Graduate thesis

NTNU
Norwegian University of Science and Technology
Faculty of Economics and Management
NTNU Business School

Jonas Emil Aasvik
Martin Bjørvik Kulsveen
Mattias Bøe Strandberg
Thomas Gunnari Latini

Valuation of Mowi ASA

Graduate thesis in Business Administration, Financial Management
Supervisor: Hans Marius Eikseth

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Preface

This graduate thesis is written by four students at NTNU Business School in the spring of 2022. The thesis is our final subject in a bachelor's degree in Business Administration with a specialization in financial economics and corresponds to 7,5 credits (ECTS).

Our paper combines three years' worth of theoretical knowledge surrounding different disciplines within our studies. From strategy to corporate finance, we see the importance of having a good understanding of several different topics within economics. With efforts into gathering information and analysis, we have expanded our knowledge of the salmon industry, and hope you as a reader find our analysis useful and insightful.

We would also like to thank our supervisor for this thesis, Hans Marius Eikseth, which have guided us with good input and advice.

Trondheim, April 2022

The authors of this thesis are responsible for its content.

Abstract

In this graduate's thesis, we have looked into Mowi ASA with the purpose of valuating the company, and based on that valuation, either give a recommendation of whether an investor should hold, sell, or buy the shares of Mowi ASA.

The paper starts with a presentation of the company's history, and then a further dive into the company's mission, vision, and business model today. This is followed up by a general introduction highlighting the most important variables for changes in the demand and supply side of the salmon farming industry. Based on this presentation we have done a strategic analysis of both external and internal factors which we believe can affect Mowi's business operations. The external assessment was done first by a PESTEL-analysis, then a Porter's Five Forces analysis, followed up by a VRIO, and then it is all summarized in an overview of SWOT. Furthermore, we have also investigated the financial statements of Mowi, which gave us an overview of the current and historical financial situation. With all this information combined, we were able to make good decisions later in the paper.

For the fundamental analysis we relied on the DCF-analysis, using WACC as our discount rate. For the multiple analysis we used the P/E, EV/EBITDA and EV/KG ratio. Using a weighted average, we estimated a share value of NOK 270,96. As of the 31.12.2021 the stock price of Mowi was NOK 208,70, and our recommendation is to buy.

We believe it is important to highlight that the world changes at a pace faster than ever before. In addition to the fact the paper is based on limited information, we have in chapter 7 included a sensitivity analysis. There is also a general criticism of our findings in chapter 8.

Sammendrag

I denne semesteroppgaven har vi sett nærmere på MOWI ASA med det formål å verdsette selskapet, og basert på den verdsettelsen enten gi en anbefaling om en investor bør holde, selge eller kjøpe aksjene i MOWI ASA.

Oppgaven starter med en presentasjon av selskapets historie, og deretter et ytterligere dypdykk inn i selskapets misjon, visjon og forretningsmodell i dag. Dette følges opp av en generell introduksjon som belyser de viktigste variablene for endringer på etterspørsels- og tilbudssiden i lakseoppdrettsnæringen. Basert på denne presentasjonen har vi gjort en strategisk analyse av både eksterne og interne faktorer som vi tror kan påvirke Mowi's forretningsdrift. Den eksterne analysen ble først gjort av en PESTEL, deretter en Porters Five Forces, fulgt opp av en VRIO, og deretter er det hele oppsummert i en SWOT-oversikt. Videre har vi også undersøkt regnskapet til Mowi, som ga oss en oversikt over dagens og den historiske økonomiske situasjonen. Med all denne informasjonen kombinert, var vi i stand til å ta gode beslutninger senere i verdsettelsen.

For den fundamentale analysen anvendte vi DCF-analyse, og brukte WACC som diskonteringsrente. For multippelanalysen brukte vi P/E, EV/EBITDA, og EV/KG forhold. Denne verdivurderingen ga oss en vektet aksjekurs på henholdsvis NOK 270,96. Per 31.12.2021 var aksjekursen til Mowi NOK 208,70, og vår anbefaling er kjøp.

Til slutt mener vi det er viktig å fremheve at verden endrer seg i et tempo raskere enn noen gang før, i tillegg til at papiret er basert på begrenset informasjon, har vi i kapittel 7 inkludert en sensitivitsanalyse. Det er også et kapittel med generell kritikk til våre funn i kapittel 8.

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1 Introduction

For this thesis, we have decided to write a valuation of the Norwegian seafood company MOWI ASA (Mowi). To conduct the valuation and finding out if Mowi is fair priced, we will apply theory and techniques acquired throughout our degree.

We were from the beginning very clear that we wanted to get a better understanding of the seafood industry, and for the company the choice fell on Mowi as it is one of the most influential and largest producers of farmed salmon in the world. Moreover, the industry faces many challenges, and is heavily regulated by government. With talks about a ground rent taxation, carbon taxes, and rising of land-based-farming, the landscape which Mowi has to navigate in is very interesting. Throughout the report, these are issues we would like to get a better understanding of.

The chosen research question is: “What is the value per share of Mowi per 31.12.21?”

To answer this, we start with giving a general introduction of the company and the industry in chapter 1. Further on, we do a strategic analysis in chapter 2, looking into the strengths, opportunities, weaknesses, and threats that Mowi are exposed to. Afterwards, we analyze Mowi’s financial situation in chapter 3 by looking into the statement of Mowi and some of its main competitors over the last five years. We will then in chapter 4, do the fundamental valuation, including both a DCF and a sensitivity analysis to show how variations in the input variables will affect the result from the DCF-model. At the end of chapter 4, we will perform a marked based analysis. In chapter 5, at the end of the report, we have included a general criticism.

2 Mowi and the Salmon Farming Industry

2.1 Mowi

2.1.1 History of Mowi

The now almost 60-years long adventure of Mowi began in 1964 when the company was established. The company was established as a result of the original owners, Johan Lærum & Co AS, wanting to expand from the jam industry (Jensen, 2018). The conditions, in the beginning, are farfetched from what Mowi is today. Whereas Mowi now has operations in over 25 countries, it all started with a few pioneers breeding salmon in their backyard and mixing fish feed by hand (Mowi, n.d.).

After having some success with breeding Atlantic salmon, Johan Lærum & Co were now looking for partners and got in touch with representatives from Norsk Hydro. In 1969, Norsk Hydro ends up investing in the companies, acquiring 50% of the outstanding shares, and the company changes its name to Mowi (Mowi, 2021). Even though they now had access to the resources of one of the largest Norwegian industrial companies at the time, Mowi still faced many challenges. Breeding salmon industrially was a new concept, and they had troubles with diseases, sea lice, and the need for oxygen. It was the belief that they one day would solve these issues which kept them going (Jensen, 2018).

During the 70s Mowi started to become a recognized international brand, and in 1980 Norsk Hydro bought the remaining parts of the shares (Mowi, 2021). The operations were also expanded to Scotland, Ireland, and Iceland, and Mowi had now become the world's largest Atlantic salmon breeder (Jensen, 2018). From here, Mowi changed its name to Marine Harvest and conducted a number of mergers and acquisitions during the 80s and 90s. Further, in 2006 Mowi merged into the Marine Harvest Group, consisting of Pan Fish, Marine Harvest, and Fjord Seafood, all under the ownership of John Fredriksen (Mowi, n.d.). The company was listed on the Norwegian Stock Exchange: Oslo Børs the same year.

In 2012, Marine Harvest started to expand its value chain by also establishing its own fish-feed department. Marine Harvest's large acquisition of Morpol was executed in

2013. In the transaction, Marine Harvest acquired 48.5% of the shares for almost 1 billion NOK (GlobeNewswire, 2012). The company had continued growth, and in 2017 Marine Harvest expanded its international operations by acquiring two Canadian companies: Gray Aqua Group and Northern Harvest. In more recent years, Marine Harvest has gone back to its roots, changing the name of the company back to Mowi (Mowi, n.d.).

2.1.2 Current Ownership

Mowi is currently listed on both the New York Stock Exchange and the Norwegian stock exchange Oslo Børs. John Fredriksen is still the indirectly largest owner of Mowi withholding 14.37% of the total outstanding shares, via his Cyprus registered company Geveran Trading Co Ltd. As we can see from table 1, other large shareholders are the Norwegian Folketrygdfondet and UBS Switzerland, withholding respectively 10% and 5.74%. Furthermore, the 20 largest shareholders own the majority of the company adding up to a total of 56.42%. This gives them heavy influence on the decisions which are made in the Annual General Meetings.

OVERVIEW OF 20 LARGEST SHAREHOLDERS 31.12.20	NUMBER OF SHARES	SHAREHOLDING %
Geveran Trading Co Ltd	74 289 287	14.37 %
Folketrygdfondet	51 727 162	10.00 %
UBS Switzerland AG	29 683 434	5.74 %
State Street Bank and Trust Comp	23 326 406	4.51 %
Clearstream Banking S.A.	20 318 358	3.93 %
State Street Bank and Trust Comp	12 532 501	2.42 %
Euroclear Bank S.A./N.V.	10 103 220	1.95 %
State Street Bank and Trust Comp	8 361 070	1.62 %
Citibank, N.A.	8 254 397	1.60 %
SIX SIS AG	7 614 563	1.47 %
J.P. Morgan Chase Bank, N.A., London	7 352 525	1.42 %
The Northern Trust Comp, London Br	5 729 058	1.11 %
State Street Bank and Trust Comp	5 353 144	1.04 %
Verdipapirfondet KLP Aksjenorge In	4 825 423	0.93 %
State Street Bank and Trust Comp	4 450 529	0.86 %
J.P. Morgan Bank Luxembourg S.A.	4 026 368	0.78 %
Citibank, N.A.	3 544 247	0.69 %
State Street Bank and Trust Comp	3 491 206	0.68 %
Verdipapirfondet DNB Norge	3 401 581	0.66 %
Danske Invest Norske Instit. II.	3 360 709	0.65 %
Total 20 largest shareholders	291 745 188	56.42 %
Total other shareholders	225 365 903	43.58 %
Total number of shares 31.12.20	517 111 091	100.00 %

Table 1: Shareholder Overview (Mowi, 2021)

2.1.3 Development in Share Price

As previously mentioned, Mowi became a listed company in 2006 and has since had remarkable growth. Over the last five years, shareholders in Mowi have received a total of 111.77% return, outperforming the Main Index at Oslo Børs by 29.23 percentage points (DN Investor, n.d.). Although beating the main index, Mowi has over the last years lagged the average on the Seafood Index at Oslo Børs, which consists of the largest seafood-related companies listed in Norway. The index has returned 124.66%, placing Mowi beneath the industry average (DN Investor, n.d.).

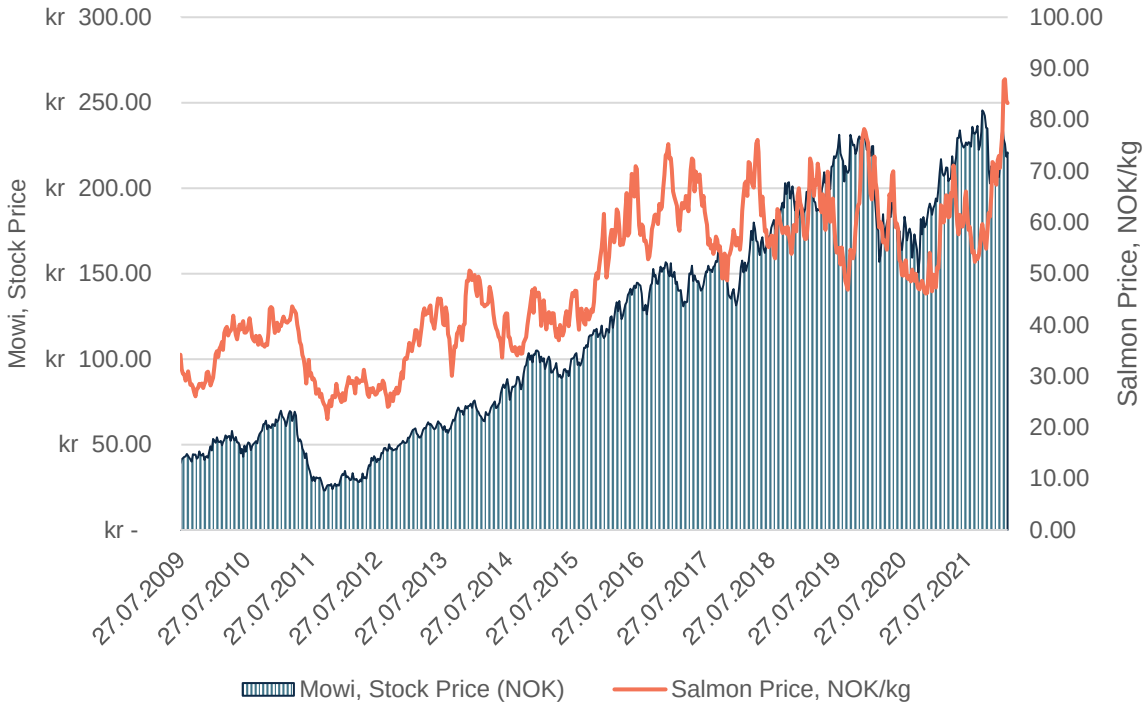

Figure 1: Comparison of Mowi's Stock Price and Salmon Price (SSB, 2022)

As of 23.03.2022, the stock price of Mowi is 238.2 and the market value is approximately 120 billion NOK, making it the fifth-largest listed company in Norway, only beaten by Equinor, DNB, Norsk Hydro, and Telenor (DN Investor, n.d.). Mowi has paid dividends to its shareholders quarterly since 2011, except for the turbulent year 2020 (Mowi, n.d.). The dividend policy claims that the payment should be at least 50% of the underlying earnings per share (EPS) each quarter, in addition to that excess capital, also will be paid out as extraordinary dividends (Mowi, 2021).

2.1.4 Mission, Vision, and Governance

2.1.4.1 Mission

A mission can be summarized as the fundamental principle that forms a firm's identity. The mission, in theory, consists of an organizational purpose, beliefs, values and a definition of the business conducted. The mission serves its purpose best if all these components are consistent and mutually reinforcing (de Wit, 2020). Figure 2 shows Mowi's mission, along with the underlying components.

Figure 2: Mowi's Corporate Mission, adapted from de Wit (2020)

The organizational purpose is supposed to function as the firm's reason for existence, and an effective purpose reflects people's idealistic motivation for performing the company's work tasks (Collin & Porras, 1996). Mowi's purpose can be summarized as to "provide sustainable and healthy food to the population" (Mowi, 2021). In other words, Mowi's reason for existing is that they are trying to feed the world's population, without forcing negative externalities upon it.

Furthermore, organizational belief is the assumption about the nature of the environment and what the firm needs to do to be successful in the business (de Wit, 2020). Mowi believes that the solution to fulfilling their mission is found in the ocean. In addition, they believe that everyone can make an impact. These beliefs mirror well

their commitment to the United Nation's Sustainable Development Goals (SDG) (Mowi, 2021).

The values of an organization are a small set of timeless guiding principles, which to no degree require external justification. It is only a true core value if it is not changed, even when the circumstances have changed, and penalize the company for holding it (Collin & Porras, 1996). Mowi have four core values (Mowi, n.d.):

- Passion - Dedication for everything we do
- Change - Pursuit of continual improvement
- Trust - Social responsibility in every part of the business
- Share - Openness and transparency, everyone can make a difference

These organizational values support and reinforce Mowi's corporate mission. For Mowi to accomplish serving sustainable and healthy food it is essential to have passion in every part of the work, and to have corporate social responsibility (CSR) close at every business level. At last, Mowi's definition of business can be said to be "working with the ocean to produce nutritious, delicious, and supreme quality food" (Mowi, 2021). This definition very well aligns with the other three components of their corporate mission, putting a clear focus for use of Mowi's resources and efforts.

2.1.4.2 Vision

De wit (2020) defines a vision as the desired future state of an organization. The purpose of a vision is to provide guidance about what core that should be preserved, in addition to what changes that should be stimulated for (Collin & Porras, 1996). Mowi's vision is defined as "Leading the Blue Revolution" (Mowi, 2021). This outlines both Mowi's possibilities and which path they want to go, and it also well reflect their vision building upon the belief that the solution for the increase in demand for food and protein is found the ocean.

A vision is no more than words on a notepad unless a company have a clear plan on how to utilize it. Mowi have in their annual report included a step-by-step guide on how they want to go from vision to action. This is visualized in figure 3 and is further discussed under the chapters of strategy and governance.

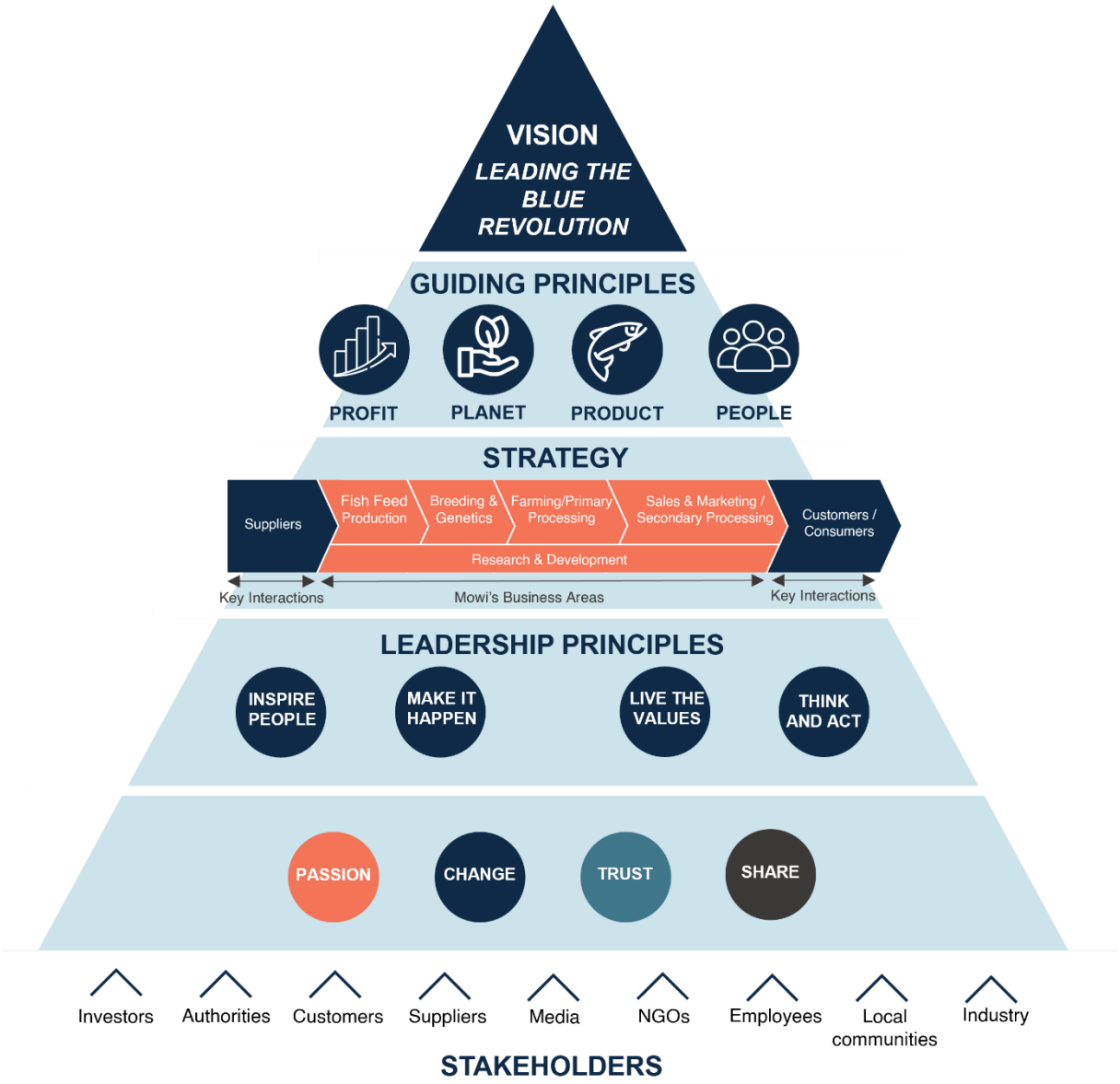

Figure 3: From Vision to Action, adapted from Mowi (2021)

2.1.4.3 Strategy

Mowi's high level strategy is well summarized in its ambition of integrating the whole value chain from feed to fork. They operate by four guiding principles, which is visualized in figure 4. Kaplan & Norton (1992) argues that no single measure can provide a clear focus for attention. Having a focus across the whole organization gives Mowi's strategy a more holistic approach.

Figure 4: Mowi's guiding principles

As we can see the first strategic principle lies in relation to economic growth and is labeled profit. Mowi believes that its financial success relies on its ability to provide value to customers via healthy, tasty, and nutritious seafood and that this has to be done both environmentally stable and cost-effectively (Mowi, 2021). Due to the widespread Covid-19 pandemic, 2020 was an unstable year in the whole world, and as we will further analyze in the financial statement analysis, this affected Mowi too. Now that things have started to calm down, Mowi's operational profits have begun to rise, and from the Q4 2021 report, we can see that the EBIT per kg was 1.76 EUR, up from 0.75 in Q4 2020 (Mowi, 2022).

The second and third of Mowi's guidelines are connected to the planet and people. We will go further into these efforts in the next chapter. Furthermore, the third guideline is connected to Mowi's products. Mowi aims to associate its product offering with top quality and with a healthy and climate-friendly lifestyle (Mowi, 2021). This is done by investing in brand development, continuing to roll out the Mowi brand all over the world. To live up to the brand expectations, Mowi has clear goals for product quality and safety.

2.1.4.4 Diversity, Gender Equality, and Sustainability

For any listed company, the importance of environmental, social, and governmental factors is more important than ever. Studies have shown that there are positive relations between high ESG performance and favorable valuations (Harvard, 2020). With operations running in over 25 countries, Mowi is exposed to many different cultures and norms. In today's society, it is believed that diversity is essential, and Mowi has developed Key Performance Indicators (KPI) for ensuring and following up on the diversity in their organization.

Over the last decades, equality between genders has been a core issue that often has been in the media spotlight. From 2020, every business with 50 or more employees in Norway must include comments on how the business copes with equality and diversity (DNB, n.d.). Mowi have developed their own Diversity & Inclusion program which relies on three strategies: seek diversity, create inclusion, and drive accountability. As we can see from figure 5: Equality between genders, approximately 60% of Mowi's full-time employees are men, and 40% are women, but the real gap lies in the management. In Mowi, women only stand for 25% of the leadership roles, whereas men have the remaining 75%. One of Mowi's KPIs are to achieve 30% of woman leaders before 2025, but this still lags far behind the current Norwegian average of 37% (SSB, n.d.).

Figure 5: Equality Between Genders, adapted from Mowi (2021)

As we can deduct from the analysis of Mowi's mission and vision, they have a clear goal to contribute to giving the world a better future, and a clear connection to the UN's SDGs. Mowi wants to lead the blue revolution by providing sustainable food from the ocean (Mowi, 2021). Mowi as many other countries have knitted their operations and KPIs to a selected few of the SDGs, as presented in figure 6.

Figure 6: Mowi's selected UN SDGs (Mowi, 2021)

As we will look further into the PESTEL- analysis, farm-raised salmon is a great source for omega 3, which entails great health benefits for humanity. Furthermore, as also discussed above, Mowi is heavily dependent on their diversity and gender balance. Hence, they have set clear KPI targets for gender neutrality throughout the business. Mowi focus on SDG 8, 10, and 11 by being prominent in over 25 countries. Mowi are contributing to creating jobs all over the world. In addition, Mowi has a large amount connected to investing in research and development(R&D), which supports SDG 9 (Mowi, 2021).

Mowi has also connected KPIs directly to reducing their carbon footprint, in addition to reporting on their Scope 1, Scope 2, and Scope 3 greenhouse gases (GHG) emissions. By the FAIRR ranking institute, Mowi was ranked as the most sustainable protein producer in the world. Having a clear focus on their own environmental externalities supports SDG 12 and 13. At the very core of Mowi, we find SDG 14; life below water. With their vision of leading the blue revolution, ocean care is one of Mowi's strongest beliefs. At last, Mowi also believes that the sustainable future will depend on interdisciplinary cooperation with other actors. They have already established partnerships with e.g., the SeaBOS initiative (Mowi, 2021).

2.1.5 Mowi's Business Model

2.1.5.1 Value Chain

Contrary to many of the other actors in the salmon farming industry where the main focus lies on farming, Mowi has adopted a more fully integrated supply chain and operates in three main business areas: Feed, Farming, and Sales & Marketing (Mowi, 2021). Feed is the most important cost component, and that is why Mowi decided to add Mowi Feed into its value chain in 2012. Their ambition is that Mowi Feed and Mowi Farming can grow alongside each other, and that their integrated production will help stabilize costs and control more of the quality and efficiency (Mowi, 2021). Over time, this will relieve Mowi from the general industry dependency on the cyclical salmon prices.

Table 2: Mowi's Business Areas, adapted from Mowi (2021)

Mowi already see results from the investment into the value chain and is among the top performers in the industry when it comes to cost (Mowi, 2021). As we can see from table 2, Mowi invests in R&D along its whole value chain. This gives Mowi the possibility to find holistic solutions and one of their largest projects is "Mowi 4.0 Smart Farming", which we will further analyze in the strategic analysis.

2.1.5.2 Product Offering

As already mentioned, Mowi has a presence in many regions of the world, and in total they export products to approximately 70 countries, providing customers all over the world with 7.5 million meals a day (Mowi, 2021). As we can see from figure 7, approximately 90% of Mowi's sales in 2021 were to countries in Europe and America.

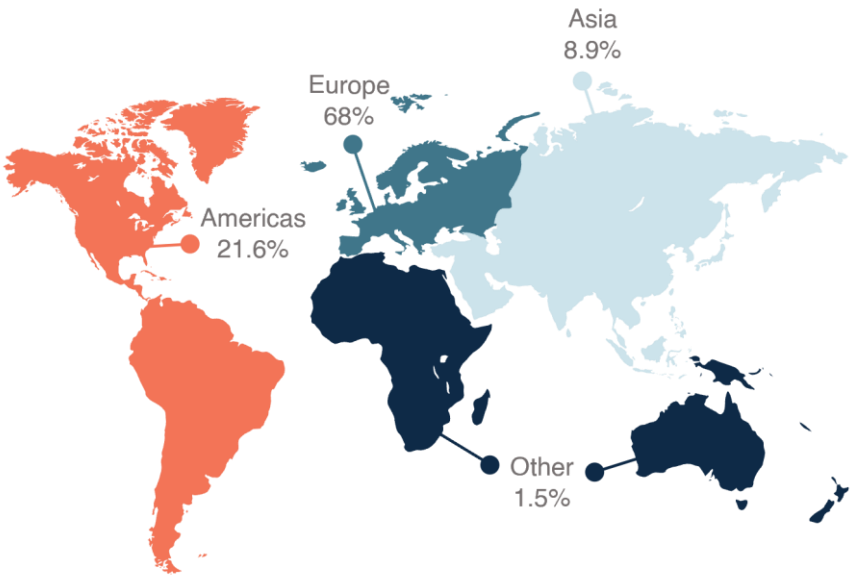

Figure 7: Sales in 2021 by Geography (Mowi, 2022)

Furthermore, Mowi report that the share of the external sales related to Atlantic Salmon was 89.4% in 2020 and 91.7% in 2019. For 2021, we have used all the quarterly reports to calculate what percentage of the external revenues compounded to. The results are shown in figure 8. As we can see, Atlantic salmon continue to make up approximately 90% of Mowi's total revenue. The fact that one product makes up such a large portion, makes Mowi exposed to changes in salmon price, which explain the similarities in change between Mowi's stock price and the salmon price in figure 16 and 17. A further analysis into Mowi's sales by product is found in table 3. As we can see, frozen products only make up at most 5% of Mowi's total revenue. Hence, we will have the main focus on fresh salmon when referring to the salmon price unless otherwise is stated.

Sales by Product	Q1	Q2	Q3	Q4
Fresh prepared	0.18	0.18	0.16	0.22
Fresh MAP	0.21	0.2	0.2	0.15
Smoked/marinated	0.16	0.15	0.13	0.17
Other species	0.1	0.09	0.09	0.08
Frozen bulk	0.01	0.01	0.01	0.01
Fresh bulk	0.3	0.33	0.38	0.33
Frozen prepared	0.04	0.04	0.04	0.04

Table 3: Sales by Product (%) in 2021 (Mowi, 2022)

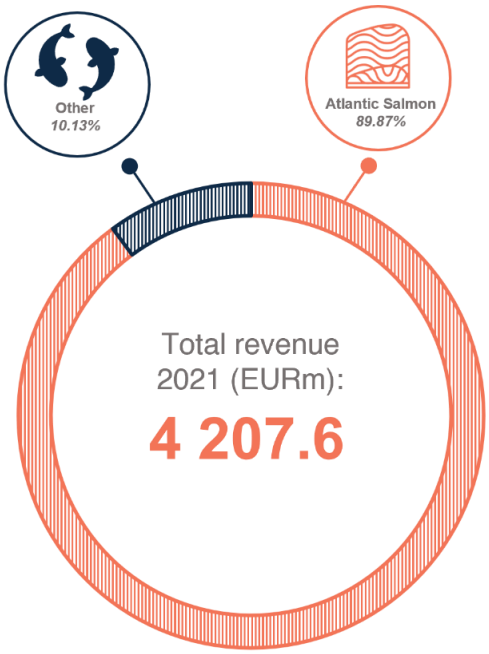

Figure 8: Mowi's Sales by Product (Mowi, 2021)

2.2 Salmon Farming Industry

2.2.1 Introduction

As already mentioned, Mowi operates in the salmon farming industry. In this chapter, we will aim to give a general introduction and then have a deeper look into the drivers in the demand and supply side of the industry. Salmon is a popular food, and it is recommended to eat fish as dinner 1-3 times a week (Helsedirektoratet, 2016). Salmon is considered a healthy product due to high levels of protein and omega-3, in addition to minerals and vitamins. Despite its obvious health gains, salmonids, which is the fish family for salmon and trout, only stand for 4.6% of the global food supply (Mowi, 2022). The UN estimates that the world will reach a population of almost 10 billion by 2020 (UN, n.d.). With continuing population growth and scarce expanding possibilities on land, it is believed that we in the future will utilize a larger part of our ocean for food supply.

2.2.2 Demand in the Salmon Farming Industry

As already mentioned, salmon is a healthy product. In this part of the report, we will further look into what drives the demand for farmed salmon. In the Salmon Farming Industry Farming Handbook 2021, it is mentioned especially six main trends that have

a large effect on global salmon demand. These are shown in figure 9. As we can see, the already mentioned population growth will help increase the total demand for food in the world. As salmon is considered a healthy product, this will also assist towards the overall demand for farmed salmon.

Figure 9: Main Drivers in Demand for Salmon (Mowi, 2022)

Moreover, the middle class is becoming larger in emerging markets, which allows for more consumption of nutritious and protein-rich food, such as salmon (Mowi, 2022). In addition, as the supply of wild salmon is already almost fully exploited, this opens up more growth potential in the market for farmed salmon. Another demographic trend is that the population in developed countries, in general, is becoming older. It is more important to eat healthy among the elderly, than else in the population (Mowi, 2022). Lastly, climate change is one of the greatest challenges the world has ever stood up against. Farmed salmon is amongst the best performers when it comes to carbon footprint per kg of edible meat, and thus it becomes a viable source of food for a sustainable future.

Growth in fish consumption has for over 60 years outpaced the growth in population, respectively at an annual rate of 3.1% and 1.6% (FAO, 2021). All continents are expected to continue to grow in consumption per capita, except for Africa where it is expected that the consumption, for now, will remain static. It is believed that the main growth will stem from Asia and developing countries, with China being the largest fish-consuming country (FAO, 2019). As we can see from figure 10, currently, the largest per capita consumption of fish is in Asia and Oceania.

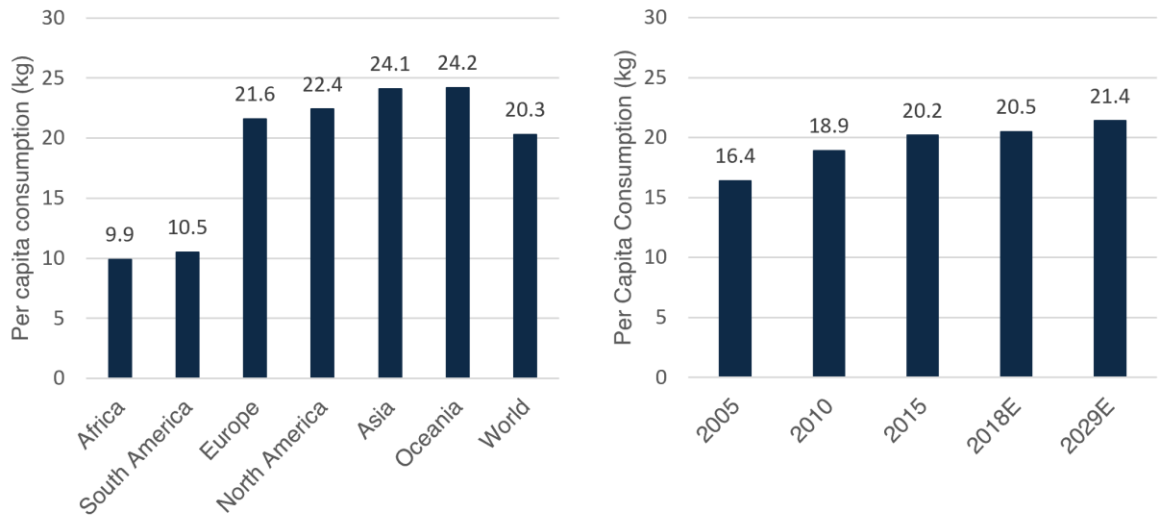

Figure 10: Fish Consumption per Capita, Per Continent, adapted from FAO (2021) (left). Global Development in Fish Consumption, adapted from FAO (2021) (right)

Moreover, the Food and Agriculture Organization of the United Nations (FAO) estimates a global rise in the per capita consumption of fish, with levels in 2029 reaching as high as approximately 21.3kg per capita. This equals another 20 million tonnes of seafood that the industry needs to provide (Mowi, 2022).

2.2.3 Supply in the Salmon Farming Industry

The demand for salmon is estimated to expand over the coming years, and in this chapter, we will look deeper into the supply side of farmed salmon. Since 1995 the supply of Atlantic Salmon has increased by 509%, which gives an annual growth rate of approximately 7%. Kontali Analyse expects growth over the coming years to be diminished to an annual rate of 4%, due to biological and technological limits (Mowi, 2022). This is visualized in figure 11.

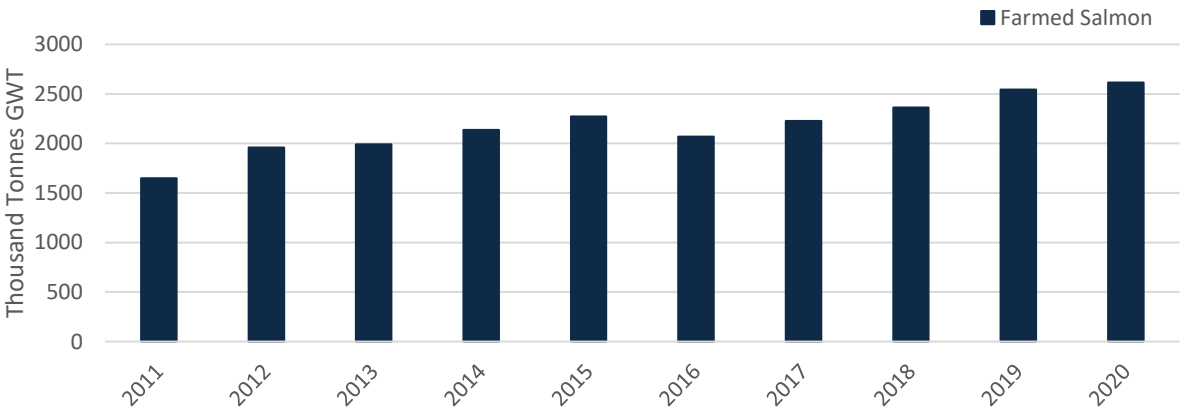

Figure 11: Growth in Supply of Farmed Salmon (Mowi, 2022)

A key limit in the salmon farming industry is where the production can take place. The optimal range for temperature when breeding salmon is between 8 and 14 degrees Celsius. Figure 12 show the main coastal areas where the requirements for breeding are fulfilled. The optimal locations are found within certain bands of latitude in the Northern and Southern Hemispheres (Mowi, 2022).

Figure 12: Suitable Locations for Breeding Salmon, adapted from (Mowi, 2022)

Moreover, as the industry is heavily exposed to sea lice, the production is regulated by the government. Licenses for breeding are given out by the local government, and this system exists in all areas where salmon breeding is performed (Mowi, 2022). We will further analyze this in the PESTEL analysis found in chapter 3. This puts clear limits on how much is produced each year.

3 Strategic Analysis

3.1 PESTEL

Various macro factors that affect Mowi are important to understand in order to visualize the strategic opportunities the company has. Such factors are inevitable and define the rules of the game in the industry. Here PESTEL is a useful tool for getting an overview of opportunities and risks related to political, economic, social, technological, environmental, and legal factors.

3.1.1 Technological

The world will increasingly rely on aquaculture to meet its growing demand for blue food, which is estimated to double by 2050 (Leape & Welsh, 2022). To meet this demand, seafood companies, such as Mowi, needs to strive towards a sustainable aquaculture. Wild stocks are now fished to near capacity. Therefore, it is most likely that aquaculture, such as farmed salmon, will contribute to most of the additional blue food consumed in the future.

To cope with the increased demand, seafood companies need to innovate in a sustainable way. There have already been remarkable technological advances during the last two decades. For example, the amount of wild fish used to produce a kilogram of farmed fish has declined by 85 percent from 1997 to 2017. In 2019, Mowi applied for several Norwegian development licenses for their AquaStorm project. With limited production areas for the fish farming industry, this project would allow Mowi to farm salmon up to 100 kilometers offshore. This would increase capacity, protect the salmon from lice, disease, and weather, and enable Mowi to manage the salmon's excrement in a more sustainable way (Fishfarming Expert, 2019). However, the project was rejected by Norway's Fisheries Directorate. Offshore farming is nonetheless still relevant, with Ocean Farming AS and Kongsberg Maritime AS building the world's first automated aquaculture facility, situated outside of Trondheim (Kongsberg Gruppen, 2016). Innovation in the offshore farming field will play a vital role if the world is to meet the growing demand for blue food. We have also in the recent years seen innovation within onshore aquaculture with Atlantic Sapphire being the global leader. One of the main ideas behind onshore aquaculture is the lack of sea lice and wild fish diseases.

However, after several reports and allegations regarding fish death, weak production volumes and poor fish-quality, it is unsure if onshore aquaculture is the future of sustainable fish farming.

In DNV's report "Marine Aquaculture Forecast to 2050", it is predicted that offshore farming will take a 13 percent market share in 2050, land-based farming will take a 10 percent share, and conventional marine fish farming will maintain a 77 percent market share (DNV, 2021). To meet the rising global demand for blue food, seafood companies therefore need to innovate in all three areas. In a data-driven world, big data is becoming a crucial element in every industry, and fish farming is no exception. Together with Alphabet's Tidal, Mowi has implemented a new sensing system called smart farming. The system gathers and analysis intelligence on real-time growth, feeding control, distribution, and lice counting for salmon (Mowi, 2020). Innovations such as this will allow Mowi and other seafood companies to produce fish more effectively, and in a more sustainable way.

3.1.2 Economics

As the financial situation is the core of business's success, economic factors are of great importance for Mowi. Several factors are of great economic importance for Mowi. As Mowi is an exporting business, their revenue is highly dependent on exchange rates. By performing a linear regression, we can illustrate this. Our regression shows that Mowi's stock price is highly correlated with the EUR/NOK exchange rate. An R-squared of 0,76 indicates that a vast majority of the company's stock fluctuations can be attributed to the Norwegian exchange rate.

However, we performed a simple regression model where we did not account for other factors. As we know, the Norwegian exchange rate is highly influenced by the policy rate. Since the beginning of the pandemic, the policy rate has been a historical all-time low of zero percent. The last few months however, the policy rate has increased to 0,5 percent, with an expected increase to 1,75 percent until 2024, though this may change.

During the epidemic, the unprecedented low interest rates have weakened the Norwegian krone. This has been highly profitable for Norwegian exporters, such as

Mowi as they get a higher price for the same amount of volume. It is therefore important to assess how the expected increases in the Norwegian policy rates will affect the exporting prices.

At the time of writing (23.02.2022), the prices of fresh Norwegian salmon have never been higher, with a kilo price of 87,60 kroner. The price of frozen salmon is 70,36 kroner (SSB, 2022). The price-surge during the last year has been an important contributor to the strengthened operating profits shown by Norway's salmon companies. This can be explained by the global normalization after the pandemic with higher demands, but also a lower supply growth. As the pandemic reaches an end, the demand is expected to improve with restaurants and hotels constituting a large proportion of the global demand.

Since 2014, Norwegian salmon export to Russia has stopped. In 2013 Russia was Norway's most important export market for salmon, trout, and herring. However, after western sanctions following Russia's annexation of the Crimean Peninsula, Russia introduced their own sanctions with an import ban for Norwegian salmon, among others. Considering the current war in Ukraine, and the strong sanctions upon Russia today, there is no reason to expect the exporting of salmon to halt. It is however worth mentioning that Ukraine accounts for 1,8 percent of the total export value of Norwegian seafood. This translates to 2,2 billion NOK as of 2021. If there were any hope that Russia would start to import Norwegian seafood in the near future, that hope has now faded. Given the geopolitical tensions in Europa, it would be a difficult task to predict future exporting volumes.

3.1.3 Environmental

Today fish farming faces several environmental challenges such as farmed fish escaping from the facilities, salmon lice and other salmon diseases.

Farmed fish, such as salmon, contains more toxins than wild salmon. This is due to the farmed fish's food which contains higher toxin levels. A major issue with farmed salmon escaping is the risk of infecting wild salmon by transferring these toxins. For Mowi, it is essential to develop secure farming-facilities which prohibit or decrease the

likelihood of escaped salmon. Several fish-farming companies, Mowi among them, have faced sizable fines for escaped salmon. In 2020 Mowi faced a fine of 60 million kroner after 690 000 salmon escaped from a facility in Chile (Ilaks, 2020). One way to handle this issue is onshore farming which we cover under the technological part. Onshore farming prevents both the escape of salmon and diseases such as lice.

Salmon lice are the most common parasite on farmed salmon and the biggest disease problem in the industry. Monitoring of salmon lice shows that the amount is increasing, and that the lice have in many cases become resistant to treatment methods such as bath treatments and oral agents (Havforskningsinstituttet, 2018). The proportion of lice in the salmon stocks is an important economic factor for the current aquaculture industry. If too many lice are detected in the salmon facility, fish farmers may find themselves forced to reduce the number of salmon. This challenge costs the industry billions each year. It is therefore critical to find a solution to the problem. There have been several innovations in the field in recent years. For example, the company Vard Aqua has developed a product that can absorb lice which are not attached to the salmon itself. Innovation in this field will play a crucial role in the future, and Mowi should continue to support innovation.

The industry also faces other environmental challenges such as the bloom of algae in fish farms. The algae produce a toxin which affects the cells in the salmon's gills, resulting in lack of oxygen. A decade ago, there was an alert system, designed to weekly inform fish farmers about weather data and algae development along the Norwegian coast (Solheimsnes, 2019). However, the project was canceled in 2010 after a lack of poisonous algae. This system would enable fish farmers to implement measures such as mowing fish to different locations, lowering fish to deeper waters, or end feeding. Considering the recent issues with algae, seafood companies such as Mowi should consider establishing an alert system to mitigate the consequences.

3.1.4 Social

As mentioned, the world will have to increasingly rely on aquaculture to meet its growing demand for blue food. This would imply a steep increase in demand which would be highly profitable for seafood companies such as Mowi. However, Norway's

seafood consumption is decreasing, even though the country is still among the top in the world (Norges Sjømatråd, 2018). Research by the Norwegian Seafood Council from 2018 shows that there is a big difference between the older and younger generation. Whereas the older generation's consumption is stable, the younger generation decreases its consumption, with a decline of 46 percent since 2012. If this negative trend continues, it could have major consequences for the industry. Research shows that people have negative associations with fish, where the characteristics of boring, expensive, and time-consuming are recurring. It is therefore crucial that the industry implements marketing measures to change the attitude towards fish. To succeed, a joint effort is required at all levels, in several areas. Product innovation is an important area in which Mowi should invest more in. With products such as minced meat made of salmon, the industry is on the right track, but much remains to be done. It is especially important to direct measures towards the young generation since they are the ones who carry on food traditions to their children.

With more urbanization and a busier everyday life, consumers mention that the time squeeze has increased the need for foods that are easier and less time consuming to make. Food such as meat is perceived as exactly this. This brings us to one of the megatrends in recent years which is e-commerce. Today e-commerce makes up an ever-increasing share of the total grocery sales, with a reported 6,5 percent of global grocery sales in 2020. The strongest growth was seen in Asian markets, whereas 46 percent of the Chinese population stated that they bought seafood often online. In Norway however, only 2 percent stated the same (Gangsø, 2021). This is an important issue for the seafood industry. New sales channels represent a great opportunity for the industry. As mentioned, Norway's seafood consumption is decreasing. E-commerce provides new points of contact with the customers, and at the same time it enables distributors to reach new customers. Especially the young generation.

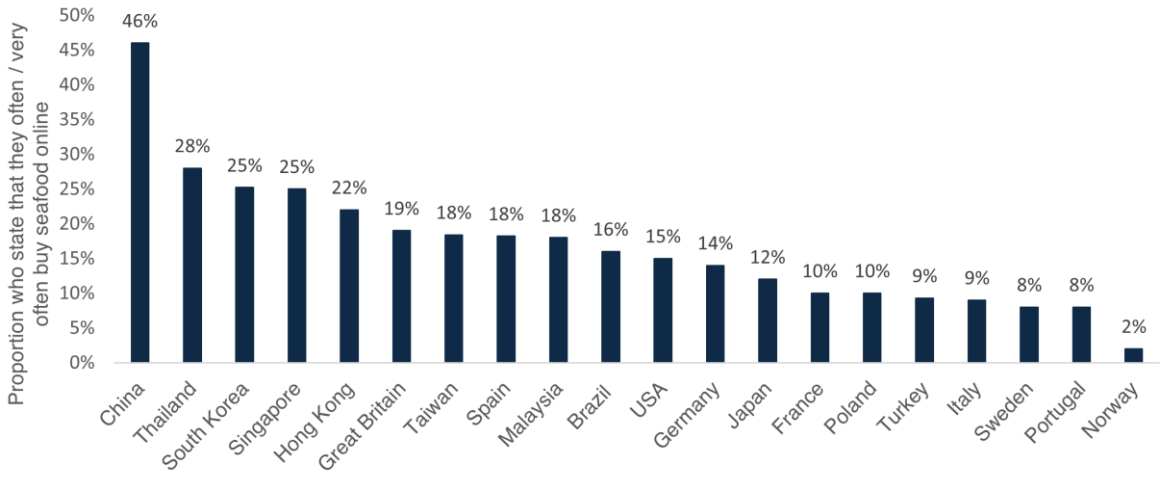

Figure 13: Proportion who state that they often / very often buy seafood online, adapted from Norwegian Seafood Council (2021)

With more awareness regarding sustainable foods, this area will become more important for seafood companies. Companies with a lack of consideration towards this risk losing customers. Several studies conducted by the Global Web Index (GWI) show that consumers support for sustainable foods is increasing (Norwegian Seafood Council, 2021). In addition, studies show that 72 percent of consumers find sustainable brands more important now than before. It is however important to note that price and simplicity still are critical drivers for consumers, but the seafood industry should continuously focus on sustainability as it's becoming increasingly important, especially for the younger generation. Additionally, the number of Norwegian vegetarians and vegans has doubled since 2020 according to Ipsos (Grundekjøn, 2021). Approximately 8 percent of Norwegians have cut out meat and fish completely. It is therefore important for the seafood industry to market seafood, such as salmon as a healthier and more sustainable substitute to meat. Creating awareness around the benefits of eating fish has never been more critical.

3.1.5 Legislation

Legal conditions and regulations are something that both the company's success and the salmon industry are generally affected by. It will therefore be important to map key limitations that affect Mowi and the industry's room for manoeuvres when discussing further strategies and plans.

The salmon industry is largely dependent on natural resources, where the Aquaculture law regulates the production of aquatic organisms (Akvakulturloven, 2005, §2). The purpose of the law will be to promote profitability, sustainable development, and competitiveness in the aquaculture industry (Akvakulturloven, 2005, § 1). Here permits and licenses for exclusive operation in areas are granted, in exchange for complying with the conditions set for operation. However, the allocation of licenses has been limited to ensure sustainable development by not overfishing the areas. In addition, there is a limit to how much fish that can be produced per permit, which is called maximum allowable biomass (MTB). This is regulated at both company- and locality level (Fiskeridirektoratet, n.d.). Therefore, the environmental bearing capacity of different locations and the company's total biomass becomes important factors to consider in the choice of fish farming areas.

Further conditions set for operation include sustainable production with low numbers of the salmon louse, prudent growth, optimal use of the coastal zone and safeguarding value creation locally and nationally (Fiskeridirektoratet, n.d.). The increased environmental focus that the legislation in the salmon industry is characterized by has also resulted in the traffic light system, which was introduced in autumn 2017.

The traffic light system determines whether manufacturers are allowed to increase, decrease, or continue with their current salmon production level. The decision is based on an assessment of infestation on wild salmon fish along the Norwegian coast, where coastal areas are divided into 13 different areas. A “green light” means that the production level can be increased, “yellow light” does not indicate a change, while a “red light” results in a reduction in production (Fagerbakke, 2020). Productivity and innovation are central aspects for the companies, where solutions that enable production to be streamlined while maintaining prudent and sustainable operations are central. Extensive resources are also being spent on the research of fish louse removal.

In 2015, the Government opened an opportunity for a five percent capacity increase in salmon production if the companies fulfilled significantly stricter environmental requirements for salmon louse. This later resulted in the Directorate of Fisheries

withdrawing licenses from several companies, including Mowi, which lost 22 licenses. The reason for the withdrawal was that the companies that had previously received capacity increases would not be able to meet the conditions in the future (Ilaks, 2021). Thus, it will also be important for the companies to establish a solid infrastructure and enable future measures that will allow them to meet the strict conditions in the future to gain capacity increases and new licenses.

3.1.6 Political

2021 was a record year for exports of Norwegian seafood. Norway exported 3.1 million tonnes of seafood worth more than 120 billion NOK, and salmon stands out with an export of 1.3 million tonnes (NTB, 2022). It's clear that the salmon export is of interest to both Norway and Mowi, and the salmon industry's global footprint makes the industry sensitive to international political instability and trade restrictions. Mowi has also mentioned political instability as a potential risk for further salmon exports in their 2021 annual report. This is due to recent events such as Russian ban on imports of salmon products from certain countries and the Chinese restrictions on imports of Norwegian salmon (Mowi, n.d.). The relation with China has become somewhat normalized after the countries agreed to normalize political relations in 2016, and Minister of Fisheries Per Sandberg signed the new salmon protocol with China in 2017 (Hovland, 2017).

In 2020, China had 4% of Mowi's total market distribution. The Norwegian Seafood Council believes that there is great potential to be gained in the Chinese market. The Seafood Council justifies this with calculations that indicate that the Chinese may go from eating about 90,000 tonnes of salmon in 2017 to 240,000 tonnes of salmon in 2025, where 65% of this could be offered from Norway. Seafood analyst at Nordea, Kolbjørn Giskeødegaard, also believes that the projections are realistic, where growth in China may result in higher and more stable salmon prices (Kampevoll, 2019). This makes Norwegian seafood's access to China important, where good processes, political stability and trade agreements become important in the time to come.

Today the EU is Mowi and Norway's most important market for seafood exports, where EU covered 44.8% of the total market distribution to Mowi in 2020. Here, trade in fish and fisheries products is regulated through a separate protocol in the EEA Agreement

and bilateral agreements, where trade takes place without internal border control and technical requirements (Regjeringen, 2021). Good established diplomatic relations therefore make logistics efficient and the risk of major complications very low.

As mentioned in the legislative section, the salmon industry makes great use of natural resources, resulting in high political pressure in domestic-and foreign policy. Natural resources are in many ways seen as 'the country's' resources, where everyone should have a right to the profits arising from the exploitation of such resources. Therefore, the Government has come up with several measures, where basic rate taxation was a key proposal. The basic rate tax is a form of property tax to the state for what are called scarce national natural resources (Finanskomiteen, 1996). The proposal was later replaced with a production tax on salmon, trout, and rainbow trout, which was introduced on 1 January 2021. Today, the production tax is NOK 0.405 per kilogram (KPMG, 2022). The possibility of increases in production taxes and further policy measures that may influence future operations and investments will be present, which makes it important for the industry to be aware of this. Especially considering that in general profitability in the salmon farming industry shows larger variety than other industries (Belsvik et. al., 2019).

3.2 Porter's Five Forces

Porter's five forces will be appropriate to apply to get an overview of the intensity in the salmon industry and its strengths and weaknesses. The model will also provide a better picture of how Mowi can position itself in relation to its competitors in the industry. The intensity and attractiveness of the industry is based on how exposed it is to five specific industry forces. Here we will go through each point to map the intensity of the salmon industry.

3.2.1 Threat of New Entrants

A natural consequence of a profitable industry like the salmon industry will be that the industry attracts new competitors who want to take part in the profits and market shares. The seriousness of the threat of entry depends on the barriers present and on the reaction from existing competitors that entrants can expect (Porter, 1979). If the entry barriers are low and the established competitors lack incentive to react, new

entrants pose a threat to the already existing market competition. Porter (1979) has mentioned six major sources of barriers to entry which is retrieved from Porter's seven main causes of entry barriers (Porter, 1979). Here we will pick out some of the central entry barriers Porter has mentioned that have a high impact on the salmon industry.

3.2.1.1 Economies of Scale

In the salmon industry, volume in production is a key factor, where large volume can provide significant economies of scale. There are many costs associated with salmon farming, where feed costs have been a comprehensive cost. Mowi also states that the cost of salmon production has increased by an average of 2.2% from 2016 to 2020. This is mainly explained by feed costs and biological challenges (Mowi, n.d.). In case of great procurement of fish feed and increases in own production, unit costs can be reduced, which could contribute to new growth and investments. The transport costs will also be reduced by transporting larger quantities. Such benefits become difficult to challenge the established companies in, making production volume a significant entry barrier.

3.2.1.2 Capital Requirements

Capital requirements are often closely related to economies of scale. Capital is a crucial factor in achieving scale benefits, while scale benefits provide a good basis for capital increases. There are also large start-up costs related to production facilities and equipment in the salmon industry. Salmon farming also has a long production cycle, which means that revenues are generated about 3 years after establishment. Thus, enough initial capital is required to withstand significant deficits in the first years.

Figure 14: Salmon Production Cycle (Laks, n.d.)

Risk tolerance is also an important aspect of funding during the start-up phase. As mentioned earlier, biological changes and increases in costs for fish feed are potential challenges in salmon farming. Such opportunities are important to consider during the start-up phase, where capital raising can be challenging when the project is associated with high risks and a long-term perspective.

3.2.1.3 Cost Disadvantages Independent of Size

Some companies may have cost benefits that are not available to rivals, regardless of their size and scale benefits. Such an advantage may seem like an obstacle to resourceful competitors, where it becomes more difficult to achieve equal profitability. Such benefits often include exclusive rights or well-implemented organizational structures and learning methods, which have a cost-saving value.

Vertical integration has long been of interest to many fish farming companies. Good integration and control in the value chain creates production control, proximity to the market and resource utilization. Here SalMar has built up a fully integrated system for farming, slaughtering, processing, selling, and distributing farmed salmon, while Mowi is the only fish farming company that controls the entire value chain including the production of fish feed (SalMar, n.d.). Here the fish feed is also specially adapted to Mowi's own salmon stock. Such a scheme could provide cost benefits, with Mowi mentioning stable costs and efficiency as results of vertical integration (Mowi, n.d). This is also reflected in Mowi's strategy, where streamlining the value chain through

digitalization and automation was presented as one of Mowi's priority areas on the capital markets day in 2021 (GlobeNewswire, 2021). Mowi's investment and continuous work on the value chain also highlights how difficult and time-consuming a vertical integration is for already established companies. This makes organizing a cost advantage regardless of competitors' access to capital.

3.2.1.4 Government Policy

As mentioned in PESTEL, natural resource exploitation entails involvement from governments and politicians in the form of restrictions, licenses, and sustainability requirements. Such measures may limit competitors' ability to acquire natural resources, where the established companies have good routines, knowledge, and resources to handle the strict requirements required to obtain licenses. Mowi has also mentioned licenses as an entry barrier in its farming industry handbook in 2021 (Mowi, n.d.).

Licenses have only been awarded in certain years since 1982 and increases in biomass are usually granted to areas with a low concentration of salmon louse and strict sustainability requirements. We also saw that companies are judged on their ability to maintain sustainability requirements in the future when licenses are to be awarded/revoked. These are requirements experienced companies also have difficulty fulfilling, which makes it likely that new companies will also face problems related to license access. On the other hand, innovative solutions that limit sustainability footprints will provide establishment opportunities and license access. This is also something that is being worked on in the industry, where Mowi has the fish farming project that is expected to be put into practice in 2025. Such projects also place higher innovative requirements on new and existing companies.

3.2.1.5 Product Differentiation

Product differences are among the factors fostering brand identification and brand identification can create a barrier by forcing entrants to spend heavily to overcome customer loyalty (Porter, 1979).

Salmon is generally considered a homogeneous product with low differentiation compared to other food industries such as chicken and meat. Nevertheless, higher demand and focus have been placed on quality attributes in the salmon industry due to increasing size and purchasing power to the grocery chains and changes in the value chains that give buyers an increased opportunity to meet greater requirements in different areas. Quality attributes could be characteristics such as flesh color, fat content, country of origin, shelf life, quality of fish feed, etc. (Kvaløy & Tveterås, 2006). It is also visible that the industry has made organizational changes to adapt to this development, where measures such as vertical integration with special feed and technological solutions have been implemented.

Bowman (1992) argues that product differentiation only provides a temporary advantage, with customers getting accustomed to the additional benefits and over time lowering their willingness to pay a premium (Cojocaru et al., 2020). This underpins the importance of branding to build lasting competitive advantages. Associating the brand with quality also magnifies the effect of quality improvements in the products and vice versa. Established brands also seem to characterize the industry, where companies such as SalMar and Mowi have established brand names and branding as a focus area in sales and marketing (GlobeNewswire, 2021). Such brand benefits make it difficult for start-ups to compete on differentiation when the possibilities for product improvements and differentiation are limited.

3.2.2 Threat of Substitutes

Substitutes are products which can be used instead of a company's products, and therefore pose a threat. If close substitutes for a company's products exist, and they are easily available, the company's power may be weakened. In this analysis we will examine which products could replace Mowi's products considering current trends. We will study consumer preferences over other types of fish, but also meat.

As we discuss in our Pestel analysis, Norway's seafood consumption is decreasing. Research by the Norwegian Seafood Council shows that the younger generation fish consumption has decreased substantially in the past ten years. For the older generation consumption is stable. Consumers characterize fish as boring, time-

consuming, and expensive. Price is an important factor to consumers when choosing what to eat. A report from Statistics Norway's consumer price index shows the price development for several foods in Norway, such as fish and meat, with 2015 as the reference-year.

	1999	2009	2015	2016	2017	2018	2019
Meat	95	103	100	103	100	101	102
Fish and seafood	71	86	100	107	117	119	122

Table 4: Comparison of Meat and Seafood Prices (SSB, 2022)

We see from Table 4 that meat prices have been stable between 2009 and 2019. However, fish and seafood prices have increased relatively much compared to that of meat. This could explain the decrease in fish consumption, and the increase in meat consumption. The Norwegian Directorate of Health reports a slow decline in total fish consumption, especially the past five years. Meat consumption shows a stable trend the past five years, with an increase in 2020 (Lande, et. al. 2021).

Factors such as stable prices, easy-to-cook meat dishes and variation in products could explain this. For consumers, meat is a cheaper and a simpler substitute to fish. For Mowi, the decline in fish consumption in Norway should raise concern. However, it is not just meat that subsidizes fish. As we discussed in our Pestel analysis, an increasing part of the global population is turning down meat and fish for a plant-based diet. The number of Norwegian vegetarians has doubled since 2020 according to Ipsos (Grundekjøn, 2021). This corresponds to eight percent of the Norwegian population, and it's expected to grow. Even though the Norwegian Directorate of Health recommends eating fish two to three times a week, the growing concern for the environment and animal welfare is increasing. As we discuss in our Pestel analysis, farmed salmon could contaminate surrounding wildlife and ecosystems. If the seafood industry works towards sustainable fish farming that doesn't harm the environment, people may be more willing to only reduce their meat intake, and not fish.

If we look at the threat of other fish-species, it would be appropriate to analyze salmonids, which is a group of ray-finned fish, including the Atlantic salmon. Salmonids also include trout, a popular fish with the same characteristics as Atlantic salmon. Mowi produces both Atlantic salmon and trout. Measured in harvested quantity, Atlantic

salmon is the largest species of salmonids (Mowi, 2021). Farmed Atlantic salmon is a versatile product which can be prepared in a variety of ways, such as sushi, fresh, smoked, minced and other ready-made meals. Atlantic salmon is present in most geographies and segments. Due to the salmon's biological constraints, temperature requirements and several other natural constraints, farmed Atlantic salmon is mostly produced in Norway, Chile, UK, North America, Faroe Islands, Iceland, Ireland, Tasmania, and New Zealand.

Trout, a near substitute to salmon, can be divided into two subgroups, which are large and small trout. Due to the small trout's minor size, the fish is not in direct competition with Atlantic salmon. However, rainbow trout have a strong resemblance with the Atlantic salmon. With the same use-cases as the Atlantic salmon, rainbow trout could pose a threat. However, if demand for different fish-species should increase because of substitution, it's reasonable to expect fish farming companies such as Mowi to adapt quickly.

Based on the possible threats we have now discussed; we believe that the threat of substitutes is low at this point of time. However, with increased salmon-prices, and with an increasing proportion of the population turning to a vegan diet, it´s not unrealistic to assume that fish consumption may decrease in the future.

3.3 Competition in the Industry

Competition in the industry refers to the number of competitors and their ability to challenge a company. Before we can analyze competition in the industry, it's important to define the industry, and what characteristics competitors has. As mentioned, Mowi operates in 25 countries. In this analysis, we will limit ourselves to the Norwegian market. We will look at the ten biggest salmon farmers in Norway, and their respective harvested quantities.

One way of assessing the market concentration and competitiveness is by using the Herfindahl-Hirschman Index. By estimating the ten biggest salmon farmers market share based on production, we can calculate an HHI. A market with an HHI below 1500 is considered a competitive marketplace (Hayes, 2021). The higher the HHI, the more

concentrated the market becomes. The index serves as a simple measure to quickly assess the intensity of the competition, as shown in the following formula.

$$HHI = \sum_{i=1}^{H} s_i^2 \times 10\,000$$

Equation 1: Herfindahl-Hirschman-Index (HHI)

In the figure below we have calculated an HHI of 819,7 based on 2020 harvesting numbers. We have excluded companies which are below the top ten list, mainly because of their small market shares, which won't affect the index greatly. The HHI is well below 1500, and it seems that the salmon-market in Norway is highly competitive. Mowi has an estimated Norwegian market share of 21,26 percent, with Lerøy Seafood in second. We also see that the "other" salmon farmers make up 31,74 percent of the total volume harvested. This share consists of 153 companies (Fiskeridirektoratet, 2021).

Company	Market Share	(Market Share)^2
Mowi	21.26 %	452.11
Lerøy Seafood	12.20 %	148.78
Salmar	11.60 %	134.49
Mitsubishi / Cermaq	5.34 %	28.52
Grieg Seafood	4.06 %	16.47
Nova Sea	3.46 %	11.95
Nordlaks	2.84 %	8.07
Alsaker Fjordbruk	2.52 %	6.33
Sinkaberg-Hansen	2.52 %	6.33
Norway Royal Salmon	2.48 %	6.13
Top 10	68.26 %	819.17
Other	31.74 %	
HHI-Index	100 %	819.171

Table 5: HHI-Index

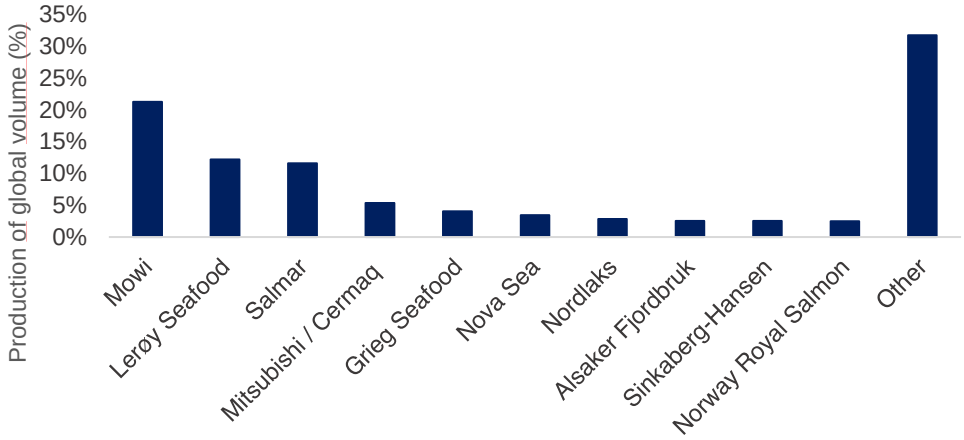

Figure 15: Estimated 2020 market share based on production

The intensity of the competition also relies on the industry growth (Porter, 1979). A slow growth may incentivize a more intense fight for market shares. As mentioned in our social part of the Pestel analysis, seafood accounts for 7 percent of total protein consumption globally. With the estimated population growth to 9,4 billion by the year 2050, this indicates a 18,9 percent increase in demand for protein, assuming that consumption per capita stays constant. Since the world will have to increasingly rely on seafood to meet this demand, it's safe to assume that seafood will account for a larger part of protein consumption than today. Supply of Atlantic salmon has increased by over 500 percent since 1995, with an annual growth of 7 percent. However, Kontali Analysis expects Atlantic salmon supply to decrease in the next few years with a projected annual growth of 4 percent (Mowi, 2021). This downward trend stems from production being pushed to its sustainable limits. As mentioned in the legislation part of our Pestel analysis, volumes are today determined by the traffic light system. This scheme determines if production can increase or decrease based on infestation of wild salmon along the coast.

Biological consequences such as contamination of the ecosystem, prevents an increase in production. As regulators impose greater measures to reduce the biological footprint, the salmon farming industry needs to develop its technology further. Innovation in pharmaceutical products for fish feed, and the implementation of non-pharmaceutical techniques is therefore vital.

To cope with the increased demand and diminished supply, political arrangements must be made to increase production in a sustainable manner. In 2021 the Norwegian government proposed to open new areas for the aquaculture industry, but with strict environmental requirements (Nærings- og Fiskeridepartementet, 2021). The proposal states that open cage production will continue to be the backbone of Norwegian fish farming. In addition to this, on-shore fish farming, and off-shore aquaculture will be facilitated. Such a scheme will provide great opportunities for growth in the aquaculture industry.

Competition in the industry also relies on the degree of homogeneity among the competitors' products. Characteristics such as taste, packaging and price will affect

how the consumers view seafood products. There are strict requirements for both the process and end product for salmon farmers. Thus, the salmon products usually look and taste the same, regardless of the producer. Based on these strict requirements, the opportunity to differentiate products are therefore small. Other differentiating factors such as marketing and branding are thus more important.

To summarize, the salmon farming market is characterized by increased demand, and a stagnated supply. This combination will decrease the internal competition. As long as the traffic model scheme is in place, competition is expected to stay low as the scheme limits the competitor's ability to compete for volumes. However, last year's proposal by the Norwegian government may change the competitive landscape in the future. With on-shore and off-shore farming based on auction, volumes may increase. This speaks for a higher internal competition. Nonetheless, an increase in volumes depends on the salmon farmers ability to develop sustainable solutions.

3.3.1 Power of Suppliers

The power of suppliers addresses how easily suppliers can drive the cost of inputs. Their power is affected by the number of suppliers, the uniqueness of their inputs, and companies switching costs. A supplier group is powerful if it is dominated by a few companies and is more concentrated than the industry it sells to (Porter, 1979). During the last decade, the number of salmonid-feed producers feed have decreased, and the feed industry is now more consolidated. Today, four producers control the majority of the feed industry. These companies are Mowi, Skretting, EWOS (Cargill) and BioMar, which all operate globally. In contrast, ten companies account for 68 percent of Norwegian salmon harvesting. The salmonid feed producers are therefore more concentrated than their buyers. This factor alone suggests that fish feed suppliers have more power than their respective buyers.

Though the salmonid feed industry is highly concentrated, the supplier group depends heavily on the fish farming industry for its revenues. While suppliers who serve many different industries may be able to extract maximum profits from each industry, this is not the case for salmonid feed producers. Since salmon farmers account for salmonid feed producers' total revenue, the suppliers will want to protect their business by

reasonable pricing. By doing this, salmon farmers may not feel an incentive to produce their own fish feed.

However, the majority of fish feed costs stems from raw materials such as soybeans, wheat, and corn. As we stated in our economic part of the Pestel analysis, the prices of these commodities have soared the last two years. The increase in raw materials have also inflated the prices of fish feed. However, feed producers have historically operated with cost-plus contracts, which is an agreement to reimburse a company for the incurred expenses, in addition to a fixed amount of profit. Such a contract decreases the risk for fish feed producers, while leaving the exposure to raw materials with the salmon farming companies (Mowi, 2021). Such a contractual agreement seems disadvantageous for smaller salmon farmers with less capital, as price-fluctuations in commodities are high. It is therefore important to regard the economies of scale when producing fish feed. With 163 Norwegian fish farming companies as of 2021, it would seem unreasonable to self-produce, as volumes would be low compared to the costs of operating production.

To summarize, the largest companies in the salmon industry such as Mowi, Lerøy and SalMar may not be highly dependent on fish feed producers. Their ability to self-produce is much higher compared with other salmon farmers. It therefore seems that the suppliers have a relatively high power over the smaller salmon farmers.
We therefore consider the power of suppliers to be moderate.

3.3.2 Power of Consumers

The power of consumers relies on their ability to drive prices lower. This ability is mainly affected by the number of customers a company has and switching costs. If changing the client base entails high costs, the power of consumers is considered high. The consumer then has better conditions to negotiate a lower price and improve deals.

While smaller salmon farmers usually sell directly to fish markets and the foodservice sector, the bigger companies such as Mowi has retailers and secondary production services as their main customers. In 2020, 80 percent of Atlantic salmon were sold to retailers in the EU. The remaining 20 percent were sold to foodservice establishments

such as restaurants (Mowi, 2021). However, these numbers were affected by the Covid-19 restrictions, which in many countries closed foodservice establishments. It is therefore expected that sales to the foodservice sector will normalize.

The Norwegian food retail industry is highly concentrated with three dominating players. For salmon farmers, the concentrated client base entails less power over the consumers. In addition, the salmon products are, as mentioned, highly homogenous. Because of this, retailers can more easily switch their salmon brand without upsetting their customers. However, retailers' ability to influence prices are low. First of all, salmon prices are decided globally based on the current supply and demand. Secondly, unlike meat, food retailers do not produce their own salmon. This is also called "private label", a scheme where retailers produce exclusive groceries with their brand on it. As we have seen with Norwegian meat producers, retailers are able to lower their purchase prices due to their own production of meat (Lorvik, 2021).

Therefore, with regard to the factors presented above, we can describe the power of consumers to be low. Their ability to drive prices lower is minimal, even though the Norwegian food retail industry is highly concentrated.

3.4 VRIO

After gaining an overview of the competitive intensity and macro factors affecting Mowi, it becomes important to take a closer look at the resources Mowi possesses to gain an integrated strategy perspective. VRIO is a good framework for assessing the competitive potential of Mowi's resources. It will be important to judge whether these resources can be permanent competitive advantages and what values this creates for Mowi.

3.4.1 Value Chain

If a resource is to be judged as a competitive advantage, it is essential that it must have a value. As mentioned, Mowi has an integrated value chain that provides various advantages where some of these were mentioned in the industry analysis. We also saw that these benefits could serve as an entry barrier for new opponents regardless

of their access to capital. An integrated value chain will entail synergies, where it will be important to identify these and how these can streamline the value chain.

Financial synergies of vertical integration can ensure more control and predictability in the expenditures and cash flows of the various units of the value chain. An example is taxes and fees, where the group can move capital between different departments to avoid large tax burdens. Parts of the value chain that have plenty of cash flows can also secure short-term capital for other departments that have capital shortages.

Operational synergies are perhaps the most important consequence of Mowi's integration. Operational synergies are achieved through optimization, coordination, and control of the operational parts of the value chain such as logistics, production, procurement, etc. Overlapping needs between the links in the value chain are also a good basis for integration gains. Mowi mentions that the breeding program, feed, raw materials, farming conditions in fresh-and seawater, processing methods, and changes can be done more effectively with full internal transparency in the value chain (Mowi, n.d.).

Coordination also affects important drivers in the value chain such as timing, internal interaction, cost savings and capacity utilization. Here fish feed can be coordinated with the fish farming, where “just in time” deliveries and utilization of the raw materials can be optimized through experience and internal interaction. This is also reflected in Mowi's results, where Mowi farming harvested 125,000 tonnes of salmon in the first quarter of 2021. This accounted for a growth of 51% from last year, while costs were reduced by 9% (Yahoo finance, 2021). The sales department will also have a better basis for making decisions to capture market share and seize opportunities through overview and control over production and logistics.

However, to achieve such operational advantages in the value chain, sensible use of technology and information systems is a necessity. Here, rationalization gains can be obtained through robotics and systems that streamline the value chain. Management gains are achieved through information systems that gather relevant information and provide a good overall picture for quick decisions. Organizational gains can also be

achieved through collaboration tools that make internal communication and coordination easier. Such tools help to spread and create competence, but also require expertise to establish. Automations and digitization of the value chain is also, as mentioned earlier, one of Mowi's priority areas with projects such as “smart farming” that will be able to open efficient production processes and a higher degree of product differentiation. Higher operational efficiency will also provide more time and resources for new innovative solutions and long-term strategic decisions in the future.

It is common with a vertically integrated value chain in the salmon industry, where we see the large fish farming companies have focused on integrating large or whole parts of the value chain because of increased competition in the industry. Companies such as Lerøy control large parts of the value chain, including slaughter, filtration, processing, sales, and distribution (Lerøy, n.d.). Furthermore, SalMar controls the entire value chain from salmon eggs to finished products, as mentioned earlier. Mowi is nevertheless the only fish farming company that controls the entire value chain including the production of fish feed. Since this is also the biggest cost driver in the salmon industry, it may be valuable to control this when revenues and costs in the industry are affected by several uncontrollable macroeconomic factors. Self-produced special feed will also strengthen the salmon's immune system and resistance to lice. Thus, Mowi's value chain can also be considered rare. In addition, no value chains are organized the same, where companies use various coordination tools, organizational forms, and information systems, making any value chain unique.

Most fish farming companies focus on vertical integration. Therefore, it is not inconceivable that other companies such as SalMar and Lerøy will produce their own fish feed in the future. However, such integration will take a long time. In addition, Mowi already has good experience with its integration, which forms the basis for further automation and digitalization in the value chain. Such expertise, coordination and organizational capital in the value chain will be difficult to imitate.

In summary, Mowi's value chain is a clear competitive advantage with its large scope and vertical integration. The integration in the value chain provides a number of

operational synergies that create value by reducing costs, increasing efficiency, and coordinating activities.

3.4.2 Brand

Branding with product innovation and operational efficiency is one major focus area for Mowi. Here, the Mowi brand will be used to achieve growth ambitions in selected segments and markets, as well as adapting to changing habits and consumption needs (GlobeNewswire, 2021). Mowi first became a recognized brand in 1975. Later, the company changed its name to Marine Harvest to further change the name back to Mowi in 2018 (Mowi, n.d.). Here Mowi wanted to return to its roots and use the original name with great historical value. The brand change is also part of a larger plan, where a number of salmon products with their own brand are launched. Here there are various products to meet different needs, such as “Mowi pure”, “Mowi gourmet” and “Mowi signature” (Mowi, n.d.). The products have been launched in the UK, US, and France, among others. The brand initiative is still in a start-up phase where further products and launches are under development.

As mentioned earlier, the salmon industry has had a very low degree of differentiation, where there has only recently been an increased focus on quality attributions to the products due to higher competition and vertical integration in the value chains. The companies in the salmon industry also cite market challenges as one of the main challenges where market access was central (Johnsen, 2004). Here, product differentiation with Mowi's own brand can be a strong tool for positioning in the market. The value of achieving customer loyalty and preferences in a relatively undifferentiated market will also be very high to Mowi.

However, there are very few examples of unique branding in the Norwegian salmon industry. The best example here is Salma, where freshness and applications of the product are the focus areas. Nevertheless, the brand initiative has yielded very little return to the owners due to the high costs of product development and marketing. Product differentiation also occurs mainly in the retail sector, where supermarket chains specialize in private labels. Here Mowi will have to outperform these to gain shelf space in the stores. There are still measurements that show that the use of

Norway as a country of production has had a positive effect on general demand (Winther et al., 2011). Mowi's own salmon stock with its own feed and high omega-3 content can also help strengthen the brand. In addition, Mowi has the value chain with low production costs and good production conditions with low numbers of sea lice and healthy oxygen content in the sea. Thus, sustainability and environmental conditions can be factors that strengthens Mowi's brand and differentiation.

Rarity is a necessity to capitalize on the Brand value Mowi possesses. As mentioned earlier, the brand Mowi has a great historical value. The company also has a large scope that makes the Mowi brand visible to both customers and suppliers. Descriptions such as quality, Norwegian, Atlantic salmon and internal control will also be associations related to the Mowi brand. The brand is also constantly changing as new brand launches and strategy changes are carried out in the company. There are several other companies with strong and large brands, but factors such as staff, visions, strategies, structuring and management that help shape the brand will always be different. This means that the brand Mowi will always be unique and difficult to imitate.

To exploit Mowi's brand value, it becomes important to have sufficient management, structure, and capital so that the brand strategy can be implemented in the organization. Automations and digitalization in the integrated value chain are factors that could create more time for innovation and product development. Mowi is also a capital-strong company that enables further product initiatives and launches in its own brand. Launches in new markets also require some patience and tolerance for losses, which Mowi seems to have the resources to tolerate.

There is little doubt that the brand of Mowi is rare, difficult to copy and can be implemented and exploited in the company. The main question will be whether the investments in the brand will be successful and create added value. Consumers and the market are hard to predict, making the success of the brand venture difficult to forecast. If the brand entails clear preferences and customer loyalty, the value may be very high and a clear competitive advantage. However, one should be cautious about adding potential competitive advantages too much focus in strategy analyses. Here,

McGrath believes that a business's strategy needs to constantly change because customers and markets are changing faster than ever (McGrath, 2013). Thus, the understanding of being able to establish lasting competitive advantages becomes dangerous. Hamel and Prahalad (1989) have also mentioned that the only lasting competitive advantage will be the ability to constantly establish new competitive advantages.

3.4.3 SWOT-Summary

The SWOT-analysis summarizes four key components regarding both internally and externally environments. Using the VRIO-, Pestel- and Porter analysis, we will categorize Mowi's strengths, weaknesses, opportunities, and threats.

Strenghts	**W**eaknesses
• Fully integrated value chain • Global operations in 25 countries • Valuable branding • Operational synergies	• Salmon escapes and algea bloom • Lack of organizational speed
Opportunities	**T**hreats
• On- and off-shore farming • Sustainable technology, which prevents lice and escapes • Increased exports to China due to high future demands	• Enviromental production restrictions • Increasing commodity prices • Withdrawel of licenses due to enviromental requirements • Decreasing fish consumption among young Norwegians • Substitutes

Table 6: SWOT Summary

4 Financial Statement Analysis

From mainly focusing on the strategic aspects of Mowi, we will in this part shift the focus over to quantitative elements of the valuation. A financial statement is a systematic way to process financial data. Whereas the strategic analysis is abstract and qualitative, the goal of a financial statement analysis is to get an unbiased understanding of a corporation's financial situation and development.

Analyzing the financial statement of Mowi makes us able to systematically comprehend the corporation's position in comparison to the rest of the salmon farming industry. The analysis will be separated in two, an analysis of profitability, and an analysis of risk. In the profitability analysis we want to identify trends and performance of the company, whilst the risk analysis focuses on understanding the financial risks regarding short- and long-term financing of the company.

Mowi operates in various parts of the world and consolidates the financial statement as one unit. With the industry being relatively uniform, we consider the consolidated financial figures to give us the best ground for analysis. The analysis will therefore be based on Mowi's publicly shared income statement and balance sheet obtained from the database ProffForvalt. We will also use the trailing twelve-month data from the fourth quarters financial report of Mowi to get a look at the key figures for 2021 before the annual report is released.

To get a contextual understanding of the analysis, we find it necessary to use a comparable benchmark based on the financial figures from similar salmon farming companies. We have chosen to make a benchmark index consisting of the companies Lerøy Seafood Group ASA, SalMar ASA, Austevoll Seafood ASA, Grieg Seafood ASA, and Norway Royal Salmon ASA. These are five of the salmon farmers traded publicly on Oslo Børs with the largest market capitalization. Where Mowi harvested about 21,26% of Norway's total harvested Atlantic salmon in 2020, the companies included in the benchmark industry harvested about 37,5%. This makes the comparatives, plus Mowi, contain roughly 57% of the market for Atlantic salmon farming in Norway (Fiskeridirektoratet, 2021).

4.1 Profitability Analysis

A profitability analysis provides insight to a company's ability to generate returns. By generating more revenue than costs, the company provides profitability. This analysis is important to all stakeholders, as it tells us something about the company's ability to create value. We analyze this with a number of key figures extracted from the financial statements of Mowi over the last 5 five years. By analyzing the key figures over a time period, we will be able to identify historical trends and form an idea of the development. It also gives us more reference points to the benchmark, making it easier to evaluate Mowi's performance relative to its competitors.

4.1.1 Return on Assets

Return on assets (ROA) measures the profitability of a company relative to its total assets. By using this key figure, we get an indication of how efficiently the corporation uses its available assets to yield profits. A larger ROA indicates better use of total resources. The formula is built to analyze how the total assets provide profitability to the business. This is done by dividing the net income by the average total assets of the company (Hargrave, 2022).

$$Return\ on\ Assets\ (\%) = \frac{Net\ income}{Average\ Total\ Assets} * 100$$

Equation 2: Return on Assets (%)

It is difficult to generalize what is considered a sufficient ROA as it varies a lot from which industry the corporation operates. However, we can say that industries with high required initial investments require a lower ROA than less capital-intensive industries. As we know, the salmon farming industry requires large amounts of fixed assets and initial investments to operate. For this reason, we can expect the ROA to be lower compared to other industries. Further, the benchmark index will probably give the best ground for defining whether Mowi's ROA is sufficient, as it gives a comparable figure relative to the competitors in the same fields.

Return on assets	Average	2016	2017	2018	2019	2020	2021
SalMar		21,8 %	17,5 %	25,5 %	15,4 %	10,0 %	
Lerøy Seafood Group		17,1 %	6,9 %	13,3 %	6,4 %	2,6 %	
Austevoll Seafood		12,2 %	5,2 %	11,6 %	5,6 %	2,1 %	
Grieg Seafood		19,2 %	8,6 %	13,0 %	7,6 %	-0,3 %	
Norway Royal Salmon		30,5 %	6,2 %	17,8 %	29,9 %	1,4 %	
Industry Benchmark	12,3 %	20,2 %	8,9 %	16,3 %	13,0 %	3,2 %	
Mowi	8,9 %	11,6 %	10,1 %	12,0 %	8,7 %	2,0 %	8,5 %

Table 7: Return on Assets

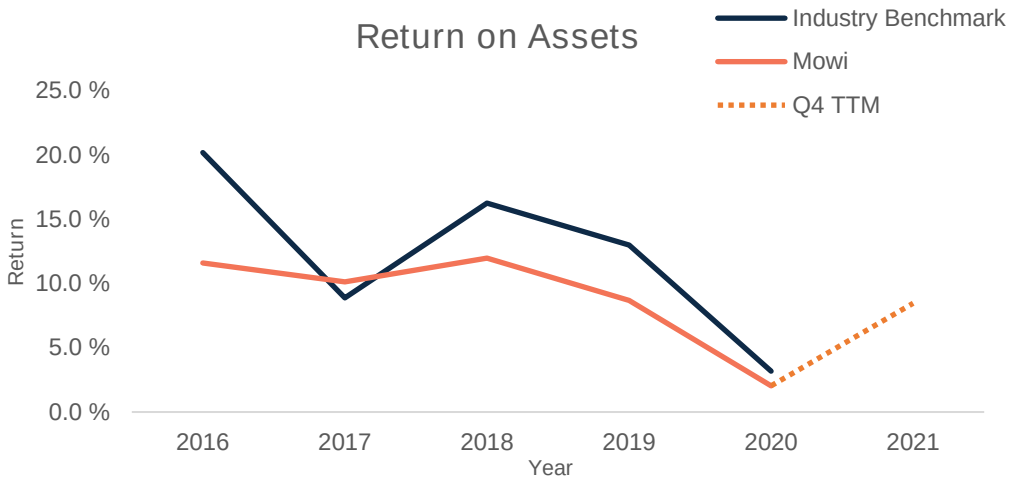

Figure 16: Return on Assets

The result from our analysis shows that Mowi from 2016 to 2020 has averaged on 8,9% ROA compared to the benchmark index's performance of 12.3%. Mowi have in other words been less efficient using their total assets to generate profits compared to an average competitor. It is however worth mentioning that Mowi, as the largest salmon farming corporation, is expected to have larger amounts of money invested in their assets. Mowi operates in more than 20 countries and will therefore be bound to have more money invested in supporting activities such as office buildings for administrations etc. These factors are of relevance to explaining the underperformance.

The analysis also shows a great amount of variance in ROA in the industry. It is reasonable to think that this is caused by underlying factors independent of the operations. We know that the industry is highly dependent on the prices of salmon.

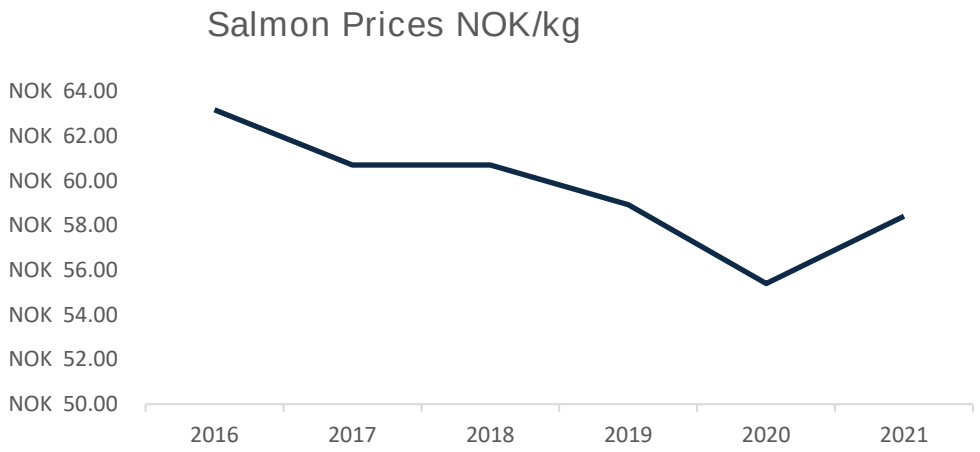

Figure 17: Average Annual Prices of Salmon from 2016 to 2021 (Fish Pool, (n.d.))

By looking at the average salmon prices from 2016 to 2021, we see a clear resemblance to the ROA chart presented in the last paragraph. In fact, if we calculate the correlation between the salmon prices and the return on assets in the industry, we can see there has been 88% correlation from 2016 to 2020. By this, we highlight the importance the salmon price has on the industry. It is also important to understand that the performance in the salmon farming industry is based on more factors than just the operations within each specific company.

4.1.2 Return on Equity

The return on equity tells us how the company uses its shareholder's equity to return profits. By using this measurement, we obtain an understanding of how efficiently the company generates profits from its assets minus the debt. The cost of capital varies between equity and debt, and it is therefore relevant to separate ROA and ROE to understand how well the equity is used to gain profits. Where ROA tells us the return to both shareholders and creditors of the company, the ROE solely focuses on how well the equity of the firm performs. As ROE does not include the debt, we will always get a similar or better return on equity than return on assets (Kristoffersen, 2016)

$$Return\ on\ Equity(\%) = \frac{Net\ income}{Average\ Equity} * 100$$

Equation 3: Return on Equity

Return on Equity	Average	2016	2017	2018	2019	2020	2021
SalMar		44,5 %	32,0 %	42,6 %	27,0 %	19,4 %	
Lerøy Seafood Group		31,6 %	12,5 %	22,8 %	10,7 %	4,5 %	
Austevoll Seafood		23,3 %	9,8 %	20,3 %	9,6 %	3,6 %	
Grieg Seafood		44,9 %	18,3 %	27,6 %	16,1 %	-0,6 %	
Norway Royal Salmon		62,1 %	12,1 %	34,0 %	46,3 %	2,3 %	
Industry Benchmark	23,1 %	41,3 %	17,0 %	29,5 %	21,9 %	5,8 %	
Mowi	18,0 %	26,3 %	21,1 %	21,8 %	16,5 %	4,2 %	17,3 %

Table 8: Return on Equity

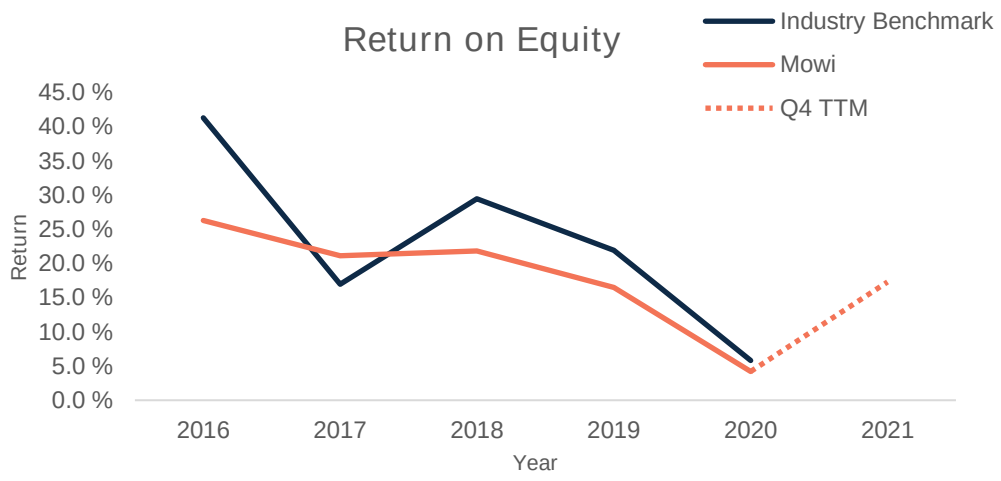

Figure 18: Return on Equity

Mowi has averaged an 18% return on equity from 2016 to 2020 whilst the industry has returned 23,1% on their equity in the same period. Like with return on assets, this tells us Mowi has underperformed. This is however expected, as ROA and ROE both use net income as the numerator. As with the ROA, the trendlines of Mowi are relatively similar to the index's trendline. We can therefore expect the ROE in the index to have had a similar spike as Mowi's TTM line shows from 2021. The returns from 2020 were highly influenced by the low salmon prices due to Covid 19, and except for this year, we see a return on equity around the 20% region. This should be considered a satisfying return for the shareholders.

4.1.3 Operating Margin

Where ROA and ROE have given insight into Mowi's profitability relative to the underlying financial values of the company, operating profits measures the return on sales. Operating margin analyzes how efficiently the operations generate profits by dividing the operating profits by the revenue. By excluding the interest and taxes, we can analyze how much of the revenue the business maintains after its operating expenses. We want as high margins as possible as it gives safety and makes the business able to resist lower sales prices. With the salmon farming industry profits being highly reliant on salmon prices, we can consider operating margins important to withstand the price volatility (Kristoffersen, 2016).

$$Operating\ Margin = \frac{Operating\ profit(EBIT)}{Revenue} * 100$$

Equation 4: Operating Margin

Operating Margin	Average	2016	2017	2018	2019	2020	2021
SalMar		34,2 %	25,8 %	38,0 %	24,8 %	21,9 %	
Lerøy Seafood Group		25,0 %	10,7 %	21,7 %	11,7 %	5,6 %	
Austevoll Seafood		23,6 %	9,6 %	22,2 %	11,2 %	5,4 %	
Grieg Seafood		23,6 %	11,7 %	17,4 %	10,4 %	5,3 %	
Norwegian Royal Salmon		20,8 %	9,8 %	15,9 %	7,6 %	2,1 %	
Industry Benchmark	16,6 %	25,4 %	13,5 %	23,0 %	13,2 %	8,1 %	
Mowi	17,1 %	28,2 %	13,3 %	24,3 %	14,9 %	4,9 %	15,1 %

Table 9: Operating Margin

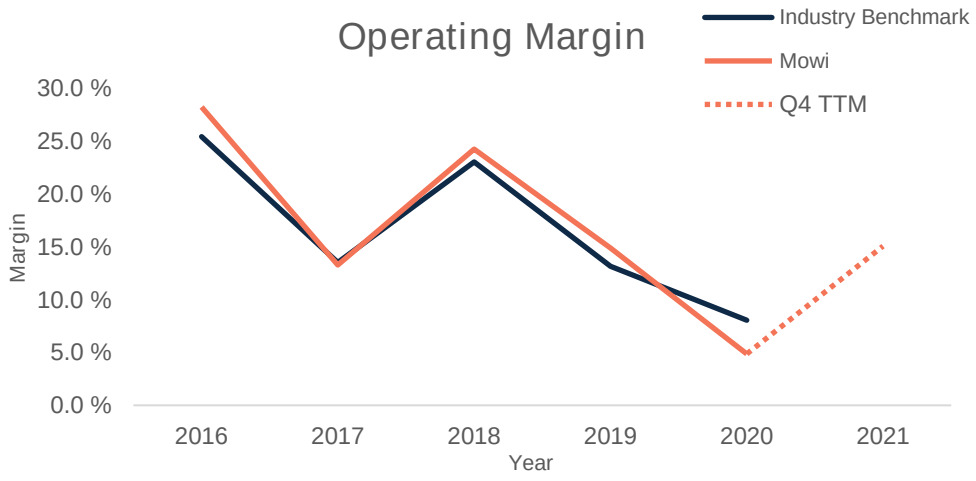

Figure 19: Operating Margin

The operating margin of Mowi has been better relative to the industry benchmark from 2016 to 2020. With an average of 17,1%, Mowi's margins are strong. The fact that Mowi overperforms in operating margins whilst underperforming in ROA and ROE tells us that the operational part of Mowi is strong. It is also an indication that less of Mowi's capital is directly activated in the operations, and that Mowi has more non-operating costs relative to its average competitor. Mowi is also highly efficient with its operations as we learned in the strategic analysis. By owning the entire supply chain, they get cost advantages with economies of scale and efficiency in logistics. These facts are of relevance to explain why Mowi's operating margins are better relative to the industry. We also see some of these traits in SalMar's operating margins. SalMar is the next largest salmon farmer after Mowi, and they also acquire economies of scale. These facts highlight the importance economies of scale has in operations.

4.1.4 Summary of Profitability Analysis

With the sharp decline in salmon prices due to Covid 19, we see the profitability in the industry getting significantly reduced. Mowi as the largest salmon farming corporation worldwide has generally had a more stable profitability relative to their competitors. The size advantages provide economies of scale essential for the efficiency of operations. Mowi performed slightly better in operating margins compared with its competitors. On the other hand, Mowi are less efficiently using their total assets and equity to generate profits. The overall results are still sufficient to make the investors and debtholders satisfied with the performance of the business, as Mowi has shown to provide a relatively stable and positive profit throughout the last five years. This analysis illustrates how luxurious the salmon farming industry has been over the last couple of years when it comes to yielding profits and operating with positive profitability. We have however understood the importance of salmon prices by looking at how the trends in profitability have varied in correlation to the trends in salmon price.

4.2 Risk Analysis

We have now analyzed how Mowi performs and generates profitability through its operations and capital. In this part of the financial statement analysis, we will analyze the risks regarding the financial stability of Mowi. This will be done in two parts. The

first part will consist of analysis of long-term financial stability, called solvency, while the second part focuses on short-term financial stability, known as liquidity.

4.2.1 Solvency

We analyze the solvency of Mowi to figure out how well the company can withstand long-term debt and financial obligations. The solvency of a company tells us the "financial health" of the business as it gives an idea of how well the company can manage financial obligations and thereby maintain operations into the future. We say that a company is solvent when the underlying values of the company are net positive, meaning the assets are more valuable than the debt (Kristoffersen, 2016).

The equity ratio can be used to understand the solvency of Mowi. The equity ratio is the shareholder's equity as a share of the total assets. The lower the equity ratio gets, the more financially leveraged the company is. In other words, we measure what portion of the assets are financed by the shareholder's equity (Kristoffersen, 2016).

$$Equity\ ratio = \frac{Total\ Shareholders\ Equity}{Total\ Equity\ and\ Liabilities}$$

Equation 5: Equity Ratio

Equity ratio	Average	2016	2017	2018	2019	2020	2021
SalMar		0,50	0,59	0,60	0,54	0,50	
Lerøy Seafood Group		0,54	0,56	0,60	0,59	0,58	
Austevoll Seafood		0,52	0,54	0,59	0,59	0,58	
Grieg Seafood		0,47	0,47	0,48	0,46	0,41	
Norwegian Royal Salmon		0,55	0,48	0,57	0,72	0,54	
Industry Benchmark	0,54	0,52	0,53	0,57	0,58	0,52	
Mowi	0,50	0,43	0,53	0,56	0,50	0,47	0,50

Table 10: Equity Ratio

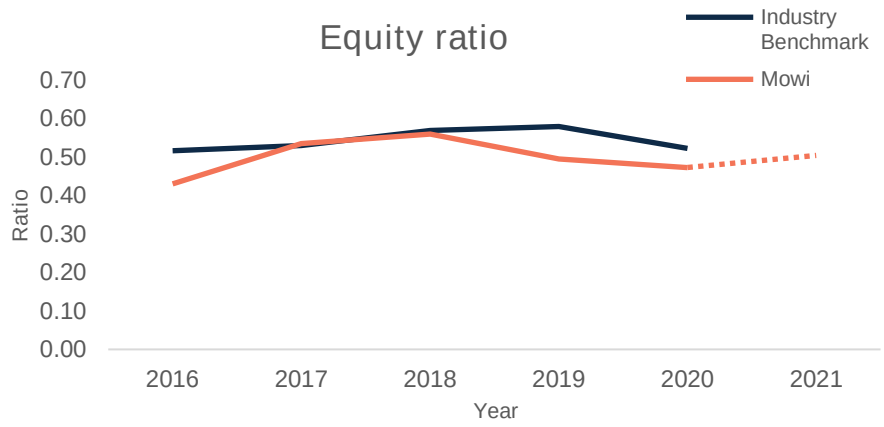

Figure 20: Equity Ratio

From the output of the equity ratio analysis, we see how Mowi generally has operated with a lower equity ratio than the industry. The average equity ratio of 0,5 tells us that Mowi has been about 50% financed by its shareholders over the last couple of years. Compared to the industry benchmarks average of 0,54, Mowi has generally been more financially leveraged.

The debt-to-equity ratio(D/E) is another key figure to measure the solvency of a business. D/E is relevant to view in context to the equity ratio as they are relatively similar. Dividing the total liabilities by the total shareholder's equity shows whether the company's capital is financed by the owners or debtholders. We associate a higher D/E ratio with more risk and a lower ratio with better solidity. Corporations tend to use higher financial leverage if they predict more returns than the cost of the debt. This is regarded as riskier, because if the cost of debt exceeds the returns, the value of the company reduces (Fernando, 2022).

$$Debt\ to\ Equity\ ratio = \frac{Total\ Liabilities}{Total\ Shareholders\ Equity}$$

Equation 6: Debt to Equity Ratio

Debt to Equity ratio	Average	2016	2017	2018	2019	2020	2021
SalMar		1,01	0,69	0,66	0,85	1,00	
Lerøy Seafood Group		0,86	0,77	0,66	0,70	0,71	
Austevoll Seafood		0,92	0,84	0,69	0,71	0,73	
Grieg Seafood		1,11	1,14	1,10	1,16	1,44	
Norwegian Royal Salmon		0,81	1,08	0,76	0,39	0,86	
Industry Benchmark	0,87	0,94	0,90	0,77	0,76	0,95	
Mowi	1,02	1,32	0,87	0,79	1,02	1,12	0,98

Table 11: Debt to Equity Ratio

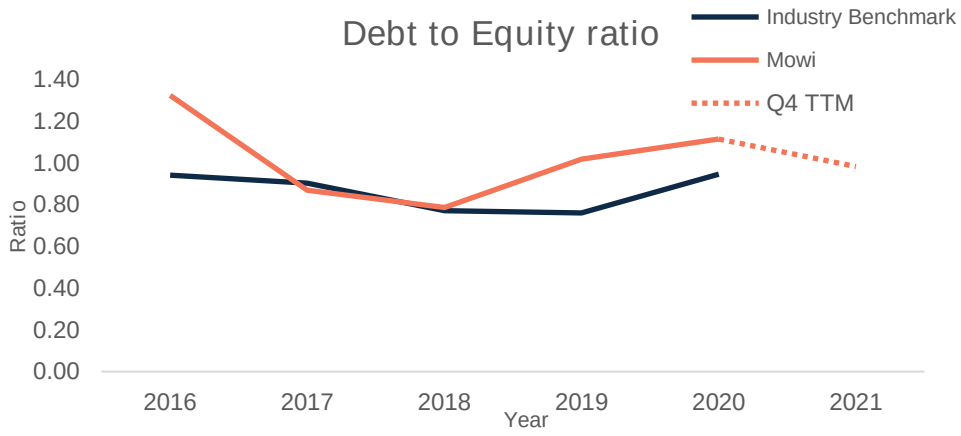

Figure 21: Debt to Equity Ratio

D/E-ratio confirms what we saw in the analysis of the equity ratio; Mowi has generally been more financially leveraged than its competitors since 2016. This indicates that Mowi has been more aggressively financing the growth of the company. We know that Mowi is the largest corporation in the industry, and the only one that controls the entire supply chain. These facts emphasize why Mowi needs capital to maintain growth. With the salmon farming industry being regulated through concessions and political factors, it is hard to maintain growth solely within the farming industry. Mowi has therefore been investing a lot to expand its operations within the supply chain, leading to higher demand for capital.

4.2.2 Liquidity

When analyzing risk, we also want to understand the risks of the short-term financial situation. By looking into the liquidity of Mowi we focus on the company's ability to access short-term financial assets. We want to look at the liquidity to foresee how well the company can withstand its financial obligations or debt within a year ahead.

Liquidity is important as it gives flexibility to the operations. Cash is considered the most liquid asset of a company, but tangible assets such as stocks, bonds, commodities, and inventory are also considered liquid. We analyze the liquidity of the firm by looking at the current ratio. The current ratio is often referred to as the liquidity ratio, dividing current assets by current liabilities (Fernando, 2021).

$$Current\ ratio = \frac{Current\ Assets}{Current\ Liabilities}$$

Equation 7: Current Ratio

Current Ratio	Average	2016	2017	2018	2019	2020	2021
SalMar		2,29	1,94	2,02	2,31	1,67	
Lerøy Seafood Group		2,90	2,98	2,99	2,81	2,68	
Austevoll Seafood		2,64	2,63	3,04	2,76	2,49	
Grieg Seafood		2,50	2,44	2,58	2,72	3,61	
Norwegian Royal Salmon		2,19	1,76	2,35	2,87	1,90	
Industry Benchmark	2,52	2,51	2,35	2,59	2,69	2,47	
Mowi	3,25	3,03	2,70	3,70	3,38	3,41	2,89

Table 12: Current Ratio

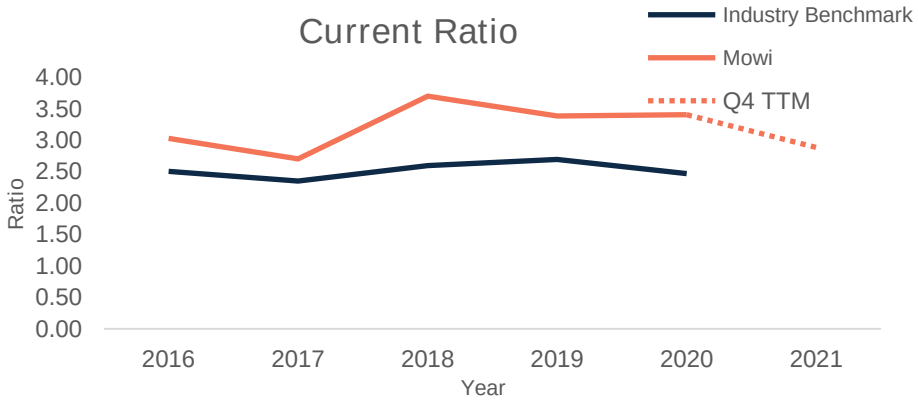

Figure 22: Current Ratio

The current ratio of Mowi has averaged at 3,25 compared to the industry's benchmark of 2,52. This is an indication that Mowi has overall better liquidity than the comparative companies. Figure 22 illustrates this further by clearly differentiating Mowi from the index. We generally want the current ratio to be above 2 as this makes the current

assets twice as large as the current debt. Mowi's average current ratio of 3,25 is considered very good as it tells us that Mowi has more than 3 times the amount of short-term assets compared to its short-term liabilities. The margin of safety within short-term financing is therefore considered sufficient for Mowi, and there are minimal risks of Mowi defaulting on its short-term debt.

4.2.3 Summary of Risk Analysis

We have now analyzed the financial risks of Mowi. The solvency of Mowi must be considered good even though the company on a general note has been more financially leveraged than its competitors. The reason for Mowi's debt financing is that they are more focused on growth, especially outside the core operations which are salmon farming. From owning the entire supply chain, Mowi has capital requirements that separate them from the rest of the industry. Furthermore, Mowi has lower risks with their operations as they are well diversified around the world. This gives Mowi an advantage where they can take on more financial leverage with less risk than their competitors. We further found that Mowi's liquidity situation is well. With the current ratio well above the industry benchmark, we can state Mowi's short-term financial risks as low. By this, we can state that Mowi overall has low risks of defaulting on both short- and long-term debt and that the financial risks of the company are shallow. These facts will be of importance in the following financial analysis where we will look at key figures and valuations of the market value of Mowi.

5 Financial Valuation

As the goal of this paper is to estimate a reasonable valuation of MOWI as of 31.12.2021, we will perform two valuation methods. Firstly, we will implement a discounted cash flow analysis, also known as the DCF model. Secondly, we will implement a multiple analysis. As both models have their advantages and disadvantages, a combination of the two will allow us to make a more nuanced conclusion.

5.1 Absolute Valuation Method

Absolute valuation method refers to a method that uses discounted cash flows to determine a company's financial worth (Investopedia, 2020). By doing this, we can find the company's intrinsic value.

5.1.1 r_e - Cost of Equity

The Capital Asset Pricing Model (CAPM) formula was first introduced in the 1960s by William Sharpe, John Litner, and Jack Treynor. They wanted to find an answer to how risk premium can be calculated when a stock does not perfectly follow either the market or Treasury Bills. The CAPM model was the answer, which states that investors who take a higher level of risks, also should expect a higher level of returns (Brealey et. al, 2019). The formula is calculated by:

$$r_e = rf \ + Beta * (r_m - r_f)$$

Equation 8: Capital Asset Pricing Model

One of the central elements in using a model for discounting cash flows is the belief that money today is worth more than money received in the future. With this in mind, any rational investor will demand compensation for taking on risk for the time loss of value. In general, this means that the required rate of return is what makes us neutral to investing in this project, and other projects with the same risks.

5.1.1.1 Risk-Free Rate

As we see from the model, one of the elements is the risk-free interest rate. In general, the risk-free interest rate is set as the same as long term government bonds (Brealey et. al., 2019). PwC in co-operation with Norske Finansanalytikernes Forening (NFF) has over the last 11 years made an annual report which goes further into the risk premium in the Norwegian stock market. In the 2021 edition, 144 respondents answered out of a total of approximately 1000 asked. 39% of the respondents verified the belief and answered that they indeed use the 10-year government bond for risk-free interest rate when calculating discount rates (PwC, 2021). As of 30.12.2021, the yield of 10-year bonds issued by the Norwegian government was 1,698%, which we will use for the purpose of this report (World Government Bonds, n.d). Although Mowi is both noted in the US and in Norway, we will use the Norwegian bond, because the largest part of Mowi's operations is in Norway (Mowi, 2021).

5.1.1.2 Market Risk Premium

In its simplest form, the market risk premium can be described as the difference between the risk-free interest rate and the expected return in the market (Brealey et. al, 2019). Even though the market risk premium is widely known as the most important variable in finance, there is still not reached a general consensus among academics and professionals as to how it should be calculated. We will go deeper into this part in the critique found in chapter 8. In addition to various calculation methods used, many practitioners have relied on survey data for finding an appropriate market risk premium. Surveys are appealing because they reflect investors' forward-looking views on the market and give an estimate on what corporate executives use as their cost of capital. The already mentioned report by PwC and NFF is this type of survey, and they have estimated that the median market premium for 2021 is 5.0%, which is the market premium we will use in our thesis (PwC, 2021).

5.1.1.3 Beta

The Beta (β) is a statistical measurement of the stock's volatility compared to the volatility of the market. Beta's coefficient describes the relationship between systematic risk and the expected return for an asset. This measurement gives us insight into how risky a stock is relative to the market. For the Beta to give meaningful insight, we need

to use the appropriate benchmark. We will here use the OSEBX (Oslo Stock Exchange Index) as a benchmark. When assessing the benchmark's relevancy, we will use R-squared. The value of the R-squared suggests how much of the security's historical price movements can be explained by movements in the benchmark index. To find the Beta we use the following formula (Kenton, 2021).

$$Beta = \frac{Cov(r_s, r_m)}{var(r_m)}$$

Equation 9: Beta

To find the returns of Mowi and OSEBX, we are using the daily historical share prices from 2017 to 2021 retrieved from Yahoo Finance and Euronext. The data collected from Yahoo are the adjusted closing prices of Mowi. We use adjusted closing prices as they reflect the stock's value after accounting for any corporate actions, such as stock splits, dividends, and right offerings.

Regression Statistics	
Multiple R	0.49547753
R Square	0.2453989
Adjusted R Square	0.24479035
Standard Error	0.01526898
Observations	1242

	Coefficients	Standard Error	t Stat	P-value
Intercept	0.00038	0.00043	0.86675	0.38625
X Variable 1	0.80342	0.04001	20.08114	0.00000

Table 13: Beta Regression Output

We performed a linear regression in Excel and found a Beta of 0,80. Correspondingly, the R-squared was 0,245. A Beta of 0,80 says that Mowi is theoretically less volatile than the market. For example, a 10 percent movement in the market, predicts an 8 percent movement in Mowi's share price. Additionally, an R-squared of 0,245 tells us that 24,5 percent of Mowi's historical returns are explained by the variation in OSEBX's returns.

5.1.2 Weighted Average Cost of Capital (WACC)

The WACC represents a company's average cost of capital from both common stock, preferred stock, bonds and other forms of debt (Hargrave, 2022). This average expresses the required rate of return for both the shareholders and the debtholders.

The formula for the WACC uses the cost of capital, described above. It also includes the market value of the firm's equity, the market value of their debt, the firm's cost of debt and the corporate tax rate. Put together, the formula is as follows:

$$WACC = \left(\frac{E}{V} \times R_E\right) + \left(\frac{D}{V} \times R_D \times (1 - T_C)\right)$$

Equation 10: Weighted Average Cost of Capital

5.1.2.1 Cost of Debt

The cost of debt is not reported in Mowi's annual report. Therefore, we had to calculate the accurate costs ourselves. We have used data from the last 5 years and calculated the average cost. The formula used is shown in Formula 11: Cost of Debt.

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

Equation 11: Cost of Debt

Cost of Debt	2017	2018	2019	2020	2021
Interest-bearing debt	903,6	1142,6	1465,8	1565,5	1358,9
Interest expenses	46,7	50,0	70,2	62,3	59,0
Annual cost of debt	5,17 %	4,38 %	4,79 %	3,98 %	4,34 %
Average cost of debt	4,53 %				

Table 14: Cost of Debt

As we can see from the table, Mowi has a quite stable cost of debt, which averaged out at 4.53%. The cost may be a bit higher than it has been in previous years, but with Norges Bank anticipating up to seven rises in the interest rate over the coming years, we believe that 4.53% is fair, and is what we will use for calculating WACC.

5.1.2.2 Taxes

Taxes are included in the WACC formula because when a firm have debt and pay interest, these costs are classified as tax-deducitble. In Norway, the corporate tax level for 2022 is set at 22% (Finansdepartementet, 2022). Although, Mowi have operations in many countries, Mowi's main operations are in Norway, hence we will use the Norwegian tax level.

5.1.2.3 Capital Structure

As the WACC is weighted, we need to calculate how large a percentage of the total capital each element composes. From the financial statement analysis, we saw that Mowi has been more leveraged than the industry average.

Firm Value (EURm)	2017	2018	2019	2020	2021
Equity	2 315	2 879	2 892	2 764	3 128
Debt	2 015	2 266	2 949	3 082	3 131
Total Firm Value	4 330	5 145	5 841	5 846	6 260
Equity (%)	53.46 %	55.96 %	49.51 %	47.28 %	49.97 %
Average	51.24 %				
Debt (%)	46.54 %	44.04 %	50.49 %	52.72 %	50.03 %
Average	48.76 %				

Table 15: Capital Structure

One of the criteria for using WACC as the discount rate is that the company has a stable capital structure. We can see from the table that Mowi in general has quite a steady capital structure and that it averages out to 51.21% and 48.76%. For calculation of WACC we use the capital structure of 2021.

5.1.2.4 WACC Conclusion

Now that we have all the different components needed to calculate the WACC, we can calculate the discount rate which we will use in our DCF Model. Firstly, we calculate the CAPM, followed by the WACC. The CAPM formula is found above, and as we can see from table 16, the final result for required return on equity is 5.698%. This is also used for calculation of WACC. As table 16 shows, we find a required rate of return on assets of 4.62%.

Required Rate of Return on Assets	
Risk-Free Interest Rate	1.70 %
Market Risk Premium	5.00 %
Beta of Mowi	0.80 %
CAPM	5.698 %
Corporate Tax Rate	22.00 %
Average Cost of Debt	4.53 %
Debt / Total Assets	49.97 %
Equity / Total Assets	50.03 %
WACC	4.62 %

Table 16: Required Rate of Return on Assets

6 Free Cash Flow Forecasting

In this segment, we will perform the DCF-analysis of Mowi. As discussed earlier, we will use the WACC as the discount rate for the free cash flows in Mowi's total capital. The DCF model is based on estimating the future cash flows of an investment in order to project the fair value of the investment. The estimated free cash flow tells us the amount of free cash flow the company will have available after capital expenditure. By using a discount rate, we can adjust the future generated cash flows to today's value. The model will be based on several assumptions where the goal is to estimate the fair value of Mowi. The assumptions we make are what make the analysis sensitive, and it is therefore important to perform an analysis of sensitivity at a later stage. There are several ways to estimate the future cash flows of an investment, where the top-down and bottom-up methods are commonly used. Top-down is based upon socioeconomic and macro factors as the drivers for estimation, whereas bottom-up projects the future cash flows based on microeconomic factors such as production volume, price, and costs.

The salmon industry is known for being cyclical, meaning the performance of the industry is correlated or reliant on how well the economy is doing. For this reason, we find it better to use macroeconomic factors as the drivers for cash flow projection. We will therefore use the top-down method to project the future cash flows. The estimation will be progressively built from estimating the salmon prices and harvesting volume and revenue in the beginning, to the costs, change in working capital, and capital expenditure at last. Based on these factors, we will predict the cash flows from 2021 to 2025, where the cash flow from 2025 will be the ground for estimating the terminal value with the Gordon Growth formula. The following formulas shows how the DCF-model is built:

$$FCFF = NOPAT + \text{D\&A} - \Delta NWC - CAPEX$$

- $FCFF = Free\ Cash\ Flow\ to\ Firm$
- $NOPAT = Net\ Operating\ Profits\ After\ Taxes\ \big(EBIT * (1 - Tax)\big)$
- $D\&A = Depreciation\ \&\ Amortization$
- $\Delta NWC = Change\ in\ Net\ Working\ Capital$
- $CAPEX = Capital\ Expenditures$

Equation 12: Free Cash Flow to the Firm

$$DCF = \sum_{i=1}^{n} \frac{FCFF_i}{(1+r^i)} + \frac{TV_n}{(1+r^{n-1})} \qquad \rightarrow \qquad TV_n = \frac{FCFF_n}{(r-g)}$$

- $r = WACC$
- $g = growth\ rate$

Equation 13: Discounted Cash Flow

6.1 Revenue

As the DCF-model will have a top-down structure, we will start of by predicting the future revenue of Mowi. Estimating the salmon prices will be give us a good foundation for predicting Mowi's revenue, as we know the main source of revenue comes from Atlantic Salmon. The prediction we make about the salmon prices are based on the database from the European exchange for financial salmon futures, Fish Pool. Fish Pool provides estimations for forward prices of Atlantic salmon until 2024 (Fish Pool, n.d.). We will use these estimations for estimating 2021-2024, and the average growth of 3,62% from 2010 to 2024 to predict salmon prices for 2025.

The next part of the revenue estimation is to predict the future harvesting volume of Mowi. In this part we will also use the last 10 years from 2010 to 2020 to estimate the average growth in harvest volume. The model gave us an average growth rate of 4,78%.

Finally, we need to estimate Mowi's revenue from other sources. Similar to the other estimates, we calculate this by averaging the historical performance. Dividing the total revenue by the revenue from other sources than salmon and averaging this figure from 2010 to 2020 will give a good estimation. After performing this, we found that Mowi had had about 66% of their revenue from sale of salmon and about 34% from other sources.

We have now estimated the needed figures to forecast the total revenue of Mowi from 2021 to 2025. By multiplying the estimated harvesting volume with the estimated salmon price of each year we find the estimated revenue from sales of salmon. Adding the estimated revenue from other sources gives us the total estimated revenue of the firm:

Revenue Estimation	2021E	2022E	2023E	2024E	2025E
Estimated Harvest Volume	465 600	487 848	511 158	535 583	561 174
Estimated Salmon Prices	5.74	7.47	6.55	6.13	6.35
Revenue from Salmon	2 672 544	3 644 222	3 348 087	3 283 122	3 564 617
Revenue from Other Sources	1 417 668	1 933 100	1 776 013	1 741 553	1 890 873
Estimated Revenue	4 090 212	5 577 322	5 124 100	5 024 675	5 455 490

Table 17: Estimation of Revenue

6.2 Operating Costs

Estimation of the various operating costs will be separated in four parts. Here we will estimate on the basis of their relativity to the revenue. We will start of by finding the estimated material and thereafter forecast the salary expenses. Further we will estimate depreciation and amortization, and lastly other operating expenses. By subtracting these costs from the revenue, we can calculate net operating costs. This part will therefore be essential in forecasting the free cash flows.

6.2.1 Costs of Material

Cost of materials is the main part of Mowi's operating costs. We will estimate this by looking at the size of cost of material compared to revenues from 2016 to 2020. The cost of material has on average made up 49% of the revenue. Since we have predicted the revenue for the next five years, we can use the average margin between cost of material relative to the revenue for predicting the cost of material in the future. This calculation gives us the following estimations:

Cost of Material Estimation	2021E	2022E	2023E	2024E	2025E
Estimated Revenue	4 090 212	5 577 322	5 124 100	5 024 675	5 455 490
Average Material Margin	48.99 %	48.99 %	48.99 %	48.99 %	48.99 %
Estimated Cost of material	2 003 604	2 732 069	2 510 057	2 461 354	2 672 390

Table 18: Cost of Material Estimation

6.2.2 Salary and Personnel Expenses

The approach for estimating salary expenses will be the same as with cost of materials. It's done by averaging margins between salary and personnel expenses to revenue from 2016 to 2020. From this calculation we found that salaries on average have been 13,47% the size of revenue.

Salary Expense Estimation	2021E	2022E	2023E	2024E	2025E
Estimated revenue	4 090 212	5 577 322	5 124 100	5 024 675	5 455 490
Margin of Salaries	13.47 %	13.47 %	13.47 %	13.47 %	13.47 %
Estimated Salary Expenses	551 006	751 340	690 285	676 891	734 928

Table 19: Estimation of Salary Expenses

6.2.3 Depreciation & Amortization

Estimating non-cash expenses is important as they reduce taxes on net income. Other than tax shields, depreciation and amortization are not influencing the operating cash flow. We will therefore add these costs back to the net profits as well as adjust for changes in working capital in order to find the operating cash flows of Mowi. Depreciation and amortization are estimated in the same way as the other costs, by projecting an average size relative to the revenue. From 2016 to 2020, non-cash expenses have averaged 5,63% of the revenue.

DD&A Estimation	2021E	2022E	2023E	2024E	2025E
Estimated Revenue	4 090 212	5 577 322	5 124 100	5 024 675	5 455 490
Depreciation and Amortization Margin	5.63 %	5.63 %	5.63 %	5.63 %	5.63 %
Estimated depreciation and amortisation	230 187	313 878	288 372	282 776	307 022

Table 20: Estimation of DD&A

6.2.4 Other Operating Expenses

The last financial statement line within the operating expenses we will forecast is other operating expenses. Other operazting expenses often consist of costs indirectly connected to the core operation such as electricity, fuel, repairs, and maintenance, rent and leases, marketing expenses etc. From 2016 to 2020, these costs have on average been 14,66% the size of the revenue, which gives us the following forecasts:

Operating Expenses Estimation	2021E	2022E	2023E	2024E	2025E
Estimated Revenue	4 090 212	5 577 322	5 124 100	5 024 675	5 455 490
Margin	14.66 %	14.66 %	14.66 %	14.66 %	14.66 %
Estimated Other Operating Expenses	599 673	817 700	751 253	736 676	799 838

Table 21: Estimation of Other Operating Expenses

6.2.5 Estimated Operating Costs and Net Profit

We have now estimated Mowi's operating costs from 2021 to 2025. Consolidated and subtracted from the estimated revenue, we have worked our way down to an estimation

of the net operating profit, often referred to as earnings before interest and taxes (EBIT).

Years	2020	2021E	2022E	2023E	2024E	2025E
Total Operating Income	3 760 200	4 090 212	5 577 322	5 124 100	5 024 675	5 455 490
Cost of Material	1 970 400	2 003 604	2 732 069	2 510 057	2 461 354	2 672 390
Salaries	558 500	551 006	751 340	690 285	676 891	734 928
Depreciation and Amortiation	338 100	230 187	313 878	288 372	282 776	307 022
Other Operating Expenses	564 100	599 673	817 700	751 253	736 676	799 838
Value Adjustment(reduction)	145 600					
Total Operating Costs	3 576 700	3 384 470	4 614 988	4 239 967	4 157 697	4 514 177
Operating Profit (EBIT)	183 500	705 742	962 334	884 133	866 978	941 313
EBIT Margin	4.88 %	17.25 %	17.25 %	17.25 %	17.25 %	17.25 %

Table 22: Estimation of Operating Profit

As we see, the projections are relatively positive where we get an estimated EBIT-margin of 17,25% over the years. As all the operating costs are calculated on the basis of revenue, we get the same margin over the years. While this may not be realistic, we do not regard this as a problem since this is an estimation.

6.3 Changes in Working Capital

Estimating the changes in working capital is necessary to predict the year-to-year operating cash flow. The working capital is calculated from the balance sheet and consists of the difference between current assets and current liabilities. We will split the estimation of working capital into three parts: inventory, payables, and receivables. After analyzing these and forming a forecast of changes in working capital, we have all the necessary variables to find the operating cash flow.

6.3.1 Inventories

Inventories consists of materials and goods used in production of the final product. In Mowi's case, the main part of inventories consists of biological assets which is both the living, and the harvested fish from the farms. Furthermore, the inventories contain all goods in progress, packaging, and finished products (Mowi, 2020). We estimate inventories by averaging their relative value compared to the cost of materials in the respective years from 2016 to 2020. We base the estimations on cost of materials rather than revenue, as the cost of materials are directly related to inventories. We

estimate the value of inventories to be 95,46% of the cost of materials from 2016 to 2020.

	2020	2021E	2022E	2023E	2024E	2025E
Cost of Material		2 003 604	2 732 069	2 510 057	2 461 354	2 672 390
Estimated Inventories	1 750 700	1 912 713	2 608 133	2 396 192	2 349 698	2 551 161
Change		162 013	695 420	(211 941)	(46 494)	201 463

Table 23: Inventories

6.3.2 Receivables

The receivables consist of short-term payable assets such as accounts receivable, prepayments to suppliers, prepaid taxes etc. The receivables are estimated relative to the revenue of Mowi, where the average receivable from 2016 to 2020 has been 12,9% of the revenue. We get the following estimation of receivables in Mowi from 2021 to 2025:

	2020	2021E	2022E	2023E	2024E	2025E
Revenue		4 090 212	5 577 322	5 124 100	5 024 675	5 455 490
Estimated Recieveables	454 000	527 600	719 423	660 962	648 137	703 708
Change		73 600	191 824	(58 461)	(12 825)	55 571

Table 24: Receivables

6.3.3 Payables

The estimation of payables consists of all the current liabilities in Mowi. Short-term liabilities such as salaries, social security, leasing costs and accrued expenses are a part of the payables. By estimating the payables from 2021 to 2025 we will have ground for estimation of the working capital, and by that be able to form an estimation of the changes in cash flow. The payables are viewed relatively to the cost of materials. The value of all payables in Mowi has on average been 15,72% of the cost of materials, and is as shown below:

	2020	2021E	2022E	2023E	2024E	2025E
Cost of Material		2 003 604	2 732 069	2 510 057	2 461 354	2 672 390
Estimated Payables	316 500	314 918	429 415	394 520	386 865	420 035
Change		(1 582)	114 497	(34 895)	(7 655)	33 170

Table 25: Payables

6.4 Capital Expenditures

Having estimated all the elements to forecast the operating cash flow, we now need to do the last calculations by estimating the capital expenditures, or investments, to find

the free cash flow which we will use to predict the value of Mowi. Forecasting the CAPEX is done by finding the average percentage size of the capex relative to operating cash flow historically. From 2016 to 2020, the CAPEX has been 45,9% of the operating cash flows.

6.5 Free Cash Flow

Underneath we find the full tabular model for the prediction of free cash flow in Mowi. As we can see, the year-to-year cash flow is changing widely. This is mainly due to the revenue's dependence on the salmon prices which are changing a lot.

Years	2020	2021E	2022E	2023E	2024E	2025E
Salmon Prices	5.20	5.74	7.47	6.55	6.13	6.35
Harvest Volume GWT	439 829	465 600	487 848	511 158	535 583	561 174
Direct Income from Salmon	2 199 145	2 672 544	3 644 222	3 348 087	3 283 122	3 564 617
Other Income	1 561 055	1 417 668	1 933 100	1 776 013	1 741 553	1 890 873
Total Operating Income	3 760 200	4 090 212	5 577 322	5 124 100	5 024 675	5 455 490
Cost of Material	1 970 400	2 003 604	2 732 069	2 510 057	2 461 354	2 672 390
Salaries	558 500	551 006	751 340	690 285	676 891	734 928
Depreciation and Amortisation	338 100	230 187	313 878	288 372	282 776	307 022
Other Operating Expenses	564 100	599 673	817 700	751 253	736 676	799 838
Value Adjustment(reduction)	145 600					
Total Operating Costs	3 576 700	3 384 470	4 614 988	4 239 967	4 157 697	4 514 177
Operating Profit (EBIT)	183 500	705 742	962 334	884 133	866 978	941 313
Taxes (22%)	40 370	155 263	211 713	194 509	190 735	207 089
Net income	143 130	550 479	750 620	689 624	676 243	734 224
Depreciation and Amortisation	338 100	230 187	313 878	288 372	282 776	307 022
Change in Inventory	(92 400)	162 013	695 420	(211 941)	(46 494)	201 463
Change in Receivables	(50 800)	73 600	191 824	(58 461)	(12 825)	55 571
Change in Payables	19 700	(1 582)	114 497	(34 895)	(7 655)	33 170
Total Change in Working Capital	(123 500)	234 031	1 001 741	(305 297)	(66 974)	290 203
Operating Cash Flow	357 730	1 014 696	2 066 239	672 699	892 045	1 331 449
Capital Expenditures	(315 800)	(462 649)	(942 099)	(306 716)	(406 727)	(607 072)
Free Cash Flow	41 930	552 047	1 124 140	365 983	485 318	724 377

Table 26: Free Cash Flow

7 Valuation

7.1 Discounted Cash Flow Analysis

Having estimated the free cash flow generated by Mowi from 2021 to 2025, we can now perform the fundamental valuation of Mowi. As discussed earlier, the fundamental valuation is based on discounting each year's free cash flow with the discount rate we found using the weighted average cost of capital. The first four years will be discounted directly, whilst the last year will be the basis of the terminal value which is calculated by Gordon's growth formula. Gordon's growth formula uses a stable growth rate we predict until infinite time. This formula will give the same estimation as if we were to discount every single year's cash flow until infinity. To find a suitable growth rate, we look at how the GDP has grown historically. From 2010 to 2020, the average GDP growth in Norway has been 1,25% according to The World Bank (The World Bank, n.d.). We are using this as the perpetuity growth rate for the terminal value. The main issue with the terminal value is that it's extremely sensitive to changes in the discount rate or the perpetuity growth rate. We will look further into this in the sensitivity analysis.

Using the WACC of 4,62%, we calculate an estimated value of the firm, which is 20,34 billion euros. Subtracting the net debt, we find the fair value of Mowi to be 18,87 billion euros. This gives us a share value of € 36,5, multiplied by the currency multiplicator of 9,98 on 31.12.2021, we have found the share price of MOWI to be NOK 364,27.

DCF-Model	0	1	2	3	4	5	Terminal
Years	2020	2021	2022	2023	2024	2025	
Free Cash Flow	€ 41 930	€ 552 047	€ 1 124 140	€ 365 983	€ 485 318	€ 724 377	€ 733 504
Discount Rate	1.00	1.05	1.09	1.14	1.20	1.25	0.042
Discounted Cash Flow	€ 41 930	€ 527 688	€ 1 027 122	€ 319 641	€ 405 163	€ 578 054	€ 17 440 212
Growth Rate	1.26 %						
Enterprise Value	€ 20 339 810						
Net Debt	€ 1 465 300						
Equity Value	€ 18 874 510						
Shares Outstanding	517 111						
Share Price	€ 36.50						
Share Price in NOK*	**kr 364.27**						

**(1 EUR = 9,98 NOK)*

Table 27: DCF-Model

7.2 Sensitivity Analysis

It is important to highlight how sensitive the DCF-model is to changes in variables. For this reason, we find it necessary to perform a sensitivity analysis where we look at the various outcomes of the share price if we use different figures for the estimation. By performing the DCF-model with different discount rates as well as with different growth rates, we understand how small changes in the model's assumptions, can result in huge impacts on the estimated fair value. Looking at table 28, we see the various outcomes from the model.

Growth Rate \ WACC		3 %	4 %	4,62 %	5 %	6 %	7 %	8 %	9 %
Coservative Scenario	-0,5 %	379	287	248	229	188	159	136	119
	0 %	437	319	272	249	202	169	143	124
	0,5 %	519	361	302	274	218	180	151	130
Base Scenario	1 %	641	416	340	304	237	193	161	137
	1,26 %	732	453	**364**	324	249	200	166	141
	1,5 %	844	494	390	344	261	208	171	144
Optimistic Scenario	2 %	1 251	610	459	397	290	226	184	153
	2,5 %	2 472	804	561	471	328	249	198	163
	3 %		1 192	727	582	378	277	216	175

Table 28: Sensitivity Analysis

We have split the table into three scenarios for WACC, and three scenarios for the growth rate. The base case is when WACC is between 4,62% and 6%, whilst the growth rate varies from 1% to 1,5%. We are choosing to use our WACC of 4,62% as the low estimate for WACC in the base scenario, as this figure on a general note is considered a low discount rate. As we discussed earlier, the CAPM model is based on many assumptions, where for instance an increase in market risk premium from 5% to 7% would increase the WACC from 4,62% to 5,42%. These minor changes are not considered unrealistic for an investor. We, therefore, consider a WACC all the way up to 6% as a base case discount rate. Similarly, we see how the growth rate has huge impact in the share price. The closer the growth rate is to the WACC, the more sensitive the outcome of the DCF is. This is perfectly illustrated in the optimistic scenario of a WACC on 3%, where a change in growth rate from 2% to 2,5% would nearly doble the already high stock price. The base case scenario is marked gray, give an interval between [NOK 237, NOK 390]. The interval spread in the base case scenario is wide due to the sensitivity of the DCF-model. It is therefore important to perform a valuation

of the business with other valuation methods, to further contextualize the value of the equity.

7.3 Market-Based Valuation

In this part of the analysis, we will implement a market-based valuation, based on a set of multiples. The valuation method attempts to value a company by comparing it to the valuation of similar companies in the market. To perform this analysis, will use three multiples, which are described in the table below. Additionally, we will compare our estimates with Mowi's share price as of 30.12.2021, which was 208,7 NOK.

Abbreviation	Name	Formula
P / E	Price to Earnings ratio	$\frac{Market\ Value\ per\ Share}{Earnings\ per\ Share}$
EV / EBITDA	Enterprise Value to Earnings Before Interest, Taxes, Depreciation and Amortization	$\frac{Enterprise\ Value}{EBITDA}$
EV / Kg	Enterprise Value to kilograms	$\frac{Enterprise\ Value}{Kilogram}$

Table 29: Multiples

7.4 Comparable companies

The main idea behind multiple analysis is that when firms are comparable, we can determine the value of one company based on the value of another. We first have to identify similar companies, which in our case will be Norwegian salmon farming companies, listed at the Oslo Stock Exchange. We will the companies; Salmar, Austevoll, Grieg, Lerøy, and Norway Royal Salmon. These are companies who are in the same industry, in addition to being traded on Oslo Stock Exchange. These are well-established companies, influenced by the same macroeconomic factors as Mowi. They therefore appear as credible comparables.

7.4.1 Forward Price to Earnings

The forward price to earnings ratio uses the price per share, and the estimated earnings per share. We will use this measurement to determine the relative value of Mowi's share, compared to our chosen comparables. Because of the pandemic, which greatly affected the salmon farmers earnings, we will use an average P/E ratio from 2016 to 2020. The industry average excludes Mowi.

In the table below, we see that Mowi's P/E ratio is 3,58 higher than the industry average. Mowi is therefore traded at a higher price relative to their earnings.

Average Price/Earnings 2016-2020	
Mowi	22.6
Salmar	16.2
Austevoll	13.6
Grieg	28.26
Lerøy	15.7
NRS	17.74
Average	19.02

Table 30: Average Price Earnings (2016-2020)

Estimated Share Price		
Estimated Net Income	€	*550 478 671*
Curency converter		9.67
Adjusted to NOK		NOK 5 323 128 745
Estimated market cap		101 228 164 959
Outstanding shares		517 111 000
Share price	NOK	195.76
Closing Price 30.12.21	NOK	208.70
Difference		-6.20 %

Table 31: Estimated Share Price

Using the estimated earnings and P/E multiple, our estimated share price is 196,76 NOK. This is 6,20% lower than the actual closing price as of 30.12.21. Based on our estimate, Mowi's share therefore seemed to be overvalued.

7.4.2 Enterprise Value to EBITDA

When calculating the enterprise value, we look at the company's market capitalization, plus total debt and subtract cash and cash equivalents. By doing so, we observe the company's debt and cash levels, in addition to its stock price, and relate it to the EBITDA, which is the company's cash profitability. The ratio is therefore commonly

used by potential acquisitors. A low EV/EBITDA ratio relative to peers can indicate that a company is undervalued, and vice versa.

	Average	MOWI	SALM	LSG	AUST	GSF	NRS
Enterprise Value		109 291	45 533	35 857	22 603	13 226	8 962
EBITDA		8 000	3 585	3 748	4 361	1 135	605
EV/EBITDA	10.79	13.66	12.70	9.57	5.18	11.66	14.82

Table 32: EV/EBIDTA (NOK Millions)

	Share Price Estimated from EV/EBITDA	
	EV/EBITDA	10.79
x	EBITDA	935 929
=	EV	10 095 757
-	Net Debt	1 465 300
=	Market Value Equity	8 630 457
	Shares Outstanding	517 111
	Estimated Value per Share (EUR)	16.69
	Share Price (NOK)	166.56

Table 33: Share Price Estimated from EV/EBITDA

We see that Mowi's EV/EBITDA ratio is at 13,66, which is above the industry average at 10,79. Based on this alone, Mowi seem somewhat overvalued compared to its peers. To estimate the share price, we multiply the industry average with Mowi's EBITDA to get the enterprise value. Afterwards we subtract the company's net debts and divide this sum by the total outstanding number of shares. The calculation gives us an estimated share price at NOK 166,56.

7.4.3 Enterprise value to kilos

	Average	MOWI	SALM	LSG	AUST	GSF	NRS
Enterprise Value		109 291	45 533	35 857	22 603	13 226	8 962
Harvest Volume (kg)		435 904	161 500	182 900	125 100	86 847	30 509
EV/KG	0.22	0.25	0.28	0.20	0.18	0.15	0.29

Table 34: EV/Harvest Volume

	Share Price Estimated from EV/Harvest Volume	
	EV/EBITDA	0.22
x	Harvest Volume (kg)	465 600
=	EV (EUR in thousands)	10 307 467
-	Net Debt	1 465 300
=	Market Value Equity	8 842 167
	Outstanding Shares	517 111
	Estimated Value per Share (EUR)	17.10
	Share Price (NOK)	170.65

Table 35: Share Price from EV/Harvest Volume

One of the most common valuation methods in the salmon farming industry is the enterprise value to kilogram metric. Kilograms is measured by a company's harvest volume. Since we assume that harvested volume equals to sold volume, we can say that the multiple represents how much you pay for each kilogram of production per year. A high EV/KG indicates that the company is overvalued, while a low ratio indicates that the company is undervalued.

From the first table we see that Mowi's EV/KG ratio is 0,03 above the peer average. One would therefore pay more per kilogram salmon production, than the industry average. With an industry average of 0,22, we can calculate Mowi's estimated share price. This is done by multiplying the industry average and Mowi's harvested volume, subtracting net debt, and dividing by the number of outstanding shares. This gives us an estimated share price at NOK 170,65.

7.4.4 Results from Valuation

We have now performed both an absolute valuation and a market-based valuation. Using the DCF method, we found an intrinsic value of NOK 364,27. In our market-based valuation we used three different multiples, which each gave us different share prices. As we saw in our sensitivity analysis, the DCF model relies on several sensitive assumptions which can give completely different answers. Changing our WACC by just 0,48 percentage points, increased the share price by NOK 40. Our target price is therefore highly sensitive to minor changes, which evokes a degree of uncertainty. However, using multiple valuation methods can eliminate some of this risk. By calculating a weighted average based on our different valuation methods, we can be more certain of a true value.

Valuation Method	Share Price	Weight
P/E	NOK 195.76	16.67 %
EV/EBITDA	NOK 166.56	16.67 %
EV/KG	NOK 170.65	16.67 %
Discounted Cash Flows	NOK 364.27	50 %
Target Price	NOK 270.96	

Table 36: Market Based Valuation

In the table above we have chosen different weights based on personal preferences. We believe the DCF model is a more precise measurement, and the most theoretically correct valuation model in our analysis. Based on this, the DCF method is weighted by 50 percent. Consequently, we assign the remaining methods equal weighting.
This gives us a target price of NOK 270,96.

7.5 Conclusion

As we stated in our introduction, the focus of the thesis was to valuate Mowi ASA as of 31.12.2021. Based on our financial analysis, in addition to the fundamental- and market-based valuation, we concluded with an estimated value per share of NOK 270,96. However, the market value per share as of 31.12.2021 was NOK 208,7.

Our estimated value of Mowi's share is therefore 29,83% higher than what it was traded on the market. We therefore consider the share to be underpriced, and our recommendation is to buy.

8 Critcism

This chapter is devoted to emphasizing potential weaknesses and flaws that may affect the estimate we have given on Mowi's share price. A first critique is that we over the report have used many different databases and sources. This inconsistency can, according to Jacobsen (2016) affect the reliability of our findings as various sources may provide different data.

In addition to various sources, we have to a certain extent relied on publications and data from Mowi themselves, e.g., The Salmon Industry Handbook and Mowi's quarterly and annual statements. As these present the company's view upon itself, some of the data used in this research may be positively exaggerated. We also have mainly used data that are from 2020 or older, as data from 2021 was not available at the time which our research question was set, nor at the time of writing. Information in these later reports may include information which do not reflect our findings.

Furthermore, although market risk premium is widely recognized as one of the most important variables in financial theory, academics and professionals have yet to find a mutual consensus as to how it shall be calculated. The market risk premium is the excess return an investor will expect by investing in the equity markets instead of government bonds (Brealey et. al., 2019). There is a variety of different methods to calculate it, including surveys, regression, dividend discount model, and historical means. Each model comes with its own pros and cons, e.g., Goyal & Welch (2006) points out that both regression- and long-term-averages-models provided poor results, and that these models had failed to estimate both in- and out- of sample. In this paper we have relied on a survey conducted by PwC. Although a survey may reflect the general view of the risk level, it is also heavily affected to noise. Greenwood & Shleifer (2014) found that respondents expectations for the future positively correlated with the current pricing of the stock market. Hence, surveys can be said to be procyclical, meaning that in bear markets, investors tend to believe that the downtimes will continue, and vice-versa (Siegel, 2017).

Moreover, for calculation of Mowi's Beta we have used the OSEBX as benchmark. It should be mentioned that Oslo Børs is dominated by oil and energy stocks, and that choosing another index for calculating Beta would have given other results.

In the sensitivity analysis we also found that the final result is very sensitive to some of the input variables, and many of the input variables which was used are based on assumptions, which may not reflect the whole reality. E.g., most of the cost variables are based on revenues, which in return are calculated from a Fish Pool estimation of the future salmon price. The salmon price is quite volatile; hence it is not easy to predict.

There are also some weaknesses and uncertainties associated with the calculation of the terminal value. Gordon's formula assumes a constant growth in cash flows, which rarely will be the case. Developments in cashflows may fluctuate due to new investments, special situations such as corona and political decisions where the salmon industry is particularly vulnerable. Fluctuations may result in both capital loss- and gains as well as operational changes in the company. On the other hand, such cases will be impossible to predict, where predicting cash flows for each year ahead will be based on far more assumptions. Thus, the solution became a conservative growth rate with the average GDP over the past decade.

Another factor that increases the sensitivity of the terminal value is required return. This is also based on assumptions, where the relationship between the growth rate and the required rate of return will be defining for the terminal value. If the required rate of return would have been lower than the growth rate, the terminal value would have been negative. When the required rate of return, which is already based on a number of assumptions, is placed together with the growth rate, which is also based on assumptions, the effect of the assumptions is amplified, and the estimate becomes more uncertain.

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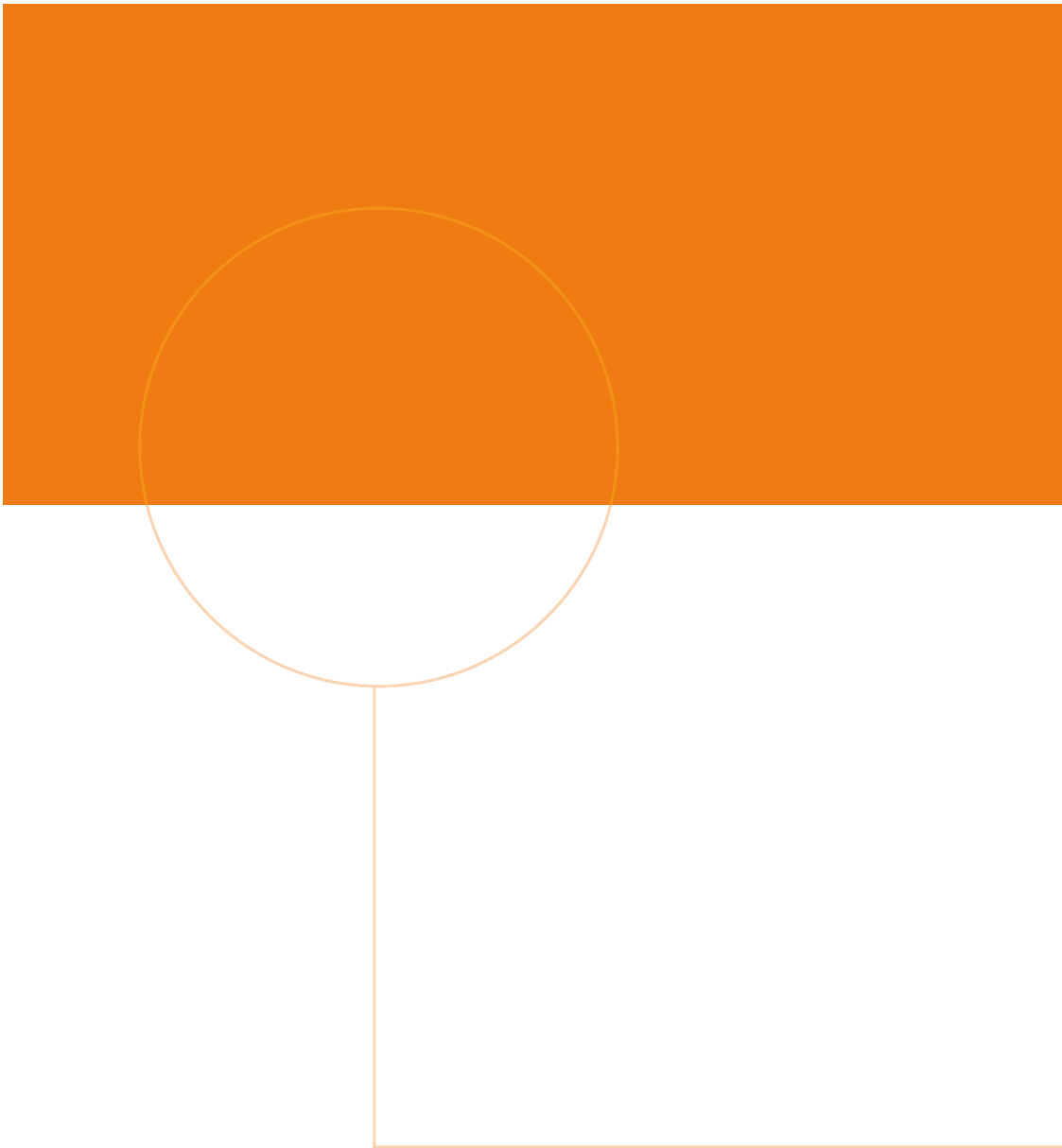

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