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Valuation of Mowi ASA

Graduate thesis in Financial Management
Supervisor: Hans Marius Eikseth

April 2020

Graduate thesis

NTNU
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Kunnskap for en bedre verden

Preface

This graduate thesis is written by three students at NTNU Business School in the spring 2020. It corresponds to 7.5 credits (ECTS) and is executed as a part of our bachelor's degree in Business Administration with specialization in Financial economics.

Despite long days of hard working, it has been exiting to work with the thesis. We have expanded our knowledge and insights of the salmon industry and challenged our abilities and skills in the analysis.

We would like to thank our supervisor, Hans Marius Eikseth, for guiding and advising us when necessary.

The authors of this thesis are responsible for its content.

Abstract

Throughout the last months we have gathered data from quarterly and annual reports, textbooks, research papers, news articles and other valuations in order to produce a comprehensive analysis and valuation of Mowi ASA. The stock price we found is a function of a relative and absolute valuation which again is based on a strategic analysis and a financial statement analysis.

We started out by going through Mowi's history in order to get a better understanding of the industry. This created the knowledge foundation for our strategic analysis, which consists of a PESTEL-analysis, Porter's Five Forces, a VRIO-analysis as well as a SWOT to sum up the important findings. In the financial statement analysis, we took a closer look at Mowi's financial situation, profitability, solidity as well as liquidity. This gave us a good impression of Mowi's overall financial and economic condition.

As a result of the relative and absolute valuation we reached a share price of NOK 178.1. Since the actual share price per 31.12.19 was NOK 228.2 our recommendation is to sell the share.

Our work with this semester thesis has been affected by the ongoing situation caused by the coronavirus in terms of communication and access to information. As the assignment is already limited in resources, we have added some final criticism in a dedicated section to shed light on potential weaknesses in our analysis.

Samandrag

Gjennom dei siste månadane har me samla data og informasjon frå kvartals- og årsrapportar, bøker, forskingsdokumenter, nyhendesartiklar og andre verdisetjingar for å kunne gjennomføra ein omfattande analyse og verdsetjing av Mowi ASA. Aksjeprisen me har kome fram til er ein funksjon av relativ og absolutt verdsetjing, som igjen er basert på strategiske og regnskapsmessige analyser.

For å få ei betre forståing av lakseindustrien, har me starta med ein gjennomgang av Mowis historie. Dette skapa kunnskapsgrunnlaget for vår strategiske analyse, som består av PESTEL-analyse, Porters fem konkurransekrefter, VRIO-analyse, samt ein SWOT-analyse for å samanfatte våre viktigaste funn. I regnskapsanalysen har me tatt ein nærmare titt på Mowis økonomiske situasjon, lønnsemd, solidaritet og likviditet. Dette gav oss eit godt inntrykk av den overordna finansielle og økonomiske tilstanden til Mowi.

Som eit resultat av den relative og absolutte verdsetjinga, har me kome fram til ein aksjekurs på NOK 178.1. Sidan den eigentlege aksjekursen per 31.12.19 var NOK 228.2, er vår anbefaling å selje aksjen.

Arbeidet med semesteroppgåva vår har blitt påverka av den pågåande coronasituasjonen, ved at kommunikasjon og tilgang til informasjon er blitt redusert. Sidan oppgåva allereie har reduserte ressursar, har me i ein eigen del lagt til kritikk av oppgåva og kasta lys over potensielle svakheiter.

Table of Contents

1. Introduction

In this thesis we have chosen to carry out a valuation of the Norwegian seafood company Mowi ASA (Mowi). We will apply relevant theory and tools acquired throughout our degree to find out if the share is reasonable priced on the Oslo Stock Exchange.

Initially, we wanted to get a better understanding of the seafood sector, and our further motivation to choose Mowi is that it is one of the largest seafood companies in the world. We find the seafood industry, and thus Mowi, interesting because it is an important GNP contributor in Norway. The sector also faces several major challenges, including biological and ethical challenges. In the recent time there has been a discussion regarding a resource rent tax for the industry, and the technological innovation, especially concerning land-based farming, is moving forward at a fast pace. These are some of the issues we wish to get a deeper understanding of and will be addressed in the further analysis.

Our research question is: "What is the value per share of Mowi per 31.12.19?"

In chapter 2, we will give a presentation of Mowi and salmon industry, such as Mowi's history, the farming production, the market's supply and demand and environmental aspects of the industry. Further on, we will in chapter 3 do a strategic analysis to analyze growth opportunities for Mowi and the industry, applying tools to analyze both macro-environmental and competitive forces. After that, we will jump into Mowi's financial statement and get an overview of its overall financial health. On the basis of the strategic and financial statement analysis, we will in chapter 5 do a financial analysis, including the absolute valuation method and the relative valuation method. Finally, we will conclude and estimate the share price, by applying all of the valuation methods in chapter 6, as well as criticism in chapter 7.

2. Presentation of Mowi ASA and the Industry

Mowi is one of the world's largest seafood companies and a global leader in its business. Since their establishment in 1964 they have become the largest producer of Atlantic salmon with a turnover of EUR 4.1 billion in 2019. They have 14 866 employees and are headquartered in Bergen, Norway (Mowi, 2020).

2.1. History

As mentioned above, Mowi ASA started their business journey in 1964 and has since that been through a lot of acquirements. Johan Lærum, Haakon Baardsen and Johan Ernst Mowinckel founded Lærum og Co AS in 1945, and in 1964 they entered the seafood business with experimenting farming of Atlantic salmon. From that moment, the salmon adventure of Mowi began (Mowi, 2020).

After some years of experience with Atlantic salmon farming and production, Lærum og Co AS was in search of investors to expand their business. In 1969 they got in touch with Norsk Hydro, who invested NOK 2.3 million in the company, equal to 50% of the shares. At the same time, they changed their name to Mowi. In the time that followed, Mowi met several problems regarding the industrial farming of salmon, such as diseases, sea lice and need of oxygen. They didn't have much of experience, but the thought of development pushed them forward. (Jensen, kyst.no, 2018)

In 1980 Norsk Hydro bought the remaining shares and separated their salmon activity into a new division called Hydro Seafood. Hydro Seafood grew a lot during the following years, and in 1985 they ran business in Norway, Ireland, Scotland and Iceland and had become the world's largest producer of Atlantic salmon. In the end of the 90's they also acquired several salmon farms at Helgelandskysten and in Rogaland. In 2000 the Dutch company Nutreco bought Hydro Seafood. Nutreco had entered the salmon business after buying the Scottish farming company, Marine Harvest, in 1999. Some years later, in 2005, Nutreco merged with Stolt Sea Farm and named themselves Marine Harvest. Stolt Sea Farm was the salmon farming company of the Norwegian shipping company Stolt-Nielsen. (Bryhn, 2019)

In the same year the Norwegian shipowner John Fredriksen bought the largest shareholding in Pan Fish through the investing company Geveran Trading Co. Ltd, as well as 25% of Fjord Seafood. The year after, in 2006, he bought the remaining shares of Fjord Seafood and the majority of the shares in Marine Harvest. Fredriksen was now controlling Pan Fish, Fjord Seafood and Marine Harvest and merged all three companies into one under Marine Harvest ASA. He listed the company on the Oslo Stock Exchange the same year.

In 2013 the Polish-Norwegian salmon farming company, Morpol, became a part of the Marine Harvest Group. In 2017 Marine Harvest acquired the Canadian companies Gray Aqua (Kinsella, 2016) Group and Northern Harvest and established Marine Harvest Canada East (Smith, 2018).

Marine Harvest announced in December 2018 a change of name into Mowi (Oslo Børs, 2018). The new name and brand were launched January 2019 and symbolized the tradition and history of Norwegian salmon farming. Mowi is today exporting seafood products to approximately 70 countries world-wide and is represented in 25 countries. John Fredriksens company, Geveran Trading Co. Ltd, is still the largest shareholder with 12.7% of the shares. Other large shareholders are Folketrygdfondet (9.1%), Clearstream Banking S.A. (5.2%) and State Street Bank and Trust Comp. (4.2%).

2.2. Current and historical share price of Mowi

Mowi has over the last five years experienced a remarkable growth and an increase of its share price of 140.11% from February 2015 to February 2020. The increase from a price of NOK 94.0 (Feb. 15), to NOK 225.7 (Feb. 20), is equivalent to an annual growth of 19.76%. As shown in figure 2-1, Mowi's growth has been greater than the OSEAX index.

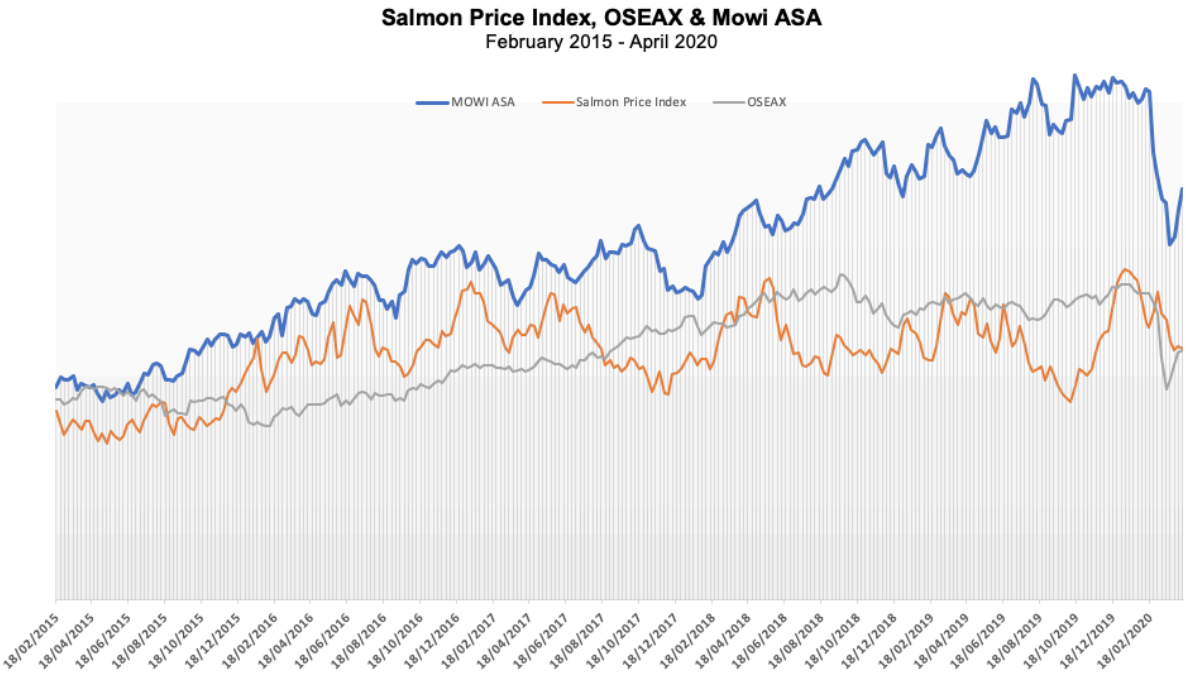


Figure 2-1: Graphical illustration of Mowi's share price, relative to OSEAX and the salmon price index. Data source: Yahoo Finance and Statistics Norway (SSB).

If we take a short look at the Salmon Price Index, we'll see that the stock of Mowi reacts quite similar to the Salmon Price. This is especially case until July 2017, and indicates quite high grade of volatility, which isn't unusual in the salmon industry. From July 2017 the share price was not as correlated to the Salmon Price as before. A part of this explanation is an appreciation of Euro, as well as record-high operational EBIT in 2016 (Mowi, 2017), with a following success in 2017 and 2018 (Hovland, 2018).

The market value of Mowi is per 16.04.2020 at NOK 93.5 billion, which equals 4.28% of the total market value at Oslo Stock Exchange. Only Equinor, Telenor, DNB and Yara are larger than Mowi measured in market value. Because of the world's general decreased demand for goods and lock-down of societies, due to the corona crises, Mowi's share price has along with the world's indexes declined from its February top. Though, since the end of March, the share price has increased with 15.24%, but the volatility in the market is still high.

Because of the available financial data, we will valuate Mowi per 31th of December 2019. The present financial situation is anyhow relevant when estimating future prospects.

The share price of Mowi per 31.12.2019 was at NOK 228.2.

2.3. The farming production Atlantic salmon

In this section our primary source of content is the Salmon Industry Farming Handbook 2019 (Mowi, 2020).

A grown Atlantic salmon is not produced over the night but has a farming production cycle at approximately three years. The production starts indoor (most often) in controlled freshwater environment, where eggs are fertilized and fish are grown to about 100-150 grams, called smolts. This process takes between 10-16 months and the smolts are thereafter transported to seawater for further growth. In Norway, smolts are mainly released twice a year, and most often in the last quarter of the year. This because it's the best period of growth. In seawater cages the salmon are grown to around 4-5 kg over a period of 12-24 months, highly dependent on the seawater temperature. When they reach a harvestable size, the fish are transported back onshore for slaughtering and processing.

The biggest key aspect regarding the time cycle of production, is as mentioned the seawater temperature. The temperature plays an important role in the growth rate of Atlantic salmon, because it's a cold-blooded animal. In the northern production countries (like Norway, Canada, Iceland, Ireland and Scotland) temperature can vary as much as 10°C. The optimal temperature is between 8°C and 14°C, which creates some challenges for Norwegian seawater, who sees temperatures down to 5°C in winter and in Ireland up to 16°C in summer. Even though the seawater temperatures sometimes are not optimal, it's still acceptable since Atlantic salmon thrive well from 4-18°C. Nevertheless, Chile has an important natural competitive advantage compared to the other production areas with its stabile seawater temperature between 10°C and 14°C.

In mid-2014, Mowi started their own feed production from their first feed plant. In 2018 the plant produced approximately 9% of the global salmonid feed and gained a market share of 19% in Norway. Mowi's second feed plant was completed in 2019. The feed production of Mowi makes them unique in the salmon farming industry, as the only salmon farming company who produces its own feed.

As well known, the world's indexes have suffered dramatic losses because of the corona crisis. This is also the case for Mowi, who has experienced a decrease in its stock value.

Much of the export of Norwegian salmon is transported with passenger planes in the commercial air traffic (Norwegian Seafood Council, 2020). The extreme decrease in the demand of travelling – because of restricted policies from the world's governments, as well of even closed borders – has reduced the activity of airline companies. If the commercial air traffic doesn't get back to normal within short time, and the cargo traffic doesn't compensate the loss, this might be the greatest concern of Mowi. Using cargo planes as shipping may cause higher transportation costs and will therefore only work as a temporary solution. Whether this remains as a short-term concern or develops into a long-term problem, is unsure, but it may have an impact at the growth of Mowi.

2.4. The salmon markets

Historically, the salmon producing regions have serviced the nearby geographical markets. This is because the salmon is marketed as a fresh product. Time and transport costs are therefore important factors that determine the circulation of salmon in the markets. As a consequence, there are short term regional differences in the salmon price development. Such arbitrage opportunities arising from supply/demand shocks are required in order to justify transatlantic trade. Regarding the Asian market, it is generally shared, as transportation costs from the different producing regions are relatively similar.

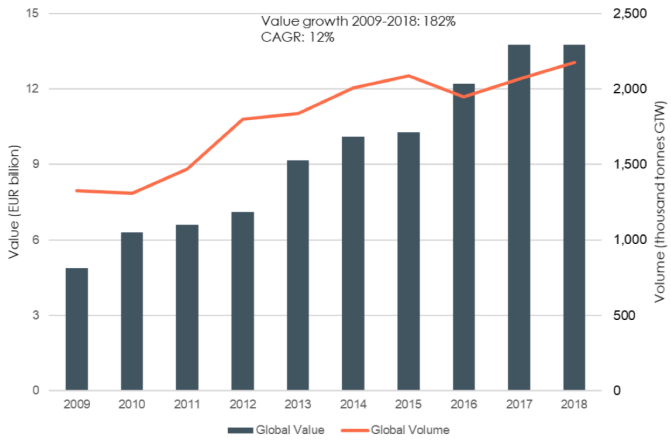


Figure 2-2: Global value and volume of Atlantic salmon.

Figure 2-2 illustrates the development of value compared to produced volume in the industry. The trend is that the demand exceeds the supply, which has implications for the salmon price development. A low growth rate in the salmon supply along with high demand have resulted

in high salmon prices and record profits. As a result, the average salmon price has increased by more than 50% from 2013 to 2018 (EY, 2019). The weakening of the Norwegian krone (NOK) vs. EUR in the period has also positively affected the profits. The salmon industry had a record high operating margin of 37% in 2016 and 33% in 2017 and 2018 (Ytreberg, DN, 2020).

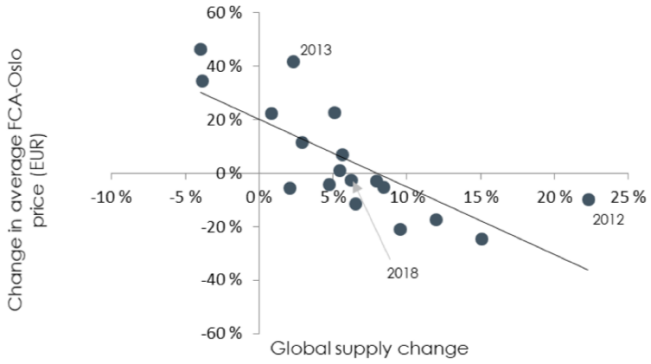


Figure 2-3: Linear regression showing the correlation between change in supply and FCA average price.

Figure 2-3 shows that there is a strong correlation between the change in supply and average FCA Oslo price (in EUR). In the period 2000 to 2011, the changes in supply explains 84% of the change in price. The salmon price is generally volatile, mainly due to the fluctuations in supply and seasonal-based changes in demand. Since the salmon producing process is long (around 3 years), the supplied volumes are difficult and costly to adjust. Other factors that affect the salmon price include sales contracts (derivatives) reducing volumes available in the spot markets, disease outbreaks (affecting supply) and the salmon quality.

There are also differences in salmon prices for different fish sizes. Due to biological factors, the fish grows at different rates. However, the fish size will be normally distributed, and the majority of fish is harvested at 4-5 kg. Naturally, the supply of different fish sizes will be smaller for the small and large fish. Generally, the smaller fish sells at a discount and the larger fish sell at a premium, partly due to the demand in niche markets. Other factors that affect the size fluctuation are market and biological risk, i.e. the salmon farmers wanting to minimize diseases and potential early harvest to improve cash flows. The trend is that the

average harvesting weight of the salmon is decreasing; from 2012 to 2018 the average harvesting size has decreased by 400g, resulting in large potential revenue losses (Ytreberg, DN, 2020).

	Top 10 - Norway	H.Q.	Top 5 - United Kingdom	H.Q.	Top 5 - North America	H.Q.	Top 10 - Chile	H.Q.
1	Mowi	230,400	Mowi	38,400	Cooke Aquaculture	60,800	"New Aquachile" (Agrosuper)	109,000
2	Salmar	142,500	The Scottish Salmon Co.	29,900	Mowi	39,300	Mitsubishi / Cermaq	66,000
3	Lerøy Seafood	137,800	Scottish Seafarms	27,500	Mitsubishi / Cermaq	21,800	Salmones Multiexport	64,800
4	Mitsubishi / Cermaq	57,400	Cooke Aquaculture	21,600	Grieg Seafood	16,600	Mowi	53,200
5	Grieg Seafood	46,100	Grieg Seafood	11,900	*		Blumar	47,600
6	Nova Sea	37,900	*				Camanchaca	43,600
7	Nordlaks	36,100					Australis Seafood	34,500
8	Norway Royal Salmon	36,000					Ventisqueros	30,300
9	Sinkaberg-Hansen	27,500					Invermar	20,000
10	Alsaker Fjordbruk	26,000					Marine Farm	19,800
	Top 10	777,700	Top 5	129,300	Top 5	138,500	Top 10	449,000
	Others	350,400	Others	8,900	Others	10,200	Others	160,700
	Total	1,128,100	Total	138,200	Total	148,700	Total	609,700

Figure 2-4: The biggest producers of salmon by region.

We can see from figure 2-4 that there are some big participants in the salmon market, and that the major producing regions are Norway and Chile. Mowi is the largest total contributor in the salmon market.

2.5. Salmon supply and demand

The presentation in this section is mainly based on the Mowi salmon farming industry handbook from 2019.

Meat (including seafood) has gradually become more important as a source of protein and other nutrients through the last decades. However, fish only accounts for 5% of the global protein consumption. The role of salmonids (primarily salmon and trout) is rather small, as it accounts for 4.4% of the global seafood supply. Since the land-based protein production is scarce, an important question arises: how can the production/harvesting of sea-based proteins be expanded? The trend is shifting towards aquaculture, as the global supply of wild catch is stagnating.

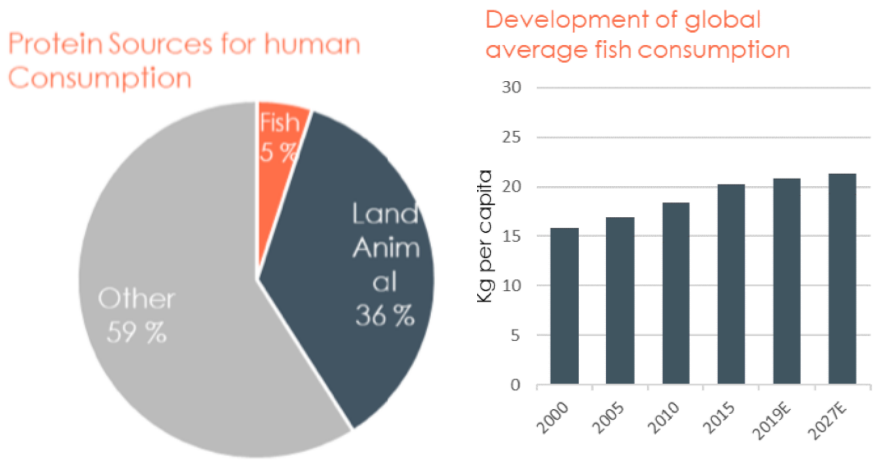


Figure 2-5: Left: Protein sources of human consumption. (Mowi, 2020)

Figure 2-6: Right: Development of global average fish consumption. (Mowi, 2020)

The aquaculture sector is expanding and is the fastest growing animal-based food industry. Since 1995 the supply of salmon has increased by 443%. However, there are some factors dramatically slowing down this growth. First, the supply growth in salmonids is constrained by biological conditions, i.e. seawater temperature and other natural factors. As a consequence, farmed salmon is only produced in Norway, Chile, UK, North America, Faroe Islands, Ireland, New Zealand and Tasmania. Some firms are trying to bypass the biological constraints by moving to land-based farming, but the volumes are so far limited. Second, there are entry barriers to the industry. In all geographical areas where salmon farming is carried out, the fish farming activities is regulated by the government. In order to start production, a license is needed. Thus, the biomass and salmon supply are limited to a given volume. Continued industry growth is highly dependent on solving the biological challenges that the sector is facing.

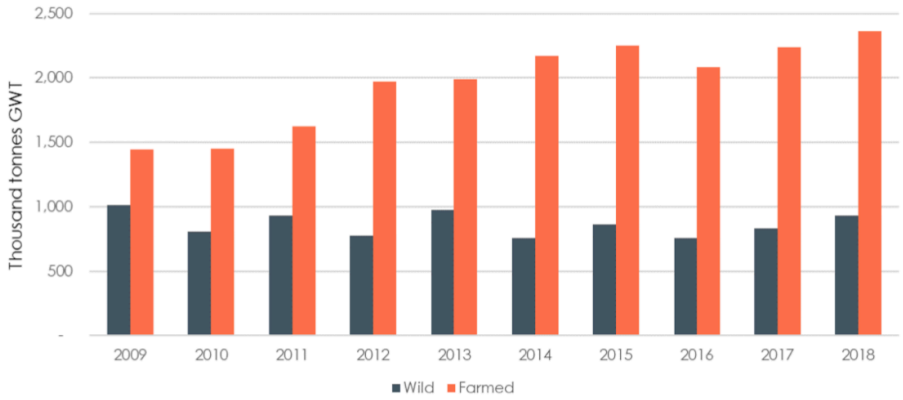


Figure 2-7: Supply of farmed and wild salmonids. (Mowi, 2020)

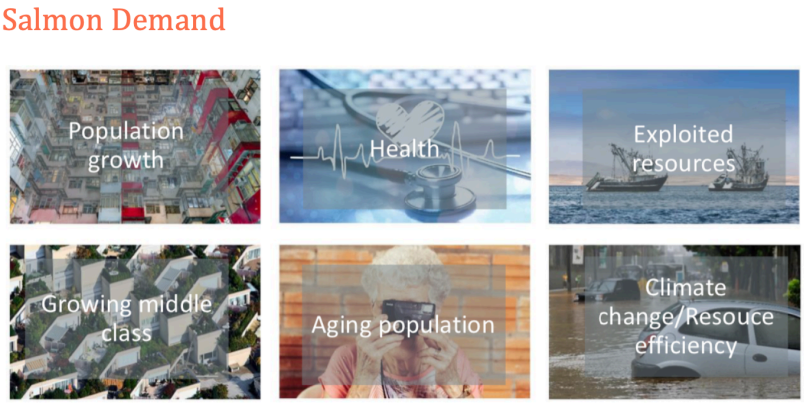


Figure 2-8: Salmon demand. (Mowi, 2020)

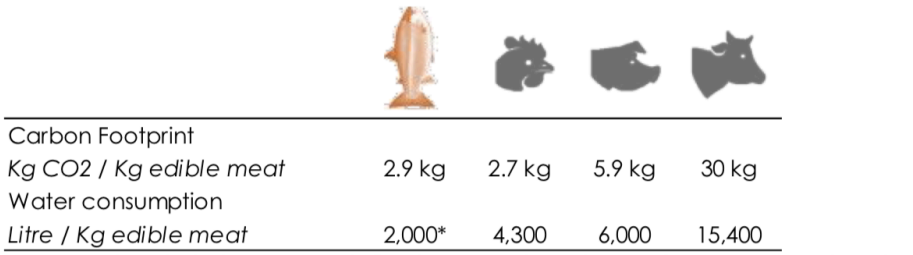
Important factors that affect the global salmon demand are listed in figure 2-8. An increasing global population leads to a greater demand for food. Along with this, the trend is that the middle class is growing in emerging markets. It is expected that this will affect the consumption habits, so that the demand for high-quality proteins like salmon will increase. Governments and health advisory organizations has emphasized health benefits from marine-based proteins and encourages fish consumption. As the population is aging, eating healthy becomes more important which may substitute some of the current protein consumption in the direction of salmon and other seafood. In addition to the mentioned factors, the income (GNP) growth in trading partners' economies is important to determine demand, along with trends in consumer preferences and the price of other substitutes available in the market.

2.6. The environmental and ethical aspects of salmon farming

The impact of carbon emissions and climate change has gained increased attention, and therefore sustainability is a key focus area to salmon farmers. The Paris Agreement, which entered into force in November 2016, brings all nations into a common cause to combat climate change and adapt to its effects (UN, u.d.). An important question is how to work towards the climate goals. The UN concluded in a report that the food industry as a whole is accountable for 37% of the total greenhouse emissions (McFall-Johnsen & Woodward, 2019).

As figure 2-9 states, the environmental impact (both CO2 emissions and freshwater consumption) of salmon farming is relatively low, especially compared to the beef producing industry. However, there are emissions, and the main contributor in the salmon farming

industry is the feed production, making out 95% of the emissions in traditional farming (EY, 2019). The feed industry has shifted from marine resources towards vegetable materials (e.g. soy) as input factors in the feed. This has implications for the nutrients in the salmon as well as environmental aspects, as this increases the carbon footprint.



Carbon Footprint				
Kg CO2 / Kg edible meat	2.9 kg	2.7 kg	5.9 kg	30 kg
Water consumption				
Litre / Kg edible meat	2,000*	4,300	6,000	15,400

**Total water footprint for farmed salmonid fillets in Scotland, in relation to weight and content of calories, protein and fat.*

Figure 2-9: Carbon footprints of meat and fish. (Mowi,2020)

An important ethical aspect of salmon farming is the fish welfare. A growing challenge in the industry is the sea lice, which causes high salmon morality rates. But not only the salmon is affected; each year approximately 50 million individual cleanerfish (i.e. fish that eat sea lice) die in the net pens (Stranden, 2020). The mortality rate is very high, and experts agree that today's use of cleanerfish is unsustainable. Another ethical challenge is salmon escaping the net pens and thus affecting the coastal wildlife and ecology, especially the tribes of wild salmon.

In the Norwegian Aquaculture Analysis of 2019, EY claim that reputational risks related to sustainable and sound production and fish health *may* represent the greatest market risk for the industry (EY, 2019). It is apparent that the industry is spending great resources trying to address these challenges, not only to increase profitability in the longer run, but also as a part of their corporate social responsibility (CSR).

3. Strategic Analysis

When estimating future earnings and financial aspects, the market situation and Mowi's strategic position are highly relevant. In this strategic analysis we will apply three different analysis; PESTEL, Porters Five Forces and VRIO, as well as summary using the comprehensive SWOT analysis.

3.1. PESTEL

The PESTEL analysis is a framework to analyze the macro-environmental factors that have impact on an organization. The goal of using this tool is to get an overview of all the external forces that may change the organization's position, growth and profitability in the future. PESTEL stands for the six elements in the analysis; political, economic, social, technological, environmental and legal.

3.1.1. Political

We'll start discussing the political aspects of the salmon business by looking at how incidents in the world politics is affecting Mowi.

China has historically been an important trading partner to Norway and a great importer of Norwegian salmon. Norwegian salmon producers benefited this relationship and had a total market cap of approximately 95% of the Chinese salmon market until 2010 (Ytreberg, DN, 2017). This turned up-side-down in the end 2010, when the Chinese regime critic Liu Xiaobo was given the Nobel Peace Prize. Because the ceremony was held in Norway, and the Norwegian politician Jan Tore Sanner was one of them that nominated Xiaobo, China reacted strongly against the western nations, especially Norway, and cut off all political contact, harming the export of Norwegian goods to China dramatically (Kristiansen, 2017). Nevertheless, in 2016, Norway and China normalized their diplomatic relationship and in May 2019 Chinese authorities let Norwegian salmon producers into their market (Skaug, Knudsen, & Haugen, 2019). As a side-effect of the non-trading period from 2010 to 2019, Chile has increased their market cap and achieved great trading terms, including a non-custom policy of fish (Bach, 2018).

There has been a lot of discussions in the aquaculture environment during the last couple of years, regarding how the Norwegian government will be taxing this fast-growing industry. The government are very clear that the industry will be given more fees and/or taxes, but the question is what tax structure they'll implement. As to the oil industry and hydropower industry, these industries are already operating with resource rent tax, which is an extra tax rate you add to the corporate tax rate when calculating profit. For the oil industry this rate is 56% (Norsk petroleum, 2019), and 37% (Energifakta Norge, 2019) for the hydropower industry. With the corporate tax at 22%, this gives a total tax rate at 78% and 59% for respectively the oil industry and hydropower industry. The idea behind resource rent tax is that corporations who uses a nation's resources, belonging the citizens of the nation, should also pay for using these resources. Salmon escapes from sea farms is one example of such resource problems concerning the salmon industry, because salmon producers only loose revenues, but doesn't directly bear any costs. The escaped salmon will regardless affect the wild Atlantic salmon negatively and could harm the wildlife of Atlantic salmon, which is the property of the nation, not the producer.

In autumn 2018, the Norwegian government appointed a committee, consisting politicians, economists, lawyers and other stakeholders, to construct a suitable tax system for the aquaculture industry (NOU 2019: 18). In November 2019, the committee suggested a resource tax rate at 40%. Nothing is yet finally decided, and the committee's suggestion has been met by resistance, both outside the committee and inside (because the minority was against the final suggestion) (Solgård, Helle, & Randen, 2019). It is hard to predict where this will end, but anyhow the salmon industry will be added more taxes and/or fees. The salmon industry has gone from being a "side-line business" to one of Norway's key export businesses, and it is therefore reasonable to believe that the government will intervene financially. A lot of political negotiations, as well as lobbying, will take place before finding a final solution. Whatever the outcome, it will somehow reduce Mowi's growth opportunities in the future.

The decisions of who that gets permission to produce salmon, and how much they are allowed to farm, is regulated by the Ministry of Trade, Industry and Fisheries of the Norwegian government. This is organized through sea-water licenses, administered by the Directorate of Fisheries (Mowi, 2020). Every second year, the government announces the condition for growth on these licenses, through the Traffic-Light-System

("Trafikklyssystemet") (Regjeringen, 2017). This system is meant offer the producers a predictable growth, as well as safeguarding the environment in the thirteen production areas along the Norwegian coast. If a production area sees the green light, the producers are allowed to increase their production with 6%. If yellow, they need to maintain the existing production level, and if red, a decrease of 6% in the production level. The politics behind the Traffic-Light-System does strongly affects the outcome, and for the consideration of Mowi it means that political stabilization and supporting politicians helps them maintaining a profitable production level.

3.1.2. Economical

Mowi is exporting most of their fish abroad and the currency of the Norwegian Krone (NOK) is therefore worth mentioning. Europe is Mowi's largest market, represented by 70% of the total revenues in 2018 and 2019, which makes it interesting to look closer to EURNOK (Mowi, 2020).

NOK has the past years been very weak, with the Euro around NOK 9.5 since 2016. For Norwegian businesses exporting their goods, this results in extra revenues, because they gain an extra profit when converting sales from Euro into NOK.

One of the explanations to the weak NOK is the Norwegian interest rate, determined by Norges Bank. After the downturn in the oil industry in the period of 2014-2016, when the oil price felt dramatically from USD 115 pr. Barrel to USD 30 pr. Barrel because of USA's new oil technology and OPEC returning to their normal production, the Norwegian economy lost its growth and the unemployment rate rose. Norges Bank did therefore reduce the interest rate to 0.5% to stimulate the economy and facilitate growth and kept this rate until August of 2018. From August of 2018 to September of 2019 they increased the interest rate to 1.5% and had further plans of keeping the slope upwards, until the Corona crises really hit the international markets in March of 2020. As one of the monetary tools to save the Norwegian economy, Norges Bank reduced the rate to 0.25% (Norges Bank, 2020). How long the interest rate will maintain this all-time low level, is very unsure because of the current situation in the world. It is anyhow reasonable to assume that the currency of NOK will stay low for quite a while, because of the low levels at the interest rate and oil price.

As mentioned, the Corona crises has affected the world's economy and the general demand for goods. We find the most dramatical decrease in export of Norwegian salmon in China and Italy, where the Corona virus also has been damaging the most. China's import of Norwegian salmon has in February 2020 decreased with 83%, resulting in a decrease of 47% this year. In contrast to Norway's export to Europe, Norwegian salmon ends directly up at Chinese restaurants and grocery stores. Because of the isolation of Chinese citizens, much of the Chinese demand for Atlantic salmon suddenly disappears. For the European markets, such as Poland, Denmark and Lithuania, where Norwegian salmon are exported for further processing and resold into new markets, the demand hasn't been hit that hard. Nevertheless, if the restrictions of European citizens continue, the Corona crises will also harm these markets. As a side-effect, some of the decrease in export of Norwegian salmon has led to an increase of export in other markets. As Norwegian Seafood Council states, much of the salmon that was meant for China have in February been exported to Taiwan (increase of 73%) and USA (increase of 22%) instead. This side-effect is only temporary though, because one of the greatest concerns regarding the global salmon market, is the missing capacity in the air transport. Because of the strict policies of travelling in these times, passenger planes cannot transport as much fish as before. The salmon producers may therefore prepare for higher transportation cost and greater competition of the limited capacity at planes, between other goods such as medical equipment and engineering components. (Norwegian Seafood Council, 2020)

3.1.3. Social

As mentioned in the salmon markets chapter, the salmon price has during the last ten years grown a lot, as a result of an increasing popularity of seafood. Of all the Norwegian exporting seafood, salmon is the most valuable, as shown in figure 3-1. Salmon constitutes 39% of all Norwegian exporting seafood, measured in quantity, but represents 66% of its value. The popularity and growth of the salmon has been, and will be, the most important social factor to maintain a profitable salmon industry. (Norwegian Seafood Council, 2020)

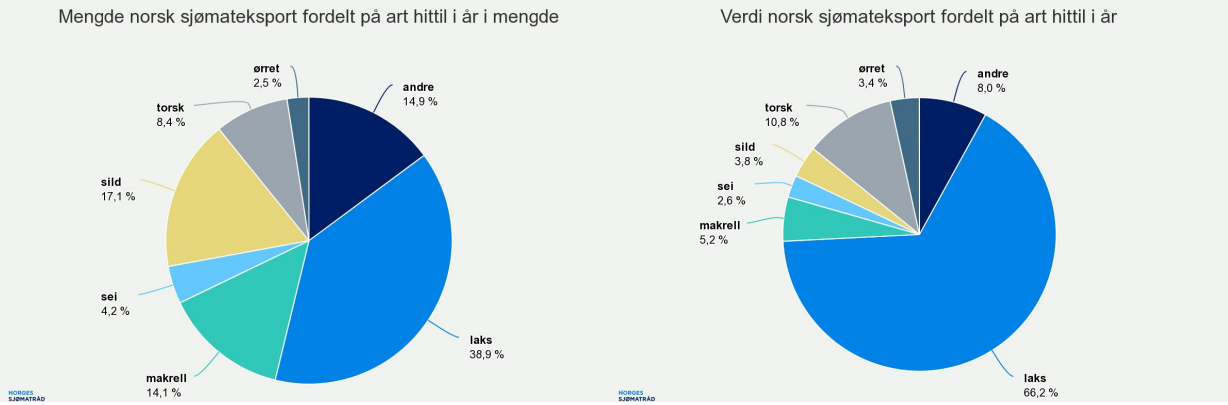


Figure 3-1: Volume vs value of Norwegian exported seafood. Source: Norwegian Seafood Council.

When discussing the social factors that has impact on the salmon industry, it is natural to look at the trendlines in the international markets. (Norwegian Seafood Council, 2020)

In Mowi's Annual Report 2019, they state Germany as a very important region and has experienced good growth in the German market in 2019 (Mowi, 2020). This correlate very well with a report conducted by the Norwegian Seafood Council in 2019, where they state that the consume of fresh salmon has been doubled the last five years. The popularity of salmon is greatest among younger people in the age group of 20 to 34 years, with the popularity of sushi as the main driver. Salmon is the preferred fish in German's sushi. The report also claims that Norwegian seafood has a very good and stable reputation and that Norway is the country they strongest associate with seafood.

The Asian market are also going very well, according to the Norwegian Seafood Council's report. Most of the salmon in China, approximately 80 percent, is fresh Atlantic salmon, where the consumption of sashimi and sushi are most popular. HORECA is the most important entrance for fresh salmon, especially through Japanese restaurants. As explained in the political aspects, Norway have struggled to get back to the Chinese market, but the Norwegian Seafood Council states that the market cap of Norwegian Atlantic salmon is 36%, per October 2019. We find the same trend in Thailand, where 30% of the respondents have answered that they eat Atlantic salmon once in a week. As in China, the Japanese food traditions have contributed the increase of the salmon consumption and the number of Japanese restaurants has had an annual increase of 20% since 2007. Similar to the Germans, Atlantic salmon has become most popular among younger people, which indicates great growth opportunities in the countries' general demand. According to the report, 50% of the Thai consumers below 34 years eat seafood at restaurants once in a week.

3.1.4. Technological

Two of the biggest topics regarding new technology and opportunities for the future aquaculture industry, is land-based farming and exposed aquaculture. The traditional method of open-net fish farming is not sustainable in the future, and there are therefore a lot of opportunities to improve the industry's challenges as sea lice, salmon escapes and extensions of the production. This forces innovative firms and institutions to bring new, technological solutions into the market.

Closed-containment farming systems can both be based at sea and land. Because of a physical barrier between the fish and the sea, lice cannot come in and fish cannot escape, which appears to be the main advantage of such systems. As known, these closed-containment systems are already in use in the production of smolts, but if these systems can be used to produce salmons up to 1 kilogram, in contrast to the 100-gram smolts, the salmon will be significantly stronger and more robust (Biomar, 2019). If so, it will handle more exposed farming locations with strong currents and waves, such as exposed aquaculture. One of those who work with closed-containment farming systems, is CtrlAQUA, which is a centre for research-driven innovation in closed-containment farming systems, established by the Research Council of Norway in 2015 (Nofima, 2019). They are cooperating with a centre for innovation within exposed-aquaculture operations, Exposed SFI (Sintef), who is doing innovative research of open-water fish pens far out in the ocean (exposed aquaculture).

As mentioned, exposed aquaculture is one of the subjects of future salmon farming. In the future, the world must produce more food using less resources with as low environmental footprints as possible. As the Centre Director of Exposed SFI, Hans Bjelland, states, the ocean has plenty of space, stable, good water conditions and greater distance between fish farming facility, which reduces the infection pressure (Nofima, 2019). It will be easier to expand production of salmon in the ocean, than in the fjords or locations close to land. If the salmon get to grow big (up to 1 kg) in closed-containment farming systems, Bjelland means that they can reduce the time spent at sea to 10 months, in contrast to the current of 16-18 months. In that case, they can avoid the two most severe winter months with bad weather, and since one third of all salmon escapes occurs in bad weather, this makes an important advantage. In order to let exposed ocean farms work sufficiently, they need farms that produces wealthy and strong salmons, as CrtlAQUA are doing research on. There are

however uncertainties if the salmon are able to thrive in fast water currents (Hvas, Folkedal, & Oppedal, 2019).

In October 2019, the first fishes were put out at Ocean Farm 1, developed by the Norwegian salmon producer, SalMar. This is the world's first offshore fish farm and was initiated by the Norwegian Ministry of Trade, Industry and Fisheries through development licenses. As SalMar states it, the offshore farm's objective is "(…) to spur new technology concepts that can ensure sufficient growth whilst also ensuring environmental sustainability." (SalMar, 2019). The project has applied technology and standards from the offshore industry, and the construction is built on the same principles as submersible offshore installations. This kind of partnership and interdisciplinary cooperation is most likely to be seen in future exposed aquaculture projects.

Along with exposed offshore farms, land-based seafood farms are the greatest opportunities for new technology to expand the production of seafood and solve the environmental issues. Land-based farms has no contact with the sea and the risk of salmon escapes are therefore declining to zero, as well as the risk of sea lice decreases significantly. There are still some uncertainties if farmers are able to eliminate the risk of sea lice completely through the supply of water (Fiskeribladet, 2019). The demand of Atlantic salmon exists all over the world, but the production does only take place in certain countries, which causes huge transportation costs. It is both quite expensive and not sustainable, with regard to the environment and climate, to transport the fish with planes across the world. With land-based seafood farms producers can supply the markets geographically closer to the demand, that would cut a lot of time and costs especially in the U.S. and Asia. With land-based farms all over the world, the geographical competitive advantage of Norway can get harmed by new foreign producers, but due the expected increase of salmon demands the effect doesn't necessarily need to get that big.

In June 2016, the Norwegian government changed the legal framework so that land-based seafood farms could get free farming licenses (Regjeringen, 2016). This has resulted in many Norwegian seafood producers experimenting the concept of land-based farming, and according to Intrafish there are now 17 corporations working with land-based farming, with two of them started the farming production (Furuset, 2018). The Norwegian salmon producer, Atlantic Sapphire, has already built two large land-based seafood farms, one in the U.S. and

one in Denmark, and according to their investor presentation they aim for an annual production of 220 000 tons of Atlantic salmon within 2031 (Atlantic Sapphire, 2019). In comparison, the present total production of Norwegian Atlantic salmon is 1.3 million tons (Fiskeridirektoratet, 2019), and the American annual import of Atlantic salmon at 500 000 tons. Atlantic Sapphire's present production is however only at 6 000 tons, which is similar to the short-term goal of production as the other Norwegian land-based farmers (Riise, 2019). This implicates one of the main challenges with the land-based technology. To meet the fast-growing demand of salmon, the farms require a lot of land area to have a viable production.

3.1.5. Environmental

As mentioned earlier, the salmon industry faces major problems concerning the environment. Fish escapes are one of the greatest environmental problems in Norwegian seafood farming, and according to The Directorate of Fisheries almost 300 000 salmon escaped form Norwegian farms in 2019 (Fiskeridirektoratet, 2020). Mowi states in the Annual Report 2019 that the number of escaped fishes in 2019 were about 68 000, with 23 000 of them in Norway. In 2018 they committed a massive number of escapes, with a total of 780 000 fishes, mainly because of an accident in Chile (Mowi, 2020). Salmon escapes remains a problem because farmed salmon affects the stock of wild salmon genetically. A lot of the escaped salmon get lost in the sea but can also swim up the river to spawn. The farmed salmons are not as robust and strong as the wild salmons, and the ecological interactions and interbreeding will therefore have a negative impact at the wild population (Barentswatch, 2020).

Another challenge that the salmon industry faces, is the existence of sea lice at fish farms. The Institute of Marine Research estimated in 2018 that the Norwegian salmon industry annually spend 500 MNOK at medicines, cleanerfishes, lost revenues etc. (Havforskningsinstituttet, 2019). Sea lice produces eggs that hatches to larvae, and to develop into adult lice these larvae find new fishes to attach. Because the salmons are swimming close to each other in the farms, it is very easy for sea lice to quickly expand its population. The growth rate of sea lice in seafood farms are therefore much greater than in the ocean, and the research community agree that the origin of sea lice at wild salmon comes from farms (Uglem, Finstad, & Næsje, 2019). Sea lice increases the mortality of both farmed and wild salmon, and it is therefore an environmental issue that spread of sea lice occurs at salmon

farms. Norwegian authorities and the aquaculture industry are working to control and reduce the sea lice levels, which has resulted in salmon farmers counting the level of lice every 14 days. The requirement for Norwegian salmons is at 0.5 female lice per locality (Barentswatch, 2020).

The seafood farms in the aquaculture industry are subject to emissions of fish faeces, uneaten fodder, chemical lice medicine, nutrient salts and microplastic, which have impact on the ocean environment. According to the Ministry of Climate and Environment, the aquaculture industry is the biggest source to emission of phosphorus, which disappears and becomes unavailable for human reuse (Miljødirektoratet, 2019). Phosphorus is one of the most important elements in all kinds of life (Økokrim, 2016). Emissions of nutrient salts from the farming plants are also a great risk to the developing ocean areas for fish and other organisms. The "HAVPLAST"-project, financed by The Norwegian Seafood Research Fund, did a research on the aquaculture's feeding pipe's emissions of microplastic and reported that the pipes were responsible for an annual emission of 10 to 100 tons of microplastic (Fagertun, 2019). This was less than expected but remains one of the environmental challenges of the industry. The industry seems to take corporate social responsibility, as Mowi states in their Industry Handbook: "The presence of microplastic in the world's ocean is an emerging issue that fish farmers have started to focus on. Fish farmers are undertaking various initiatives to reduce plastic waste, such as improving waste management, engaging in beach clean-up events around the world, and monitoring the presence of microplastic and plastic-related contaminants in fish." (Mowi, 2020)

3.1.6. Legal

As explained in the analysis of the political factors, every aquaculture firm need sea-water licenses to farm seafood. This is regulated by the law of Aquaculture §4-9, which contains certain terms as environmental sustainability, food safety, emissions and geographical regulations.

The legal framework that regulates growth in the production areas, the Traffic-Light-System, is also explained in the political analysis.

The law of Aquaculture does not only regulate the farming permissions, but also the aspects of the environment, the exploitation of coast areas and penalties if infringement occurs. The main authority is the Ministry of Trade, Industry and Fisheries, who has the responsibility of regulating legal terms and maintaining a sustainable industry. There are also other authorities that are important to the industry, as The Directorate of Fisheries, Norwegian Environment Agency, The Norwegian Coastal Administration and the Norwegian Municipalities.

For Mowi's three biggest production countries (measured in volume, 2019) after Norway, the legal licenses are issued as followed. In Scotland the farming permissions are required through four permissions from three organizations; the local Planning Authority, Marine Scotland, Scottish Environment Protection Agency (SEPA). Because of the Maximum Allowed Biomass (MAB), salmon farms have only been able to issue licenses for MAB < 2 500 tons, but SEPA's regulatory framework during 2019 will allow licenses to be issued for MAB > 2 500 tons. In Chile, the farming licenses are based on two authorizations; the Undersecretaries of Fisheries and Aquaculture (facilities and technical requirements) and the Undersecretaries for Fisheries for Armed Forces (physical areas).The trading of licenses in Chile is regulated by the General Law of Fisheries and Aquaculture and controlled by the Undersecretaries of Fisheries and Aquaculture of the Ministry of Economy. In Canada, there are different regulations depending on the geographical area of farming. Some of them are the Federal Fisheries Act, Navigation Protection Act, Health of Animals and the National Aquaculture Activities Regulation. To operate a seafood farm, you'll need provincial and/or federal authorizations. In Newfoundland and New Brunswick, only the provincial is required and in British Columbia, both provincial and federal authorization is required.
(Mowi, 2020)

3.2. Porter's Five Forces

Porter's five forces a model used to identify the competitive forces dominating an industry. Understanding the competitive forces is important to analyze industry structure and corporate strategy and enhance long term profitability. The five forces in Porter's model are competition in the industry, potential of new entrants in the industry, power of suppliers, power of customers and threat of substitute products.

3.2.1. Competition in the industry

As earlier mentioned, the salmon farming industry is fairly consolidated, as the biggest 10 players in Norway and Chile account for around 70% of the output. However, there are enough players to provide efficient competition (Johansen, 2019). Some of the big firms are vertically integrated in the value chain, but the firms are similar to each other with regards to origin, costs and the markets they serve. This indicates less intense competition in the industry. In spite of this, the technological innovation is high, and both land-based farming as well as offshore-based farming are still in the starting pits. The cost efficiency and the potential to solve biological challenges may change the industry structure, competition and big players in salmon farming.

Traditionally, Atlantic salmon has been considered to be a homogenous product, and thus the differentiation has been fairly low. However, some players, like Salma, have differentiated their brand in order to obtain a premium in the market. Mowi is also working to de-commoditize the industry and differentiate their products and brand (Berge, 2020). The goal is to obtain competitive advantages like customer loyalty, higher margins and increased traceability. The consulting firm EY expressed the following in their Norwegian Aquaculture Analysis from 2019: "Branding will become an increasingly important factor for suppliers of salmon as a means to differentiate themselves from each other". The Board of Directors of Mowi stated in their Q2 2019 report that, "It will take time to change the commodity driven salmon market into a branded market." This statement illustrates how little the salmon suppliers have focused on branding historically." (EY, 2019). Even though differentiation is a goal looking forward, the situation today is generally still that Atlantic salmon is a homogenous product.

Furthermore, there are low exit barriers in the industry, as the assets needed to conduct salmon farming are liquid. In addition to this, high profits in the industry give reason to believe that new players are interested in establishing in the market, which we will address in the next section.

To summarize, the longer-term effects of land-based and offshore farming as well as differentiation in the markets may potentially change the internal rivalry in the industry and

increase the competition. Considering status quo in combination with forward expectations, we assume the threat from internal rivalry to be moderate.

3.2.2 Potential of new entrants in the industry

As we have earlier pointed out, there are geographical constraints to traditional Atlantic salmon production because of seawater temperature and other natural factors. These natural factors along with the different license systems that governments operate with, create barriers to entry. In Norway, which is the largest producer of farmed salmon, the Aquaculture Act (17 June 2005) and the Food Safety Act (19 December 2003) are the two most important laws regarding the regulations that exist (Mowi, 2019).

New licenses in Norway are awarded and regulated by the governments only in certain years, and the licenses can be sold in the second-hand market. The growth in licenses and biomass in different geographical areas depend on the lice and disease development, which is monitored by the government. Firms that comply with the standards are offered additional growth, which incentivizes sustainable production.

Furthermore, the industry is capital intensive with substantial capital expenditures required in order to establish as a salmon farmer. This includes investments in equipment and licenses. The high degree of vertical integration through M&A activity also allows the big players to exploit economics of scale throughout the supply chain and thus have a competitive advantage over smaller firms.

Investors have shown a great interest in land-based farming in the past years. New firms include Atlantic Sapphire (valued at NOK 7.6B as of September 2019) and Andfjord Salmon (valued at NOK 866M as of August 2019), neither of the firms having produced or sold any salmon at the time. The technology is yet to prove itself as efficient, but the potential threat of new entrants in the industry is greater than before.

The threat of entry from new firms is considered to be low-moderate, but acquisitions from large firms (like for example Mitsubishi Corp., which acquired Cermaq in 2014) and big players within land-based farming should not be disregarded.

3.2.3 Power of suppliers

The power of the suppliers is mainly dependent on the supplier concentration and the differentiability of the products.

Feed represents about half of the total production costs for the Atlantic salmon production (EY, 2019), and naturally, it is important to address the feed suppliers' bargaining power. The feed industry is largely consolidated, whereby the top four players have a total market share of 80-90% (EY, 2019). However, Mowi started producing feed in 2014, and produces around 90% of their own feed consumption (Jensen, kyst.no, 2020). As a consequence, we consider external feed suppliers' bargaining power to be low. On the other hand, the suppliers' power is considered greater for the industry as a whole.

Smolt is another essential input factor in salmon production. Smoltification is the biological process of producing young fish ready for transition from freshwater to net pens (seawater). The smolt industry is, unlike the feed industry, fragmented, where the top 5 players account for around 30% of the revenue in the market (EY, 2019). The trend is however shifting towards vertical integration, as this enables the sea farming firms to have better control of the production cycle. The smolt is generally considered to be homogenous, and combined with a fragmented industry, the smolt suppliers' bargaining power is limited.

3.2.4 Power of customers

The big players in the industry, like Mowi, have retailers and secondary processors as their main customers. As the degree of vertical integration is large, Mowi controls the value chain and hence the customers have little bargaining power, except for some of the large retail chains. The salmon in traded on the free market, where Fishpool serve as the international marketplace for buying and selling financial salmon contracts (Fishpool, u.d.). Hence, the price formation is transparent and easily accessible, so customers generally take the price as given. Considering these factors, we evaluate the customer's bargaining power to be low.

3.2.5 Threat of substitute products

The potential threat from substitutes include products that serve a similar function as Atlantic salmon with regards to nutrients, price, taste and other factors that customers appreciate. If the transaction costs are low, and close substitutes exist, the profitability in the industry may be under greater pressure.

With the increasing demand for salmon in the previous years, in combination with stagnating volumes, the high prices may turn customers away, making them look for substitutes (EY, 2019). In the long run, this may be unfavorable for salmon producers, as demand may decline. We have earlier pointed out that the industry players are looking to differentiate their products, which may reduce the threat from substitutes, as customer loyalty is expected to improve.

Some products that may serve as close substitutes are other salmonids like trout and other forms of lean meat. Salmon has traditionally been branded as a healthy product, with high levels of omega 3-acids and protein. Potential substitutes like chicken also have high protein levels but lack the fatty acids. The price difference between the products is substantial, whereas the salmon price is NOK 60 per kg (week 12) (Fish pool, 2020) and the chicken price is NOK 29 per kg (IMF Commodity Prices, 2020). We believe that the purchasing power of the customers is of importance, especially customers with less focus on health benefits from omega-3 acids.

Frozen fish is also a near substitute to fresh Atlantic salmon. With modern freezing technologies, the quality of frozen fish may not necessarily be inferior to fresh fish, potentially increasing the threat from frozen fish in the future (EY, 2019). Also, the frozen fish may be transported by ships, reducing the carbon footprint. However, the distribution of frozen salmon is decreasing in size (Mowi, 2019) .

Regarding other fish species, trout and coho should be taken into consideration. Trout is a near substitute to Atlantic salmon, with small differences in taste, price and nutrient levels. The volume is nonetheless rather small compared to salmon, which we can see in figure 3-2. Coho is a fish species farmed in Chile and is mainly used for salted products. Due to

transportation costs and logistics it is not direct competition with Atlantic salmon sold in the European markets.

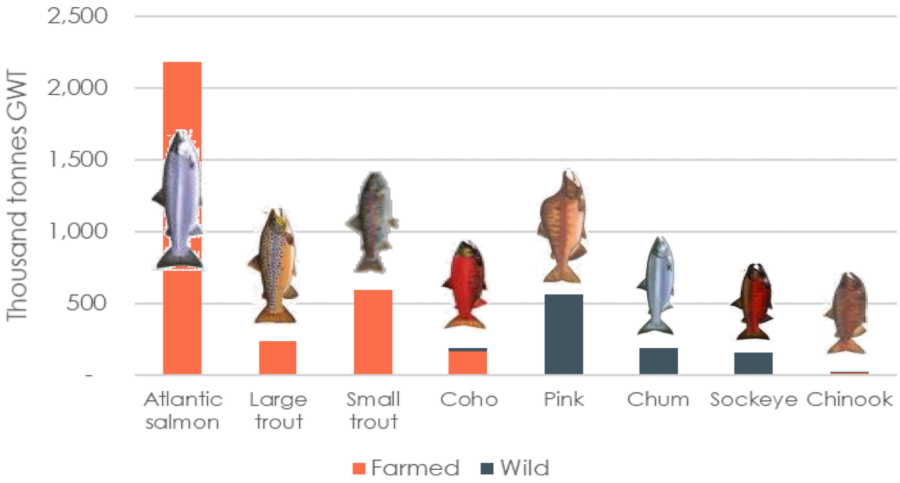


Figure 3-2: Salmonids harvest 2018. (Mowi,2020)

Taking these factors into consideration, we believe that the threat from substitutes is moderate.

3.3 VRIO-analysis

The VRIO framework was introduced by Jay B. Barney, and is a tool used as a part of the internal resource analysis. Barney found that a firm's resources need to possess four attributes in order to maintain a sustained competitive advantage. The attributes are *value, rare, imitability* and *organization* (Barney, 1995). In the further analysis we use this framework to better understand the potential of some of Mowi's resources.

Economics of scale

Since Mowi is among the largest and leading players in the industry, it is expected that there are economics of scale (e.g. lower unit costs) that benefits Mowi. Having control over the value chain and increased bargaining power with customers in contracts is valuable. With the barriers to entry through licenses, competitors would have to buy licenses or companies with licenses to grow. This makes the resource rare. Although acquisition of firms or licenses creates barrier to entry, it is still imitable, but at a high cost. Furthermore, Mowi is organized to exploit the economics of scale, and hence the firm has a temporary competitive advantage.

Differentiation

Differentiating the product from the industry standards of Atlantic salmon may increase the demand and increase the potential profitability of the product. Through brands like Rebel Fish, Ducktrap, Mowi Salmon and Kritsen, Mowi is trying to stand out from the competition (Mowi, 2020). Creating increased value for the customer by adapting to the preferences and trends in the market, in addition to potential access to new markets and segments is a valuable and rare resource which Mowi is exploiting to gain a competitive advantage. This resource is however imitable, and it is expected that other firms will follow this path.

Research and development

Mowi's R&D capital expenditure for 2019 was EUR 46.5 million (Mowi, 2020). New technology such as camera technology, machine learning, process automation as well as new genetic breakthroughs is implemented into the Mowi value chain from smolt production to processing and sales operations. In November 2015, the Ministry of Trade, Industry and Fisheries opened for development permits ("Utviklingstillatelser") within aquaculture. The goal is to stimulate new technology and solutions to help the industry grow parallelly with the biological and environmental challenges that exist (Fiskeridirektoratet, 2020). The technology that derive from the development permits is to be shared with the industry, and thus it is imitable and not rare.

The salmon farming industry is well on its way into the knowledge-based era where the players in the industry is making use of big data and digitalization to improve decision making and profitability (EY, 2019). Mowi's ability to make use of the whole value chain in this process is valuable, rare and exploited. It is however expected, looking forward, that this is imitable by other players in the industry. In light of this, we believe that Mowi has a temporary competitive advantage regarding R&D activities.

3.4 SWOT

SWOT is an acronym for the four letters *strengths, weaknesses, opportunities* and *threats.* The model is used to map out the internal and external factors that are favorable or unfavorable in order for å business to reach its strategic goals. The contents of the SWOT-analysis derive from the strategic analysis and will sum up the most important strategic aspects of our analysis.

S	INTERNAL **STRENGTHS**
1	Economics of scale
2	Supply chain
3	Differentiation
4	Investments in R&D
5	Barriers to entry
6	
7	

W	INTERNAL **WEAKNESSSES**
1	Only temporary competitive advantages
2	Long and unelastic production cycle
3	Fish escapes
4	
5	
6	
7	

O	EXTERNAL **OPPORTUNITIES**
1	Increasing population
2	Environmental, sustainable and healthy products are trendy
3	Access to new markets
4	Solving biological challenges
5	
6	
7	

T	EXTERNAL **THREATS**
1	Substitutes
2	Biological challenges
3	Geopolitical risk and increased protectionism
4	NOK appreciation
5	Resource rent tax in Norway
6	
7	

Figure 3-3: SWOT analysis of Mowi.

4 Financial Statement Analysis

The purpose of the financial statement analysis is to give a comprehensive impression of a firm's financial situation. It is used for decision making within the business, while external stakeholders and the market use the measures to evaluate the overall health of the organization (Kenton, 2019). There are different ways of analyzing a financial statement and the method we have used is the ratio analysis. All financial data used in this analysis is received from Mowi's annual reports from 2015 to 2019.

4.2 Profitability

When calculating profitability ratios, the result in the income statement, both before and after financial items and taxes, is very decisive for the outcome of the ratios. For Mowi and the seafood farming industry, there is one factor that influences the result more than others. This is the adjustment of the fair value of their biomass (fishes, smolts and broodstocks), which is calculated as either a revenue or cost in EBIT, depended of a positive or negative adjustment. The estimated fair value will always be based on uncertain assumptions as biomass volume, the quality of the biomass, size distribution, costs, mortality and market prices. As Mowi states in the Annual Report 2019, the level of uncertainty increases i.e. when estimating the biomass volume, if an incident has resulted in mass mortality. If the total biomass at sea was 1% lower than their estimate, this would result in a decrease in fair value of €5.7 million.

(EUR MILLION)	2015	2016	2017	2018	2019
EBIT	345,30	991,20	484,90	925,40	617,00
Change in €	**-89,2**	**645,9**	**-506,3**	**440,5**	**-308,4**
Net fair value adjustment biomass	**10,1**	**386,2**	**-340,3**	**146,4**	**-127,5**
% of EBIT change	-11,32%	59,79%	67,21%	33,23%	41,34%

Figure 4-1: The adjustment of fair value of biomass' impact on EBIT.

Figure 4-1 shows how much the adjustment of fair value of biomass vary, and what impact it has at EBIT. As mentioned, this influences the outcome of the profitability ratios and explains some of the movements over the last five years. Figure 4-2 illustrates the movements in the changes of EBIT and fair value of biomass graphically.

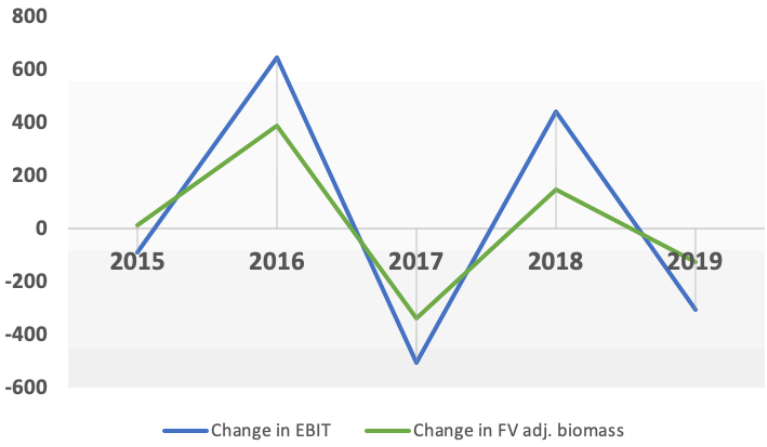


Figure 4-2: Movements in changes of EBIT and FV adj. biomass.

Operating Profit Margin

The Operating Profit Margin measures how marginal the Operating Result (EBIT) is compared to the Operating Revenues. It tells us how much of the Operating Revenues that remains after paying Operating Expenses such as material costs, personnel expenses and depreciations. The level of the ratio varies from industry to industry, as some industries are more profitable than others. The Operating Profit Margin is calculated by dividing the Operating Profit (EBIT) by the Operating Revenues.

$$Operating\ Profit\ Margin = \frac{Operating\ Profit\ (EBIT)}{Operating\ Revenues}$$

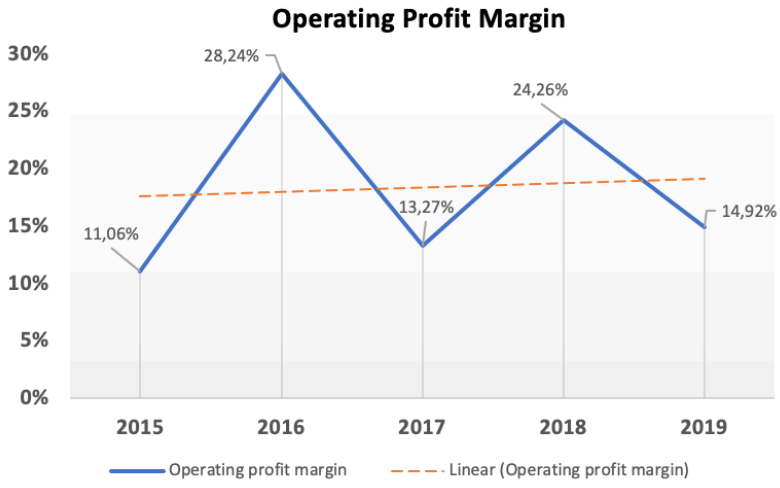


Figure 4-3: Operating Profit Margin.

As shown in figure 4-3, the Operating Profit Margins have been swinging a lot during the last five years. The main explanation to this is the adjustment of the fair value of biomass in the income statement. This has as mentioned a great impact on EBIT. In 2015, Mowi's result was disappointing, due to failing revenues, lower levels at the salmon price index compared to later years, as well as increasing costs because of sea lice problems (Valvik, 2015). Despite the variety of the Operating Profit Margin, the trend line is positive and the margins since 2016 have been at acceptable levels.

Return on Assets

Return on Assets (ROA) is a key ratio to measure a company's profitability relative to its assets. The ratio gives an indicator of how efficient the total assets are used to generate profit and includes both debt and equity. Higher ROA states more efficient use of a company's assets. ROA is calculated by dividing net profit by the average total assets (average of the respective and the previous year to measure the real activity of the respective year).

$$Return\ on\ Assets = \frac{Net\ profit}{Average\ Total\ Assets}$$

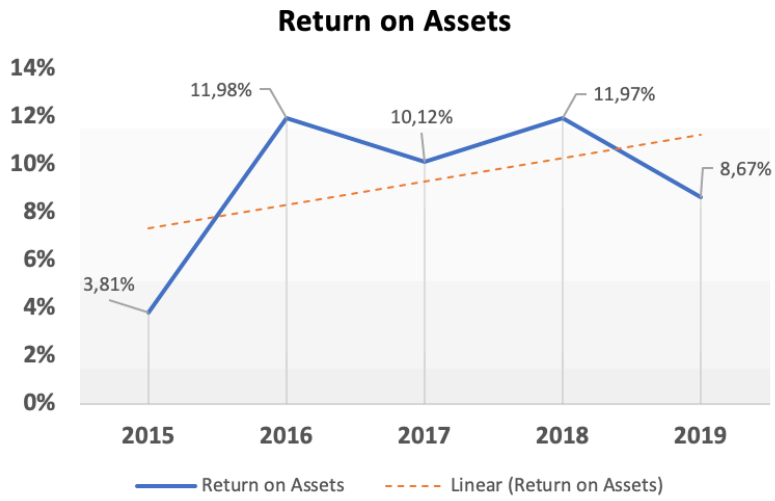


Figure 4-4: Return on Assets.

A quick analysis of the ROA ratios from 2015 to 2019 shows that the movements are quite similar to the Operating Profit Margin, though not that volatile. The explanation is much the same; difference in the net profit, due factors as variety in the adjustment of fair value of biomass and variety in revenues and material costs. The decrease in ROA from 2018 to 2019 is mainly because of a decrease in net profit of 16%, as well as an increase in Mowi's non-current assets of 25% (property, plant and equipment + €145.5 millions and right-of-use

assets + €386.8 millions). As shown in figure 4-4, the trend line is significantly positive, but if you ignore the ROA from 2015, the trend line will shift to negative. Mowi's ROA is regardless greater than the average in the industry at 6.78% (Investing.com, 2020).

Return on Equity

The Return on Equity ratio (ROE) is similar to ROA but does not include liabilities and will therefore be greater than ROA. ROE measures how efficient a company is using the equity to gain profit, and the greater the ROE the better. The ratio is calculated by dividing net profit by the average equity. As in ROA, we use the average of the respective and the previous year, to get a more sufficient value of the respective year.

$$Return\ on\ Equity = \frac{Net\ profit}{Average\ Equity}$$

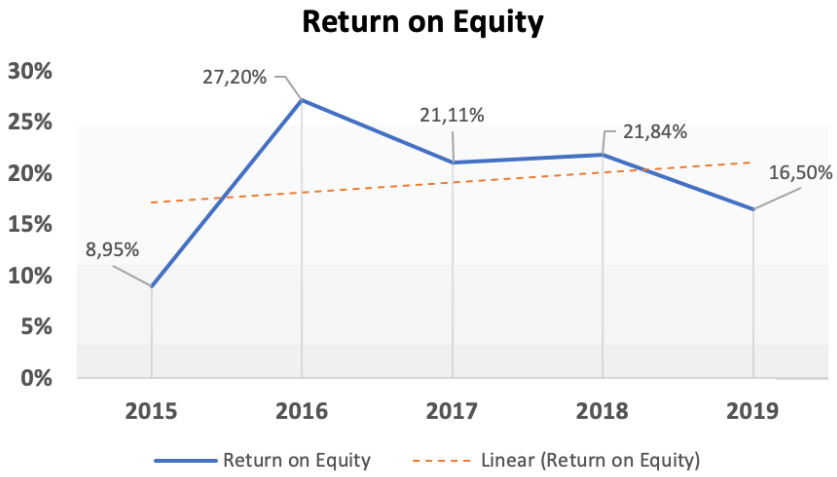


Figure 4-5: Return on Equity.

As expected, ROE is greater than ROA. The ROE has an average at 19.12% over the last five years, which is greater than the average of the industry at 13.47% (Investing.com, 2020) and implicates therefore that the ROE for 2019 was at an acceptable level. The explanations of the movements are the same as earlier explained, but a slowdown of the increasing equity has greater impact here. From 2015 to 2018 the equity had an average annual increase of 15.25%, but from 2018 to 2019 the increase was just at 0.47%. This makes the impact of a decreased net profit from 2018 to 2019 at ROE smaller.

4.3 Financing / Liquidity

The liquidity ratios measure a company's ability to pay its short-term debts, without using the long-term (non-current) capital (Kristoffersen, 2014). Current ratio, quick ratio and working capital are tools used to analyze the liquidity in the next section.

Current Ratio

The current ratio is a liquidity ratio measuring a firm's ability to pay short term obligations (usually due within one year). The ratio compares a company's current liquid assets to its current liabilities. The current assets include cash, accounts receivable, inventory and other liquid assets. Current liabilities include accounts payable, wages, taxes payable and other short-term liabilities. Generally, a higher current ratio is better than a lower. A low current ratio relative to the industry may indicate a higher risk of default or distress. However, a very high current ratio may indicate that assets are ineffectively allocated.

$$Current\ Ratio = \frac{Current\ assets}{Current\ liabilities}$$

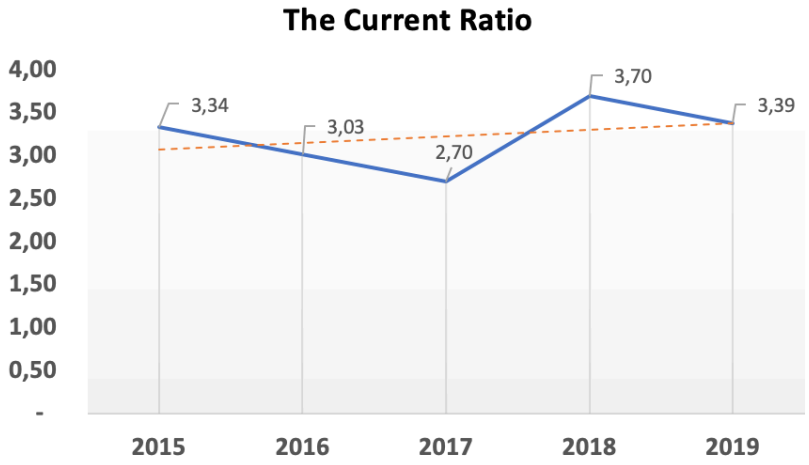


Figure 4-6: The Current Ratio.

We can see from figure 4-6 that Mowi's current ratio has varied from 2.7 to 3.7 from 2015 to 2019, and that the trend is slightly positive. Generally, a current ratio of 3 means that per €1 of current debt, Mowi has €3 available to service the debt at the given time. The average industry current ratio is 2.22 (Investing.com, 2020), which implies that Mowi's liquidity is strong relative to the industry.

Quick Ratio

The quick ratio, like the current ratio, measures a company's short-term liquidity and financial health, but the quick ratio is calculated slightly different. The quick ratio, which is often referred to as the acid-test, only includes assets that can be converted to cash within 90 days and is a more conservative measure because it excludes assets that are less liquid (e.g. inventory).

$$Quick\ ratio = \frac{Cash + Cash\ Equivialents + Current\ Receivables + Short\ Term\ Investments}{Current\ Liabilites}$$

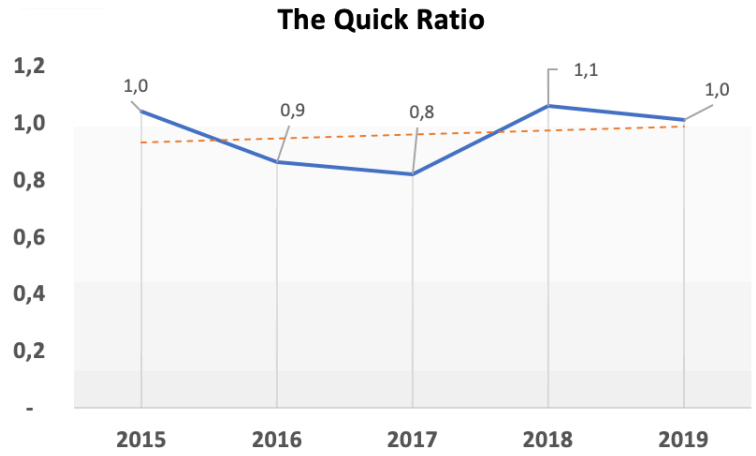


Figure 4-7: The Quick Ratio

Mowi's quick ratio has varied from 0.8 to 1.1 in the given period, and the trend is slightly positive.

Working capital

Working capital is a financial measure of the short-term liquid assets available after short-term liabilities are subtracted. With excess current assets (working capital), a firm has funds to pay off short-term liabilities and to internally finance further growth. On the other hand, without excess working capital, a firm may need to turn to external financing (Corporate Finance Institute, 2020). Low or negative working capital indicates a less favorable financial situation. The long and inelastic production cycle of salmon farming requires a large amount of biomass and thus high working capital levels (Mowi, 2020).

$$Working\ Capital = Current\ Assets - Current\ Liabilities$$

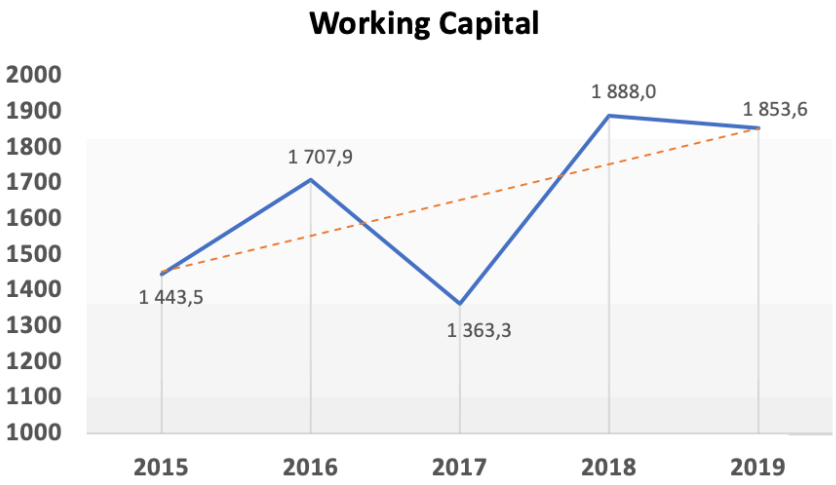


Figure 4-8: Working Capital.

We see from figure 4-8 that there has been a substantial increase in working capital in the given period (around 28.4%), which implies a positive liquidity trend.

4.4 Solvency

As the liquidity ratios measure a company's ability to pay its short-term debts, the solvency ratios, sometimes called leverage ratios, measure the ability to pay long-term debts and financial obligations, as well as the interests on the debt. If the solvency ratios are very high, the probability of bankruptcy are greater than with low ratios. On the other hand, low ratios indicate that the company's leverage is at sustainable levels and able to meet its debts (Hayes, 2019).

Debt-to-equity ratio

The D/E-ratio is a measure of a firm's financial leverage, i.e. how a company finances its activities. More specifically, it measures the debt compared to the shareholder's equity.

$$\frac{D}{E} Ratio = \frac{Total\ liabilities}{Total\ shareholder\ Equity}$$

Generally, a higher D/E-ratio means increased financial gearing and increased risk to shareholders.

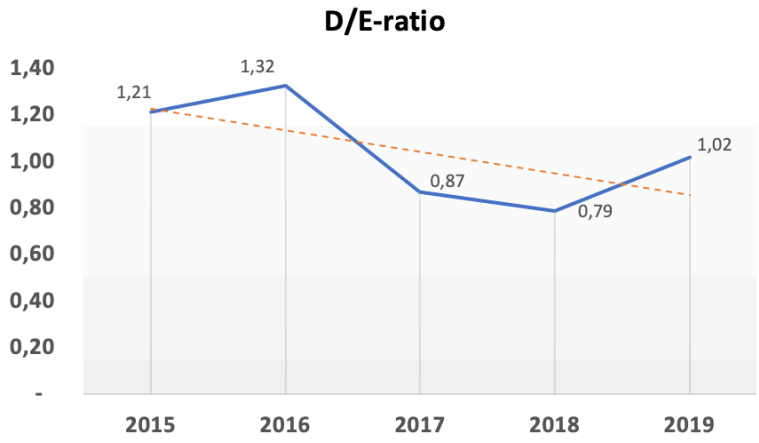


Figure 4-9: Debt-to-Equity ratio.

We can see that the D/E-ratio is decreasing in the period, but with an increase in 2019, mainly due to an increase in long term liabilities. As the D/E-ratio is near 1, this means that the total liabilities are approximately equal to the shareholder equity. The decrease in D/E-ratio indicates that Mowi is less reliant on external debt financing.

Times Interest Earned (TIE) ratio

TIE is a measure that shows how many times a company could cover its interest expenses with its pretax earnings. Implicitly, it indicates a firm's ability to pay its debts (Chen, Investopedia, 2019).

$$TIE = \frac{EBIT}{Total\ interest\ payable\ on\ debt}$$

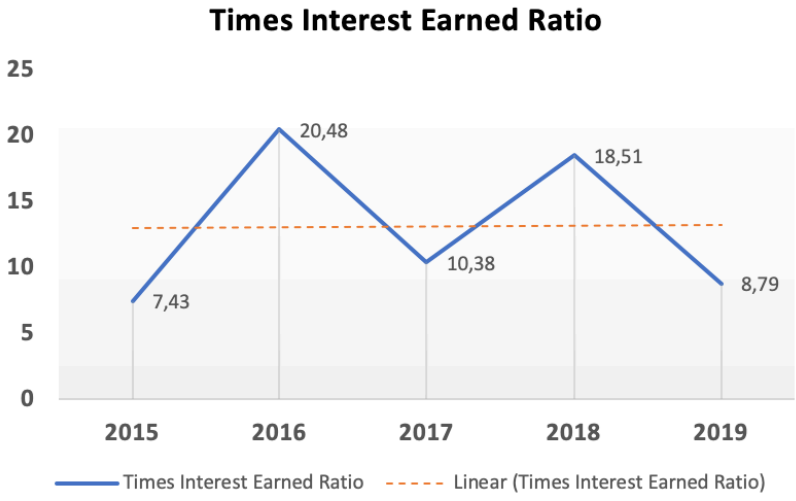


Figure 4-10: Time Interest Earned.

As we can see from figure 4-10, TIE has varied from 7.4 to 20.5. The fluctuations in TIE is mainly driven by variability in EBIT in the period. Generally, the TIE should exceed 1 as an absolute minimum. The observed TIE-levels are good in spite of the recent decrease from 2018 to 2019.

Equity Ratio

The equity ratio is a metric measuring the amount of financial leverage in a firm. High equity ratio implies low financial gearing and less financial risk, and vice versa (Corporate Finance Institute, u.d.). A larger equity ratio means stronger solvency.

$$Equity\ Ratio = \frac{Total\ Equity}{Total\ Assets}$$

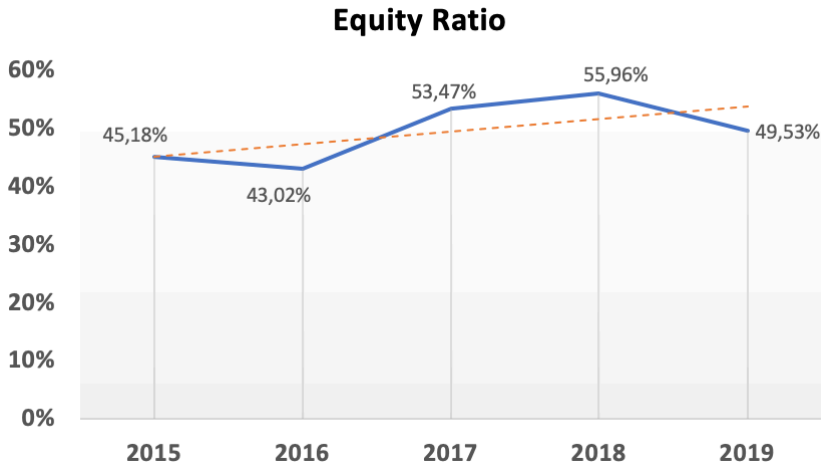


Figure 4-11: Equity Ratio.

We can see from the chart that there has been an increase in equity ratio. In 2019 the equity ratio was 49.53%, which is as expected from the debt-to-equity metrics. The decrease in equity ratio from 2018 to 2019 is mainly caused by an increase of 13.5% in total assets, while the increase in equity was 0.5% in the same period 2019 (Mowi, 2020). There is no general norm for the size of equity or optimal capital structure (Brealey, Myers, & Allen, 2017) but in light of the ratios above we evaluate the solvency as acceptable.

4.5 Summary of the Financial Statement Analysis

To sum up, the overall financial health of Mowi is acceptable and at stable levels with positive trend lines for the future. The profitability is good but varies a lot, due to changes in the annual profit results. This is mostly because of the adjustments in fair value of biomass. Mowi's liquidity is considered sustainable and the level of the liquidity ratios are greater than the average of the industry, which indicates that Mowi won't have any problems of paying its obligations. The amount of financial leverage in Mowi is no subject of concern and the solvency ratios states acceptable levels. The average level of non-current debt, relative to the total amount of debt, has an average of 70% over the last five years, which is satisfactory.

5 Financial Analysis

The goal of our term-paper and the reason we are doing a financial analysis of Mowi ASA is to attempt to find an accurate valuation of the company as of 31.12.2019. Mowi ASA is traded on Oslo Stock Exchange (OSEBX) and is also one of the 25 companies on the OBX-Index.

There are several methods one can use to value a company. We have decided to use two different types of valuation, the first one being an absolute valuation method where we will do a discounted cash flow analysis. Secondly, we will use a relative valuation method (Peer-analysis).

5.2 Absolute Valuation Method

Absolute valuation is a method that is used to find the intrinsic value of a company (Chen, 2020). This is done by projecting future cash flow and discounting said cash flows to present value. We are going to use the method that is called the discounted cash flow-analysis, also commonly referred to as DCF Model.

5.2.2 Discount Rate

In our analysis, we are going to discount projected cash flows to find the present value. That leads to the question of what the discount rate should be.

In our DCF Model, we are going to use estimate unlevered free cash flow. This is an estimate of all available cash for the company's entire capital structure, which includes both debt and equity holders. Therefore, we must use a discount rate which takes into account both the required rate of return on equity and the debt rate.

To be able to calculate this discount rate, we must first find the required rate of return on equity and the debt rate.

CAPM

When trying to find an appropriate required rate of return on equity, we can introduce the capital asset pricing model, or CAPM (Brealey, Myers, & Allen, 2017). This model states that the investors who invest in the market require a higher return from the asset than from risk-free alternatives. It shows the relationship between systematic risk and return (Kaldestad & Møller, 2016).

(1) $CAPM = r_E = r_f + \beta * (r_m - r_f)$

Whereas:

$$r_E = Required\ Rate\ of\ Return\ on\ Equity$$
$$r_f = Risk - free\ Rate$$
$$\beta = Beta$$
$$r_m - r_f = Market\ Risk\ Premium$$

Time Value & Inflation

A key element in CAPM is that we would rather have the same amount of money today than in the future. The reasoning behind this is that money will lose their purchasing power with time, therefore are investors expecting to be compensated for the time value of money.

Norway is using the KPI-Index to measure the inflation rate with a goal of having a y/y growth of 2% (Norges Bank, 2020).

PricewaterhouseCoopers (PwC) is a global company and is considered one of the Big Four accounting firms (Accountingverse, 2020). They cooperated with NFF (The Norwegian Society of Financial Analyst) and published in December 2019 an article about risk premium in the Norwegian market. In their article, they sent out 1062 e-mails to those who are members of the NFF and received 14% response (PwC, 2019).

34% of the respondents said that they use the 10-years government bond as the risk-free rate when calculating required rate of return on equity In Norway, the 10-years government bond is currently yielding 1.49% (Norges Bank, 2020). This means that we are compensating for some of the lost time value of money, but not completely.

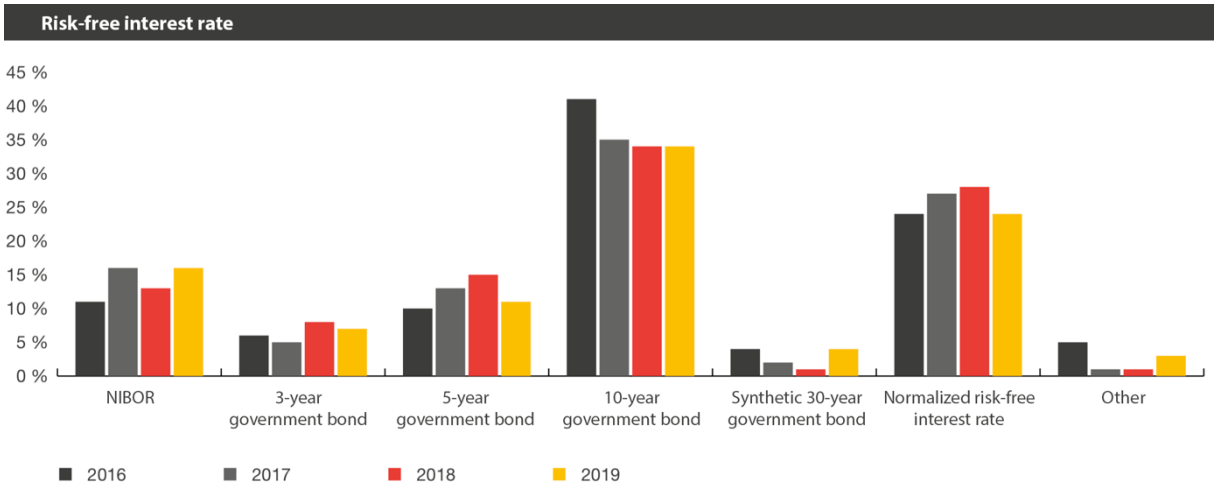


Figure 5-1: Risk-free interest rate.

Market Risk Premium

Market risk premium is the difference between the expected return on the market portfolio and the risk-free rate. The market portfolio consists of all the securities on the market. Each security in this portfolio have the same proportional size as the company has in the market. The expected return on this theoretical portfolio will be equal to the expected return on market.

From the same article published by PwC, we can see from the results that the median for the market risk premium is 5% and the mean is 4.9%. In our analysis we are going to use 5% as our market risk premium.

Beta

Beta measures the sensitivity of a security towards the market. This means that an asset with beta of 1 theoretically has the same volatility as the market. Sensitivity or volatility is a measurement of how much the security will change in comparison to the market. When measuring risk of a security, we will often turn to standard deviation as a measurement of risk, but in the context of market portfolio we must look at beta as a more accurate representation of risk (Brealey, Myers, & Allen, 2017). The marginal contribution of a stock to the risk of the market portfolio is measured by beta.

$$(2)\ Beta\ relative\ to\ market\ portfolio = \frac{covariance\ with\ the\ market}{variance\ of\ the\ market} = \frac{\sigma_{im}}{\sigma_m^2}$$

We can extract d/d %-returns from Yahoo Finance and Oslo Stock Exchange. With this information, we can calculate Mowi ASAs beta relative to Oslo Stock Exchange. In our calculations, we use 1-year beta.

By doing a linear regression analysis, we get the following output (Midtbø, 2013).

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0,379763823
R Square	0,144220561
Adjusted R Square	0,140755867
Standard Error	0,014250074
Observations	249

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,008452721	0,008452721	41,6257706	5,788E-10
Residual	247	0,050156962	0,000203065		
Total	248	0,058609683			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,000748456	0,000905889	0,826211155	0,409481675	-0,0010358	0,00253271	-0,0010358	0,00253271
Returns OSEBX	0,712814935	0,110483048	6,451803671	5,78798E-10	0,49520589	0,93042398	0,49520589	0,93042398

1-year Beta	0,712814935

Figure 5-2: Linear regression analysis table.

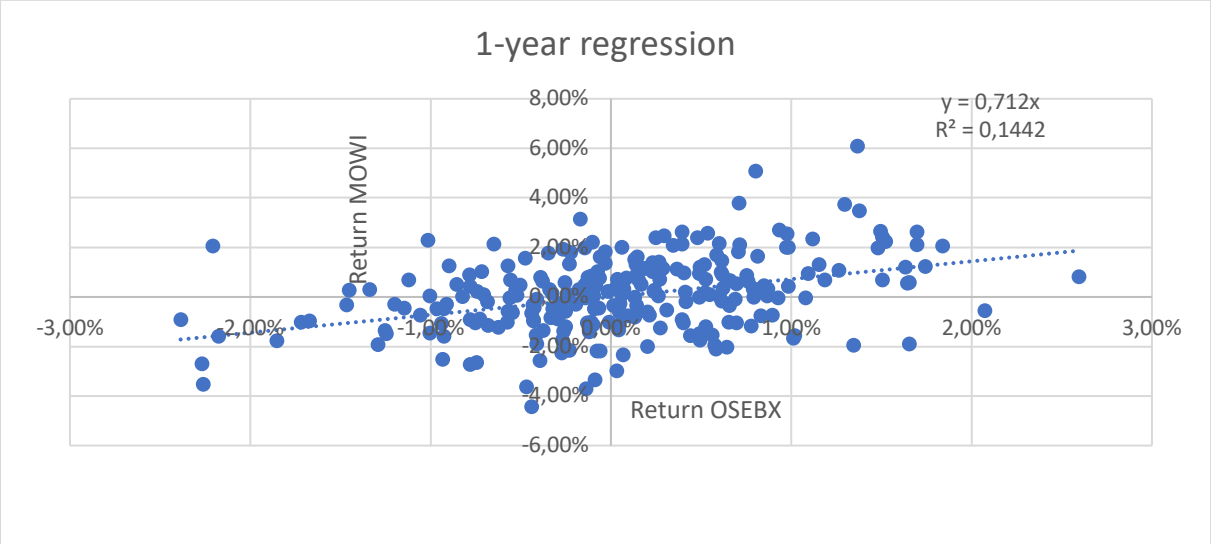


Figure 5-3: Linear regression analysis graphically illustrated.

From our calculations we get a beta of 0.71 which is what we are going to use in our calculations. Since it is lower than 1, it will not fluctuate as much as the market, our company is more stable (Kenton, 2019).

R-Squared is a measurement on how much of the variance for a dependent variable is explained by an independent variable or variables (Løvås, 2015). In our case, R-Squared is 14.4% which means that 14.4% of Mowi's variance is explained from Oslo Stock Exchange.

Required Rate of Return on Equity

Now that we have all our necessary data, we can calculate CAPM.

(3) $r_E = 1.49\% + 0.71 * 5\% = 5.04\%$

WACC

Earlier we concluded that the discount rate must take both the cost of equity and cost of debt into consideration when trying to find an appropriate discount rate. The company's cost of capital is a blend of these two, which leads to the weighted-average cost of capital model, or WACC (Brealey, Myers, & Allen, 2017).

(4) $WACC = r_E * \frac{E}{V} + r_D * \frac{D}{V} * (1 - T_c)$

Whereas:

$r_E = Cost\ of\ Equity$

$r_D = Cost\ of\ Debt$

$E = Equity$

$D = Debt$

$V = Firm\ Value = Equity + Debt$

$T_c = Marginal\ Corporate\ Tax\ Rate$

Cost of Debt

Mowi's annual report does not directly say what their average cost of debt is, therefore, we must calculate it ourselves. In order to have a close estimate, we'll take the arithmetic mean of the last 4 years.

$$(5)\ Cost\ of\ Debt = \frac{Interest\ Expenses}{Total\ Interest\ Bearing\ Debt}$$

	2016	***2017***	***2018***	***2019***
Total Interest-Bearing Debt (EURm)	993,50	903,60	1142,60	1465,80
Interest Expenses (EURm)	48,40	46,70	50,00	70,20
Cost of Debt	4,87 %	5,17 %	4,38 %	4,79 %
Average Cost of Debt	4,80 %			

Figure 5-4: Cost of debt.

Firm Value

In order to take the weighted average of cost of capital and cost of debt, we must have equity and debt ratio.

$$(6)\ Firm\ Value = Equity + Debt$$

EURm	2016	2017	2018	2019
(E) Equity	2069,3	2315,4	2879	2892,6
(D) Debt	2741,1	2014,9	2266,2	2947,5
(V) Firm Value	4810,4	4330,3	5145,2	5840,1
Ratio (% in Firm Value)	2016	2017	2018	2019
(E) Equity	43,02 %	53,47 %	55,96 %	49,53 %
(D) Debt	56,98 %	46,53 %	44,04 %	50,47 %
(V) Firm Value	100,00 %	100,00 %	100,00 %	100,00 %

Figure 5-5: Firm value.

Tax Shield

With debt, follows interest expenses. Interest expenses does have a tax advantage, because it is a tax-deductible expense. There are two common ways to incorporate this when valuing a company (Brealey, Myers, & Allen, 2017). You can either adjust the present value, which assumes that the company is fully equity-financed and adds the present value of interest tax shields.

$$(7)\ \text{Adjusted Present Value} = \text{Base Case Value} + \text{PV(Interest Tax Shields)}$$

Or we can adjust the discount rate, and not have to include the present value of interest tax shield. We can do this by introducing T_c which is the marginal corporate tax rate. Notice that the WACC formula uses $r_D * \frac{D}{V} * (1 - T_c)$ as cost of debt. This is how we incorporate the value of interest tax shield in our valuation, and it is this method we are going to use.

WACC Conclusion

Now that we have all our data, we can calculate the discount rate which will be used in our DCF Model.

Input	
Company	Mowi ASA
Tax	22%
Net-Interest-Bearing Debt (EURm)	1337,2
Terminal Growth Rate	1,00%
Required Rate of Return on Asset	
Risk-Free Rate (10 year government bond)	1,49%
Beta of the company	0,71
Market Risk Premium	5,00%
CAPM (Re)	5,04%
Average Interest Rate (Rd)	4,79%
Debt / Total Assets (D)	50,50%
Equity / Total Assets (E)	49,50%
WACC	4,38%

Figure 5-6: WACC conclusion.

$$WACC = 5.04\% * 49.5\% + 4.79\% * 50.5\% * (1 - 22\%) = 4.38\%$$

To use WACC as our discount factor, there is one important assumption that we will assume to be satisfied at all time. That is that the company will keep the same cost of equity, cost of debt and debt-to-equity ratio throughout the lifetime of the company. In other words, we are using the company's current characteristic to discount future cash flows. WACC is fine to use as long as the firm's business risk and debt ratio are expected to remain constant (Brealey, Myers, & Allen, 2017)

5.2.3 Unlevered Free Cash Flow

By using historical data and our analysis of future growth estimates, we can estimate future inflow and outflow of cash. In our DCF Model, we are going to use unlevered free cash flow (UFCF). UFCF is the company's cash flow before taking financial obligations into account (Hayes, 2020).

(8) $UFCF = EBITDA - Taxes - Change\ in\ Working\ Capital - CAPEX$

The downside to using UFCF is that if the company has high amount of debt and interest payments, this will not be taken into consideration when calculating the projected cash flows. This means that the unlevered free cash flow is what the company has available to pay all equity and debt holders in the company. using the UFCF we can calculate the company's enterprise value.

(9) $Enterprise\ Value = \sum_{t=1}^{\infty} \frac{\mathrm{UFCF_t}}{(1+\mathrm{WACC})^{\mathrm{t}}}$

With the company's enterprise value, we can subtract the net interest-bearing debt (NIBD) and find the company's equity value.

(10) $Value\ of\ Equity = Enterprise\ Value - NIBD$

It could be worth mentioning that by using levered free cash flow instead of unlevered free cash flow, and CAPM instead of WACC, we would've gotten the equity value directly from formula 9 (Kinserdal, 2017).

EBITDA

We are first calculating earnings before interest, taxes, depreciation, amortization and impairment losses. The reason is that depreciation, amortization and impairment losses are not cash outflows or inflows, these are simply lost value of existing assets (Kristoffersen, 2014).

To help us estimate future growth, we will use historical data back to 2016. These will show us historical revenue growth and rates which we than can use to forecast future growth.

	Previous years				Forecast					
Profitt/Loss (EURm)										
	2016	2017	2018	2019	2020e	2021e	2022e	2023e	2024e	2025e
Operating Income										
Revenue	3502,80	3626,10	3749,80	4074,20	3463,07	3584,28	3770,45	3966,30	4172,31	4389,03
Other Income	7,40	23,30	62,10	61,40	61,40	65,70	75,55	86,89	99,92	114,91
Sum Operating Income	3510,20	3649,40	3811,90	4135,60	3524,47	3649,98	3846,00	4053,18	4272,23	4503,94
% Growth		3,97 %	4,45 %	8,49 %	-14,78 %	3,56 %	5,37 %	5,39 %	5,40 %	5,42 %
Forecast for operating income growth (%)										
Revenue		3,52 %	3,41 %	8,65 %	-15,00 %	3,50 %	5,19 %	5,19 %	5,19 %	5,19 %
Other Income		214,86 %	166,52 %	-1,13 %	0,00 %	7,00 %	15,00 %	15,00 %	15,00 %	15,00 %
Operating Expenses (- Impairment loss, Depreciation & Amortization)										
Cost of materials	1782,20	1688,50	1812,20	1982,80	1683,39	1742,31	1832,81	1928,01	2028,16	2133,50
Salery and personnel expenses	440,00	477,90	505,00	563,50	459,20	475,27	499,95	525,92	553,24	581,98
Other operating expenses	472,50	555,00	589,90	585,60	509,94	527,78	555,20	584,03	614,37	646,28
Restruction costs	5,40	2,50	-0,30	19,20	5,94	6,15	6,47	6,81	7,16	7,53
Net fair value adjustment biomass	-386,20	340,30	-146,40	127,50	-20,91	-21,64	-22,77	-23,95	-25,20	-26,50
Onerous contracts provision	108,70	-119,80	6,10	-5,30	-1,45	-1,51	-1,58	-1,67	-1,75	-1,84
Other non-operational items	-1,30	-0,30	-1,00	2,40	-0,11	-0,12	-0,12	-0,13	-0,14	-0,14
Income/Loss from associated companies & JV	-62,60	-33,70	-45,50	-48,70	-44,37	-45,93	-48,31	-50,82	-53,46	-56,24
Forecast for operating expenses growth (% in revenue)										
Cost of materials	50,88 %	46,57 %	48,33 %	48,67 %	48,61 %	48,61 %	48,61 %	48,61 %	48,61 %	48,61 %
Salery and personnel expenses	12,56 %	13,18 %	13,47 %	13,83 %	13,26 %	13,26 %	13,26 %	13,26 %	13,26 %	13,26 %
Other operating expenses	13,49 %	15,31 %	15,73 %	14,37 %	14,72 %	14,72 %	14,72 %	14,72 %	14,72 %	14,72 %
Restruction costs	0,15 %	0,07 %	-0,01 %	0,47 %	0,17 %	0,17 %	0,17 %	0,17 %	0,17 %	0,17 %
Net fair value adjustment biomass	-11,03 %	9,38 %	-3,90 %	3,13 %	-0,60 %	-0,60 %	-0,60 %	-0,60 %	-0,60 %	-0,60 %
Onerous contracts provision	3,10 %	-3,30 %	0,16 %	-0,13 %	-0,04 %	-0,04 %	-0,04 %	-0,04 %	-0,04 %	-0,04 %
Other non-operational items	-0,04 %	-0,01 %	-0,03 %	0,06 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %
Income/Loss from associated companies & JV	-1,79 %	-0,93 %	-1,21 %	-1,20 %	-1,28 %	-1,28 %	-1,28 %	-1,28 %	-1,28 %	-1,28 %
Sum Operating Expenses	2358,70	2910,40	2720,00	3227,00	2591,61	2682,32	2821,65	2968,21	3122,38	3284,56
EBITDA & Impairment Loss	1151,50	739,00	1091,90	908,60	932,86	967,65	1024,36	1084,97	1149,85	1219,37
% Margin in OI	32,80 %	20,25 %	28,64 %	21,97 %	26,47 %	26,51 %	26,63 %	26,77 %	26,91 %	27,07 %

Figure 5-7: Historical and forecasted EBITDA.

For our operating income, we are using y/y growth in % to forecast future growth. In our case, we have lowered our forecast for operating income growth in 2020e and low growth in 2021e. This is because of the ongoing COVID-19 pandemic. Mowi also released information about Q1 2020 where operational EBIT for the group was down from EUR 196 million in Q1 2019 to EUR 107 million in Q1 2020. For 2022e and outwards we would expect this situation to balance out and continue with the average growth they have had in 2016 to 2019.

For our operating expenses, we are using cost in % of revenue to find an average rate. Most of these rates are consistent throughout the years, with that in mind, we are going to simply use the average from the past 4 years.

Depreciation, Amortization & Impairment Losses

DA&IL is a non-cash expense, it's only important because it reduces taxable income. It creates a tax shield for the company, which must be included in our valuation as this is valuable (Boye, Koekebakker, Krakstad, & Oust, 2018).

Balance (EURm)	2016	2017	2018	2019	2020e	2021e	2022e	2023e	2024e	2025e
Depreciation, Amortization & Impairment Loss										
PP&E (01.01.)	963,70	1008,10	1082,70	1216,10	1361,60	1298,18	1266,95	1339,51	1412,21	1485,05
DA&I	158,30	149,90	160,10	159,80	201,60	192,21	187,58	198,33	209,09	219,87
ΔAdditions in the year	149,10	213,00	200,20	183,30	68,08	90,87	190,04	200,93	211,83	222,76
Net Investment	-9,20	63,10	40,10	23,50	-133,52	-101,33	2,46	2,60	2,74	2,88
ΔAdjustments	53,60	11,50	93,30	122,00	70,10	70,10	70,10	70,10	70,10	70,10
PP&E (31.12)	1008,10	1082,70	1216,10	1361,60	1298,18	1266,95	1339,51	1412,21	1485,05	1558,04
Right-of-use assets (Opening balance 01.01.)				373,30	386,80	309,44	263,02	249,87	237,38	225,51
ΔContracts				134,60	38,68	46,42	65,76	62,47	59,34	56,38
D&A				124,80	116,04	92,83	78,91	74,96	71,21	67,65
ΔAdjustments				3,70	0,00	0,00	0,00	0,00	0,00	0,00
Right-of-use assets (31.12)				386,80	309,44	263,02	249,87	237,38	225,51	214,23
∑Depreciation	158,30	149,90	160,10	284,60	317,64	285,04	266,49	273,29	280,30	287,53
% in revenue	4,52 %	4,13 %	4,27 %	6,99 %	9,17 %	7,95 %	7,07 %	6,89 %	6,72 %	6,55 %
Forecast for Depreciation, Amortization & Impairment Loss										
DA&I (% PP&E)	16,43 %	14,87 %	14,79 %	13,14 %	14,81 %	14,81 %	14,81 %	14,81 %	14,81 %	14,81 %
ΔAdditions in the year (% PP&E)	15,47 %	21,13 %	18,49 %	15,07 %	5,00 %	7,00 %	15,00 %	15,00 %	15,00 %	15,00 %
ΔContracts (% RoU Assets)				36,06 %	10,00 %	15,00 %	25,00 %	25,00 %	25,00 %	25,00 %
D&A (% RoU Assets)				33,43 %	30,00 %	30,00 %	30,00 %	30,00 %	30,00 %	30,00 %

Figure 5-8: Historical and forecasted depreciations, amortizations and impairment loss.

Mowi's method of depreciation follows the linear method. Property, plant and equipment are divided into 6 categories which each has different estimated lifetimes. In the period of 2016 to 2018, this was the only significant depreciation made. IFRS 16 & 17 introduced regulations on how to depreciate right-of-use assets. This complicates thing as Mowi ASA only has done this for 2019. This makes it hard to estimate future depreciation as we only have data for one year.

Even though we are reducing the additions and new contracts for our 2020e and 2021e estimates, we are still keeping the depreciation percentage the same, as that is a fixed percentage of which the assets on balance will depreciate.

Working Capital

As previously stated, working capital is a financial measure of the short-term liquid assets available after short-term liabilities are subtracted. When working capital increase or decrease from the previous year, it means that more cash is either bound or available (Kristoffersen, 2014). That is why we need to look at change in working capital when calculation UFCF.

Balance (EURm)	2016	2017	2018	2019	2020e	2021e	2022e	2023e	2024e	2025e
Working Capital										
Trade Receivables	498,00	477,60	493,30	504,80	461,90	478,34	504,03	531,19	559,89	590,26
Other Receivables	112,80	99,10	142,80	146,20	116,40	120,54	127,02	133,86	141,09	148,75
Other Current Financial Assets	14,20	7,20	0,80	6,90	6,96	7,21	7,59	8,00	8,43	8,89
Biological Assets	1573,80	1200,50	1559,30	1522,40	1359,15	1406,72	1479,78	1556,65	1637,50	1722,56
Inventory	248,20	306,90	285,50	320,70	268,69	278,09	292,54	307,73	323,72	340,53
Cash In Bank	88,00	59,10	93,90	117,50	83,10	86,06	90,68	95,56	100,73	106,19
Restricted Cash	15,90	12,60	11,40	11,10	12,03	12,46	13,13	13,84	14,59	15,38
Sum Current Assets	2550,90	2163,00	2587,00	2629,60	2308,22	2389,42	2514,77	2646,83	2785,95	2932,55
Current Tax Liabilities	142,60	90,80	120,10	99,60	90,16	100,04	111,07	118,96	127,44	136,57
Trade Payables	275,50	280,90	280,20	296,80	263,14	272,35	286,49	301,37	317,03	333,49
Other Current Liabilities	425,00	428,00	298,90	379,80	357,06	369,56	388,76	408,95	430,19	452,53
Sum Current Liabilities	843,10	799,70	699,20	776,20	710,36	741,95	786,32	829,28	874,65	922,59
Net Working Capital (NWC)	1707,80	1363,30	1887,80	1853,40	1597,86	1647,47	1728,46	1817,55	1911,30	2009,96
% in revenue	48,76 %	37,60 %	50,34 %	45,49 %	46,14 %	45,96 %	45,84 %	45,82 %	45,81 %	45,80 %
ΔNWC		-344,50	524,50	-34,40	-255,54	49,62	80,98	89,09	93,75	98,66
Forecast for Current Assets & Liabilities										
Trade Receivables (% in Operating Income)	14,19 %	13,09 %	12,94 %	12,21 %	13,11 %	13,11 %	13,11 %	13,11 %	13,11 %	13,11 %
Other Receivables (% in Operating Income)	3,21 %	2,72 %	3,75 %	3,54 %	3,30 %	3,30 %	3,30 %	3,30 %	3,30 %	3,30 %
Other Current Financial Assets (% in Operating Income	0,40 %	0,20 %	0,02 %	0,17 %	0,20 %	0,20 %	0,20 %	0,20 %	0,20 %	0,20 %
Biological Assets (% in revenue)	44,93 %	33,11 %	41,58 %	37,37 %	39,25 %	39,25 %	39,25 %	39,25 %	39,25 %	39,25 %
Inventory (% in revenue)	7,09 %	8,46 %	7,61 %	7,87 %	7,76 %	7,76 %	7,76 %	7,76 %	7,76 %	7,76 %
Cash In Bank (% Operating Income)	2,51 %	1,62 %	2,46 %	2,84 %	2,36 %	2,36 %	2,36 %	2,36 %	2,36 %	2,36 %
Restricted Cash (% Operating Income)	0,45 %	0,35 %	0,30 %	0,27 %	0,34 %	0,34 %	0,34 %	0,34 %	0,34 %	0,34 %
Current Tax Liabilities (% Tax)	65,26 %	70,06 %	58,59 %	72,55 %	66,62 %	66,62 %	66,62 %	66,62 %	66,62 %	66,62 %
Trade Payables (% Cost of materials)	15,46 %	16,64 %	15,46 %	14,97 %	15,63 %	15,63 %	15,63 %	15,63 %	15,63 %	15,63 %
Other Current Liabilities (% Cost of materials)	23,85 %	25,35 %	16,49 %	19,15 %	21,21 %	21,21 %	21,21 %	21,21 %	21,21 %	21,21 %

Figure 5-9: Historical and forecasted working capital.

5.2.4 Net Present Value and Gordons Growth Model

The formula we introduced to find enterprise value assumes we have calculated UFCF for all the periods into the future. That would be time consuming and very inaccurate as we cannot predict that far into the future (Brealey, Myers, & Allen, 2017). Therefore, we must split the formula into two parts, explicit period and terminal value. Since we have estimated for 2020e to 2025e, this will be considered our explicit period.

$$(11)\ Enterprise\ Value = \sum_{t=1}^{5} \frac{\mathrm{UFCF_t}}{(1+\mathrm{WACC})^{\mathrm{t}}} + \frac{Terminal\ Value}{(1+WACC)^5}$$

$$(12)\ Terminal\ Value = \frac{UFCF_5 * (1+Terminal\ Growth\ Rate)}{(WACC - Terminal\ Growth\ Rate)}$$

Cash Flow (EURm)	2020e	2021e	2022e	2023e	2024e	2025e
EBITDA & Impairment Loss	932,86	967,65	1024,36	1084,97	1149,85	1219,37
- Depreciation, Amortization & Impairment Loss	317,64	285,04	266,49	273,29	280,30	287,53
EBIT	615,22	682,62	757,87	811,69	869,55	931,84
Tax	135,35	150,18	166,73	178,57	191,30	205,01
Unlevered net income	479,87	532,44	591,14	633,12	678,25	726,84
Depreciation, Amortization & Impairment Loss	317,64	285,04	266,49	273,29	280,30	287,53
- ΔNWC	-255,54	49,62	80,98	89,09	93,75	98,66
- Investments and Contracts	106,76	137,29	255,80	263,39	271,18	279,14
Unlevered Free Cash Flow	946,29	630,57	520,84	553,92	593,62	636,57
Cash Flow in % EBITDA&IL	101,44 %	65,16 %	50,85 %	51,05 %	51,63 %	52,21 %

Figure 5-10: Forecasted cash flow.

With the following projected unlevered free cash flow, we can find NPV for our explicit period.

$$(13)\ NPV\ of\ explicit\ period = \sum_{t=1}^{5} \frac{\mathrm{UFCF_t}}{(1+\mathrm{WACC})^{\mathrm{t}}} = 3380.60\ EURm$$

And by using Gordons Growth Model formula, we can find the net present value of our terminal value. But first, we need to establish a terminal growth rate. This is the rate that the company will keep growing after our explicit period.

Usually, we would use the inflation rate as our terminal growth rate, Mowi states that they use a five-year average historic inflation rate. As of 2019, the inflation rate in Norway is 2% (Norges Bank, 2020). Mowi also gives out their assumption for terminal growth for each of their cash generating units (Mowi, 2020). By using these numbers, we can find the average growth rate for the company. Since this is a bit lower than the inflation rate, we will use an approximated growth rate of 1%.

Terminal Growth Rate		
Units	**Harvest Volume**	**Terminal Growth**
Mowi Norway Farming	236880	0,80 %
Mowi Chile Farming	65688	1,50 %
Mowi Canada Farming	54408	0,80 %
Mowi Scotland Farming	65365	0,60 %
Mowi Ireland Farming	6650	0,30 %
Mowi Faroe Islands Farming	6913	0,80 %
	435904	***0,87 %***

Figure 5-11: Terminal Growth rate.

$$(14)\ NPV\ of\ TV\ = \frac{\frac{636{,}57*(1+1\%)}{4{,}38\%-1\%}}{(1+4{,}38\%)^5} = 14696{,}20\ EURm$$

We can look at the distribution of value. It is clear that most of the company's value come from terminal value, as that is many more periods than our explicit periods.

Distribution of value	EURm	%
NPV of explicit period	3380,60	18,70 %
NPV of TV	14696,20	81,30 %
Total Enterprise Value	18076,80	100,00 %

Figure 5-12: Distribution of value.

5.2.5 Price Target and Sensitivity Analysis

Our target price is found by subtracting NIBD and then dividing by number of shares.

Target Price	EURm
Enterprise Value	18076,80
- NIBD	1337,2
Value of equity	16739,60
Number of shares (m)	517,111091
Value each share	32,3713817
EURNOK (31.12.19)	9,8525
Value each share (NOK)	318,94

Figure 5-13: Target price Mowi ASA.

Since a DCF Model is very sensitive to small changes in our discount rate, we must also do a sensitivity analysis to gain a better idea of what range our target price should be within (Brealey, Myers, & Allen, 2017). It is also worth noting that our theoretical WACC is quite low, which leads to high target price.

Mowi themselves use different WACC pre-tax for their various cash generating units, which they have provided in their annual report 2019 (Mowi, 2020). They use an average WACC pre-tax around 9% and we can approximately use 7% as after-tax.

WACC Pre-Tax		
Units	**Harvest Volume**	**WACC Pre-Tax**
Mowi Norway Farming	236880	9,10 %
Mowi Chile Farming	65688	11,70 %
Mowi Canada Farming	54408	9,70 %
Mowi Scotland Farming	65365	8,50 %
Mowi Ireland Farming	6650	7,40 %
Mowi Faroe Islands Farming	6913	8,80 %
Sum	435904	***9,45 %***

Figure 5-14: Average WACC pre-tax.

DCF Sensitivity Analysis						
		Terminal Growth				
	318,94	0,50 %	0,75 %	1,00 %	1,25 %	1,50 %
WACC	2,88 %	473,50	525,31	590,89	676,56	793,24
	3,38 %	387,35	421,20	462,16	512,73	576,74
	3,88 %	326,69	350,35	378,12	411,17	451,15
	4,38 %	281,66	299,02	318,94	342,04	369,15
	4,88 %	246,92	260,11	275,01	291,95	311,40
	5,38 %	219,30	229,61	241,11	253,99	268,53
	5,88 %	196,82	205,06	214,16	224,23	235,45

Figure 5-15: DCF Sensitivity Analysis using theoretical WACC.

		Terminal Growth				
	318,94	0,50 %	0,75 %	1,00 %	1,25 %	1,50 %
WACC	5,50 %	213,57	223,33	234,18	246,31	259,95
	6,00 %	192,09	199,94	208,56	218,10	228,70
	6,50 %	174,20	180,61	187,61	195,27	203,70
	7,00 %	159,06	164,38	170,14	176,41	183,24
	7,50 %	146,09	150,56	155,37	160,57	166,20
	8,00 %	134,85	138,64	142,71	147,08	151,78
	8,50 %	125,02	128,27	131,74	135,45	139,42

Figure 5-16: DCF Sensitivity Analysis using approximate WACC.

By using our theoretical WACC we can say that the target price range should be somewhere between NOK 275 and NOK 378, and by using our approximate WACC which we have from the annual report, the target price range should be somewhere between NOK 155 and NOK 187.

5.3 Relative Valuation Method

In the further analysis we will be looking at multiples. This form of valuation is relative because similar firms are compared by looking at metrics like P/E, EV/EBIT and other ratios. The goal is to use the metrics from other businesses to value a firm. When valuing Mowi, we will use the mean of the industry's multiples (excluding Mowi).

Benchmarks	Mowi	Salmar	Lærøy Seafood Group	Bakkafrost	Grieg Seafood
Ticker	MOWI	SALM	LSG	BAKKA	GSF

Figure 5-17: Benchmarks in the Relative Valuation Method.

The different multiples will be explained in the next section.

5.3.2 Price-to-Earnings Ratio

The P/E-ratio measures the share price relative to earnings per share and is a commonly used multiple in stock valuation. The interpretation of P/E is the amount of time a firm needs to sustain current earnings in order to pay back the share price (Corporate Finance Institute, u.d.)

$$\frac{P}{E}\ Ratio = \frac{Share\ price}{Earnings\ per\ share}$$

2019	MOWI	SALM	LSG	BAKKA	GSF	Average
P/E Ratio	16,69	17,73	13,08	20,18	11,85	15,71

Source: DN Investor

Figure 5-18: P/E Ratio

Generally, firms with high P/E-ratios have high expectations for future earnings and performance and therefore the investors are willing to pay more for the stock. Also, stocks with high P/E ratios may be overvalued.
On the other end there are firms with low P/E-ratios, which are often considered to be value stocks. If a stock trades with a low P/E this may indicate that it is undervalued because the stock price is low relative to fundamentals.

	P/E Multiple	
	MOWI EPS 2019	11,07
x	Average P/E	15,71
=	**Estimated value per share**	**173,91**

Figure 5-19: Estimated share price using P/E ratio.

By multiplying Mowi's EPS with the average P/E-ratio for the industry, we can estimate the share price of Mowi. This gives us an estimate of NOK 173.91.

5.3.3 Price-to-Sales Ratio

The Price-to-sales ratio (P/S) measures the share price of a company to its revenues and shows how much investors are willing to pay per NOK of sales. It is calculated by dividing the share price at the company's revenues (Hargrave, 2019).

$$\frac{P}{S}\ Ratio = \frac{Share\ price}{Sales\ revenues\ per\ share}$$

2019	MOWI	SALM	LSG	BAKKA	GSF	Average
P/S Ratio	2,03	3,79	1,53	4,18	1,29	2,6975

Source: DN Investor and Proff Forvalt

Figure 5-20: P/S Ratio.

A low P/S ratio indicates that a company is undervalued, while a high ratio indicates that it is overvalued. As shown in figure 5-20, there are some differences in the industry's ratios, with Mowi at the center, slightly below the average.

	P/S Multiple	
	Mowi number of shares (million)	517,1
	Mowi revenues 2019 (EURm)	4135,6
	Mowi revenues 2019 (NOKm)	40746,83
	Mowi Revenue per share 2019	78,799
x	Average P/S	2,698
=	**Estimated value per share**	**212,56**

Figure 5-21: Estimated share price using P/S ratio.

Further on, to estimate Mowi's share price using the P/S multiple, we find Mowi's revenues per share and multiply it with the average P/S ratio. The revenues are converted from EUR to NOK at the currency of 31.12.19. This gives an estimate of the share price at NOK 212.56.

5.3.4 EV/EBITDA

The EV/EBITDA-ratio, also known as the enterprise multiple, is a ratio to determine the value of a company, by dividing the enterprise value by the company's EBITDA. The ratio is commonly used to value companies that might be subjects to acquisitions. As a rule of thumb, ratios less than 7.5 indicates underpriced companies, while ratios greater than 7.5 indicates overpriced companies. The standard of satisfactory ratios will vary from industry to industry. (Zakamulin, 2020)

$$\frac{EV}{EBITDA} = \frac{Enterprise\ Value}{EBITDA}$$

2019	MOWI	SALM	LSG	BAKKA	GSF	Average
Entreprise value (NOKb)	114,3	49,4	35	33,7	14,3	
EBITDA (NOKb)	11,2	4,1	4,3	2,9	1,9	
EV/EBITDA	10,2	12,0	8,1	11,6	7,5	**9,8**

Source: DN Investor

Figure 5-22: EV/EBITDA ratio.

As shown in figure 5-22, all of the EV/EBITDA ratios are equal or greater than 7.5. This may signify that the standard of sufficient EV/EBITDA is higher than 7.5 in the salmon industry. Mowi's ratio at 10.2 is however decent compared with its peers.

	EV/EBITDA Multiple	
	Multiple	9,8
x	EBITDA (NOKb)	11,2
=	EV (NOKb)	110,139
-	Total debt (NOKb)	24,54
+	Cash + cash equivalents (NOKb)	0,40
=	Market value equity (NOKb)	86,00
/	Mowi number of shares (billion)	0,5171
=	**Estimated value per share**	**166,31**

Figure 5-23: Estimated share price using EV/EBITDA ratio.

In the figure above, the average multiple has been multiplied with Mowi's EBITDA to equal the enterprise value, and then further on calculated to an estimate of the share price. The EV/EBITDA-ratio gives us an estimate target price at NOK 166.31.

5.3.5 EV/KG

The EV/KG-ratio is similar to the multiple ratio described above, but instead of dividing at EBITDA, we divide EV at the slaughter volume of salmon in kilograms. This ratio is therefore very suitable for valuing companies in the seafood farming industry. Low ratios indicate underpriced companies, while high ratios indicate overpriced companies. (Berge, iLaks.no, 2013).

$$\frac{EV}{KG} = \frac{Enterprise\ Value}{Slaughter\ volume\ in\ kilograms}$$

2019	MOWI	SALM	LSG	BAKKA	GSF	Average
Entreprise value (NOK thous.)	114 300 000	49 400 000	35 000 000	33 700 000	14 300 000	
Slaughter volume (kg)	435 904 000	153 100 000	158 178 000	157 184 000	82 973 000	
EV/KG	0,262	0,323	0,221	0,214	0,172	**0,233**

Source: DN Investor and respective annual reports (slaughter volumes)

Figure 5-24: EV/KG ratio.

As shown in figure 5-24, Mowi's EV/KG-ratio is slightly above the industry average with the second largest ratio. Only SalMar has higher ratio, which indicates the least efficient production of salmon, relative to their enterprise value. Grieg Seafood has the lowest ratio and produces salmon cheapest, relative to their enterprise value.

When using the average EV/KG multiple ratio to estimate Mowi's share price, through calculation of the EV, this method gives us an estimate of the share price at NOK 191.4.

	EV/KG Ratio	
	Multiple	0,233
x	Slaugther volume Mowi (kg)	435 904 000,00
=	Enterprise value (NOKm)	101 421,59
-	Total debt (NOKm)	2 490,30
+	Cash + cash equivalents (NOKm)	40,60
=	Market value equity (NOKm)	98 971,89
/	Mowi number of shares (millions)	517,1
=	**Estimated value per share**	**191,40**

Figure 5-25: Estimated share price using EV/KG ratio.

5.3.6 Summary Relative Valuation Method

We have now applied different multiple ratios to measure the value of the Mowi stock and our estimates are somewhat unalike. When using parameters as price, revenues and kilograms of harvested salmon, the estimates are expected to vary some. Still, there is a significantly large gap between the estimates determined through the EV/EBITDA and the P/E multiple. It is no subject of directly concern, but this aspect needs to be included when weighting the average of our final estimated share price.

To determine an estimate of Mowi's share price based at the multiple ratios, we use the average, with the same weight at all ratios. This gives us an estimate of the share price at NOK 186.04, which is 18.4% below the actual share price at 31.12.19.

Value estimate Mowi 2019	
P/E	173,91
P/S	212,56
EV/EBITDA	166,31
EV/KG	191,40
Average	**186,04**
Stock price 31.12.19	228,2

Figure 5-26: Estimated share price using the Relative Valuation Method.

5.4 Valuation

Now that we have done both an absolute valuation and a relative valuation, we can combine them both to try to find the correct value of this company.

An absolute valuation has several flaws, mostly that it is dependent on assumptions. Assumptions such as growth opportunities, discount rate, terminal growth and so on. Earlier we did a sensitivity analysis on discount rate and terminal growth and saw how sensitive the target price is to minimal changes. Throughout our analysis we have been aware of these flaws, and thus it should be expected that it is a fair grade of uncertainty when it comes to our target price.

Using different valuation method to value a company makes us more certain that our target price is close to the true value of the company. Since we have used 5 different ways to value Mowi, we will take a weighted average of those methods. P/E, P/S, EV/EBITDA and EV/KG will each be weighted 12.5% and our DCF-analysis will be weighted 50%. This gives us a target price of NOK 178.1.

Our reason behind weighting the DCF at 50% is because it is a more fundamental analysis of the company and much more comprehensive method to valuate Mowi. If this is the optimal weighting is unclear and is just an assumption that we believe is appropriate.

6. Conclusion

In our term paper we wanted to value Mowi ASA as per 31.12.19. We have done a thorough intrinsic valuation and a relative valuation which has given us an estimated value of NOK 178.1. Mowi ASA has overall solid financial health.

The market capitalization per 31.12.19 is NOK 118.00 billion and our calculations shows that Mowi's value of equity is NOK 92.10 billion. Our target price is NOK 178.1 whilst the market value of one stock is NOK 228.2 as of 31.12.19.

Since the value of one Mowi stock is worth 21.95% less than what is traded on the market, we must conclude with that the company is overpriced and therefore our recommendation and conclusion is to sell.

7. Criticism

This part of our semester thesis is meant to emphasize potential weaknesses that may affect our estimate of Mowi's share price.

Due to the lockdown of NTNU Business School effective from March 12, we were unable to access the financial databases/terminals available at The Economics and Management Library. As a consequence, we had to use other databases (e.g. DN Investor, Yahoo Finance, Oslo Børs etc.) in the calculations we carried out. Due to rounding errors and inconsistency in the use of databases, this may affect the reliability of our findings (Jacobsen, 2015).

Furthermore, in our DCF we have included a revenue growth for 2020e of -15% due to the ongoing COVID-19 pandemic. This is purely based on our expectations, which is subject to potential bias and uncertainty. At the same time our calculations in the multiple-based valuation is based on financial data retrieved 31.12.2019. Consequently, there is a knowledge-inconsistency in our valuation. In our DCF-analysis, we have included the effect of Covid-19 while our multiple-based valuation was not adjusted for Covid-19.

The theoretical after-tax WACC we initially ended up with was 4.38%, which gave a share price of NOK 318.94. Naturally this is very high, considering the current and previous share prices. The WACC we ended up using was the pre-tax WACC from Mowi's 2019 annual report, which we adjusted for tax using an approximation. This is not a theoretically correct approach but given the circumstances we find this an adequate way of calculating the after-tax WACC.

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9. Table of figures