338
R Square	0,000362192
Adjusted R Square	-0,010160311
Standard Error	0,089786944
Observations	97

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,000277489	0,000277489	0,034420689	0,853210359
Residual	95	0,765861048	0,008061695		
Total	96	0,766138537			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,028699207	0,009166277	3,130955647	0,002315624	0,010501846	0,046896567	0,010501846	0,046896567
X Variable 1	0,044847299	0,241727748	0,185528136	0,853210359	-0,435042957	0,524737554	-0,435042957	0,524737554

34. Beta regression – OSEBX (Weekly)

SUMMARY OUTPUT 2Y

Regression Statistics	
Multiple R	0,197147788
R Square	0,03886725
Adjusted R Square	0,02944438
Standard Error	0,04002474
Observations	104

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,006607812	0,006607812	4,124778321	0,044861124
Residual	102	0,163401944	0,00160198		
Total	103	0,170009755			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,002713747	0,003992598	0,679694406	0,498237632	-0,005205553	0,010633046	-0,005205553	0,010633046
X Variable 1	0,535810782	0,263822081	2,030955027	0,044861124	0,012520935	1,059100629	0,012520935	1,059100629

SUMMARY OUTPUT 3Y

Regression Statistics	
Multiple R	0,19939861
R Square	0,039759806
Adjusted R Square	0,03352448
Standard Error	0,042148622
Observations	156

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,011327964	0,011327964	6,376540075	0,012575445
Residual	154	0,273581978	0,001776506		
Total	155	0,284909942			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,006585063	0,003376676	1,950161128	0,05297289	-8,55208E-05	0,013255647	-8,55208E-05	0,013255647
X Variable 1	0,434285478	0,171981907	2,525181196	0,012575445	0,094537274	0,774033681	0,094537274	0,774033681

SUMMARY OUTPUT 5Y

Regression Statistics	
Multiple R	0,245869751
R Square	0,060451935
Adjusted R Square	0,056810276
Standard Error	0,040117432
Observations	260

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,026716352	0,026716352	16,60010778	6,14659E-05
Residual	258	0,415227347	0,001609408		
Total	259	0,441943699			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,007275462	0,002492747	2,918652855	0,003825709	0,002366742	0,012184182	0,002366742	0,012184182
X Variable 1	0,509706904	0,125102233	4,074322984	6,14659E-05	0,263355413	0,756058395	0,263355413	0,756058395

SUMMARY OUTPUT 8Y

Regression Statistics	
Multiple R	0,248687759
R Square	0,061845602
Adjusted R Square	0,059595831
Standard Error	0,041342719
Observations	419

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,046986016	0,046986016	27,48973505	2,51561E-07
Residual	417	0,712744912	0,00170922		
Total	418	0,759730929			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,006417473	0,002020611	3,176006306	0,001604106	0,00244562	0,010389325	0,00244562	0,010389325
X Variable 1	0,462194797	0,088153544	5,243065424	2,51561E-07	0,288914096	0,635475498	0,288914096	0,635475498

35. Beta regression – MSCI World (Weekly)

SUMMARY OUTPUT 2Y

Regression Statistics	
Multiple R	0,040387589
R Square	0,001631157
Adjusted R Square	-0,00815677
Standard Error	0,04079269
Observations	104

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,000277313	0,000277313	0,166649883	0,683962183
Residual	102	0,169732443	0,001664044		
Total	103	0,170009755			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,00405175	0,004017016	1,008646596	0,315530929	-0,003915983	0,012019483	-0,003915983	0,012019483
X Variable 1	0,115614768	0,283211449	0,408227734	0,683962183	-0,446133798	0,677363334	-0,446133798	0,677363334

SUMMARY OUTPUT 3Y

Regression Statistics	
Multiple R	0,107021486
R Square	0,011453598
Adjusted R Square	0,005034466
Standard Error	0,042765344
Observations	156

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,003263244	0,003263244	1,7842907	0,183594063
Residual	154	0,281646698	0,001828875		
Total	155	0,284909942			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,00681048	0,003424419	1,98879885	0,04849502	4,55817E-05	0,013575379	4,55817E-05	0,013575379
X Variable 1	0,2758804	0,206532328	1,335773446	0,183594063	-0,132121748	0,683882547	-0,132121748	0,683882547

SUMMARY OUTPUT 5Y

Regression Statistics	
Multiple R	0,166723983
R Square	0,027796886
Adjusted R Square	0,024028657
Standard Error	0,04080864
Observations	260

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,012284659	0,012284659	7,376644448	0,007054229
Residual	258	0,42965904	0,001665345		
Total	259	0,441943699			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,007518639	0,002534806	2,966159096	0,003298178	0,002527095	0,012510183	0,002527095	0,012510183
X Variable 1	0,429628151	0,158184274	2,715997873	0,007054229	0,11813146	0,741124842	0,11813146	0,741124842

SUMMARY OUTPUT 8Y

Regression Statistics	
Multiple R	0,212935216
R Square	0,045341406
Adjusted R Square	0,043052057
Standard Error	0,041704788
Observations	419

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,034447269	0,034447269	19,80536972	1,10177E-05
Residual	417	0,72528366	0,001739289		
Total	418	0,759730929			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,006256086	0,002040209	3,06639492	0,002307589	0,00224571	0,010266462	0,00224571	0,010266462
X Variable 1	0,462305567	0,103881365	4,450322429	1,10177E-05	0,258109173	0,666501961	0,258109173	0,666501961

36. Beta regression – MSCI Europe (Weekly)

SUMMARY OUTPUT 2Y

Regression Statistics	
Multiple R	0,084847136
R Square	0,007199037
Adjusted R Square	-0,00253431
Standard Error	0,040678781
Observations	104

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,001223906	0,001223906	0,739626322	0,391797489
Residual	102	0,168785849	0,001654763		
Total	103	0,170009755			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,003908905	0,004003444	0,976385453	0,331183496	-0,004031908	0,011849718	-0,004031908	0,011849718
X Variable 1	0,203880471	0,237066096	0,860015304	0,391797489	-0,266339007	0,674099949	-0,266339007	0,674099949

SUMMARY OUTPUT 3Y

Regression Statistics	
Multiple R	0,128146139
R Square	0,016421433
Adjusted R Square	0,010034559
Standard Error	0,042657752
Observations	156

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,00467863	0,00467863	2,5711222	0,110879497
Residual	154	0,280231313	0,001819684		
Total	155	0,284909942			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,00697832	0,003415852	2,042922166	0,042765169	0,000230345	0,013726296	0,000230345	0,013726296
X Variable 1	0,262094738	0,163454523	1,603471921	0,110879497	-0,06080772	0,584997195	-0,06080772	0,584997195

SUMMARY OUTPUT 5Y

Regression Statistics	
Multiple R	0,194560451
R Square	0,037853769
Adjusted R Square	0,03412452
Standard Error	0,040597021
Observations	260

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,016729235	0,016729235	10,1505074	0,001620153
Residual	258	0,425214464	0,001648118		
Total	259	0,441943699			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,007473241	0,002521338	2,963998029	0,00332065	0,002508219	0,012438263	0,002508219	0,012438263
X Variable 1	0,394139048	0,123710222	3,185986095	0,001620153	0,150528707	0,637749389	0,150528707	0,637749389

SUMMARY OUTPUT 8Y

Regression Statistics	
Multiple R	0,239010948
R Square	0,057126233
Adjusted R Square	0,054865145
Standard Error	0,041446575
Observations	419

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,043400566	0,043400566	25,26492957	7,43142E-07
Residual	417	0,716330362	0,001717819		
Total	418	0,759730929			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,006390313	0,002025934	3,154255019	0,00172556	0,002407997	0,010372629	0,002407997	0,010372629
X Variable 1	0,461276993	0,091770426	5,026423138	7,43142E-07	0,280886698	0,641667289	0,280886698	0,641667289

37. Beta regression – MSCI ACWI (Weekly)

SUMMARY OUTPUT 2Y

Regression Statistics	
Multiple R	0,041671233
R Square	0,001736492
Adjusted R Square	-0,00805041
Standard Error	0,040790538
Observations	104

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,000295221	0,000295221	0,17743026	0,674477294
Residual	102	0,169714535	0,001663868		
Total	103	0,170009755			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,004031189	0,004020416	1,002679633	0,31838822	-0,003943287	0,012005664	-0,003943287	0,012005664
X Variable 1	0,117984569	0,280098876	0,421224714	0,674477294	-0,437590223	0,673559361	-0,437590223	0,673559361

SUMMARY OUTPUT 3Y

Regression Statistics	
Multiple R	0,102430411
R Square	0,010491989
Adjusted R Square	0,004066612
Standard Error	0,042786139
Observations	156

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,002989272	0,002989272	1,632898674	0,203225433
Residual	154	0,28192067	0,001830654		
Total	155	0,284909942			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,006813663	0,003426084	1,988761199	0,048499222	4,54749E-05	0,013581851	4,54749E-05	0,013581851
X Variable 1	0,258944985	0,202641264	1,277849238	0,203225433	-0,141370412	0,659260382	-0,141370412	0,659260382

SUMMARY OUTPUT 5Y

Regression Statistics	
Multiple R	0,163607164
R Square	0,026767304
Adjusted R Square	0,022995084
Standard Error	0,040830243
Observations	260

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,011829641	0,011829641	7,095902646	0,008212439
Residual	258	0,430114057	0,001667109		
Total	259	0,441943699			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,00756146	0,002535436	2,982311694	0,003134583	0,002568676	0,012554243	0,002568676	0,012554243
X Variable 1	0,417841736	0,156858477	2,663813553	0,008212439	0,108955806	0,726727665	0,108955806	0,726727665

SUMMARY OUTPUT 8Y

Regression Statistics	
Multiple R	0,214035774
R Square	0,045811313
Adjusted R Square	0,04352309
Standard Error	0,041694523
Observations	419

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,034804271	0,034804271	20,02048196	9,89601E-06
Residual	417	0,724926658	0,001738433		
Total	418	0,759730929			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,006302371	0,002039166	3,090661995	0,002131	0,002294047	0,010310696	0,002294047	0,010310696
X Variable 1	0,462387675	0,103340126	4,474425321	9,89601E-06	0,259255178	0,665520172	0,259255178	0,665520172

38. Summary of regression statistics

Beta	2Y		3Y		5Y		8Y	
	Monthly	Weekly	Monthly	Weekly	Monthly	Weekly	Monthly	Weekly
OSEBX	0,73	0,54	-0,32	0,43	-0,42	0,51	0,14	0,46
MSCI world	-2,44	0,12	-1,02	0,28	-0,50	0,43	0,06	0,46
MSCI EUR	-1,07	0,20	-0,63	0,26	-0,52	0,39	-0,09	0,46
MSCI ACWI	-2,51	0,12	-1,06	0,26	-0,52	0,42	0,04	0,46

R-squared	2Y		3Y		5Y		8Y	
	Monthly	Weekly	Monthly	Weekly	Monthly	Weekly	Monthly	Weekly
OSEBX	0,02	0,04	0,01	0,04	0,02	0,06	0,00	0,06
MSCI world	0,27	0,00	0,10	0,01	0,03	0,03	0,00	0,05
MSCI EUR	0,07	0,01	0,05	0,02	0,04	0,04	0,00	0,06
MSCI ACWI	0,29	0,00	0,11	0,01	0,03	0,03	0,00	0,05

Alpha p-value	2Y		3Y		5Y		8Y	
	Monthly	Weekly	Monthly	Weekly	Monthly	Weekly	Monthly	Weekly
OSEBX	0,45	0,50	0,06	0,05	0,00	0,00	0,00	0,00
MSCI world	0,06	0,32	0,05	0,05	0,00	0,00	0,00	0,00
MSCI EUR	0,17	0,33	0,07	0,04	0,00	0,00	0,00	0,00
MSCI ACWI	0,05	0,32	0,05	0,05	0,00	0,00	0,00	0,00

Valid CAPM?	2Y		3Y		5Y		8Y	
	Monthly	Weekly	Monthly	Weekly	Monthly	Weekly	Monthly	Weekly
OSEBX	YES	YES	NO	NO	NO	NO	NO	NO
MSCI world	NO	YES	NO	NO	NO	NO	NO	NO
MSCI EUR	YES	YES	NO	NO	NO	NO	NO	NO
MSCI ACWI	NO	YES	NO	NO	NO	NO	NO	NO

Ownership structure

39.Top 20 shareholders

#	**20 Largest Shareholders**	**Origin**	No. of shares	**Share**
1	JACOBSEN Oddvør	FRO	4 594 437	9,40 %
2	JACOBSEN Johan Regin	FRO	4 494 251	9,20 %
3	FOLKETRYGFONDET	NOR	3 759 341	7,70 %
4	Nordea Bank AB Denmark Branch, CCA	DNK	3 513 840	7,20 %
5	CLEARSTREAM BANKING	LUX	1 320 109	2,70 %
6	VERDIPAPIRFONDET DNB V/DNB ASSET MANAGEME	NOR	1 316 188	2,70 %
7	SWEDBANK ROBUR SMABO NORDEN	SWE	1 073 369	2,20 %
8	Skandinaviska Enskil SEB AB, UCITS V - Sw	SWE	960 369	2,00 %
9	JPMorgan Chase Bank, S/A NON-TREATY LENDI	GBR	951 705	1,90 %
10	JPMorgan Chase Bank, JPMCB RE HB SWED FUN	SWE	717 852	1,50 %
11	State Street Bank an A/C EXEMPT LUX REGI	USA	637 346	1,30 %
12	State Street Bank an A/C WEST NON-TREATY	USA	558 477	1,10 %
13	AVIVA INVESTORS JPML SA RE CLT AVIVA	LUX	554 194	1,10 %
14	J.P. MORGAN BANK LUX JPML SA RE CLT ASSET	LUX	528 316	1,10 %
15	JPMORGAN CHASE BANK, A/C VANGUARD BBH LEN	USA	514 793	1,10 %
16	NORDEA NORDIC FUND	FIN	501 040	1,00 %
17	SEB SVERIGEFOND Skandinaviska Enskil	SWE	493 980	1,00 %
18	VERDIPAPIRFONDET ALF	NOR	478 139	1,00 %
19	State Street Bank an A/C CLIENT OMNIBUS F	USA	473 405	1,00 %
20	KLP AKSJENORGE INDEK	NOR	456 915	0,90 %
	Total share of the 20 largest shareholders		**27898066**	57,10 %
	Total number of shares outstanding		48 619 276	99,30 %
	Treasury Stock		238 789	0,70 %
	Total number of shares		**48 858 065**	**100,00 %**

Multiple Valuation

40.

Ratios	P/E	M/B	EV/Core OP. Inc.	EV/NOPAT	EV/Sales	EV/GWkg
Lerøy	7.97	2.05	6.24	12.78	2.19	259
Marine Harvest	10.15	3.51	16.06	15.43	2.91	274
Norway Royal Salmon	11.64	3.95	14.41	18.45	1.89	262
Salmar	11.81	5.60	27.94	15.86	4.72	315
Grieg	9.36	1.14	7.97	18.14	1.73	194

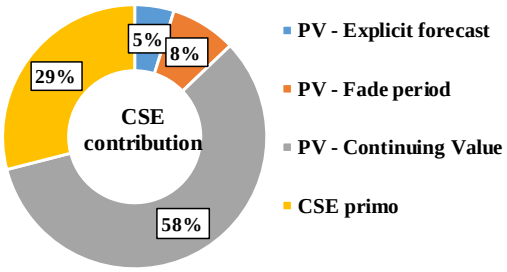
	P/E	M/B	EV/Core OP. Inc.	EV/NOPAT	EV/Sales	EV/GWkg	Listed price	ReOI-Valuation
Close peer average	9.97	2.40	11.03	15.85	2.36	254.43		
BAKKA	*21.57*	*4.63*	*0.96*	*17.38*	*4.86*	*444*		
BAKKA's implied price	210	235.06	*270*	*411*	*199*	*243*	*455*	*372*
Market pricing error	*-54%*	*-48%*	*-41%*	*-10%*	*-56%*	*-47%*	*0%*	*-18%*

Scenario-Analysis

41.Scenario 1: ISA Base-case outbreak in the Faroe Islands

		Explicit forecast				
Numbers in mDKK	**2017A**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**
Time period (*t*)	*Actual*	**1**	**2**	**3**	**4**	**5**
Net sales	3,770	3,303	2,536	3,129	3,690	3,892
Operating Income	550	767	-88	166	491	467
NOA	3,757	3,852	4,375	4,480	4,479	4,627
RNOA	20.50%	20.17%	-2.13%	3.74%	10.96%	10.25%
WACC		4.24%	4.36%	4.55%	4.75%	4.94%
Residual operating income (ReOI)		589	-271	-70	236	193
PV of ReOI		**565**	**-249**	**-61**	**196**	**152**

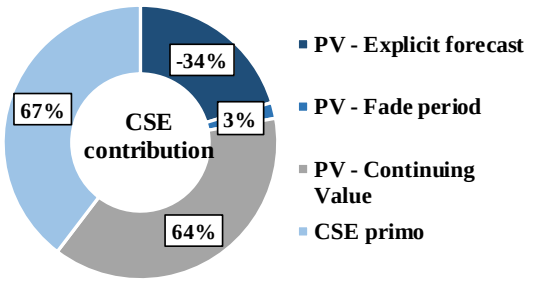
Valuation estimates	
$NOA_{t=0}$ (primo)	3,757
PV - Explicit forecast (2018 - 2022)	603
PV - Fade period (2023-2027)	1,007
PV - Continuing Value (2027-)	7,271
Value of operations (V_NOA)	**12,637**
$NFO_{t=0}$	-258
BIO $MV_{t=0}$	127
Intrinsic value of CSE	**12,506**
Number of shares outstanding at AR date	49
Value per share	**257.22**
Value per share adjusted (92 days)	**265.65**
Value per share adjusted (NOK)	**341.94**
Current stock price (06.04.2018)	454.60
Market pricing error (Downside)	-25%



42. Scenario 1: Decisive ISA outbreak

		Explicit forecast				
Numbers in mDKK	**2017A**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**
Time period (*t*)	*Actual*	**1**	**2**	**3**	**4**	**5**
Net sales	3,770	3,303	1,314	2,106	2,937	3,253
Operating Income	550	767	-1,057	-645	-106	-39
NOA	3,757	3,852	4,620	4,681	4,632	4,755
RNOA	20.50%	20.17%	-24.94%	-13.86%	-2.27%	-0.84%
WACC		4.53%	4.65%	4.83%	5.02%	5.21%
Residual operating income (ReOI)		579	-1,161	-900	-385	-326
PV of ReOI		**554**	**-1,060**	**-781**	**-316**	**-253**

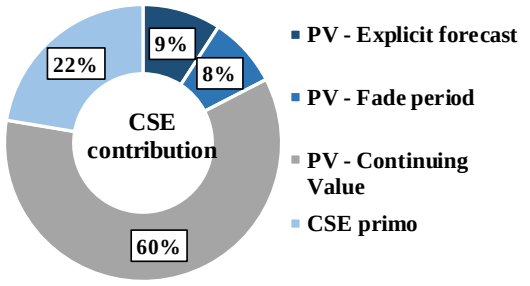
Valuation estimates	
$NOA_{t=0}$ (primo)	3,757
PV - Explicit forecast (2018 - 2022)	-1,856
PV - Fade period (2023-2027)	172
PV - Continuing Value (2027-)	3,493
Value of operations (V_NOA)	**5,566**
$NFO_{t=0}$	-258
BIO $MV_{t=0}$	127
Intrinsic value of CSE	**5,435**
Number of shares outstanding at AR date	49
Value per share	**111.78**
Value per share adjusted (92 days)	**113.13**
Value per share adjusted (NOK)	**145.62**
Current stock price (06.04.2018)	454.60
Market pricing error (Downside)	-68%



43. Scenario 2: Investment in 1 offshore production rig

		Explicit forecast				
Numbers in mDKK	**2017A**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**
Time period (*t*)	*Actual*	**1**	**2**	**3**	**4**	**5**
Net sales	3,770	3,303	3,350	3,892	4,009	4,483
Operating Income	550	767	519	528	501	599
NOA	3,757	3,852	4,747	4,817	4,859	4,912
RNOA	20.50%	20.17%	12.07%	11.04%	10.36%	12.27%
WACC		4.24%	4.35%	4.54%	4.74%	4.92%
Residual operating income (ReOI)		590	276	271	225	308
PV of ReOI		**566**	**253**	**237**	**187**	**242**

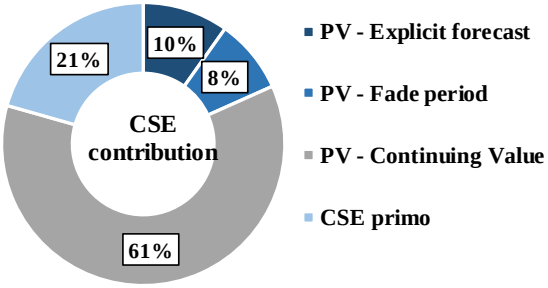
Valuation estimates	
$NOA_{t=0}$ (primo)	3,757
PV - Explicit forecast (2018 - 2022)	1,486
PV - Fade period (2023-2027)	1,339
PV - Continuing Value (2027-)	9,765
Value of operations (V_NOA)	**16,347**
$NFO_{t=0}$	-258
BIO $MV_{t=0}$	127
Intrinsic value of CSE	**16,216**
Number of shares outstanding at AR date	49
Value per share	**333.51**
Value per share adjusted (92 days)	**337.29**
Value per share adjusted (NOK)	**434.15**
Current stock price (03.04.2018)	454.60
Market pricing error (Downside)	-4%



44. Scenario 2: Investment in 2 offshore production rig

		Explicit forecast				
Numbers in mDKK	**2017A**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**
Time period (*t*)	*Actual*	**1**	**2**	**3**	**4**	**5**
Net sales	3,770	3,303	3,350	4,864	4,993	5,224
Operating Income	550	767	440	745	713	698
NOA	3,757	3,852	5,819	5,601	5,547	5,572
RNOA	20.50%	20.17%	9.09%	13.05%	12.80%	12.56%
WACC		4.24%	4.35%	4.54%	4.74%	4.92%
Residual operating income (ReOI)		590	161	449	399	368
PV of ReOI		**566**	**148**	**393**	**332**	**289**

Valuation estimates	
$NOA_{t=0}$ (primo)	3,757
PV - Explicit forecast (2018 - 2022)	1,728
PV - Fade period (2023-2027)	1,494
PV - Continuing Value (2027-)	10,751
Value of operations (V_NOA)	**17,730**
$NFO_{t=0}$	-258
BIO $MV_{t=0}$	127
Intrinsic value of CSE	**17,599**
Number of shares outstanding at AR date	49
Value per share	**361.97**
Value per share adjusted (92 days)	**366.07**
Value per share adjusted (NOK)	**471.19**
Current stock price (06.04.2018)	454.60
Market pricing error (Upside)	4%



45. Scenario 3: Land-based technology catches on

		Explicit forecast				
Numbers in mDKK	**2017A**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**
Time period (*t*)	*Actual*	**1**	**2**	**3**	**4**	**5**
Net sales	3,770	3,303	3,331	3,418	3,451	3,590
Operating Income	550	767	543	397	305	231
NOA	3,757	3,852	4,215	4,423	4,528	4,687
RNOA	20.50%	20.17%	13.47%	9.19%	6.82%	5.02%
WACC		4.24%	4.36%	4.55%	4.75%	4.94%
Residual operating income (ReOI)		589	330	162	50	-42
PV of ReOI		**565**	**303**	**142**	**42**	**-33**

Valuation estimates	
$NOA_{t=0}$ (primo)	3,757
PV - Explicit forecast (2018 - 2022)	1,019
PV - Fade period (2023-2027)	205
PV - Continuing Value (2027-)	2,209
Value of operations (V_NOA)	**7,190**
$NFO_{t=0}$	-258
BIO $MV_{t=0}$	127
Intrinsic value of CSE	**7,059**
Number of shares outstanding at AR date	49
Value per share	**145.19**
Value per share adjusted (92 days)	**146.83**
Value per share adjusted (NOK)	**189.00**
Current stock price (06.04.2018)	454.60
Market pricing error (Downside)	-58%