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Time to Transfer the Profits to Salmon Else?

An emperical analysis of the stock market's reaction to the announced resource rent tax on Norwegian aquaculture

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The purpose of this thesis has been to improve the knowledge about the announced resource rent tax on Norwegian aquaculture and how this affects the companies. As this topic has been heavily debated during the process it has been truly rewarding working with the thesis. We hope this thesis inspires further research on the topic.

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Abstract

On the 28th of September 2022, the Norwegian Government announced a proposal for resource rent taxation on the Norwegian fish farming industry. This thesis examines the Norwegian stock market's reactions to the proposal to raise awareness of its financial implications. These implications are answered using the event study methodology described by MacKinlay (1997). The sample consists of five salmon farming companies listed on the Oslo Stock Exchange, where all the companies are directly impacted by the implementation of resource rent tax.

The primary objective is to identify if the resource rent tax announcement leads to a cumulative abnormal return significantly different from zero on the event day and in our main event window [-5, 5]. In addition, the thesis will investigate if there are signs of information leakage prior to the announcement and examine if there are any post-event price drifts. We will also attempt to determine how operational and financial flexibility affect the stock market's response.

The analysis finds a cumulative abnormal return of -27.60% on the event day. The steep cliff shows that the market instantly changes the fish farming companies' valuation following receiving the information about the resource rent tax. In the main event window [-5, 5], we find a cumulative abnormal return of -44.03%. This cumulative abnormal return is distributed between the pre-event and post-event window. In the pre-event window [-5, -1], we find a cumulative abnormal return of -8.47%. Our findings could indicate information leakage prior to the event, but that would only be speculation. However, in the post-event window [1, 5], we find a cumulative abnormal return of -7.96%, and we notice a price drift after the 28th of September 2022. All cumulative abnormal returns mentioned above are calculated using the market model and are significantly different from zero on all conventional levels.

To measure operational flexibility, we have used harvested volume in Norway as a ratio of the total harvested volume. We identified a trend towards a higher concentration of harvested volume in Norway, resulting in a lower cumulative abnormal return. Further, to measure financial flexibility, we use a net debt to assets ratio. Also, here, we identified a trend towards a higher net debt to assets ratio resulting in a lower cumulative abnormal return. However, the results should be interpreted with caution due to the small sample size in our research.

Keywords – Resource rent tax, salmon farming, event study, Oslo Stock Exchange

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1. Introduction

On the 28th of September 2022, the Norwegian Government announced a 40% resource rent tax on Norwegian salmon farming, which comes into force from the 1st of January 2023. In addition to the corporate tax of 22%, the fish farming companies will now be subject to a 62% marginal tax rate on earnings from farming activities (Regjeringen.no, 2022). According to Greaker and Lindholt (2021), high returns in a sector based on the extraction of a natural resource can be referred to as resource rents. The Norwegian Government argues that the salmon farmers have been fortunate for several generations to utilise these resources to make supernormal profits for their company (NOU 2019:18, 2019).

Today, the fish farming industry represents one of Norway's largest industries and one of the most prominent contributors to export. In 2021, Norway exported farmed salmon for NOK 81.4 billion (Seafood, 2022). According to data provided by Kontali Analyse, 91 companies held a license for salmon farming in Norway as of the 31st of December 2021 (Kontali Analyse, 2022). From those 91 companies, we identified total assets of NOK 269,545 million as of the 31st of December 2021. A total of 85 companies are privately held, while the rest are registered on either the Oslo Stock Exchange or Euronext Growth Oslo.

Following the announcement of the resource rent tax on salmon farming, the topic has been heavily debated and is a daily subject in the news. According to The Norwegian Seafood Federation, NOK 35 billion in investments have been put on hold directly due to the resource rent tax (Haram Ø. A., 2022). In addition, several salmon farming companies have sent out layoff notices to a total of 1,384 employees as a direct consequence of the resource rent tax (Haram Ø. A., 2022). There are also heralded substantial ripple effects. Hence, given the industry's size, the proposed resource rent tax has a significant economic impact. Due to the large economic impact of the industry, the research provided in this thesis is an essential contribution to highlighting the impact of the recently announced resource rent tax. The aspiration behind this thesis is that it can contribute to further research on the topic.

The purpose of this thesis is to investigate how the announcement of the resource rent tax on salmon farming affected Norwegian salmon farming companies. As this event happened recently, the thesis will focus on investors' response to the listed companies by using event study methodology. This motivates the following research question of the thesis:

"How does the stock market react to the announcement of a resource rent taxation proposal on salmon farming in Norway?"

To answer this research question, we will apply the event study methodology by MacKinlay (1997). In our event study, we have included five salmon farming companies listed on the Oslo Stock Exchange. The included companies represent a substantial part of the industry and inherent 53.46% of total assets and 52.91% of harvested volume in Norway. The results from the event study will be interpreted according to valuation theory. According to Damodaran (2006), the value of an asset is a function of the expected cash flows on that asset and assets with high and predictable cash flows should have higher values than assets with low and volatile cash flows.

We have determined two key variables for stock performance following the announced resource rent tax. Consequently, we will research how operational and financial flexibility affect cumulative abnormal returns. According to Tang & Tico (1999), when a firm has operations in several different geographic locations, the multinational corporation can use this to its advantage and respond profitably to country-specific shocks and instabilities by shifting factors of production across national borders. In addition, financial flexibility represents the ability of a firm to access and restructure its financing at a low cost (Gamba & Triantis, 2008). Hence, financially flexible companies are more likely to avoid financial distress when facing negative shocks.

Our thesis is structured as follows: Section 2 presents a review of relevant literature and previous empirical findings. Section 3 provides an overview of the Norwegian fish farming industry. In section 4, we present the event study methodology. In section 5, we discuss how we created our data sample. Section 6 provides the results from our analysis based on our research question. In section 7, we discuss the limitations of this analysis. Lastly, section 8 provides our conclusion and suggestions for future research.

2. Literature review

2.1 Valuation

Valuation is an essential and central part of what we do in finance. The true value of an asset is called the intrinsic value and is based on underlying fundamentals for a single company and does not take other companies into account. Aswath Damodaran (2006) states that understanding what determines the value of a firm and how to estimate that value seems to be a prerequisite for making sensible decisions.

Finding the intrinsic value of an asset can be problematic since investors need to have perfect information about the company to make a proper valuation assessment. According to Damodaran (2006), the best valuation target we can make is the one that comes closest to an asset's intrinsic value. Numerous techniques have been developed to value a company, and new methods are constantly approaching. Unfortunately, no valuation method is perfect for finding the correct intrinsic value. Therefore, it can be beneficial to use multiple valuation approaches to assess which technique best fits the specific company.

Analysts use a broad spectrum of models, while there, in general terms, are four approaches to valuation (Damodaran, 2006). The first, discounted cash flow valuation method, relates the value of an asset to the present value of expected future cashflows generated on that asset. This valuation method will be examined further in this subsection. The three other approaches are liquidation and accounting valuation, relative valuation, and contingent claim valuation.

2.1.1 Discounted Cash Flow Valuation

Based on our research and review of existing literature, the discounted cash flow approach is the most frequently used valuation method. The essence of discounted cash flow valuation is that the value of an asset is a function of the expected cash flows on that asset (Damodaran, 2006). Hence, assets with high and predictable cash flows should have higher values than assets with low and volatile cash flows. The discounted cash flow approach delivers different variants. However, we will narrow our focus to the highly recognized discounted cash flow (DCF) model.

2.1.2 The DCF Model

The DCF model values the company by discounting the free cash flow to the firm at the weighted average cost of capital (WACC). In this model, the cash flows discounted back are the cash flows available to the firm as if the firm had no debt and no benefits from interest expenses. The source of this firm valuation method lies in one of corporate finance's most cited papers by Miller and Modigliani (1958). The theories presented are still highly relevant in today's corporate finance courses. Miller and Modigliani presented the value of a firm as the present value of its after-tax operating cash flows:

$$Value\ of\ firm = \sum_{t=1}^{t=\infty} \frac{E(X_t - I_t)}{(1 + Cost\ of\ Capital)^t}$$

X_t are the after-tax operating earnings and I_t the investment made back into the firm's asset in year t. This traditional paper focuses on capital structure and argues that the cost of capital would remain unchanged as the debt ratio changed in a world with no taxes, default risk and agency issues. There are different methods to interpret the after-tax operating earnings. The most common in today's corporate finance theory is the free cash flow to the firm (FCFF). When using the FCFF to value a firm, a general and more modern approach is to calculate the value of a firm through the formula:

$$Value\ of\ Firm = \sum_{t=1}^{t=\infty} \frac{FCFF_t}{(1 + WACC)^t}$$

FCFF can be calculated by the following formula:

$$FCFF = NOPAT + Depreciation - CAPEX - \Delta NWC$$

NOPAT is defined as net operating profit after tax. To calculate NOPAT:

$$NOPAT = EBIT \times (1 - T)$$

From the formula above, one can see that an increase or decrease in the effective tax rate directly impacts the cash flows used to value the firm and will decrease or increase the firm valuation, respectively. This firm valuation model values the whole firm rather than solely equity. One must subtract the market value of outstanding debt to find the equity value.

2.2 Operational Flexibility

When a firm has operations in several different geographic locations, the multinational corporation can use this to its advantage and respond profitably to country-specific shocks and instabilities by shifting factors of production across national borders (Tang & Tikoo, 1999). Firms that possess this ability will gain a significant advantage over their competitors during shocks or crises. This capability, called operational flexibility, has been studied extensively by scholars in different fields, such as economics, finance, management, and manufacturing. According to Kogut (1983, 1985a, 1985b, 1989), who has led the conceptual discussion of operational flexibility, a multinational firm has flexible options that enable it to exploit profit opportunities generated by varying country environments.

Even though several influential theoretical works have been done studying the value of operational flexibility, only one empirical study has addressed the topic. Allen and Pantzalis (1996) find operational flexibility to be positively associated with their excess market value measure, suggesting that operational flexibility enhances the market value of a firm. Unfortunately, their studies cannot be generalized since they do not control for firm size. Firm size is positively associated with excess market value and can attribute the positive effect of firm size to operational flexibility leading to incorrect inference (Tang & Tikoo, 1999).

Tang and Tikoo (1999) use a different approach to study the value of operational flexibility for firms. They examine the coefficient that relates stock returns to changes in earnings for firms with different operational flexibility levels. The earnings response coefficient (ERC) represents the stock price response to the changes in earnings reported by a firm (Beaver, 1968; Collins & Kothari, 1989). Operational flexibility positively affects ERC in at least two ways. Firstly, operational flexibility allows firms to accomplish higher earnings growth. Secondly, operational flexibility reduces uncertainty around future earnings that arises from economic exposure.

Although operational flexibility has several advantages, it comes with a cost. According to Roth (1992) and Roth, Schweiger and Morrison (1991), a multinational network of subsidiaries is complex and challenging to manage and entails significant agency and transaction costs. The agency costs originate from mismanagement and monitoring of subsidiaries. The transaction costs are from managing internal transactions among executives between subsidiaries and external transactions due to Government agencies, suppliers, and customers (Hitt, Hoskisson, & Kim, 1997). These costs result in higher uncertainty of future earnings and reduce a company's growth potential. Therefore, a firm will only benefit from having an international network if the positive value of operational flexibility is higher than the negative value of agency and transaction costs.

2.3 Financial Flexibility

Over the last few years, many businesses have been compelled to change their operations to remain resilient and viable in an unpredictable marketplace. Therefore, it has become more critical for firms to constantly evaluate their level of financial flexibility. Recent surveys of American and European CFOs suggest that the most crucial driver of firms' capital structure decisions is the desire to attain and preserve financial flexibility (Gamba & Triantis, 2008). According to Gamba and Triantis (2008), financial flexibility represents the ability of a firm to access and restructure its financing at a low cost. This statement suggests that financially flexible firms are more likely to avoid financial distress when facing negative shocks. Being financially flexible is also an advantage for a firm when profitable opportunities arise to fund the investment. Gamba and Triantis (2008) state that while a firm's financial flexibility depends on external financing costs that may reflect firm characteristics such as size, it is also a result of strategic decisions made by the firm related to capital structure, liquidity and investment. Further, DeAngelo and DeAngelo (2009) state that financial flexibility is the critical missing link for an empirically viable theory, but that pecking order fails to deliver that theory because its numerous restrictive assumptions narrow its focus sufficiently to preclude a meaningful analysis of the impact of financial flexibility on corporate financial policies.

In addition, according to Denis and McKeon (2012), firms that intentionally increase leverage through substantial debt issuances do so primarily as a response to operating needs rather than a desire to make a large equity payout. They find that following debt reduction is neither immediate nor the result of proactive attempts to rebalance the firm's capital structure toward a long-run target. Instead, the development of the firm's leverage ratio depends mainly on whether or not the firm delivers a financial surplus (Denis & McKeon, 2012). Their findings generally concur with the capital structure theory that financial flexibility is essential in capital structure choices.

2.4 Resource Rent Taxation Theory

This subsection will examine and summarize the literature on resource rent, emphasizing empirical work. Even though fish farming has developed to be an essential industry globally, issues relating to resource rent have yet to receive much attention from economists. Therefore, most research presented below originates from relatable resource industries, particularly the traditional fisheries and hydropower industry.

David Ricardo was one of the most influential classical economists. Ricardo (1817) uses a picture of unpopulated land to illustrate the term "rent", which could be understood as resource rent. The first to enter this land has full access to settle where they find the most fertile soil. At first, this soil does not contain any unique value since there are still many great places to settle. Afterwards, when many have settled and there is not much fertile soil left, a big difference in income occurs between the first mover and the late movers. This is a location-bound factor occurring because of the difference in soil quality. As a result, the soil is considered a fixed factor that yields a resource rent. Importantly, it is not the areas used in production that yield resource rent. Instead, it is the difference in quality between the areas, the fixed- factor, in this case, the soil, which creates resource rent. According to Ricardo (1817) and Vennemo and Bjerkmann (2018), in a free market, the last establishment, the marginal establishment, will not hold an area that yields resource rent.

According to Greaker and Lindholt (2021), resource rent is the additional income from utilizing a natural resource beyond the income one would generally get by investing in real capital and human capital in other industries. In their paper from 2021, they use the National Accounts and the definitions of the System of Environmental-Economic Accounting to calculate the resource rents in Norwegian aquaculture in the period 1984-2020 (Greaker & Lindholt, 2021). They argue that if they know the remuneration of all input factors such as capital, labour, and technology, except the remuneration of the aquaculture services, the resource rent will appear as the difference between the value of output and the remuneration of all other input factors. Their study found that there has been significant resource rent in Norwegian aquaculture since 2000, and it has risen rapidly since 2012.

In addition, Nielsen et al. (2012) studied the estimated resource rent in traditional fisheries in Nordic countries under different management regimes. They established a three-staged bioeconomic model with data from five case studies of fisheries from Norway, Iceland, Denmark, Sweden and the Faroe Islands (Nielsen, Flaaten, & Waldo, 2012). The study concluded that, like most research on resource rent in fisheries, there is a base for resource rent with substantial potential through reducing capacity.

A relatable example of the Norwegian fish farming industry is the Norwegian hydropower industry. Amundsen and Tjøtta (1993) studied the hydro rent before and after the reorganization of the electricity sector. There are many similarities between the hydropower and fish farming industry, mainly that both depend on limited common property resources of water and unique locations. Amundsen and Tjøtta (1993) argued that the hydro rent would be easily observable with the introduction of resource rent and show that there is natural scarcity in the hydropower market, namely the production sites. This scarcity of resources makes the basis for resource rent, and the authors have estimated an annual hydro rent between eight to fifteen NOK billion, depending on assumptions (Amundsen & Tjøtta, 1993).

In conclusion, industries with a scarcity of resources which can create extraordinary returns if utilised accurately, have the potential to generate resource rent. In order to secure positive rent, the industry must be regulated correctly with strict policies. Therefore, most researchers encourage redistributing rights and licenses to operate from inefficient producers to the most efficient producers to maximise rent.

3. The Norwegian Fish Farming Industry

The Norwegian fish farming industry is characterised by concentration to a large extent. During the last decades, the industry has been subject to a period of consolidation. The most prominent companies in the Norwegian market account for a substantial part of the total harvest volume on both a Norwegian and global basis. In 2021, the top 10 companies accounted for approximately 71% of the total volume produced in Norway. While the top five accounted for approximately 56% of the Norwegian volume. Mowi Group represents, by far, the largest total production, harvesting about 20% of the Norwegian volume. Including production abroad makes Mowi the world's largest producer of salmon (Mowi Global, 2022).

3.1 Regulation of the Fish Farming Industry in Norway

To farm salmon in Norway, the company is legally required to hold a license. These licenses are limited by the Government to constrain growth and are distributed through auctions. When a company is assigned a license, it receives an extraordinary good. This advantage includes the opportunity for an exclusive operation on Norwegian property as long as one follows the terms specified by the authorities. The most important terms are keeping the farmers operating and contributing to value creation locally and nationally. In other words, there is a "social contract" between the fish farmers and the Government (Fiskedirektoratet, 2022). The number of licenses for Atlantic salmon and trout in seawater was limited to 1260 in 2021 (Kontali Analyse, 2022). In general, one license permits MAB (maximum allowable biomass) of 780 tonnes. The exception is in the counties Troms and Finnmark, where one license permits a MAB of 945 tonnes. In addition, each production site has its total MAB restrictions. Historically the allocation of licenses has happened sporadically and been based on different criteria (NOU 2019:18, 2019, p. 44). A company can hold several sites, each of which may contain multiple licenses. However, each site has a total capacity limit. This capacity limit has limited farmed salmon's production and contributed to a substantial increase in salmon prices.

3.2 Norwegian Fish Farming Companies

There are several fish farming companies listed on the Oslo Stock Exchange. As expected, there are major differences between many of these companies in terms of size, trading volumes and how they operate. In our analysis, we only include firms holding licenses for farming, and exclude companies only indirectly affected by the resource rent tax proposal. Further, we have only included stock-listed companies with a sufficient daily trading volume which sell their output primarily to the same market.

Table 3. 1: Company Overview

Company	Harvested Volume	Share %	Assets	Share %
Mowi	273 204	19.81%	62 667	23.25%
Lerøy	186 600	13.53%	34 194	12.69%
Salmar	170 500	12.36%	28 085	10.42%
Grieg	61 154	4.43%	10 714	3.97%
NRS	38 161	2.77%	8 442	3.13%
Sum	729 619	52.91%	144 102	53.46%
Total Norway	1 378 900	100%	269 545	100%

Note: Harvested Volume in Norway, as of 31st December 2021, in tonnes HOG (head on gutted). Assets, as of 31st December 2021, in NOK millions. Norway Royal Salmon (NRS).

Mowi ASA

Mowi ASA is the biggest seafood company in the world and the most prominent Atlantic salmon farmer, with harvested volumes in 2021 of 466.000 tonnes HOG (Mowi, Integrated Annual Report 2021, 2021). This massive harvest volume equals a global market share of approximately 20%. Around 59% of the supply comes from Norway, followed by 14% from both Scotland and Chile and 10% from Canada. The remaining volume originated from Iceland and the Faroes.

Lerøy Seafood Group ASA

Lerøy Seafood Group ASA is the world's fourth-largest salmon farmer and had a total harvest volume of 202,800 tonnes HOG in 2021 (Lerøy Seafood Group, 2022). Around 92% of the total harvested volume came from Norwegian operations. The Norwegian operations are divided into Lerøy Aurora AS, Lerøy Midt AS and Lerøy Sjøtroll, with 24%, 39% 38% of harvested volume, respectively. The remaining harvest comes from Scottish Sea Farms, which is a joint venture with Salmar.

Salmar ASA

Salmar ASA is the second largest stock-listed fish farming company in Norway in terms of market capitalisation. Salmar harvested a record-high volume in all regions in 2021, with a total harvested volume of 198,200 tonnes HOG (Salmar, 2022). About 86% of the total harvested volume originates from their operations in Norway. The remaining volume is divided into approximately 6% and 8% in Iceland and Scotland, respectively.

Grieg Seafood ASA

Grieg Seafood ASA is currently one of the smallest fish farming companies on the Oslo Stock Exchange. With the sale of their Shetland operations, Grieg Seafood decided to narrow the company's focus to the production countries where they see the most considerable growth potential for profitable and sustainable growth, namely Norway and Canada (Grieg Seafood, 2022). In 2021, they harvested a volume of 75,601 tonnes HOG (Grieg Seafood, 2022).

Norway Royal Salmon ASA

Norway Royal Salmon ASA (NRS) is a Norwegian fish farmer listed on the Oslo Stock Exchange. In 2021, NRS had a total harvested volume of 49,640 tonnes HOG (Norway Royal Salmon, 2022). About 77% of the total harvested volume came from Norwegian operations. On the 31st of October, Salmar and Norwegian Royal Salmon confirmed the merger of the two companies, forming a new global number-two player with leading Mid Norway operations and a powerful position in Northern Norway with substantial synergies.

3.3 Historical Development in the Norwegian Aquaculture

In the late 1960s, the two brothers, Ove and Sivert Grøntvedt, managed to put out the first salmon smelt in the sea (Misund, 2022). This event marked the start of the Norwegian fish farming industry. From this event until today, the industry has developed from a primitive experimental stage to a research-based, highly technologically refined industry. A viable farming industry with distinctively Norwegian features and excellent development potential emerged in the early 1970s. Putting rainbow trout and salmon in floating cages in the ocean gave better growth, less risk, and lower capital and operating costs than land-based facilities. Norway's long sheltered coast with suitable temperature and current conditions opened enormous possibilities for expansion. In 1973 the Norwegian Government established a new system whereby companies were required to have a license to operate or establish new facilities. The new rules for localisation and ownership structure made fish farming a district industry and the concessions a district policy tool. The license implementation had the intention to regulate the industry's growth and competition. Conversely, the licenses have limited farmed salmon production, resulting in higher salmon prices and increased market power for the big companies due to limited competition in the industry.

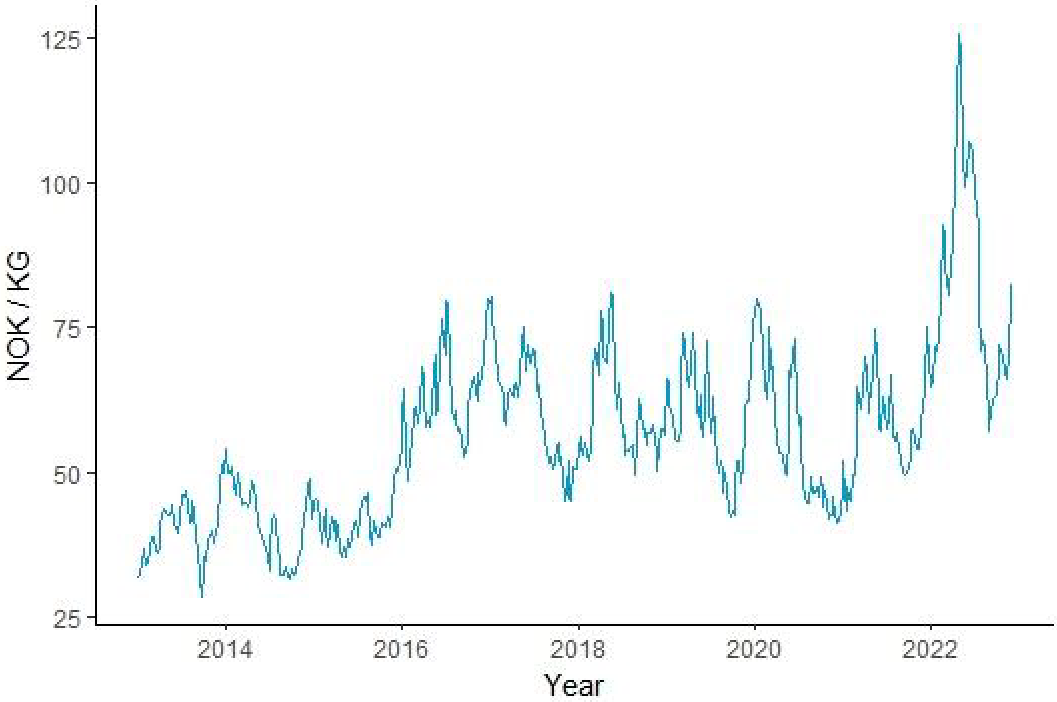
During the 1980s, the distribution of licenses prioritised the northern counties. This prioritisation resulted in increased production, and the salmon price fell by 50%, resulting in multiple bankruptcies in the industry. Between the 1970s and the start of the 1990s, the licenses were limited to only one license for each company. In addition, all sales from the salmon farming industry were organised by Fiskeoppdretternes Salgslag (FOS) (Misund, 2022). However, in 1991, FOS went bankrupt, and the possibility of owning more than one license emerged. In addition, the law from 1973 was mitigated in 1991, which relieved pressure on the fish farming companies. The majority of owners no longer needed local affiliation; thus, the industry started consolidating through mergers and acquisitions.

Norway has long traditions within fisheries, and for the first time in 1999, the fish farming industry exceeded the traditional fisheries industry on first-hand value (SSB, 2017). Through the early 2000s, the supply of salmon exceeded the demand resulting in declined salmon prices. As a result, several fish farming companies went bankrupt or were forced to restructure. Today, the fish farming industry is consolidated and relatively stabilised as it represents one of Norway's largest industries and one of our largest export industries. In 2021 Norway exported farmed salmon for NOK 81.4 billion (Seafood, 2022).

3.4 Economic Development

The fish farming industry has historically been highly volatile. Over the past 35 years, significant fluctuations have affected the industry's profitability. To meet these fluctuations, the companies and the owners need to build equity to secure financing ability and cheaper financing from the banks to secure profitability and increased robustness. The variable that best illustrates the changes in profitability is the salmon price. For example, if one looks at a graph of the salmon price per kg from 2013 to 2022, one can see great spreads.

Figure 3. 1: Weekly Nasdaq Salmon Index 3-6 kg in NOK (2013-2022)



Source: Fish Pool

Although the price has not been constant over time, more knowledge about the industry and better insight into the production process has been a driver to securing better profitability. New technology has played an essential role in the further improvement of the industry. Since the fish farming industry is capital-intensive, companies can secure higher profits using sufficient technology. To further investigate what has caused the increased profitability, we will look at how price, costs, and currency effects have affected the industry.

3.4.1 Salmon Price

The salmon industry is a cyclical industry affecting the supply, demand, and price of salmon. Over the last several years, the salmon price has increased due to an increase in demand combined with supply restrictions. The salmon price has reached its all-time high several times during 2022. Earlier, the salmon price had only reached over 80 NOK/kg a few times, but in 2022 the price has been over 120 NOK/kg. Volatile exchange rates significantly impact Norwegian fish farming companies since nearly all the supply in Norway is exported abroad.

The salmon price is cyclical, mainly due to variations in demand and growth conditions throughout the year. The harvesting of salmon is spread relatively evenly over the year, although most harvesting takes place in the last half of the year as this is the period with the best growth. After a site is harvested, the location is fallowed for between 2 and 6 months before the new generation is put to sea at the same location (Mowi, Salmon Farming Industry Handbook 2022, 2022). Due to high harvesting volumes from August to October, the salmon price tends to be low in this period. As a result of low harvesting volumes during the summer, the salmon price is commonly higher during this period. Adjusting the short-term production levels is difficult because farmed salmon's production cycle extends over several years. Therefore, the main reason for the high volatility in the salmon price is demand and harvesting volumes changing a lot according to season (Mowi, Salmon Farming Industry Handbook 2022, 2022).

3.4.2 Cost Structure

The production costs per kg salmon went significantly down from the start of the fish farming industry to the middle of the 1990s. This reduction in production costs was mainly due to innovations and technological advancements in the production process. In 2005 the production costs reached the bottom at NOK 16.50 and has thereafter had an increasing trend (NOU 2019:18, 2019). Increased feed costs and costs originating from monitoring, preventing, and treatment of the salmon lice are the most significant variables in explaining the increased production costs. Costs associated with feed constitute approximately 50% of production costs.

The most prominent cost driver for feed is the ingredients for making the feed. The essential elements are fish oil, fish meal, rapeseed oil, and soy flour, containing around 85% of the feed price (NOU 2019:18, 2019). However, there is a scarcity of the input factors making the price of the ingredients volatile. Also, most of the feed is traded internationally, and the price in NOK is sensitive to changes in the exchange rates. As a result of the depreciation of the Norwegian Krone against the American Dollar, commodity prices have increased. The production costs may vary significantly between regions. For example, the grow-out period can be different between regions. Also, the salmon lice problem varies a lot between regions making the needs for treatment under the sea phase different.

3.4.3 Currency Effects

Volatile exchange rates have a significant impact on Norwegian fish farming companies since nearly all of the supply in Norway is exported abroad. In 2021, the total harvest quantity of Atlantic Salmon in Norway amounted to 1.53 million tonnes WFE (Whole Fish Equivalent) most of which was exported abroad (Stormer, 2022). Norway, as the exporter, trades in the traded currency, while the customers have exposure to both traded and local currencies. Most of the salmon is exported to EU countries and traded in Euros. In recent years, approximately 70% of Norway's exported volumes were exported to the EU (Valumics, 2021). Consequently, the EUR/NOK exchange rate will likely be one of the primary drivers of the salmon price.

3.5 Taxation of the Norwegian Aquaculture industry

Norway has an ideal environment containing locations with perfect climatic conditions for salmon farming. The salmon farmers have been fortunate for several generations to utilise these conditions to make so-called "supernormal profits" for their company (NOU 2019:18, 2019). The salmon farmers utilise Norwegian fjords and sea areas when these areas belong to the Norwegian society. Statistics Norway reports that they have identified substantial resource rent in the fish farming industry. The resource rent has grown rapidly since 2012, and from 2016 to 2018, the rent amounted to NOK 20 billion (Regjeringen.no, 2022). In comparison, this is approximately the same level of resource rent as hydropower. The Government, therefore, finds it reasonable that society receives a share of the extraordinary return from exploiting these resources through resource rent taxation.

3.5.1 Current Taxation of the Fish Farming Industry

The fish farming industry mostly follows the same taxation regulations as other Norwegian industries. Income from aquaculture in Norway is subject to the ordinary Corporate Income

Tax of 22% (Regjeringen.no, 2021). Companies operating in the fish farming industry also pay property tax to their respective municipality. The property tax is calculated based on the value of floating aquaculture facilities in the sea. In addition, Norwegian fish farming companies are subject to an export tax (NOU 2019:18, 2019, pp. 58-59). The export tax consists of two parts: market tax and research tax. The market tax is supposed to fund the Norwegian Seafood Council, and the research tax is supposed to fund the Norwegian Seafood and Research Fund. The export tax on salmon and trout is 0.6% based on revenue generated from export. (Toll.no, 2019). In addition to corporate taxes, the owners of salmon farming companies may be subject to personal taxes such as wealth and dividend tax.

3.5.2 Proposal of Resource Rent Taxation

On the 28th of September, the Norwegian Government unveiled plans for a 40% resource tax on conventional salmon farming in Norway. In addition to the corporate tax of 22%, this would take the marginal tax rate to 62% on earnings from farming activities in Norway (Regjeringen.no, 2022). The proceeds are estimated to be between NOK 3.65 billion and NOK 3.8 billion in 2023, depending on the level of the tax-free allowance (Regjeringen.no, 2022). However, if a company has a negative calculated resource rent income, this can be carried forward with interest and deducted from positive calculated resource rent income in subsequent years.

According to SSB, resource rent is defined as: Extraordinarily high returns in a sector based on the extraction of a natural resource can be referred to as resource rents (Greaker & Lindholt, 2021). The resource rent tax is designed as a cash flow tax (Regjeringen.no, 2022). With this design, income and investments will be taxed on an ongoing basis in the year they are earned or incurred, respectively. In addition, the proposal includes two different models for salmon and trout and rainbow trout regarding income. The proposal suggests that salmon revenues should be based on a norm price to counteract tax-motivated pricing of salmon. The norm price will be set based on prices for salmon traded on Nasdaq. In the other case, with trout and rainbow trout, there are no listed commodity prices and will therefore be based on actual sale prices.

The resource rent tax covers returns from commercial licences for fish for consumption relating to the production of salmon, trout and rainbow trout, irrespective of how the licence holder is organised (Regjeringen.no, 2022). The tax will not affect production at land-based facilities or development licenses unless such a permit is converted to a standard license for fish consumption. In addition, the proposal aims to protect small companies. Therefore, it contains a tax-free allowance between 4000 and 5000 tons of biomass (Regjeringen.no, 2022). Since the proposal aims for the most prominent players, 65-70 per cent of the aquaculture industry is unaffected (Regjeringen.no, 2022).

3.5.3 Tax Consequences

The new proposal suggests using a similar tax model used for hydropower and petroleum. In this model, the ordinary corporate tax is calculated first, and then the corporate tax is deducted from the basis for the resource rent tax. Also, fixed assets acquired before the introduction of the resource rent tax should be deductible through the depreciation of remaining tax values. Importantly, no deductions will be given for the costs of fish licenses or expenses incurred in the acquisition of a license.

4. Event Study Methodology

In this section, we will present the event study methodology used to assess the abnormal returns of the Norwegian fish farming companies following the proposal of resource rent tax in the Norwegian fish farming industry. Event studies are the most frequently used analytical tool in determining abnormal or excess returns for specific events (Peterson, 1989). In our case, the event in question is the announcement of the proposal for resource rent taxation in the Norwegian fish farming industry on the 28th of September. Event studies have been used for a long time, and in 1933 James Dolley published what possibly is the first event study paper (Dolley, 1933). He wanted to examine the price effects of stock splits, studying nominal price changes at the time of the split. After this paper was published, event studies developed to be more sophisticated and gradually improved until the 1960s. In the late 1960s, the methodology of event studies that is fundamentally the same as today was introduced. The prominent studies were performed by Ray Ball and Philip Brown (1968) and Eugene Fama et al. (1969). Ball and Brown studied the information content of earnings, and Fama et al. studied the effects of stock splits after removing the effects of simultaneous dividend increases (MacKinlay, 1997).

4.1 Event Study Usage

Several modifications have been introduced in the years following these revolutionary event studies. Even though various modifications have been conducted, there is no unique methodology for event studies. The event study used in this paper has many variations. Still, the one we consider the most suitable fit is similar to the one MacKinlay (1997) employed when investigating the effect of bad, no, and good news on a company. The test is conducted by searching for abnormal stock returns and trading volume induced by the impact of a specific event around a specified time horizon, commonly known as the event window (Kritzman, 1994).

In addition, event studies rely on the assumption that markets are efficient and reflect all available information. Fama (1970) presented the Efficient Market Hypothesis (EMH). The EMH theorizes that the market is efficient and cannot be beaten by investors because it incorporates all information from the market into current share prices (Maverick, 2022). Therefore, stocks always trade at a fair value in the market, meaning that stocks are not under or overvalued because the share price contains all available information. Fama (1970) categorizes empirical tests of efficiency into "weak-form", "semi-strong-form," and "strong-form," stating that stock prices fully reflect all available information in the market. Therefore, when new information is available in the market, stock prices will adjust to the new fair value; otherwise, the price should remain unchanged. In addition, Fama (1970) assumes that all investors are fully rational. These forms offer their underlying theory of what information reflects stock price movements.

The weak form assumes that stock prices reflect all public information from the market but may not reflect new information that has yet to be made public. In addition, past information in terms of price, volume, and returns are independent of future prices, making it impossible to generate an excess return above the market over time using trend analysis.

The semi-strong form of the EMH holds the same assumptions as the weak form adding the assumption that prices adjust quickly to new available public information. Therefore, it is impossible to exploit public news to predict future price movements to gain return over the market portfolio.

The strong form states that all information is ultimately reflected in security prices, both available public information and any information not publicly known. This version of EMH claims that no information can give any investor an advantage over the market portfolio in predicting future stock prices.

By relying on EMH when performing an event study, one can observe securities before the event of interest happens and monitor how the stock price changes according to the new information. In our case, we can measure the impact the announced resource rent tax proposal has on stock prices by testing for abnormal returns and observing how the market reacts. Even though the EMH is an essential part of modern financial theory, it is somewhat controversial and heavily debated among academics and practitioners. The EMH is a central theory in finance but builds on several assumptions to hold, which in reality will not be present.

Therefore, expanding the period of interest around the announcement date is crucial to sufficiently capture market inefficiencies. According to MacKinlay (1997), the initial task of conducting an event study is to define the event of interest and identify the period over which the security prices of the firms involved in this event will be examined, namely the event window. In our case, the event of interest is the announcement of the proposal for the resource rent taxation on the 28th of September. After deciding on this event of interest, one needs to determine the length of the event window. When selecting the length of an event window, one must consider a trade-off. For example, a long event window may run the risk of capturing other confounding events, influencing the abnormalities in returns and trading volume. On the other hand, a short event window may not capture the full effect of the event of interest. According to Peterson (1989), the optimal event window should contain all information around the announcement, including the lag of speed adjustments. Therefore, we have decided to use an 11-day event window as our primary event window. With an event window that runs five days before and five days after the event, we ensure that we capture the full impact of the event but avoid capturing other disruptive events. In addition, we include multiple event windows in our analysis to fully capture the effect of the event of interest.

4.2 Calculation of the Abnormal Returns

To sufficiently give an appraisal of the event of interest impact, it requires a calculation of abnormal returns. According to MacKinlay (1997), abnormal returns are defined as "the actual ex-post return of the security over the event window minus the normal return of the firm over the event window". In order to calculate the abnormal return, we need the expected return for each company to estimate how each company's stock would perform had the event of interest not happened. For the company and event date, the abnormal return is calculated as follows:

$$AR_{it} = R_{it} - E(R_{it}|X_t) \qquad (1)$$

Where AR_{it}, R_{it} and $E(R_{it}|X_t)$ are the abnormal, actual, and normal returns, respectively, for time period t. $X_t$is the conditioning information for the normal return model (MacKinlay, 1997).

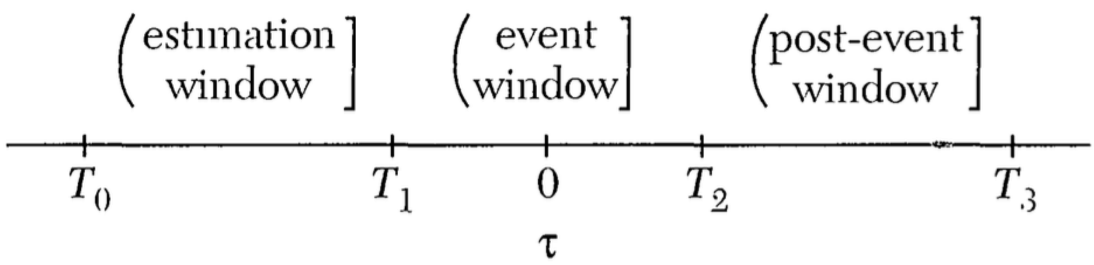
According to MacKinlay (1997), there are two standard models for modelling the normal return: the constant mean return model and the market model. We have decided to apply the market model as it represents a potential improvement over the constant mean return model. MacKinlay (1997) states that it removes the portion of the return related to variation in the market's return, and the variance of the abnormal return is reduced. This advantage can lead to an improved ability to detect event effects. The market model relates the return of any given security i to the return of the market portfolio (MacKinlay, 1997). The market model for any security i is as follows:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \qquad (2)$$

$R_{it}$and R_{mt} are returns on security i and the market portfolio for time t, respectively, and ε_{it} is the zero mean disturbance term. The parameters for the market model are α_i, β_i and $\sigma^2_{\varepsilon_t}$ (MacKinlay, 1997).

After deciding on which model to apply, the next step is to find the timeline for the event study. According to MacKinlay (1970), the timeline of an event study consists of the event date, $t = 0$, the event window with duration from $t = T_1$ to $t = T_2$, and lastly the estimation window from $t = T_0 + 1$ to $t = T_1$. The length of the estimation window and the event window is $L_1 = T_1 - T_0$ and $L_2 = T_2 - T_1$respectively. Lastly, the post-event window will be from $t = T_2 + 1$ to $t = T_3$ and have the length of $L_3 = T_3 - T_2$. Notably, the estimation and event window must not overlap because it will hurt the precision of the event study.

Figure 4. 1: Event Window Illustration



Note: Illustrates the components of the event window. $T_0 - T_1$ *represents the estimation window,* $T_1 - T_2$ *presents the event window, and* $T_2 - T_3$ *presents the post-event window. The announcement of the proposal of the resource rent tax is* t.

4.3 Estimation of the Market Model

The market model uses the general conditions of ordinary least squares (OLS) to consistently estimate the parameters in the model (MacKinlay, 1997). The market model uses the estimation window to assess how the stock prices would behave in the event window if the event of interest never emerged. The estimation for the i^{th} firm in the event time, the market model parameters for an estimation window of observations are:

$$\widehat{\beta_\iota} = \frac{\sum_{t=T_0+1}^{T_1} (R_{it}-\widehat{\mu_i})(R_{mt}-\widehat{\mu}_m)}{\sum_{t=T_0+1}^{T_1}(R_{mt}-\widehat{\mu}_m)^2} \qquad (4)$$

$$\widehat{\alpha_\iota} = \widehat{\mu_\iota} - \widehat{\beta_\iota}\widehat{\mu_m} \qquad (5)$$

$$\hat{\sigma}_{\varepsilon_i}^2 = \frac{1}{L_1-2}\sum_{t=T_0+1}^{T_1}(R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt})^2 \qquad (6)$$

Were

$$\hat{\mu}_i = \frac{1}{L_1}\sum_{t=T_0+1}^{T_1} R_{it}$$

And $$\hat{\mu}_m = \frac{1}{L_1}\sum_{t=T_0+1}^{T_1} R_{mt}$$

Where R_i and R_m is the actual return in estimation period L_1. Security i has an estimated return α_i exceeding the mean return of the market multiplied by the β of security i.

With the estimated parameters from the market model, one can now measure and analyze the abnormal return for stock i. By measuring the normal return using the market model, the sample abnormal return is:

$$AR_{it} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt} \qquad (7)$$

The abnormal return is calculated on an out-of-sample basis, representing the market model's disturbance term. According to MacKinlay (1997), the null hypothesis, conditional on the event window market returns, is that the abnormal returns will be jointly normally distributed with a zero conditional mean and conditional variance $\sigma^2(AR_{it})$ where:

$$\sigma^2(AR_{it}) = \sigma_{\varepsilon_i}^2 + \frac{1}{L_1}\left[1 + \frac{(R_{mt} - \hat{\mu}_m)^2}{\hat{\sigma}_m^2}\right] \qquad (8)$$

Equation (8) has conditional variance from two components. First, the disturbance variance from component $\sigma_{\varepsilon_i}^2$ from equation (3) and secondly, variance due to sample error in a_i and β_1 for all observations in the event window leads to serial correlation of the abnormal returns even though the true disturbances are independent through time (MacKinlay, 1997). When the timeline of the estimation window, L_1 increases, the second component of the equation goes towards zero as the sampling error of the parameters disappears. Therefore, the market model assumes that the second component is zero. Under the null hypothesis, that the event of interest has no effect on the performance of returns, the distributional properties of abnormal returns can be used to draw inference over any period in the event window. Consequently, under the null hypothesis, each observation in the event window has an abnormal return with a distribution of (MacKinlay, 1997):

$$AR_{it} \sim N\left(0, \sigma^2(AR_{it})\right) \qquad (9)$$

After establishing that the abnormal returns are normally distributed, the next step in the process is aggregating the abnormal return observations for the event of interest. According to MacKinlay (1997), the aggregation needs to be done along two dimensions: through time and across securities. The aggregated abnormal return and its variance with a large estimation window for a sample with N events is given by:

$$\overline{AR_t} = \frac{1}{N}\sum_{i=1}^{N} AR_{it} \qquad (10)$$

And

$$var(\overline{AR_t}) = \frac{1}{N^2}\sum_{i=1}^{N} \sigma_{\varepsilon_{it}}^2 \qquad (11)$$

By using the estimates from equation (10) and (11), one can analyze the abnormal returns for any given event period. This gives the opportunity to aggregate the average abnormal returns over the event window using cumulative abnormal returns. To calculate the cumulative abnormal returns for each security i for any interval in the event window:

$$\overline{CAR}(t_1, t_2) = \sum_{t=t_1}^{t_2} \overline{AR_t} \qquad (12)$$

And the variance is given by:

$$var\left(\overline{CAR}(t_1, t_2) = \sum_{t=t_1}^{t_2} \overline{AR_t}\right) \qquad (13)$$

The distribution is the same for the cumulative abnormal returns by the assumption that the event windows for the securities do not overlap, making the covariance in the CAR zero. The inference of the CAR is:

$$\overline{CAR}(t_1, t_2) \sim N\left[0,\ var\left(\overline{CAR}(t_1, t_2)\right)\right] \qquad (14)$$

Further, by applying this, one can test whether the null hypothesis holds or if the returns are significantly different from zero. By using the variance of the aggregated CAR and the aggregated CAR from equation (10) we can test the null hypothesis:

$$\theta_1 = \frac{\overline{CAR}(t_1,t_2)}{var(\overline{CAR}(t_1,t_2)^{\frac{1}{2}}} \sim N(0,1) \qquad (15)$$

5. Data

This section presents the data used in this thesis. First, section 5.1 presents the data collection and cleaning process. Further, section 5.2, presents the descriptive statistics.

5.1 Sample Selection

A list of all companies holding a license for commercial salmon farming in Norway was provided by Kontali Analyse AS. The list was as of the 31st of December 2021 and included 91 companies after identifying licences held in cooperation between companies. By only including firms holding a license for farming, we exclude companies only indirectly affected by the resource rent tax proposal. Subsequently, balance sheet data for all salmon farming companies were downloaded from Eikon. In our event study, we have only included stock-listed companies with a sufficient daily trading volume. The data set for the event study thus consists of five companies. Company-specific data for our included companies are retrieved from their respective annual report for 2021.

Daily adjusted stock prices for the companies were retrieved from Yahoo Finance on the 1st of November 2022. The adjusted closing price is adjusted for splits and dividend distributions. To ensure the quality of the downloaded data from Yahoo Finance, we have compared the data to Eikon and found them identical. The daily adjusted stock prices are retrieved for 31.01.2022 to 05.10.2022, which covers the estimation period of 160 days and our main event window [-5, 5], a total of 11 days. Although some prior studies have used monthly return data (Fama, Fisher, Jensen, & Roll, 1969) the modern standard is to use daily data. According to MacKinlay (1997), daily data increases precision compared to monthly data. However, some researchers criticize using daily returns due to a possible bias in daily betas because of nonsynchronous trading (Morse, 1984). On the other hand, Brown and Warner found that daily data generally do not hurt the specification of event studies (Brown & Warner, 1985).

In applying the market model, the chosen index is the OBX Index. The OBX index is a total return index and consists of the 25 most traded securities on the Oslo Stock Exchange (Euronext Indices, 2022). The index data was retrieved from Eikon.

One can use both simple and logarithmic returns when calculating stock and market returns. According to Strong (1992), logarithmic returns are analytically more tractable to form returns over longer intervals. Consequently, we have used logarithmic returns in this event study. The following formula shows the calculation of the returns:

$$Logaritmic\ Return = \ln\left(\frac{Today's\ Price}{Yesterday's\ Price}\right)$$

5.2 Discriptive Statistics

This subsection describes the sample, which consists of Mowi, Lerøy Seafood Group, Salmar, Grieg Seafood, and Norway Royal Salmon. All numbers and ratios presented in this subsection are as of 31.12.2021.

Table 5.1 presents the minimum value, maximum value, median and mean of the company-specific financial figures and ratios used in our thesis.

Table 5. 1: Descriptive Statistics, Financial Figures

	Market Cap	Net Debt/Equity	Net Debt/Assets	Net Debt/Assets
	(1)	(2)	(3)	(4)
Min	7,119.70	0.31475	0.16750	0
Max	107,921.10	0.91263	0.39705	1
Median	41,108.38	0.55986	0.27759	1
Mean	47,439.80	0.55756	0.26711	0.6
Dummy Variable: 0				2
Dummy Variable: 1				3

Note: (1) Market Cap is in NOK million. (2) Net Debt/Equity is based on the book value of equity. (4) Net Debt/Assets are a dummy variable. The dummy variable is based on the median value. 1 indicating above and 0 indicating below the median.

From the first column, the median of market capitalization is somewhat below the mean. As we know from part 3.2, Norwegian fish farming companies, some companies with a high market capitalization, increase the average. In addition, the minimum value is quite small relative to the sample. However, all companies included in the sample are considered well-established companies by Norwegian standards.

The second column shows the net debt-to-equity ratio. One can observe the median and mean difference by just a small decimal. One can also observe that both the minimum and maximum values are far from the mean at 24.28 percentage points below and 35.51 percentage points above, respectively.

The third column shows the net debt-to-assets ratio. One can see that the mean is slightly below the median while the difference is small. Also, one can observe that both the minimum and maximum values are quite far away from the mean at 9.96 percentage points below and 12.99 percentage points above, respectively.

In the fourth column, the sample data is divided into two groups based on the net debt-to-assets ratio relative to the median to investigate the impact of net debt-to-assets on the stock market reaction. The dummy variable takes the value 1 if the net debt-to-assets ratio is equal to or above 0.27759 and zero otherwise. As we see from the table, three observations are equal to or above the median, while two are below.

Table 5.2 presents the minimum value, maximum value, median and mean of the company-specific operating figures and ratios used in our thesis.

Table 5. 2: Descriptive Statistics, Operating Figures

	Licenses (1)	Harvested Volume (2)	Harvested Volume in Norway (3)
Min	33	49,640	0.58678
Max	241	465,600	0.92012
Median	138	198,200	0.80890
Mean	122	198,368	0.78896

Note: (2) Harvested Volume is in tonnes of head on gutted (HOG). (3) The Harvested Volume in Norway as a ratio to the Total Harvested Volume.

From the first column, one can observe that the median of licenses is 16 above the mean value of licenses. This indicates that the distribution of our sample is skewed. Hence, some companies have a smaller number of licenses, which decreases the average. We also note that the maximum value is significantly above the median. However, all companies in our sample are considered large salmon farmers and all are included in the top 10 license holders in Norway.

The second column shows the harvested volume in 2021, measured in tonnes of head on gutted (HOG). One can observe that the median value is very close to the mean value. The minimum value is about a quarter of the mean, while the maximum value is about 2.35 times above the mean value. Accordingly, the harvested volume is quite widely distributed in our sample.

The third column shows the harvested volume in Norway as a ratio to the total harvested volume. One can observe that the mean value is just below the median. Also, here we observe a significant difference in the minimum and maximum values relative to the median and mean. This difference indicates that the companies in the sample have diversified their operations to different countries, both to a small and larger degree. This ratio is used to investigate the impact of operational flexibility on the stock market reaction.

6. Analysis

This analysis aims to answer the following research question "how does the stock market react to the announcement of a resource rent taxation proposal on salmon farming in Norway". We will examine this research question by applying the event study methodology by MacKinlay (1997), described in chapter 4.

In this analysis section, we test the following null hypothesis against the alternative hypothesis:

$$H_0: The\ cumulative\ abnormal\ return = 0$$

$$H_A: The\ cumulative\ abnormal\ return\ \neq 0$$

From the regression output below, the numbers within the square brackets indicate which day, relative to the event day, has been tested. Day zero represents the event day. Negative values are days before the event day, and positive values are after the event day. Our analysis's primary day of interest is the event day at time zero because this was when the event of interest transpired. In addition, we will report on the cumulative abnormal return for the pre-event day window and the post-event day window.

Firstly, we look at the overall results of our sample. Secondly, we examine how operational flexibility affects cumulative abnormal returns. Thirdly, we examine how financial flexibility affects cumulative abnormal returns. Lastly, we run multiple regressions adding different firm characteristics variables to examine how this affects the cumulative abnormal return.

6.1 Stock Market's Reaction to the Resource Rent Tax

Table 6.1 shows the cumulative abnormal return for the event day and our three chosen event windows. In addition, we have added the pre-event and post-event windows. The normal performance for a given stock is estimated using the market model described in section 4 about event study methodology.

Table 6. 1: CAR Estimated with the Market Model

Event Window	CAR
[0]	-0.2760***
	(-7.39)
[-1, 1]	-0.3468***
	(-4.49)
[-2, 2]	-0.3561***
	(-4.67)
[-5, 5]	-0.4403***
	(-5.34)
Pre-Event	
[-5, -1]	-0.0847***
	(-5.45)
Post-Event	
[1, 5]	-0.0797***
	(-4.69)
Observations	5

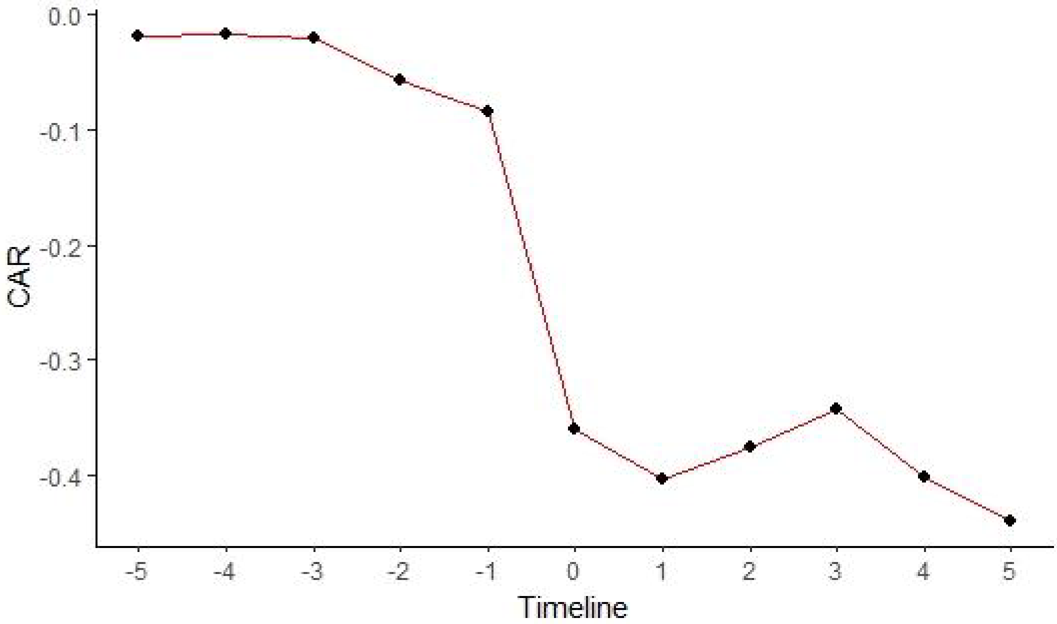
*Note: T-statistics in parentheses. * p <0.10, ** p <0.05, *** p <0.01.*

Table 6.1 shows that the cumulative abnormal return is significantly different from zero at the 1% level for the event day and our three different event windows. The average abnormal return on the stock price within our sample due to the announcement of the resource rent taxation proposal was -27.60% on the event day. This indicates that the market instantaneously reacts to the news about increased taxation. Hence, the investors instantly react by estimating how the increased taxation will affect future cash flows. Consequently, the valuation of the companies changes when the investors receive new information about the future.

Further, we see from table 6.1 that the longer we expand the event window from [-1, 1], [-2, 2], and to [-5, 5], the cumulative abnormal return decreases to -34.68%, -35.61%, and -44.03%, and are significantly different from zero on all conventional levels. Hence, we see that the most extreme window is the longest. We have also included a pre-event and post-event window in this subsection. The cumulative abnormal returns for the pre-event and post-event windows are significantly different from zero at the 1% level. The cumulative abnormal return was -8.48% and -7.97% in the pre-event and post-event window, respectively. This indicates that there could be information leakage before the event and possible insider trading. There could be rumours that this would be announced in the national budget, making some investors eager to stay ahead of the news. Obviously, this would only be speculation, and we cannot say anything about this with certainty. In the post-event window one can observe that the cumulative abnormal return drifting downwards. However, the post-event window indicates that the investors value the salmon farming companies lower as they get more time to process the information of the resource rent tax proposal.

The cumulative abnormal return can be plotted in a graph to better illustrate how it develops over the main event window. Figure 6.1 shows the cumulative abnormal return for the market model. Ultimately, the figure illustrates how the stocks in our sample perform before, at and after the event date.

Figure 6. 1: Cumulative Abnormal Return



Note: The x-axis is the number of days relative to the event day. The y-axis illustrates the Cumulative Abnormal Return.

Figure 6.1 shows that the cumulative abnormal return decreases materially on the event day. This decrease indicates that investors apply new information in their valuation of the salmon farming companies after the news about the implementation of resource rent taxation is made public. Prior to the event date, we see that the decline intensifies towards the event day. Our pre-event window illustrates the decline in table 6.1. On the other hand, in our post-event window from table 6.1, the cumulative abnormal returns continue downward the day following the announcement before the stock prices start to rise until three days after the event. However, the cumulative abnormal return reaches its lowest point at the end of our timeline. Hence, we see that the stock prices fluctuate during the post-event window and drifts downwards. This drift indicates that the investors need time to process the new information, which supports our findings in table 6.1.

Explanation of the Stock Market's Reaction

A possible explanation for the observed results in figure 6.1 is that the announcement of the proposed resource rent tax represents fundamental changes to the overall value of the companies within our sample. It is fair to assume that this new taxation will decrease the cash flow available from farming activities in Norway, which is the most significant contributor to cash flows for the included companies. Hence, an announcement of resource rent tax would decrease the company's net income. As explained in subsection 2.1 about valuation, this will directly affect the FCFF used in the DCF model and decrease the company's valuation. Further, if we assume that companies do not change their capital structure, for example, raise more equity to finance contractual obligations, this net income reduction will reduce the company's return on equity. This would further increase the discounting rate used to value the company. We also assume that the investors will increase the discounting rate due to insecurities about how this resource rent tax will affect the companies in the long-term.

Investors are aware of all these effects of the resource rent tax. They will immediately incorporate the new information following this announcement as a real decrease in the company's value. This decrease entails that, at the time of the event, the investors would immediately value the company at a lower price. Therefore, a steep decrease in the stock price is expected, given that the market is at least efficient in the semi-strong form.

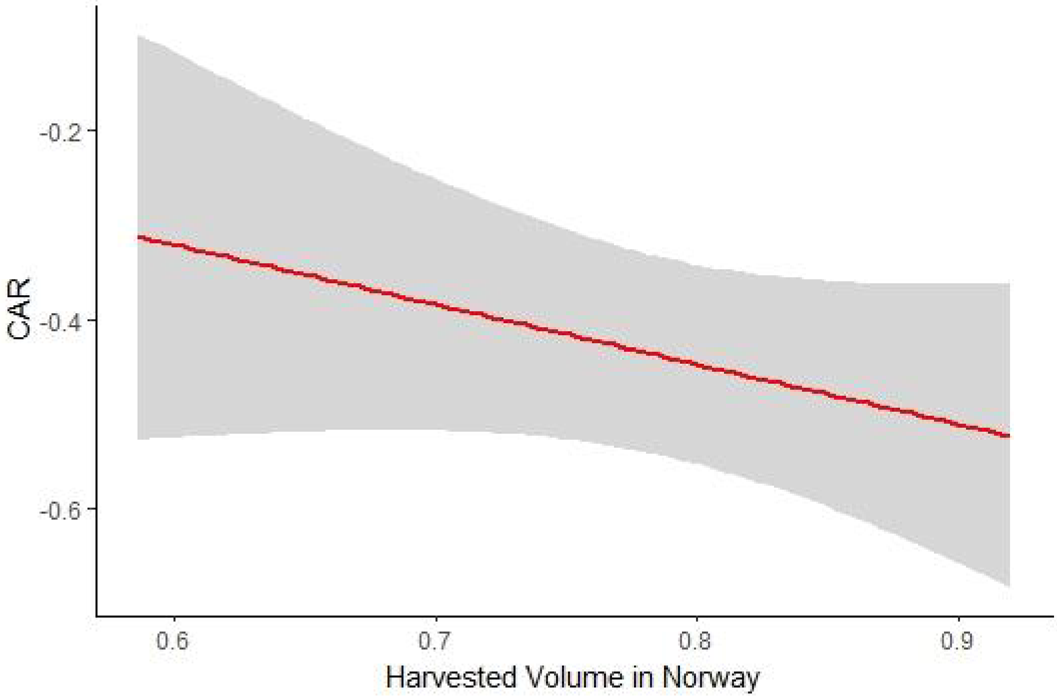
6.2 Key Variables Determining Stock Performance

In this subsection, we will present our analysis of to what degree key variables have been affecting stock performance. Following the announcement of the proposed resource tax for salmon farming, we have determined two key variables for long-term stock performance and analysed how those have affected the short-term performance in our event window. We identified operational and financial flexibility as our two key variables. First, we start by presenting the results of operational flexibility. Second, we deliver the results of financial flexibility. Lastly, we run multiple regressions using cumulative abnormal return as the dependent variable and applying different independent variables.

6.2.1 Operational Flexibility

Following the announcement of the proposed resource tax for salmon farming companies, it would be fair to assume that companies with better operational flexibility should perform better in the short and long term. As a result, lower exposure to farming in Norway and having other cash-generating assets would be preferable. To measure a company's operational flexibility, we applied harvested volume in Norway as a ratio to the total harvest volume during 2021. Due to the small sample size, we have visualised the results to get the most reliable analysis in figure 6.2. As we have implemented the regression line in our plot as a linear model, we would be able to detect trends within our sample. In figure 6.2, we have plotted the dependent variable, cumulative abnormal return, against the independent variable harvested volume in Norway. We also included the standard error given by the shadow in figure 6.2.

Figure 6. 2: CAR Plotted Against Harvested Volume in Norway



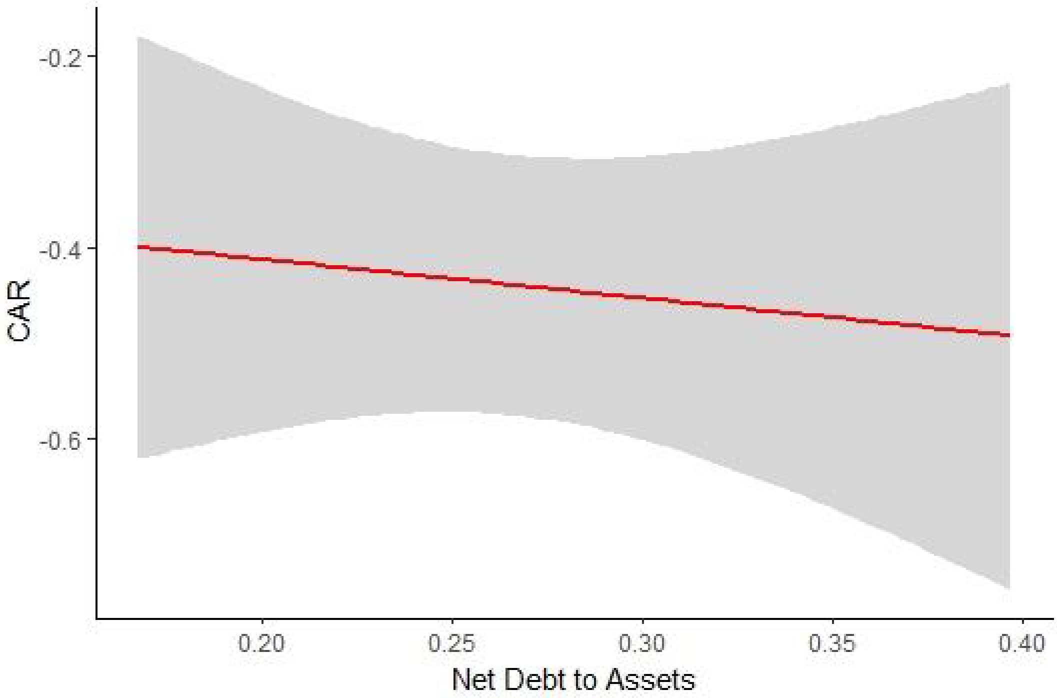
Note: The X-axis is the Harvested Volume in Norway relative to the Total Harvested Volume (2021). The Y-axis illustrates the Cumulative Abnormal Return over the [-5, 5] event window. The regression line is given by a linear model. The grey area indicates standard errors on a 95% confidence interval.

Figure 6.2 shows that the regression line decreases towards a higher concentration of harvested volume in Norway. This decrease is an expected outcome as the companies with a higher concentration of harvested volume in Norway will be subject to taxation on a more significant part of their net income. On the other side, it is expected that the companies with a lower harvested volume in Norway have differentiated their basis for net income through farming in other countries unaffected by the resource tax or having other cash-generating assets. However, we also see a material standard error in our figure. This originates from the small sample size. We see a clear trend towards lower operational flexibility resulting in lower cumulative abnormal returns. In addition, this is measured on a short-term basis in our event window of [-5, 5], and we expect the outcome to be more measurable on a long-term basis due to the changes in preferred operating flexibility.

6.2.2 Financial Flexibility

Another fair assumption after the announcement of the resource rent tax proposal is that companies with better financial flexibility should perform better in both the short and the long term. A strong balance sheet and limited capital expenditure needs are preferable. To measure financial flexibility, we have used the net debt as a ratio of assets as of the 31st of December 2021. The net debt is calculated by subtracting total cash and cash equivalents from total short-term and total long-term debt. Due to the small sample size, we have visualised the results in figure 6.3 to get the most reliable analysis. As we have implemented the regression line in our plot as a linear model, we can detect trends within our sample. In figure 6.3, we have plotted the cumulative abnormal return against the independent variable Net Debt to Assets. The figure also includes the standard error given by the shadow in figure 6.3.

Figure 6. 3: CAR Plotted Against Net Debt to Assets



Note: The X-axis is Net Debt relative to Assets (as of the 31st of December 2021). The Y-axis illustrates the Cumulative Abnormal Return over the [-5, 5] event window. The regression line is given by a linear model. The grey area indicates standard errors on a 95% confidence interval.

Figure 6.3 shows that the regression line slightly decreases towards a higher Net Debt to Assets ratio. This decrease is an expected outcome as the companies with a higher net debt ratio will have a lower cash flow available from the Norwegian farming operations to service debt following the announcement of resource rent tax. Conversely, companies with a lower net debt ratio will be at less risk of financial distress due to lower cash flows from farming operations in Norway. Further, companies with higher net debt ratios could face higher costs if refinancing is needed due to rising interest rates and higher premiums in debt capital markets. Consequently, a low net debt ratio would be preferable, and we expect this to influence cumulative abnormal return positively. Also, we note that we have a material standard error in figure 6.3, similar to figure 6.1. Again, this originates from the small sample size. However, we see a trend that cumulative abnormal returns are negatively affected by a larger net debt to assets ratio. In addition, this is measured on a short-term basis in our event window of [-5, 5], and we expect that the financial flexibility has a more significant effect on performance on a long-term basis.

6.2.3 Regression Analysis

Table 6.2 presents the regression results with cumulative abnormal return for the sample during the event window [-5, 5] as the dependent variable. We start by adding independent variables for operational flexibility and financial flexibility in separate regressions, given in regressions (1) and (2). Further, in regression (3), we include both Harvested Volume Norway and the Net Debt to Assets variable. Lastly, in regression (4), we include the Harvested Volume Norway and a dummy variable for Net Debt to Assets.

Table 6. 2: Regression for CAR, Event Window [-5, 5]

	(1)	(2)	(3)	(4)
Harvested Volume Norway	-0.6316		-0.9149**	-0.9847*
	(-1.60)		(-3.69)	(-2.82)
Net Debt to Assets (1)		-0.4069	-0.9748*	
		(-0.54)	(-2.69)	
Net Debt to Assets (2)				-0.1495
				(-1.87)
Intercept	0.0580	-0.3316	0.5418*	0.4262
	(0.19)	(-1.59)	(2.14)	(1.39)
Observations	5	5	5	5
$\mathbf{R^2}$	0.462	0.090	0.883	0.802
F	2.571	0.296	7.569	4.055

*Note: Dependent variable is CAR in the event window [-5, 5]. Harvested Volume Norway is harvested volume in Norway as a ratio to total harvested volume (2021). Net Debt to Assets (1) is the regular ratio based on net debt as a ratio of assets, as of the 31st of December 2021. Net Debt to Assets (2) is a dummy variable based on the median value. 1 indicates above the median, and 0 indicates below the median. T-statistics in parentheses. p<0.10, ** p <0.05, *** p <0.01*

In regression (1), Harvested Volume Norway is negative but not significant at any conventional level. However, the negative sign is expected and in line with the analysis in section 6.2.1. The intercept is positive and not significant.

In regression (2), Net Debt to Assets (1) is negative but not significant at any conventional level. This negative sign is also as expected and in line with earlier analysis in section 6.2.2. This intercept is negative and not significant.

In regression (3), both Harvested Volume Norway and Net Debt to Assets are negative, as we would expect from our analysis. Harvested Volume Norway is significant at a 5% level, while the Net Debt to Assets is only significant at a 10% level. The intercept is positive and significant only at the 10% level. However, the 10% significance should not be given too much credence.

In regression (4), Harvested Volume Norway is negative and only significant at the 10% level. We have also included a dummy variable Net Debt to Assets. The dummy variable is negative but not significant. The intercept is positive but not significant here either.

To summarise the regression results, we note that the independent variables Harvested Volume Norway and Net Debt to Assets, including the dummy, have a negative sign in all regressions. This outcome supports our analysis in subsections 6.2.1 and 6.2.2. On the other hand, only one coefficient is significant on a 5% level or less, namely Harvested Volume Norway in regression (3). However, we want to point out that our sample size is small and that these regression results should be interpreted cautiously.

7. Critical Assessment

7.1 Small Sample Size

A limitation of our study is the sample size. We have included only five companies in our sample. According to data provided by Kontali Analyse, 91 companies hold a license for commercial salmon farming in Norway (Kontali Analyse, 2022). The 91 companies have total assets of approximately NOK 269,545 million in their balance sheets as of the 31st of December 2021. Hence, our thesis has a significant economic impact, given the industry's size. However, we only included five companies in our sample due to data limitations. The included companies hold salmon farming licenses and are registered on the Oslo Stock Exchange. A total of 85 of the omitted companies are private companies. One is registered on Euronext Growth Oslo and has not had a sufficient trading volume during the estimation period to be included in the event study.

The included companies are all within the top ten largest companies in the form of harvested volume and assets. Hence, one would expect the companies within the sample to be more affected than the average by the proposed resource rent taxation. However, the companies in our sample collectively held a total of 611 licenses and total assets of NOK 144 102 million. This share amounts to 49.5% of the licenses and 53.5% of the total assets in the industry. Thus, the companies included in the sample represent a substantial part of the industry. By potentially increasing the sample size, the sample would be more likely to represent the population, and the probability of measuring the overall effect in the industry would increase.

7.2 Other Mechanisms Explaining Stock Performance

In this analysis, we have identified operational and financial flexibility as the primary mechanisms for stock performance following the announced resource rent tax. However, other factors could drive the results and affect firm performance. The literature suggests, among others, that it would have been beneficial to include the cost pass-through channel and the investment channel as mechanisms determining stock performance.

The cost pass-through channel asserts that when costs, including taxes, increase, firms can increase the output price. Consequently, the net effect is zero (Yang, 1997). According to the theory, one could expect Norwegian salmon farming companies to increase salmon prices to offset the cost of the resource rent tax. However, this theory can be problematic to accomplish. For example, firms do not have pricing power due to market competition (Weyl & Fabinger, 2013). Therefore, one would expect consumers to purchase salmon from farmers located in an area unaffected by the resource rent tax. In addition, consumers are price-sensitive, so firms cannot just increase the price (Lee, Mauer, & Xu, 2022). Hence, the firms in our sample will suffer from higher costs, leading to a negative valuation outcome.

The investment channel states that firms need to invest to stay competitive. For the fish farming industry, investments in developing new technologies have played an essential role in the improvement of the profitability of the industry. However, higher tax discourages investment, which may have a negative effect on firm value in the long term (Brill & Hassett, 2007; Mukherjee, Singh & Zaldokas, 2017). It is also reasonable to assume that future investments will be focused on improving the sites outside of Norway to maximise net income.

There could be other forces that may explain our results, but our data limitation does not allow us to distinguish these alternative, non-mutually exclusive channels. Therefore, we leave it to future research.

7.3 Limitations of the Event Study Methodology

The event study methodology requires the researcher to make several decisions, such as the length of the estimation window, the definition of the event window, the choice of the normal performance model, and which explanatory variables to include in the cross-sectional analysis. All these choices made by the researcher will likely affect the analysis results. Hence, it is crucial to address these potential issues when interpreting the results.

In the analysis, we estimate abnormal returns. To calculate the abnormal returns, one first has to estimate the normal performance. The normal performance calculation is based on two crucial assumptions: the dating of the estimation window and the preferred normal performance model. We have chosen the length of our estimated window based on MacKinlay's paper on event studies in economics and finance (MacKinlay, 1997). To be precise, the estimation window must observe a period without major shocks or crises. In our study, we have used the same estimation period for all companies. We have not observed any shocks, but the macroeconomic conditions have been complex, with higher inflation and rising interest rates. However, all companies have been subject to the same macroeconomic environment during the estimation window. In addition, the choice of the normal performance model could affect the calculation of normal performance. There exist different models with different strengths and weaknesses suitable to estimate normal performance. In our analysis, we have used the market model described in section 4. However, there may be more suiting models to estimate the normal performance more accurately in our sample. Finally, we would like to point out that an estimation model has limitations because it approximates reality and will not reflect reality perfectly.

Another essential part of an event study is deciding the event date and the length of the surrounding event window, both explained in section 4. According to MacKinlay (1997), in cases where the event date is difficult to identify or the market partially anticipates the event date, the event study methodology might be challenging (MacKinlay, 1997). In our case, the event date was easily detected as it was an official statement from the Government and equal for all companies in the sample. Based on our research and to our best knowledge, the announcement was a surprise and not anticipated by the market. However, there could be rumours or investors trying to be ahead of the news as the Government presented the resource tax in an announced press conference. Therefore, we have introduced event windows of various lengths in our analysis.

Nevertheless, there is no guarantee that the chosen event windows capture the full effect of the event. Our analysis is concentrated on the short-term effect as the event happened recently. Hence, it is impossible to measure the long-term effect in this thesis. However, we did not detect any confounding events in the event window. Even though event study suffers from the limitations mentioned above and has weaknesses, it is widely accepted and often applied in empirical analysis.

8. Conclusion

In this last section, we will answer our research question by providing our most important findings from the analysis. Finally, we present some recommendations for future research at the end.

8.1 Summary of the Most Important Findings

This thesis has examined the research question, "how does the stock market react to the announcement of a resource rent tax on Norwegian salmon farming". To answer our research question, we performed an event study including five salmon farming companies listed on the Oslo Stock Exchange. In addition, we exclusively included companies with farming activities in Norway. Consequently, all companies in the sample are directly affected by the implementation of resource rent taxation on salmon farming.

We applied the event study methodology and used the market model to calculate the cumulative abnormal returns over the sample size. We find a cumulative abnormal return of -27.60% on the event day, the 28th of September 2022. The result is significant on all conventional levels. The steep cliff shows that the market instantly changes the fish farming companies' valuation following receiving the news about the resource rent tax. Further, in our main event window [-5, 5], we find a cumulative abnormal return of -44.03%. In the pre-event window [-5, -1], we find a cumulative abnormal return of -8.47%. These findings could indicate that there could have been information leakage or rumours about the announcement. However, that would only be speculation. In the post-event window [1, 5], we find a cumulative abnormal return of -7.97%. Hence, we see a price drift after the event day. This drift indicates that the market needs time to process the new information and changes the valuation of salmon farming companies as they get more time to analyse the actual effects of the content in the resource rent tax. All cumulative abnormal returns found over the different event windows are significant on all conventional levels.

We determined operational and financial flexibility as key variables for stock performance following the announcement of the resource rent tax. To measure operational flexibility, we use the harvested volume in Norway as a ratio to the total harvested volume. As expected, we find a trend towards a higher concentration of harvested volume in Norway, resulting in a lower cumulative abnormal return. However, this is only significant on a 5% level when the regression includes a variable for net debt to assets. To measure financial flexibility, we use net debt to assets. As expected, we find a trend towards a higher net debt to assets ratio resulting in lower cumulative abnormal return. The result is only significant on a 10% level when the variable for harvested volume in Norway is included in the regression. However, the results should be interpreted carefully due to the small sample size.

In conclusion, the findings suggest that the Norwegian stock market seems to change the valuation of Norwegian salmon farming companies following the announcement. The cumulative abnormal return on the event day is -27.60%, which indicates a fundamental change in the valuation of the companies in the sample.

8.2 Suggestions for Future Research

A reasonable continuation of our research would be to measure the impact of the resource rent tax on a long-term basis. As the implementation of a resource rent tax on Norwegian salmon farming was announced on the 28th of September 2022, we had limited approaches to research this special event. We found the short-term stock market reaction most suitable. However, as time goes on, it could be interesting to research the long-term effects of this particular announcement.

Furthermore, there has been a lot of news and criticism following the announcement of the resource rent tax. An interesting approach could be researching how the stock market reacts to positive or negative news or writings regarding the new resource rent tax.

Moreover, another interesting approach could be to research the ripple effects of the announcement of the resource rent tax. Many stakeholders are affected by the new resource rent tax indirectly—for example, suppliers, distributors, municipalities, employees, and the local society. While writing this thesis, there has been a heated debate about such a tax's negative and positive effects.

Lastly, analysing the effect post the implementation of the resource rent tax on the 1st of January 2023 will be an essential contribution to this topic. Research on stock performance in the coming years is a natural extension of this thesis. Such research will improve the accuracy of how the stock market reacts to implementing a resource rent tax—in addition, analysing how the companies change after the 1st of January 2023 is an exciting approach. It may be interesting to see how the companies in our sample change their operational and financial flexibility and how this affects their performance in the coming years. There could be other essential mechanisms to explore as well. However, we leave it to future research.

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10. Appendix

Appendix 1

A 1 Appendix 1

The table shows the results of estimated abnormal returns over the event window [-5, 5]. We apply a traditional t-test in order to test the abnormal returns.

Table A 1.1: Results from the Statistical Market Model

Event Day	AAR	t-stat
-5	-0.0031	-0.49
-4	0.0015	0.04
-3	-0.0031	-0.08
-2	-0.0360	-0.96
-1	-0.0287	-0.77
0	-0.2760***	-7.39
1	-0.0421	-1.13
2	0.0267	0.72
3	0.0340	0.91
4	-0.0592*	-1.58
5	-0.0392	-1.05
Observations	5	

*Note:Average Abnormal Return (AAR). *p < 0.10, **p < 0.05, ***p < 0.01*

Appendix 2

A 2.1 Operational Flexibility

In this thesis, we have measured operational flexibility by the ratio of harvested volume in Norway. The ratio is calculated by this formula:

$$Harvested\ volume\ Norway\ ratio = \frac{Harvested\ Volume\ in\ Norway}{Total\ Harvested\ Volume}$$

An overview of harvested volume in Norway is shown in the table below.

Table A 2.1: Overview of Harvested Volume, Harvested Volume in Norway, and the Harvested volume in Norway Ratio.

Company	Harvested Volume	Harvested Volume in Norway	Harvested Volume in Norway Ratio
Mowi	465 600	273 204	0.5868
Lerøy	202 800	186 600	0.9201
Salmar	198 200	170 500	0.8602
Grieg	75 601	61 154	0.8089
NRS	49 640	38 161	0.7688
Observations	5		

Note: Harvested Volume and Harvested Volume in Norway are measured in tonnes head of gutted. The numbers are for 2021.

A 2.2 Financial Flexibility

In this thesis, we have measured financial flexibility by the net debt-to-assets ratio. The ratio is calculated by this formula:

$$Net\ Debt\ to\ Assets = \frac{Net\ Debt}{Assets}$$

Net debt represents the sum of total debt, redeemable preferred stock, preferred stock (non-redeemable), and minority interest, less cash, cash and cash equivalents, and short-term investments.

An overview of the net debt to assets is shown in the table below:

Table A 2.2: Overview of Net Debt, Assets, and Net Debt to Assets

Company	Net Debt	Assets	Net Debt to Assets
Mowi	17 538	62 667	0.2799
Lerøy	5 728	34 194	0.1675
Salmar	7 796	28 085	0.2776
Grieg	2 288	10 714	0.2136
NRS	3 352	8 442	0.3970
Observations	5		

Note: Net Debt and Assets are in NOK millions as of 31st December 2021.

Appendix 3

Table A 3.1: Overview of Norwegian fish farming companies with a license for salmon farming as of 31st December 2021

Company	Licenses	Assets
MOWI	241	62 667
LERØY SEAFOOD GROUP AS	149	34 194
SALMAR AS	138	28 085
CERMAQ (***)	70	15 518
GRIEG SEAFOOD AS	50	10 714
NORDLAKS HOLDING AS (*****)	46	3 660
NOVA SEA AS	41	3 816
NORWAY ROYAL SALMON	33	8 442
SALMONOR AS	27	5 143
BREMNES SEASHORE AS (*)	26	2 291
SINKABERG-HANSEN AS	24	4 468
ALSAKER AS	24	3 854
EIDSFJORD SJØFARM AS	17	2 178
MÅSØVAL	16	4 530
FIRDA MANAGEMENT (*)	13	1 201
BLOM FISKEOPPDRETT AS	12	694
BOLAKS AS	12	895
ELLINGSEN SEAFOOD	11	1 838
EIDE FJORDBRUK (*)	11	1 042
HOFSETH AQUA (*)	11	960
BJØRØYA FISKEOPPDRETT (*)	10	683
LINGALAKS AS	10	1 223
ERKO SEAFOOD	10	835
TOMBRE FISKEANLEGG AS	9	1 363
KOBBEVIK OG FURUHOLMEN OPPDRETT AS	9	618
GRATANGLAKS	8	576
OSLAND HAVBRUK (*)	8	612
LOVUNDLAKS	7	1 336
EMILSEN FISK AS	7	1 192
WILSGÅRD FISKEOPPDRETT AS	7	711
GIGANTE HAVBRUK	6	1 674
STEINVIK FISKEFARM	6	352
SALAKS	6	788
BRØDRENE KARLSEN AS	6	1 770

KRISTOFFERSEN, EGIL & SØNNER	6	1 914
FYLKESNES FISK AS	6	486
KLEIVA FISKEFARM AS	6	664
AQUA GEN AS	6	1 281
KVARØY FISKEOPPDRETT	5	1 543
AKVAFUTURE AS	5	568
LETSEA AS	5	348
KLO, GUNNAR AS / ØYFISK AS	5	569
SULEFISK	5	333
EIDESVIK LAKS AS (*)	5	446
ALLER AQUA NORWAY AS	4	1 473
ERVIKS LAKS OG ØRRET	4	381
LOFOTEN SJØPRODUKTER AS (*)	4	431
ARNØY LAKS	4	492
NORTHERN LIGHTS SALMON (*)	4	329
KNUTSHAUGFISK	4	426
ENGESUND FISKEOPPDRETT (**)	4	31 878
SKRETTING AS	4	4 842
KOBBVÅGLAKS	3	NA
EDELFARM AS	3	553
HELLESUND FISKEOPPDRETT AS	3	580
SØRROLLNESFISK	3	369
ISQUEEN AS	3	281
SVANØY HAVBRUK AS (*)	3	178
AUSTEVOLL MELAKS AS (*)	3	225
LANGØYLAKS (*)	3	224
SELØY SJØFARM (*)	3	452
LANDØY FISKEOPPDRETT AS (****)	3	146
SANDNES FISKEOPPDRETT (*)	3	217
WENBERG FISKEOPPDRETT	3	587
SELSØYVIK HAVBRUK	2	227
SJURELV FISKEOPPDRETT (****)	2	136
YTTERSTAD FISKERISELSKAP AS	2	1 367
SALMO PHARMA AS	2	87
TELAVÅG FISKEOPPDRETT	2	203
SALTEN FOU AS	2	NA
AKVAFORSK GENETICS CENTER AS / Benchmark Genetics Norway AS	2	NA
EWOS INNOVATION AS	2	349

SALTEN AQUA	2	1 044
Nordnorsk Stamfisk AS	2	218
FREMSKRIDT LAKS	2	198
NUTRIMAR AS	2	1 180
TROLAND LAKSEOPPDRETT AS (*)	2	158
NORDFJORD LAKS AS (**)	2	211
FLOKENES FISKEFARM (*)	2	165
MARØ HAVBRUK AS (*)	2	203
E. KARSTENSEN FISKEOPPDRETT AS	2	240
EUROPHARMA AS (*)	2	217
NORDFJORD FORSØKSSTASJON AS	2	NA
Arctic Seafood Group AS (***)	1	242
FISHGLOBE AS	1	NA
Delt Eierskap (KF/Fremskridt)	1	NA
LINGALAKS / VARDE FISKEOPPDRETT	1	NA
ILSVÅG HOLDING AS	1	NA
SALMOBREED SALTEN AS	1	542
PROPHYLAXIA AS (*)	1	140
ØYLAKS (OLA MISUND)	1	280
FALK OG MAGNAR VILNES ANS	1	NA

Source: Kontali Analyse AS. Note: Assets in NOK Millions. NA indicating no balance sheet data found. (*) 2020 numbers, (**) 2019 numbers, (***) 2018 numbers, (****) 2017 numbers, (*****) 2016 numbers.