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The Effects of Government Ownership on Financial Performance

A Study of the Aquaculture Industry

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Abstract

This paper empirically investigates the effects of government ownership on financial performance within the seafood industry. Looking at the period of 2005-2012 we measure financial performance using Tobin's Q and return on assets. Our dataset consists of quarterly data from eleven companies listed on the Oslo Seafood Index. Using an econometrical approach we are not able to conclude that government ownership is associated with significantly negative performance. These findings are in line with previous studies on government ownership in Norway. However, we find that government ownership has a significant positive effect on return on assets during periods when EBIT-margins are low.

Foreword

Government ownership is frequently debated in Norway. The issue is closely related to our vast natural resources, and how these should be controlled in order to benefit the society in the best way possible. The Government has until now chosen to solve this, primarily through regulation and direct ownership.

Our motivation for writing this paper is a direct consequence of the fight for control we witnessed in Cermaq over the last couple of months. The Government has defined this as a commercially motivated investment, meaning that there in reality should be no other reasons for the investment, other than the wish to maximize profit. It was therefore interesting to note that the Government played such an active part, when Cermaq was attempted acquired by Marine Harvest earlier this year. The Government was vocal about their opinion and finally The Ministry of Trade and Industry increased their ownership to almost 60 percent by purchasing shares close to the offer-price, which it previously had deemed inadequate.

We hope that this paper will be as interesting to read, as it was for us writing it. While working, issues regarding Government ownership have often made headlines. Most recently in association with the controversial Aker Wayfarer transaction between Aker Solutions and Aker ASA. It has been truly exiting to work with such a relevant topic.

We would very much like to thank our brilliant supervisor, Martin Evanger, who has given us valuable feedback throughout the whole process. He has constantly both challenged us and pointed us in the right direction.

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1. Introduction

Norway is in a different situation than other European countries with regards to the magnitude of government ownership. While the international trend is a reduction it is consistently the subject of public debate in Norway with the attitude fluctuating in line with changes in society and the political landscape (Øyum and Torvatn, 2010).

1.1 Background

Historically, the main reason for government ownership in Norway has been the limited availability of capital. Following the Second World War, an insufficient domestic capital market made the government supply the long-term capital necessary for industrial development. Investments such as *Årdal and Sunndal Verk* (1947) and *Norsk Jernverk* (1955), which in other countries would most likely be carried out by the private sector, were made by the Government.

Government ownership is often intended to safeguard social and political goals, and individual companies have become publically owned as a consequence of intertemporal and situational considerations. When the extraction of oil and gas started in the 1970's, the desire for control in relation to these natural resources was the rationale behind the public ownership in Statoil, and later Norsk Hydro. During the banking crisis in the 1990's the government's takeover of shares in several banks was necessary in order to prevent the bankruptcy of critical financial institutions (Meld. St. 13 (2010-2011)).

The different reasons for government ownership are categorized and presented in the *Government Ownership Policy (2012)*. As government ownership has become more professional, several public agencies have been privatized. Examples are the transformation of Televerket into Telenor in 1994 and the establishment of Cermaq, based on the government's grain business in 1995.

Today, public ownership is widespread and includes ownership in 10 companies listed on the Oslo Stock Exchange. As of 31st of October 2013, the ownership share on The Oslo Stock Exchange owned by the government and municipalities was 34.9 percent, equivalent to NOK 655 billion. This ownership is illustrated in Table 1.

Table 1: Government Ownership in Companies Listed on Oslo Stock Exchange

Company	Ownership
Cermaq	**59.2%**
SAS	14.3%
Aker Solutions	12.0%*
Kværner	12.0%*
DNB	34.0%
Kongsberg Gruppen	50.0%
Norsk Hydro	34.3%
Statoil	67.0%
Telenor	54.0%
Yara Holdings	36.2%

Note: Ownership by the Norwegian Government in companies listed on the Oslo Stock Exchange. *The ownership in Aker Solutions and Kværner is organized through Aker Kværner Holdings AS, where the government has an ownership share of 30.0%. Aker Kværner Holdings owns approximately 40% of Aker Solutions and Kværner, and is co-owned with Aker ASA.

1.2 Fisheries and Aquaculture

Due to its coastline, fishing has always been of great importance to Norway. After oil and gas, it is today the second largest export industry. The industry has connected Norway with foreign markets and contributed to economic development.

The industry has proven to be very adaptable, incorporating technological development and seizing opportunities related to fish farming. Since the introduction during the 1970`s, fish farming now accounts for more than half of Norwegian exports of fish. Norway is today a modern fishing and aquaculture nation, with an advanced fleet of vessels and state-of-the-art infrastructure along the coast, with fish farms, gutting and processing facilities. Norway has expert knowledge relating to the farming of North-Atlantic salmon and feed production, and is world leading in research on diseases affecting fisheries. These factors have given Norway a unique position within aquaculture internationally (Ministry of Fisheries and Coastal Affairs, 2013).

1.3 Examples of Government Ownership in Norway

Among the most relevant public ownership strategies is the well-known *Hydro model*. That implies taking on the role as a passive owner, meaning that the operations are unaffected and the government provides financial stability. This has proven to be a solution that is welcomed by the capital markets, the government is seen as a professional investor and reliable business partner. The Hydro model shows how government ownership might be conducted, if the focus is to give management a high level of strategic and operational freedom.

In other companies, ownership has been more debated. The Norwegian Government's ownership in SAS serves as an example of how public ownership may influence financial performance negatively. SAS has for several years operated with sizable deficits, and relied on the governments of the three Scandinavian countries for financial support, in order to survive. Here the public ownership may have delayed the company's willingness to tackle its financial difficulties.

Other motives for government ownership are for example determined by goals related to sector political concerns and national anchoring. The government's ownership in DNB is important in order to secure domestic funding for Norwegian companies and maintain a sustainable financial climate. This is an example of how government ownership might be justified through positive externalities and cluster effects.

1.4 Main Objective

Ownership within the aquaculture industry is differentiated, comprising of owners with different identities. The government currently owns 56.7 percent of Cermaq, which equals 7.8 percent of the entire Seafood Index (OSLSFX). In addition to direct ownership, the industry is strictly regulated, with the distribution of licenses[1] being the most important tool. This raises an interesting question: If the government through regulation can control the

[1] The government has since 1973 been distributing licenses to companies within the aquaculture industry. Through this process it controls the industry both in terms of which companies that are part of it, and in what regions fish farming is carried out.

industry and induce sustainable development, how does one justify the need for direct ownership?

Assuming efficient capital markets, the reaction will be reflected in the share price and can be quantified by comparing Tobin's Q for Cermaq to that of its competitors. With the government taking on multiple roles, we would also look into the actual impact on the company's results. We therefore study the return on assets. The reason for using these two measures will be discussed later.

We consequently raise the following research question:

Does government ownership have any significant effect on Cermaq's financial performance, measured as (i) Tobin's Q and (ii) return on assets?

1.5 Peer Group

Building a peer group consisting of comparable companies within the same industry and with the same characteristics will improve the accuracy and credibility of our results. Oslo Stock Exchange is the world's largest and most important financial market place for the seafood industry and the Oslo Seafood Index (OSLSFX) has served as a natural starting point. The Seafood Index consists as of 01.11.2013 of 14 companies: AKVA, AUSS, BAKKA, CEQ, DOM, GSF, HBC, HFISK, LSG MHG, NRS, SALM, SSC and STRANS. Most of these companies are engaged in fish farming, fish feed and processing.

Out of the 13 companies (besides Cermaq) being listed on OSLSFX, we have chosen to include 9 companies in our peer group. This selection is based on several characteristics such as type of business, size, legislation, business environment etc. We have also chosen to include Copeinca (COP), a Peruvian producer of fishmeal and fish oil also listed on OSE.

We have eliminated Hofseth Biocare (HBC) and Sølvtrans (STRANS), these companies are listed on Oslo Axess and are engaged in a type of business which is not comparable to Cermaq. This is also the case with Domstein (DOM) and AKVA Group (AKVA), which are involved in the production of raw-materials to the seafood industry and technology for fish farming, respectively. A description of each company is provided in Appendix 2.

1.6 Scope and limitations

In this paper, we will direct our attention towards government ownership. This implies that we will not discuss all aspects of other ownership identities. Discussion of other explanatory variables will mostly be linked to whether there are observable differences between government and non-government owners, and the potential impact of these differences.

There are numerous measures of financial performance, we will only focus on two of them, Tobin's Q and the return on assets. A more holistic approach would have been to analyze government ownership from a social economic point of view, but we will ignore the broader stakeholder perspective and focus solely on shareholder value. We regard this as a reasonable limitation since the effects of externalities are difficult to quantify.

Focusing on one single industry will limit the number of observations and also the external validity of our results. This will, on the other hand, allow us to get a better understanding of the impact of government ownership in this particular sector. Focusing solely on the aquaculture industry means however that we will only be able to observe one company with government ownership, and we consequently look at the companies from the very first quarter Cermaq was listed, the period from Q4 2005 until Q4 2012.

Building a peer group consisting of comparable companies within the same industry and with the same characteristics is crucial for our results and their credibility. With Oslo Stock Exchange (OSE) being the world's largest and most important financial market place for the seafood industry, it serves as a natural starting point. We have used companies on the Oslo Seafood Index (OSLSFX) as a basis, and made individual adjustments based on their fit. The result is a peer group, which we believe will serve as a good benchmark for Cermaq.

In order to study the relationship empirically we have chosen a commonly used empirical method. In our case, this is the Random Effects model, since this is the most efficient method, utilizing the highest amount of variation. We have chosen to ignore more complex econometric methods of simultaneous equations as these, due to a limited number of observations, could produce unreliable results.

1.7 Structure

In section 2 we provide a theoretical framework on corporate governance mechanisms, emphasizing the different ownership identities. We will also briefly present previous studies to give the reader a sense of where the research on government ownership currently stands. In section 3 we will present the Norwegian Government's ownership policy, and explain how this is conducted. Moving on to our analysis in section 4, where we offer a thorough description on how we came to our conclusions. Section 5 will elaborate further, and at the very end of the study we will conclude upon our findings.

2. Theoretical Framework

We will begin this chapter with an explanation of corporate governance, before we turn our attention towards agency theory. Furthermore we will present the reader with different theories and empirical studies concerning several ownership-characteristics such as identity, concentration etc. We also discuss different corporate governance mechanisms, and how these affect the performance of the firm.

2.1 Corporate Governance

We often see that owners separate themselves from their invested capital, and delegate the decision-making authority to others having the necessary skill and experience. A set of rules is determined so that management will not take advantage of the authority given them. This is referred to as *alignment of incentives* and it is common to look at a company as a set of oral and written contracts (Coase, 1937). Traditional corporate governance is a set of principles assisting investors to protect their invested capital and influence, in a context where perfect contracts do not exist.

We use the definition provided by Eckbo (2006); "a company's corporate governance system is defined as the sum of constraints that the company's internal organization, external capital markets and legal framework place on the opportunity for insiders to expropriate values from minority shareholders".

2.2 Principal-Agent Theory

Berle and Means, (1932) were among the first who addressed the problems with separating ownership and control. These ideas where further developed by Jensen and Meckling (1976) who described the agency relationship as a contract under which one person engages another person to perform some services on their behalf, which involves delegating decision-making authority. If the principal and the agent have different agendas, then the agent will not always act in the principal's best interest. Agency theory is closely linked to the concept of moral hazard, meaning that the principal knows very little about how, and with what effort the agent acts (Dembe and Boden, 2000).

The *agent* will typically be the management responsible for running the company on a daily basis. Consequently, the *principal* will be the owners, having provided the necessary capital. The principal will be concerned with maximizing return while the agent may have other goals. There are three key reasons why contracts can be problematic: (*i*) information asymmetry, (*ii*) conflicts of interest and (*iii*) risk aversion. In the case of information asymmetry, the basic problem is that the management possesses more company-specific information than the owner. A conflict of interest might be a disagreement on what the overall goal of the company is, or how this goal should be reached. Finally, management can be more concerned with delivering consistently good results and may therefore be reluctant to take on risky projects, even if it is expected to create additional value (Fama and Jensen, 1983).

The value loss resulting from separating ownership and control is referred to as agency costs. We can distinguish between monitoring costs incurred by the principal when monitoring the agent, bonding (reporting) costs incurred by the agent demonstrating that he or she is in fact acting in the principal's best interest, and residual loss which is the wealth or welfare loss incurred by the principal if the agent's decisions and activities do not coincide with the decisions or activities that maximize the principals utility. Corporate governance is a set of mechanisms aiming at reducing agency costs.

The free cash flow problem is a direct consequence of the potential conflict of interests between the management and owners. Management will want more freedom and has incentives to keep most of the capital in the company, despite lacking positive net present value (NPV) investments. A growing business offer higher status and income for the management, at the same time as expansion is both exciting and challenging. The management may however prioritize personal interests, and could be tempted to increase corporate spending, representing unnecessary and unwanted costs for the owners. Ideally this cash flow should rather have been distributed to the shareholders.

2.3 Owner Identity

Owner identity determines the preferences and goals of owners, and therefore their incentives and methods to monitor and influence. Different types of owners differ in terms of wealth, costs of capital, competence, preferences for perks and non-ownership ties (Thomsen and Pedersen, 2000). In the classification of different owners, we apply five

different labels: *individual*, *financial*, *non-financial*, *international* and *government.* This is based on the framework provided by the Central Securities Depository (Oslo VPS, 2013).

Agency theory predicts that direct ownership, in terms of performance, is better than indirect ownership, as it minimizes the distance between owner and management (Jensen and Meckling, 1976). This implies that there are differences with regards to both incentives and the ability to create value. Empirical evidence from Norway and the US support the assumption that direct ownership has a better effect on profitability than indirect ownership (Bøhren and Ødegaard, 2005). It is therefore surprising that the share of individual private owners on Oslo Stock Exchange is among the lowest in Europe, and decreasing.

2.3.1 Individual Ownership

Individual owners represent a personal claim on the firm's cash flow. In theory this direct monitoring should have a positive effect on performance as the principal has incentives to monitor the agent closely. On the other hand, a personal owner holding a relatively small stake in the company will have little influence and therefore fewer incentives to monitor.

A family owned company is a special case in the sense that families typically play the role of both owner and manager. Because families do not act through agents, the incentive alignment theory suggests a positive effect. Family loyalty can overcome problems related to incentives and improve efficiency (Thomsen and Pedersen, 2000). Personal owners and families are classified as direct owners, and therefore per definition active. The fact that this type of ownership has indeed survived in competition with other types of ownerships can be seen as evidence that this specific ownership-style may be optimal in some situations.

There is no empirical evidence suggesting that family owned companies underperform compared to similar companies with different ownership (Denis and Denis, 1994). Measured as Tobin's Q, family owned companies seem to outperform non-family owned companies, however when measured on return on assets, the majority of studies find no significant difference (Jaskiewicz and Klein, 2005).

2.3.2 Financial Ownership

Financial owners are often referred to as institutional investors, with hedge funds, private equity funds and pension funds being examples. An institutional investor is an indirect

owner acting as an agent on behalf of other investors. With indirect ownership it is the direct agent (the institution) that monitors, without interference from the direct principal (the providers of capital) (Bøhren and Ødegaard, 2001a). This will, according to the *strategic-alignment hypothesis* imply a negative effect on performance, as these institutions will monitor with lower quality because of insufficient value-maximizing incentives. On the other hand, the *efficient-monitoring hypothesis* predicts that financial institutions are more competent than other investors, and that they can monitor with higher quality at a lower cost (Pound, 1988).

Although empirical evidence is not decisive, in the US there has been proven a strong positive relationship between Tobin's Q and the amount of shares held by institutional investor, consistent with the efficient-monitoring hypothesis (McConnell and Servaes, 1990). Research following the privatization of Eastern Europe found that banks (as owners), despite potential conflicts of interests, have a positive effect on corporate governance because of their monitoring ability.

2.3.3 Non-Financial Ownership

Non-financial ownership occurs when other companies (limited companies, operational firms and non-profit organizations) have long-term equity positions in other firms. Ownership in other companies may represent strategic advantages, for example lower contracting costs in product markets. It may also provide useful information regarding investment opportunities in target firms. Non-financial ownership could be seen as a form of diversification, as a company can adjust its exposure to certain markets and risk factors by investing in other companies. On the other side, relationship-specific assets can create hold up costs between different companies. According to agency theory, the quality of the monitoring would be lower, since a non-financial owner is an institution relying on agents.

2.3.4 International Ownership

According to agency theory, international investors perform less active corporate governance since they lack specific knowledge on the particular local business environment (Bøhren and Ødegaard, 2001b). As a direct consequence, monitoring costs for foreign investors can be considerably higher than for local investors. If international owners hold shares in Norwegian listed firms, they would therefore most likely be passive owners, not contributing to corporate governance. On the positive side however, foreign owners may have a positive

influence through spillover effects. Potential spillovers are for example capital, technology, human capital and best practice from other countries (Hill, 2003). International owners have no emotional ties to the country they are investing in, as they are disconnected from local society and environment, and are consequently in a position where they can make solely value-maximizing decisions. This may represent a challenge for politicians concerned with job losses if production and/or headquarter functions are moved abroad.

When an international investor regards the investment as solely financial, this will often also relate to the fact that he or she wishes to diversify the portfolio. The fact that foreign investors have become more anonymous and are over-represented in B-shares, suggests that diversification is the primary motive. Although international investors have traditionally been the largest ownership-type, these are often invested through nominee[2] accounts, making it difficult to quantify the extent of foreign ownership. Studies from other countries indicate however a positive relationship between international owners and performance, but there are issues related to the causality of these findings. It has been indicated that it is the size and economic strength of these companies that impose a positive effect on performance, rather than the fact that the owner is foreign (Douma, George and Kabir, 2006).

2.3.5 Government Ownership

There are two key arguments for government ownership: market failure and unfair distribution. In the case of market failure, theory suggests that the government should intervene and thereby ensure an effective use of resources. But even if the market is efficient, the resulting allocation may still not be justified in political terms. The government may then take action through market regulation or direct ownership.

One of the most important arguments raised in favor of government ownership is that it gives better control with decision making, than what can be achieved through regulation. Regulation is both costly and demanding, favoring direct government ownership. In cases of natural monopolies it is challenging to develop a regulatory framework that prevents that the monopolist is left with a large surplus (Pedersen, 1995).

[2] A nominee account is a type of account in which a stockbroker holds shares belonging to clients, making buying and selling securities easier.

A major concern with public ownership is the fact that the government can mix its roles as owner, monitoring authority and regulator (Bøhren, 2005; Shirley and Walsh, 2003). This may prove problematic, as the government on one side shall determine the regulatory framework and on the other side shall run a company based on market principles. Public companies are typically inefficient, and their losses result in relatively large costs for the society (Boyko, Schleifer, and Vishny, 1996). This has naturally become the center of attention in the debate concerning government ownership. The majority of studies indicate that public companies are less efficient than corresponding private companies. An international study by Megginson, Nash and Van Randenborgh (1994) found that the efficiency of public institution was increased following privatization. Another argument, opposing government ownership, can be the lack of competition, which in itself is a disciplining mechanism.

By partly privatizing a company, it will be exposed to market forces, leading to a more market-oriented, adaptable, dynamic operation and flexible organization of the company. But the government may resemble a large corporate owner since they are both represented by agents. Agency theory suggests that misalignment of incentives will imply negative effects on performance, and both wholly owned and partly privatized companies are therefore expected to perform worse than private companies. Private companies do generally perform better than public companies, while partly privatized companies do interestingly not perform better than public companies. On the contrary, these companies often perform worse than wholly owned public companies, which may be explained by the conflict of interest between the private and public owners. A study of 25 international airline companies revealed that partly privatization has resulted in few productivity effects in the short run (Ehrlich, Gallais-Hasmonno, Liu, and Lutter, 1994).

The fact that the government through its ownership can extract benefits, can be seen as a sort of majority-minority problem. Since the government obviously often is concerned with other considerations in addition to profit maximization, the matter is especially sensitive since various interest groups may influence the politicians and gain support for their cause through lobbying. Since the motivation behind government ownership is generally not only financial, a complete analysis should therefore include a larger stakeholder perspective.

The Norwegian Government has yet to provide sufficient economic reasons for using public funds to prevent influence by foreign owners (Bøhren, 2005).

2.4 Ownership Concentration

Concentration of ownership will affect the owner's influence and the incentives to monitor. Large shareholders have increased power and can often ensure that management acts according to their interests (Schleifer and Vishny, 1986). Minority shareholders are likely to free ride, as only an owner with a sufficiently large equity stake will have economic incentives to carry monitoring costs (Schleifer and Vishny, 1996). When ownership is separated from control, and the ownership concentration is dispersed, this may have an adverse effect on firm value.

Large owners may benefit at the expense of minority shareholders in several ways, increased ownership concentration may therefore imply greater entrenchment, resulting in a lower market capitalization (Jensen and Meckling, 1976; Morck, Schleifer, and Vishny, 1988). Further on, financial performance may suffer as large owners may become risk averse and focus on low risk due to the fact that they might have invested an irrationally large amount of their wealth in a single company and lack diversification. Minority-protection is regulated through legislation and company-specific statutes.

2.5 Insider Ownership

According to agency theory one of the major problems with separating ownership and control, is the misalignment of incentives. If we observe a high degree of insider ownership, this means that the management has the same kind of exposure as the owners. In theory, increased insider ownership therefore reduces the need for outside monitoring, as the management and owners now have aligned incentives. This implies that there is a positive relationship between insider holdings and firm performance (Jensen and Meckling, 1976).

However, there is still a possibility that insider-owners have a different agenda than outside owners, and powerful insiders may expropriate wealth from outsiders. Most importantly however is perhaps the fact that a manager, which is heavily invested in his or her own company, is prone to make risk adverse investment decisions. This will impact the performance negatively. Managers may also make value-reducing decisions, if that is needed to safeguard their current position (Morck, Schleifer, and Vishny, 1988).

2.6 Other Corporate Governance Mechanisms

2.6.1 Market Competition

The market in itself provides various corporate governance mechanisms, as competition within different markets discipline management and reduce agency costs. When product, labor and takeover markets are fully competitive, a self-serving manager will find it optimal to maximize shareholder value.

A highly competitive *output market* will have positive effects on corporate governance and may reduce agency costs as the management has fewer opportunities for wasting corporate resources (Bøhren and Ødegaard, 2001b). If management does not realize the company's potential by maximizing profitability and share value, the company may lose its competitiveness (Grossman and Hart, 1988).

The *market for corporate talent* may also function as a corporate governance mechanism. The reputation of a corporate manager will likely determine whether he or she will receive attractive offers in the future (Bøhren and, 2001a). With a well-functioning labor market for qualified leaders, the current management will be incentivized to run the company in a way that benefits the shareholders.

A well-functioning *market for corporate control* will in theory serve as a governance mechanism, as managers that are not performing optimally will be replaced (Fama, 1980; Fama and Jensen, 1985; Stultz, 1988). If there is a takeover, the acquirer must have identified possible improvements, probably related to the fact that the current management was underperforming. This threat will have a disciplining effect on management, which will perform the best they can to avoid this kind of situation. Research indicates that the market for corporate control serves both shareholders and the society as a whole (Jensen, 1988).

2.6.2 Financial Policy

A company with a high debt ratio, generous dividend policy, extensive program for repurchasing of own shares or preference for raising capital through offerings, will likely display better corporate governance than companies without such policies. By financing the company with debt instead of equity, or committing to a generous dividend policy, the company will restrict the available free cash flow and thereby reduce the agency costs

related to the *free cash flow problem* (Jensen, 1986). In order to carry out new investments, the company must rely on capital markets, meaning that it will be on a shorter leash, and under constant scrutiny. According to agency theory, both debt financing and dividend payments are value-creating corporate governance mechanisms.

In the choice between dividends and debt, the latter is a firmer claim, forcing management to pay out a given amount of cash. Since the purpose is to motivate management to pay out the free cash flow, there are benefits to debt in making the company more focused on profitability (absolute payables) and reducing agency costs (Jensen, 1986). If new borrowing is solely a disciplining mechanism, money raised from the debt issue is usually paid out as extraordinary dividends.

Paying dividends reduces excess equity in the company and will have similar effects as debt on agency costs. Although it is not as firm a claim as debt, dividend is no soft claim. Lintner (1956) pointed out that dividend changes are infrequent, and that dividend payments in that sense are sticky. Companies that have communicated a certain dividend payments will have strong incentives to follow this path, since any less than promised payment will be interpreted as a negative sign by the capital markets, impacting the market capitalization of the company. Furthermore, payment of dividends can be a signal that the majority will not exploit the minority, because dividend payments benefit all shareholders. Dividend payments will not be optimal if the company is able to reinvest its retained earnings and receive a return higher than the shareholders cost of capital.

2.6.3 Legal Framework

Shareholder protection is linked to how easily the majority may exploit their position of power, and is meant to make sure that owners get back their investment through a fair share price. Sufficient protection reduces the possibility of majority owners and management exploiting the company's resources at the expense of other stakeholders.

Empirical findings support the fact that countries practicing common law have a higher degree of shareholder protection than countries practicing civil law (La Porta, Lopez-de-Silanes, Schleifer, and Vishny, 1999). The Norwegian legal tradition is based on civil law. If shareholder protection is poor, investors may protect themselves by increasing their ownership, and in that sense legal protection and high ownership concentration can be regarded as substitutes. Differences in regulation and legal framework may to some extent

explain the observable differences in ownership structure between different countries (La Porta, Lopez-de-Silanes, Schleifer, and Vishny, 2000). Control by large owners can make up for a lacking shareholder protection and undeveloped capital markets, and may consequently have positive effects.

Costs associated with control and monitoring can be related to complexity in the company structure and geographically dispersed operations (Jensen and Meckling, 1976). Control and monitoring through revision, formal control systems, budget restrictions, incentive- and reward programs, and interaction with management are necessities if the company is to be managed as efficiently as possible. Adequate control mechanisms are especially important in the process of raising capital since no rational investor will invest capital in a complex company dominated by individuals having unfounded power.

The General Meeting is the company's legislative body, deciding the framework for how the company should be operated. The voting system at these general meetings will also affect the quality of the company's corporate governance.

2.6.4 Market Efficiency

Stock prices follow a random walk, possibly with a drift, implying that price changes should be random and unpredictable and that changes, depending on the efficiency, will be caused by new and unpredictable information (Fama, 1965). Consequently, we would expect sudden changes in ownership structure to have an immediate effect on share prices. Looking at the relationship between market- and book values (Tobin's Q) one could have included a discussion regarding different degrees of market efficiency. However, as we believe that this would be outside the scope of this paper it has deliberately been left out, and we regard the market capitalization of the company as its fair value.

High quality information makes it possible for owners and stakeholders to more easily monitor and control the company's progress and performance. The different participants make the capital market an important analyst, interpreter and distributor of information, and any disappointment or sign of bad performance will be reflected in the share price. Reporting through annual and quarterly reports is the company's most important way of communicating what they have achieved over the period. However, the credibility of this information will rely on the current accounting standards and practices, making revision an

important control mechanism. Investors with a global investment strategy face increasing challenges, as capital markets are characterized by continued deregulation and integration.

2.6.5 Incentive Contracts

Incentive contracts can reduce agency costs, as it is a way of aligning the manager's monetary interests with the shareholders wish for return on their investment. We usually distinguish between compensation based on accounting measures and compensation based on share performance. The former will pay a cash-bonus, while the latter provides management with an upside potential through shares or options.

Accounting based measures are not perfectly suitable as the managements current effort will materialize in the future, and not in the previous periods results (Lambert and Larcker, 1987). Accounting-based measures may also become subject of measurement errors. Criticism of option-based compensation usually relates to the fact that management may act opportunistic on behalf of the company, as higher volatility equals a higher option value. This is referred to as *asset substitution*. Measures of share performance are sensitive to noise in demand and supply, and the correlation between effectiveness and share performance is reduced as the market capitalization of the company increases. Thus the option scheme can have a positive incentive effect, but may also have a negative effect through risk taking. Incentive based compensation is therefore counterproductive if the current management is not willing, or simply not able to add more value than it already does (Kim and Suh, 1993).

2.7 Previous Research

We have already mentioned several empirical findings, but to get a sense of where research currently stands, we present important studies related to government ownership. We will in addition, mention some empirical research on family owned firms since this will be applicable to several companies within the aquaculture industry.

2.7.1 Evidence on Government Ownership

Ødegaard (2009) investigates, in a report ordered by The Ministry of Trade and Industry, whether publically owned firms are traded with a discount on the Oslo Stock Exchange. This paper is an extensive research report, looking at the effects on both market and accounting based performance measures, over the period of 1989-2007. Ødegaard finds indications of

such a discount early on in the period, but this effect is no longer significant after 1997. However, there are still some indications that firms with government ownership have lower liquidity[3] in the period 1998-2007, since the number of free-floating shares is limited. Effects on volatility are not unambiguous. According to his findings, government ownership is associated with negative performance because of conflicting interests between the capital markets and the government, and a liquidity discount as a result of the government's large ownership share. During recent years, the government has become a more professional investor, thus the negative effects have more or less been cancelled out.

Pedersen and Thomsen (2003) conduct a comprehensive corporate governance study where they look at the impact of ownership structure and identity of the largest owner in Norway and 11 other European countries, using data from 435 of the largest firms. They find that government ownership is associated with a discount when looking at market-to-book values, and highlight the same reason as Ødegaard. The results indicate differences between countries, making it difficult to conclude. The overall findings however, is that government ownership impacts the market-to-book ratio negatively, thereby having a negative effect on performance.

A study conducted by Boardman and Vining (1989) reveals that companies with mixed ownership do not perform better, than publically or privately owned companies. These companies even show a tendency of underperforming publically- and privately owned companies, which according to this paper is a consequence of the conflict of interests.

2.7.2 Evidence from the Banking Sector

There are a limited number of studies investigating the general effects of government ownership. However, government ownership within the banking sector has been subject to several studies, and we find it useful to include some of these in order to broaden our understanding. Barth, Caprio, and Vining (2001) study ownership structure and regulation within the banking sector, in relation to financial development in more than sixty countries. They find that a large degree of government control is associated with less financial development. But, reverse causality is an issue especially related to the banking sector because intervention is common when the financial system is vulnerable, and the

[3] Measured as the bid-ask spread, a commonly used to measure of stock liquidity.

government must take over banks in order to maintain financial stability[4]. Hence, government ownership will appear to have a negative effect on performance, while the causality link actually is the other way around.

Altunbas, Evans, and Molyneux, (2001) study the German banking sector, but do not find evidence that publicly owned banks underperform relative to privately owned banks, when investigating cost and profit inefficiencies. Verbrugge, Megginson, and Owens (1999) find that there is limited improvement in profitability (measured as return on assets) caused by privatization.

2.7.3 Evidence on Privatization

Studying performance before and after privatization is perhaps the best indication of differences between public and private ownership, since it will provide comparable results. Megginson, Nash and Van Randenborgh, (1994) investigate the effects of privatization by comparing the financial and operating performance pre and post privatization. The study includes 61 companies from different countries and industries, over the period of 1961-1990. This shows that performance is significantly better post privatization when measured in terms of profitability, real sales and productivity. The reason is mainly that the company that is privatized most likely will experience an increase in operating efficiency[5]. Shirley and Walsh (2003) summarize the results of numerous studies and find that 61.5 percent concluded that private or privatized companies perform better than their publically owned counterparts. Only 9.6 percent of the studies conclude that government ownership performs better.

2.7.4 Evidence on Individual Owners

Maury (2006) finds a positive relationship between family ownership and financial performance in corporations based in Western Europe. The results suggest that family owned companies have a 7.0 percent higher firm valuation than companies with non-family ownership. Jaskiewicz and Klein (2005) summarize 50 empirical studies on family

[4] A stable financial system, relatively immune to cyclicality, is important in order to distribute capital, execute payments and redistribute risk effectively. This became evident in the aftermath of the Financial Crisis in 2008, when liquidity in the inter-bank market completely froze.

[5] Eckel, Eckel, & Singhal (1997) studied the privatization of British Airways (BA) in 1987 and found that the stock price of U.S. competitors, in direct competition with BA, on average fell by 7.0 percent. This implied that the capital markets anticipated a much more competitive company, following the privatization.

ownership and find that 46.0 percent of family companies outperforms non-family companies. Only 8.0 percent of the studies indicate that family owned companies underperform. The remaining studies do not show any significant differences, or they link performance to situational factors such as regulations or competition. Looking at return on assets, the majority of the studies do not reveal any significant difference.

2.7.5 Summary of Previous Research

It is hard to prove a strong negative relationship between government ownership and financial performance. Two of the most relevant studies on government ownership in Norway, Ødegaard (2009) and Pedersen and Thomsen (2003), indicate a neutral or slightly negative effect. Other studies indicate the same effects, but these are, for a number of reasons, not directly comparable with regards to the effects of government ownership in Cermaq. In terms of concentration, government ownership may resemble family ownership, and there are studies indicating that these companies overperform relative to publically owned companies. That being said, government ownership has certain attributes that separate it from other ownership identities, and one should also look into what goals the government states for its ownership, besides maximizing profit.

2.8 Our Contribution to Existing Research

As we have seen, previous reports study the effects of government ownership by focusing on either a cross section of the economy or socially critical pillars such as the banking sector. This provides little insight on how government ownership is actually conducted when commercial goals are balanced with other political concerns. Through our paper, we wish to provide a deeper understanding of how government ownership is conducted in an industry that historically has been of great importance to the Norwegian economy. Norway has as previously stated a high degree of government ownership, and we will look more closely at how the government succeeds in running a previously wholly owned company with commercial objectives.

3. The Government's Ownership Policy

The purpose of this chapter is to explain the Norwegian Governments attitude towards direct ownership. We will start off with introducing the different motives for government ownership and the type of classification that is currently being used. We will then address the different expectations and how the ownership is carried out. Finally, we will look at the government's motivation for investing in Cermaq.

3.1 Purposes of Government Ownership

The government wants to contribute to economic development in Norway through active ownership. In the Government Ownership Policy[6] the government has, besides long-term value creation, stated five main arguments for direct ownership.

National anchoring:

The government wants to facilitate an innovative, knowledge based and sustainable economy that is retained and further developed in Norway. By holding an ownership share of more than one third and establishing a controlling minority, the government can retain companies representing key competence in the country.

Control with natural resources:

In order to secure jurisdiction and revenues from natural resources, the government is of the perception that direct public ownership is vital. This is especially the case with energy companies where direct ownership is more efficient than the tax system. Ownership will provide good control with how the business is conducted, and its strategic direction.

Sector-political considerations:

The government believes that some tasks are of such importance that they should not be controlled by commercial interests. This includes the health sector, and parts of the transport and communication sector and other critical infrastructure.

[6] The Government Ownership Policy was published in June 2012 by the Stoltenberg II Government.

Correcting market failure:

The government considers that certain goods and services are best produced in markets *not* characterized by perfect competition, such as public goods and products produced in natural monopolies. Consequently, separate and controlled markets have been established for some products and services.

Long-term ownership:

Being a financially strong long-term owner, the government aim to ensure stability in ownership and induce industrial development. Although being interested in short-term profitability, the government believes that its ownership will encourage a long-term healthy and beneficial development.

3.2 Classification of Investments

Ownership may have several purposes, and based on the motivation each publically owned company is placed into one out of four different categories:

Category 1: Commercial investments

For these companies the goals are profitability, value creation and maximizing return. Changes in the government's ownership will happen if it is likely to improve industrial and commercial development while also securing that the government's values are protected.

Category 2: Commercial investments with national anchoring

The ownership is commercially motivated, but with the additional dimension that it secures a domestic anchoring of the company's headquarters and related functions. This is secured through an ownership share of no less than one third.

Category 3:Commercial investments with other specific objectives

Ownership is characterized by goals other than commercial profitability. These goals are ensured through direct ownership in addition to ordinary regulatory instruments.

Category 4: Investments with sector-political objectives

For this last category ownership is mainly motivated by sector political goals. The government will as an owner focus on achieving specific goals, ideally with an accounting profit.

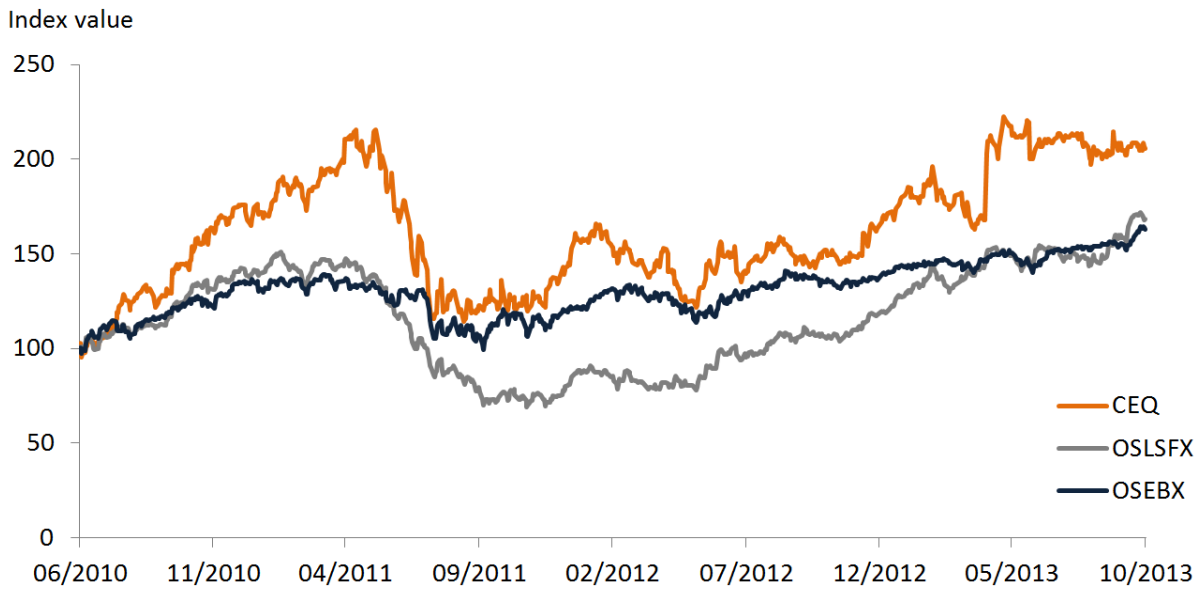
3.3 Expectations and Guidelines

The government will have certain expectations on how companies, and especially publically owned companies, conduct their business. All expectations have, unless otherwise noted, a time horizon of 3-5 years and are based upon a "*follow or explain*" principle[7]. In the following we will only focus on expectations for companies classified as commercial investments, such as Cermaq.

Return

The government has a long-term perspective, wishing to contribute to industrial growth, employment and development. It is, however, important that companies also achieve a long-term return on invested capital. For listed companies, this return will typically be measured as the share performance, relative to market development and industry-indices. A target, or expected return, will be prepared for every company. Impacting the return, it is also desirable that the company maintains a reasonable capital structure.

Figure 1: Share Performance vs. OSEBX and OSLSFX



Note: Cermaq's share performance versus Oslo Stock Exchange Benchmark Index (OSEBX) and Oslo Seafood Index (OSLSFX), rebased at 100 as of 01.06.2010. OSEBX is an investable index consisting of a representative sample of all shares listed on the Oslo Stock Exchange, adjusted for free-floating shares and dividends. OSLSFX consists of 14 companies operating within the seafood sector. The index includes listings on Oslo Stock Exchange and Oslo Axess and is adjusted for company-specific events and dividends on a daily basis.

[7] It is expected that publically owned companies either: (i) follow the guidelines laid out by the government, or (ii) on their own initiative explain why they have deviated from these.

Since the listing in October 2005, Cermaq's stock price has increased 139 percent[8]. Measured against the Oslo Stock Exchange Benchmark Index (OSEBX) Cermaq has over the last 12 months overperformed by 18.5 percent. However, compared to the Oslo Stock Exchange Seafood Index (OSLSFX) Cermaq has underperformed by 21.6 percent. The relative performance is shown in Figure 1, while a detailed overview is provided in Appendix 3.

Dividend policy and repurchase of shares

The government will support a dividend policy that promotes long-term value creation, and reflect what the government as an owner regards as an appropriate tradeoff between dividends and retained earnings. Long-term dividend expectations are formulated as a percentage of the accounting result after minority interests and should not cause competitive advantages or disadvantages compared to privately owned companies. The government also expresses its year-to-year expectations, which are communicated to the board prior to the general meeting. The government cannot dictate the company's dividend policy but may freely, and with legitimacy, express its expectations and what assessments these are based upon.

Repurchase of shares should be seen in connection with the company's financial position. Through buying back shares and taking them out of circulation there will be no changes to underlying values of the remaining shares, and repurchase-programs are thus instruments for optimizing the company's capital structure. The government regards repurchase programs as a supplement rather than an alternative to dividends. Whether the government wishes to participate will be evaluated in each single case, but the government typically prefers that the repurchase does not affect their ownership share.

Corporate Social Responsibility

Publically owned companies are expected to be leading in the work on corporate social responsibility (CSR), and to follow "*best practice*" regardless of where their business is conducted. In those cases where activities are regarded as harmful, regulation is preferred over direct ownership. Companies with international operations are expected to commit themselves to several international guidelines and conventions[9]. It is the government's

[8] Based on closing price October 24, 2005 (NOK 44.10) and closing price October 30, 2013 (NOK 105.50).
[9] The UN Global Compact, OECD guidelines for international companies and ILO's eight core conventions.

opinion that high expectations in the field of CSR will give high returns over time and that it is a value driver to act ethically correct. We will not revert to this topic, as we believe a discussion regarding the effects of CSR is outside the scope of this paper[10].

Research and development

The government highly values focus on research and development, and expects publically owned companies to emphasize R&D activities. The corporate management is expected to actively work on research, innovation and development of competence in order to strengthen operations, and to deliberately communicate own research results and commercialize results from other research groups.

Executive remuneration

The government bases its executive remuneration policy on the Norwegian welfare model, valuing a sound social safety net, small wage differentials and collaboration between the different parties in the labor market. Publically owned companies are expected to show moderation in their compensation of executive management. The government published adjusted guidelines concerning executive remuneration in publically owned companies in April 2011.

The main component should be the fixed salary and potential arrangements with variable salary must be transparent, time-limited and based on objective and measurable criteria. Unless special circumstances dictate otherwise, the total variable salary for any given year should not exceed 6 months fixed salary. The government opposes option-like agreements, but the use of share programs is permitted if regarded as especially suitable for realizing long-term goals. Pension terms should be in line with the terms of other employees in the company. In case of a termination, severance of up to 12 months' salary may be agreed upon, given that the departure is not voluntary and that the manager has waived his rights stated in the Working Environment Act.

The Board

The government wishes to secure a well-composed and competent board in companies with public investments. The board shall collectively possess the desired competence, and the

[10] Large corporations such as for example Apple and BMW are known for their efforts regarding CSR, and have proven that this is perfectly compatible with solid financial performance. But one could discuss the causality, since the CSR focus itself likely won't be the reason for high earnings.

chosen members should have broad and relevant experience. The government will emphasize differences in background in the composition of the board, and it believes that the legal requirement of one third of the board members being chosen among employees in the company has a positive influence. The government also supports a fair distribution between men and women and amended the legislation to reach this goal a few years ago. Members of parliament should not be elected as board members, and it is an unwritten rule that both councils and state secretaries resign similar positions prior to taking office. Furthermore, a CEO should never be appointed as a member of the board[11].

Diversity and gender equality

The implementation of gender representation on the board level has, in the government's opinion, been successful[12]. Although paving the way, these regulations haven't secured diversity on all levels of the company, and the government stated that it would work to increase the share of female chairmen and women in leading positions. The government believes that Norwegian companies should develop strategies for how women and minorities can be recruited to management positions.

3.4 Organization of Ownership

Most of the ownership has, encouraged by OECD, been moved to The Ministry of Trade and Industry in an attempt to coordinate the commercial ownership. As part of the process of setting more ambitious goals for the exercise of ownership, the government strengthened The Ministry of Trade and Industry through the establishment of the Ownership Department. This is likely to increase expertise and resources in relation to the government ownership and strengthen cooperation.

[11] This problem is widespread in the US, where it is quite common that the CEO of the company also is the chairman of the board. Examples are Blackrock and JP Morgan Chase. In JP Morgan Chase there has been a growing discontent with CEO and Chairman Jamie Dimon's mixed roles, and this was put to a vote twice during the last two years. The attempt of dividing the two roles was rejected, but still made some ripples in the water here in Norway, as NBIM as a shareholder in JP Morgan were criticized for not announcing what they had voted. This was seen as a violation of the Norwegian Government's transparency-policy.

[12] The law regarding gender representation for corporate boards was implemented in 2008, resulting in increased representation, from 6 to 43 percent (measured as of 2010).

3.5 The Ownership in Cermaq

The ownership in Cermaq is justified in the Government Ownership Policy (2012) report:

"The objective with the ownership in Cermaq is to contribute to the development of an important environment for fish farming, fish feed and fish feed related research, both in Norway and internationally. It is of great importance to the government that the company is a major player in the further development in the aquaculture industry in Norway. The company should be run on a commercial basis".

Cermaq ASA was during 2012 moved from Category 2 into a Category 1. At the time Cermaq was listed on the Oslo Stock Exchange, the government owned 43.5 percent of the company, with the possibility of reducing its ownership through a combination of dilution and direct divestments. This authorization was later limited, allowing dilution to an ownership share of no less than 34 percent. As a result of the attempted acquisition by Marine Harvest, the Norwegian parliament revised the mandate, allowing the government to increase its ownership in Cermaq, with an upper limit of 65 percent. As a result the government increased their ownership to 59,17 percent. This was justified with arguments claiming that increased ownership would provide room for actions in a situation where the company was at stake. A complete case study of the attempted acquisition is provided in Appendix 4.

4. Empirical Analysis

In this chapter we will explain our empirical approach. We start by presenting our dataset, its sources and what adjustments we have made. Then we will shift our focus towards the different explanatory variables and regression models. We present each single variable and describe the univariate relationship before diving into the technicalities. We want to use a model that utilizes the variation in our data in the best way possible and therefore chose the random effects model. Finally we will discuss possible weaknesses relating to our approach and the choice of model. A comprehensive analysis of our findings will be conducted later on, in chapter 5.

4.1 Dataset

The quality of our results will heavily depend on the quality of our dataset. For that reason it is important to be consistent in the way that we select and extract data.

4.1.1 Descriptives

Our dataset consists of both annual and quarterly data, for the period of 2005-2012. In order to include any given company for any given year, it is a prerequisite that all the necessary information is available. This means that a company will be included as of the period in which it was listed, at the earliest 2005 when Cermaq was listed. Data is gathered for a total of 10 companies, in addition to Cermaq. The peer group consists of Marine Harvest (MHG), Lerøy Seafood Group (LSG), Salmar (SALM), Norway Royal Salmon (NRS), Austevoll Seafood (AUSS), Bakkafrost (BAKKA), Grieg Seafood (GSF), Havfisk (HFISK), The Scottish Salmon Company (SSC) and Copeinca (COP). A more detailed explanation is provided in Appendix 2. Because several of the firms are not listed throughout the entire period we have what is called an unbalanced panel dataset (Wooldridge, 2006)

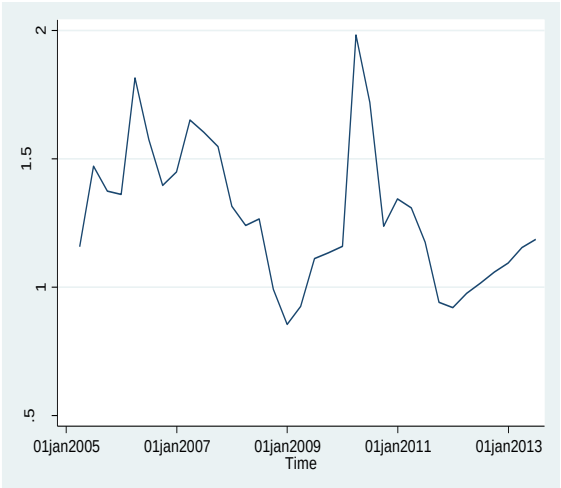
Table 2: Descriptive Statistics

	Mean	Std.dev	Min	Max	Obs
Tobin's Q	1,238	0,636	0,619	8,288	264
ROA	0,015	0,026	-0,105	0,101	264
Insider ownership	0,184	0,228	0,038	0,670	199
Herfindahl	0,251	0,141	0,038	0,565	238
Top1	0,453	0,166	0,124	0,750	238
Top3	0,589	0,155	0,266	0,873	238
Top5	0,657	0,142	0,342	0,898	238
Ln mcap	8,044	1,098	5,319	10,120	266
Sate	0,120	0,352	0,000	1,000	259
Individual	0,456	0,500	0,000	1,000	259
International	0,185	0,389	0,000	1,000	259
Financial	0,093	0,291	0,000	1,000	259
Non-financial	0,147	0,346	0,000	1,000	259

Note: Mean, standard deviation, minimum and maximum value and number of observations for all collected variables. Tobin's Q (market value of equity and debt/total assets), ROA (net income/average total assets). Herfindahl (sum of squared ownership). Insider ownership (number of shares owned by members of management and the board as percentage of shares outstanding). Ownership of Top1, Top3 and Top5 largest shareholders. Ln mcap is the natural logarithm of the market value of equity measured in NOK million. State. Individual, International, Financial and Non-Financial is the identity of the largest shareholder. Numbers are based on a group of companies, consisting of CEQ, MHG, LSG, SALM, NRS, AUSS, BAKKA, GSF, HFISK, SSC and COP.

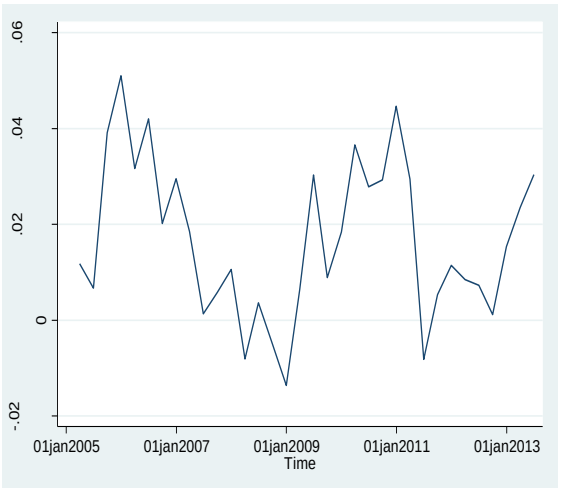
We see from Table 2 that the average Tobin's Q is 1.2, while the minimum- and maximum values are 0.6 (COP) and 8.3 (SSC), respectively. Companies will on average have 1.5 percent return on assets. The average amount of insider holdings is 18.4 percent, and the average ownership concentration measured by Herfindahl index is 0.25. The largest ownership share by one investor is observed in Lerøy and constitutes 75.0 percent as of Q4 2008. Individual ownership is the most common ownership identity with 45.6 percent.

Figure 2: Average Tobin's Q



Note: Equally weighted average Tobin's Q for peer group, based on data from Q1 2005 until Q2 2013.

Figure 3: Average Return on Assets



Note: Equally weighted average return on assets for peer group, based on data from Q1 2005 until Q2 2013.

Looking at Figure 2, Tobin's Q is volatile and displays a highly cyclical pattern with peaks in first quarter 2006 and mid/year end 2010. Figure 3 tells us that the return on assets follows a similar cyclical path.

4.1.2 Data Sources

The majority of data is gathered from the annual and quarterly financial reports of the respective companies, and we have manually collected all accounting numbers as well as information on ownership concentration, insider ownership, largest shareholders and their identity.

Share specific information such as share prices, shares outstanding, turnover rates etc, has mainly been gathered from Datastream[13], using FactSet[14] in those cases where information was not available. We have also utilized the information available through The Oslo Stock Exchange and NewsWeb. Our framework for classification of ownership identity is obtained from Oslo VPS, but the classification in itself is based on our personal evaluations.

In order to get a sense on how government ownership is exercised and which guidelines that apply, we have read numerous parliamentary reports and different editions of the Government's Ownership Policy.

4.1.3 Adjustments

Some of the necessary information, such as insider ownership and ownership concentration is only disclosed in the more detailed annual reports. In order to use quarterly data we have therefore made some assumptions. Ownership in each company seems to be stable, both in terms of concentration and insider holdings. We believe it would be fair to assume a linear relationship between each annual observation, and find the quarterly data points by interpolating. Classification of ownership identity is crucial and if there during one year has been a change related to the largest shareholder, we have traced this transaction using NewsWeb, so that the classification at all times will be correct.

[13] Datastream is a database available for NHH students, and includes financial information (share prices, financial reports etc.) dating all the way back to 1980.
[14] FactSet is a financial information and analytic software for investment professionals.

When calculating the Herfindahl index[15] the ideal approach would be to use all ownership shares. However, since we only have limited information, we base our calculations on the 20 largest shareholders, and interpolate in order to get quarterly data points. Since ownership is concentrated, this assumption will increase the number of observations without inflicting validity.

The majority of firms within our peer group have been listed later than 2005, and from an econometrical point of view this represents a problem, since these public listings should be randomly distributed in order to be included in our dataset. We know that public listings are cyclical and that this assumption is violated, but we see no other choice than to ignore this problem. It will likely not impact our results.

After adjusting for missing information we are left with a total of 199 quarterly observations, which corresponds to an average of 18 observations per company. Previous corporate governance studies have included a larger data sample, studying several industries and countries. Since we are looking at one industry, and Cermaq was listed in 2005, this puts obvious constraints on the number of observations.

4.2 Financial Performance Measures

In order to measure financial performance we chose two different measures. While Tobin's Q is a forward-looking valuation measure based on the observed relationship between market and book values, the return on assets is an accounting measure, focusing on the company's past performance. The purpose is to highlight different aspects of profitability and to study performance from different angles, providing us with a better understanding.

4.2.1 Tobin's Q

Previous research on corporate governance, such as for example Ødegaard (2009), Himmelberg, Hubbard and Palia (1999) and La Porta, Lopez-de-Silanes, Schleifer and Vishny (1999), has measured financial performance in terms of Tobin's Q. We use the definition provided by Tobin (1969):

[15]Herfindahl index is the sum of squared ownership shares. Ødegaard (2009) finds an average of 0.15 (when firms are equally weighted) for Norwegian listed firms in the time period 1989-2007.

$$Tobins`Q = \frac{market\ value\ of\ the\ company}{book\ value\ of\ the\ company} \quad \textbf{(Eq. 1)}$$

The numerator equals the combined market value of both equity and debt, but since the debt is not traded, we use the observed book value as a proxy. This is a fair assumption since the debt, even if traded, would have been valued close to the actual book value. The denominator is equal to the replacement cost of the company's total assets, also using book values as a proxy. The economic interpretation of Tobin's Q is fairly similar to that of the more familiar price-to-book ratio: A Q-ratio between 0 and 1 will imply that the replacement cost of the firm's assets is greater than its market value, indicating that the stock is undervalued. A Q-ratio greater than 1 will mean the opposite, implying that the company is overvalued.

The advantage with using Tobin's Q is that it is a forward-looking measure taking expectations regarding future performance into account by looking at the market value of the company's equity. Under the assumption that capital markets are perfectly efficient[16], the market value will reflect the company's intrinsic value, thereby absorbing the possible effects of ownership identity.

4.2.2 Return on Assets

We also chose to include an accounting-based[17] performance measure, which can give us an objective and unbiased indication of how the company actually is performing. Return on asset is subject to cyclicality, but since we are looking at an entire industry this will have no implication for our results. When seen in the same context as Tobin's Q, the return on assets will increase our understanding of the company's performance.

The calculation of this performance measure is seemingly straightforward, with the return on assets being defined as the net income (after tax and before distributions to minority owners) as a percentage of the representative level of total assets (usually regarded as the average of

[16] There are three different degrees of market efficiency, depending on how much information that is reflected in the share price. Different theories claim that financial markets either are weak, semi-strong or strong.
[17] All companies in this paper report in accordance with the IFRS framework, eliminating problems related to different accounting practices and making financial statements comparable.

the opening and closing balance). Since we will need both the opening and closing balance of total assets, we encounter a problem when accounting figures are not available for the preceding year. In these cases the return on assets has been calculated on the basis of the closing balance.

4.3 Explanatory Variables

The selection of explanatory variables (X_{it}) is critical for our results, and is motivated by previous research in the fields of corporate governance. We have based our variables on Ødegaard's (2009) study of government ownership on the Oslo Stock Exchange, and made some modification so that it better fits with our dataset. We use both internal and external explanatory variables.

4.3.1 Insider Ownership

We measure insider ownership as the number of shares held by members of management and the board of directors. A broader definition is usually preferred, but for simplistic purposes we have only included information available in the annual reports. The average insider ownership in our peer group (excluding CEQ) is 21.7 percent, which is high compared to the average of 0.2 percent in Cermaq.

Besides looking at insider ownership we also include squared insider ownership as an explanatory variable, in order to adjust for non-linear effects. The larger part of previous research reveals that insider ownership has a curvilinear effect; first increasing value at low holdings, before the effect at higher levels can be decreasing, increasing or neutral (Morck, Schleifer and Vishny, 1988; McConnel and Servas, 1990; Belkaoui and Pavlik, 1992; Holderness, Krozner and Sheenan, 1999).

4.3.2 Ownership Concentration

There are several ways to measure ownership concentration but we have chosen to use the Herfindahl index, which shows the accumulated squared ownership share of all shareholders. Looking at the Top1, Top3 and Top5 shareholders could also provide us with useful information, but it will not be necessary to include all variables as they provide roughly the same insight. The Herfindahl index is a better-suited measure when addressing ownership concentration because it utilizes information from a large sample of shareholders.

The average Herfindahl index for our peer group is 0.25, while it is 0.20 for Cermaq. Compared to 0.15, which Ødegaard (2009) found to be the average for all companies on the Oslo Stock Exchange. This tells us that there is a high degree of ownership concentration within the aquaculture industry.

4.3.3 Identification Variables

In order to investigate the possible differences between ownership identities we must first develop a classification framework that lets us separate between different owners. We have chosen to use the five different ownership identities presented by Oslo VPS, meaning that the largest shareholder in each company at any given point in time is placed in one of the following categories: (i) State, (ii) Financial, (iii) Non-financial, (iv) Individual and (v) International. A complete overview is provided in Appendix 5.

4.3.4 Market Capitalization

We also include the firm's market capitalization as an explanatory variable, as this is likely to affect performance in several ways. One could argue that this variable is related to how easy it is to acquire the company, thereby influencing the competition in the market for corporate control. It could also be that stellar performance is related to the fact that the company is of a certain size, and thereby can benefit from economies of scale. Market capitalization could also be thought of as a variable that controls for heterogeneity which the model otherwise cannot explain.

When looking at the companies within our peer group it becomes evident that there are great variations, with market values spanning from NOK 558 million for Havfisk, to NOK 26 029 million for Marine Harvest. The market capitalization is usually log-normally distributed and by using the natural logarithm our observations become more normally distributed, at the same time as adjusting for outliers.

4.4 Univariate Relationships

Table 3: Correlation Matrix

	Tobins Q	ROA	Insider	Hf	Top1	Top3	Top5	Ln mcap
Tobins Q	1,000							
ROA	0,448	1,000						
Insider	0,142	0,029	1,000					
Hf	-0,280	-0,128	-0,034	1,000				
Top1	-0,247	-0,111	-0,009	0,976	1,000			
Top3	-0,278	-0,121	0,164	0,943	0,939	1,000		
Top5	-0,235	-0,107	0,244	0,903	0,883	0,985	1,000	
Ln mcap	0,452	0,251	-0,245	-0,370	-0,248	0,467	-0,546	1,000

Note: Correlation between profitability and explanatory variables. Tobin's Q (market value of equity and debt/total assets), ROA (net income/average total assets). Herfindahl (sum of squared ownership). Insider ownership (number of shares owned by members of management and the board as percentage of shares outstanding). Ownership of Top1, Top3 and Top5 largest shareholders. Ln mcap is the natural logarithm of the market value of equity measured in NOK million. Numbers are based on a group of companies, consisting of CEQ, MHG, LSG, SALM, NRS, AUSS, BAKKA, GSF, HFISK, SSC and COP.

Table 3 displays the correlation between the financial performance measures and various explanatory variables. Univariate relationships are important, as it will provide us with an understanding of the connection between two separate variables. However, it will not say anything about the effects. Because the identity variables are "dummies", looking at correlation will provide no added value.

Insider ownership is positively correlated with both Tobin's Q and return on assets, although more for Tobin's Q. Ownership concentration is negatively correlated with financial performance, with the relationship for all four variables being negative. Finally, we see that the market capitalization has a high degree of correlation with performance, but this is not surprising given that it together with debt constitutes the numerator in the Tobin's Q fraction.

4.5 Econometrical Issues

Before moving on to our regression model, there are a couple of issues, which we must take into consideration. In order to get as reliable results as possible, we will in the following section discuss well-known econometrical issues, which could bias our results.

4.5.1 Heteroskedasticity

One of the most common assumptions within the field of econometrics is that of constant variance in the error term (u_{it}). If this is the case we have what is known as homoscedastic standard errors. The problem arises when standard errors are hetereroskedastic, as they cannot be used for hypothesis testing and estimation of confidence intervals, unless adjustments have been made. This will not bias our estimates, but it will bias the standard errors and the R-squared (positively). We test for heteroskedasticity by performing a Breusch-Pagan/Cook-Weisberg test, and reject the null hypothesis of constant variance based on a chi square value of 68.68. We account for heteroskedasticity by using robust standard errors.

4.5.2 Multicollinearity

Another potential problem is multicollinearity, meaning that our explanatory variables are highly correlated. According to Wooldridge (2006) multicollinearity will have the same effect as a small sample size, increasing standard errors of the explanatory variables, and potentially effect significance. There is nothing wrong with including variables that are correlated, given that the correlation between these independent variables is not too high. If this was the case our estimates would be unreliable (Verbeek, 2012).

A case of multicollinearity would be if one explanatory variable is the exact linear combination of one or more other explanatory variables. Applicable to our problem, multicollinearity would be the result if including all ownership identity variables, known as the *dummy variable trap* (Verbeek, 2012). To eliminate the possibility of multicollinearity we will therefore always leave out at least one identity variable, and restrict the ownership concentration to the Herfindahl index. A correlation matrix, describing the relationship between all identified variables, is provided in Appendix 6.

4.5.3 Autocorrelation

A third issue that could bias our results is if our explanatory variables (X_{it}) are correlated over time, so-called autocorrelation. This is a common problem when studying time series, because one observation is likely to be dependent on previous observations.

$$Y_{it} = \beta_0 + \beta_n X_{it} + u_{it} \quad \textbf{(Eq. 2)}$$

Similar to heteroskedasticity, autocorrelation does not bias our estimates directly, but tend to underestimate standard errors. This would in turn overestimate test statistics, possibly portraying the coefficient as significant, while it in reality is suffering from autocorrelation. Variables such as ownership concentration, market capitalization and ownership identity are likely to remain fairly constant over time and would therefore display clear signs of autocorrelation. To account for this problem we use standard errors clustered by company, which is a type of heteroskedasticity and autocorrelation-consistent standard errors (HAC). This allows for heteroskedasticity and for arbitrary autocorrelation (Stock and Watson, 2012). Another method would have been to adjust for autocorrelation by running the regression based on changes between periods, rather than absolute values. This is not rational in our case since we would lose further observations.

4.5.4 Endogeneity Problems

The by far most critical assumption is the one involving exogenous regressors. If omitted variables have explanatory power and are correlated with one or more of the included variables, our regression will suffer from what is known as *omitted variable bias*.

$$\widehat{\beta_1} \xrightarrow{p} \beta_1 + \rho_{xu}\frac{\sigma_u}{\sigma_X} \quad \textbf{(Eq. 3)}$$

Eq. 3 explains the properties of the omitted variable bias. If not biased, the sample coefficient ($\widehat{\beta_1}$) would converge towards the actual population coefficient when the sample size increases. On average these two coefficients would then be identical. If the model on the other hand suffers from endogeneity problems, these would not converge. How large the bias is depends on the correlation (ρ_{xu}) between the explanatory variables and the error term, the stronger the correlation, the larger the bias. It will also be linked to the variance in the omitted variable (σ_u) and the included variables (σ_X). The direction depends on the correlation (ρ_{xu}) (Stock and Watson, 2012). In our model we have included the variables that we deem the most important. We are aware that there are several omitted variables with significant explanatory power, and we will as far as possible, elaborate on these in our analysis.

Besides omitted variables, functional form misspecification and measurement errors in the independent explanatory variables will also lead to biased estimates. Furthermore, a sample selection bias arises when entities can only be observed based on their dependent variables, meaning that the error term is correlated with the dependent variable. If the causality between the dependent and independent variable goes both ways we would have what is known as a *simultaneous causality issue*. The coefficients would in this case not reflect the true causal effect. Finally, panel data with several observations from different companies could have time invariant unobservable effects that bias the results. This is an important issue which we will revert to in section 4.7.

4.6 Regression

In order to decide what kind of model we should use, we run a Breusch-Pagan Lagrange Multiplier test for random effects. The ordinary least squares (OLS) model will only be appropriate if there are no significant differences across companies. We reject the null hypothesis that there are no significant differences across entities at a 1 % level and use a RE model because it is more efficient than OLS. The test results are provided in Table 4.

Table 4: Breusch and Pagan Lagrangian multiplier test for random effects

Breusch and Pagan Lagrangian multiplier test for random effects

tobinsq(firm1,t) = xb + u(firm1) + e(firm1,t)

Estimated results:

	Var	sd - sqrt(Var)
tobinsq	.1109777	.3331331
e	.0280282	.1674162
u	.0684457	.2616213

Test: Var(u) = 0

chibar2(01)	=	71.91
Prob > chibar2	=	0.0000

Eq. 4 and Eq. 5 represent our final model, using identical variables for explaining the two performance measures, Tobin's Q and return on assets. Keeping in mind that we are interested in whether government ownership influences performance, we have included identification variables as dummies.

$$Tobins\ q = \alpha + \beta_n X_{it} + \beta_i D_{identity} + u_i + e_{it} \quad \textbf{(Eq. 4)}$$

$$ROA = \alpha + \beta_n X_{it} + \beta_i D_{identity} + u_i + e_{it} \quad \textbf{(Eq. 5)}$$

4.7 Fixed Effects vs. Random Effects

The RE model will only be preferred to the fixed effects (FE) model, if the random error is not correlated with any of the explanatory variables. The problem with endogenous regressors is common with panel data because the individual specific error term (u_i) can be correlated with the explanatory variables (X_{it}). If this is the case, we will want to use the FE model, which produces consistent estimates.

$$v_{it} = u_i + e_{it} \quad \textbf{(Eq. 6)}$$

To decide which model to use one could conduct a Hausman test. The FE model eliminates the individual random effect (u_i) and other time invariant factors, meaning that the FE model will be preferred if there is correlation.

If we fail to reject the null hypothesis, meaning that FE=RE estimates, we should use the RE model. The FE model does not utilize the information on how changes in the dependent variable over time for the different entities could be attributed to different variables for the same entities (in our case the different firms). The RE-model takes this into account, meaning that if the random errors (u_i) are not correlated with our explanatory variables, we should use this model as it is more efficient. This is also supported by the fact that RE is a generalized least square procedure while FE is a least square estimator (Hill, Griffiths, and Lim, 2011).

The Ministry of Trade and Industry is throughout the whole period, the largest shareholder in Cermaq, with a constant ownership share. As the FE model can only be used when analyzing the effect of variables that change, we are forced to use the RE model.

4.8 Results

4.8.1 Random Effects Model for Tobin's Q

Table 5: Random Effects Model for Tobin's Q

	(1) Tobin's Q
Hf	-0.084
	(0.265)
Insider ownership	1.662***
	(0.269)
Insider ownership^2	-0.624
	(0.859)
State	0.318
	(0.272)
Individual	0.256
	(0.162)
International	0.401
	(0.434)
Financial	0.774***
	(0.238)
Lnmcap	0.338***
	(0.052)
Constant	-2.016***
	(0.571)
Observations	199
Adjusted R^2	0.188

Note: The results for the dependent variable Tobin's Q (market value of equity and debt)/(total assets) using Non-financial owners as reference. Explanatory variables: Hf (Herfindahl index, sum of squared ownership top 20 owners) Insider ownership is measured as fraction shares owned by the board and management. The insider squared is meant to pick up any nonlinear effects of insider ownership. State, Individual, International, Financial and Non-financial is the identity of the largest shareholder. LnMcap is the natural logarithm of the companies' market capitalization measured in million NOK. Results are based on a group of companies, consisting of CEQ, MHG, LSG, SALM, NRS, AUSS, BAKKA, GSF, HFISK, SSC and COP. Standard errors in parentheses: * $p < .10$, ** $p < .05$, *** $p < .01$

We choose to investigate ownership identities by setting non-financial owners as a reference, and the results are shown in Table 5. Most identities show a non-significant effect and only financial owners have a statistically significant effect on Tobin's Q. We have no reason to believe that government ownership neither over- nor underperforms international, individual and non-financial owners. However, since government ownership is not statistically different

from zero, but financial ownership is, we can conclude that the government as an owner (along with all other ownership identities) underperforms relative to financial owners. But we have to be careful when reading our estimates as the number of observations will be highly relevant for the significance of our results. It will not be meaningful performing further hypothesis tests as only one ownership identity has a statically significant effect.

It is also worth mentioning that ownership concentration is not statistically significant. Insider ownership is associated with higher values of Tobin's Q and the effect is statistic significant at a 1% level. Squared insider ownership has a non-significant effect but the accumulated effect of insider holdings will be positive. Market capitalization is significantly associated with better financial performance, reflecting both the importance of size and the previous highlighted correlation with the market-to-book ratio. Complete results are provided in Table A7.1 in Appendix 7.

4.8.2 Random Effects Model for Return on Assets

Table 6: Random Effects Model for Return on Assets

	(1)
	ROA
Hf	-0.024
	(0.027)
Insider ownership	0.014
	(0.088)
Insider ownership^2	-0.011
	(0.111)
State	-0.010
	(0.008)
Individual	-0.008
	(0.019)
International	-0.024**
	(0.012)
Financial	-0.002
	(0.010)
Lnmcap	0.008**
	(0.003)
Constant	-0.035
	(0.033)
Observations	199
Adjusted R^2	0.057

Note: The results for the dependent variable ROA (net income/average total assets) using Non-financial owners as reference. Explanatory variables: Hf (Herfindahl index, sum of squared ownership top 20 owners) Insider ownership is measured as fraction shares owned by the board and management. The insider squared is meant to pick up any nonlinear effects of insider ownership. State, Individual, International, Financial and Non-financial is the identity of the largest shareholder. LnMcap is the natural logarithm of the companies' market capitalization measured in million NOK. Results are based on a group of companies, consisting of CEQ, MHG, LSG, SALM, NRS, AUSS, BAKKA, GSF, HFISK, SSC and COP. Standard errors in parentheses: * $p < .10$, ** $p < .05$, *** $p < .01$

In Table 6 we have provided the results for the analysis with return on assets as the dependent variable, still using non-financial owners as reference. Neither here, does government ownership display a significant effect. This is also true for the other identities, except for international owners, who are associated with lower return on assets at a 5 percent level. Using the same analogy the only conclusion we can derive is that the government outperforms international owners. Ownership concentration is still not statistically

significant, but neither are the two insider ownership variables. The positive effect of size is also in the terms of return on assets strongly significant. See Table A7.2 in Appendix 7.

4.9 Summarized Results of Government Ownership

Neither of our models reveal any statistically significant effects of government ownership. Because the government effect is not significantly different from zero and other ownership identities neither are significant this means that the identity of the owner is irrelevant with regards to financial performance. But there are two exceptions: financial owners outperform all other ownership identities in terms of Tobin's Q, and international owners underperform in terms of return on assets.

If this was an industry where the identity of the largest shareholder was constantly changing, it would have made sense to lag performance and detect possible delayed reactions. But given the constant ownership structure in aquaculture, this would only have reduced the number of observations, providing no additional value.

Since we want to problematize further, we wish to study the effects when using government ownership as the only ownership identity variable. This will allow us to measure government ownership against the industry average.

Table 7: Random Effects Model with All Other Identities as Reference

	(1) ROA, all identities as reference	(2) Tobin's Q, all identites as reference
Hf	-0.015	-0.333
	(0.025)	(0.228)
Insider ownership	0.020	1.826***
	(0.059)	(0.522)
Insider ownership^2	-0.026	-0.755
	(0.100)	(0.908)
State	-0.007	0.050
	(0.017)	(0.339)
Lnmcap	0.011***	0.324***
	(0.003)	(0.030)
Constant	-0.073**	-1.581***
	(0.029)	(0.278)
Observations	199	199
Adjusted R^2	0.087	0.243

Note: Regression 1: The results for the dependent variable ROA (net income/average total assets) using all other owners as reference. Regression 2: The results for the dependent variable Tobin's Q (market value of equity and debt)/(total assets) using all other owners as reference. Explanatory variables: Hf (Herfindahl index, sum of squared ownership top 20 owners) Insider ownership is measured as fraction shares owned by the board and management. The insider squared is meant to pick up any nonlinear effects of insider ownership. State is the only ownership identity variable. Ln mcap is the natural logarithm of the companies' market capitalization measured in million NOK. Results are based on a group of companies, consisting of CEQ, MHG, LSG, SALM, NRS, AUSS, BAKKA, GSF, HFISK, SSC and COP. Standard errors in parentheses: * $p < .10$, ** $p < .05$, *** $p < .01$

Table 7 summarizes these findings. We do still not find any significant results, but the coefficients are small, both in terms of Tobin's Q and return on assets, implying that even if they were significant the effect would have been limited. This supports our impression that government ownership is insignificant in relation to financial performance for companies operating within the aquaculture industry.

4.10 Criticism of Empirical Approach

Critics of corporate governance studies often emphasize the endogenity problem linked to ownership and performance. It is not certain that the implied causality link goes from ownership to performance. Financial performance could also determine ownership identity (Demzets, 1983).This illustrates how important it is having a sound theoretical foundation, as econometrical analysis only describes certain relationships.

Since the government ownership share is time invariant, we cannot use the FE model. If we were to do so, the government ownership share would have been left out of the regression since this does not change over time. This implies that we must be cautious when interpreting results, as they will rely on the vital assumption that there is no correlation between our included variables and unobserved firm-specific fixed effects. There are countless unobservable fixed variables, which may explain the company's current performance, and if any of these have large explanatory power it will be an obvious weakness, when using the RE model. Himmelberg, Hubbard, and Palia (1999) mention for example corporate culture and market power as examples of such effects.

We would once again like to stress the fact that the number of observations in all likelihood has impacted our result. We are restricted by the date of Cermaq`s listing, but with a larger amount of observations it is possible that we would have found significant effects.

5. Results and Discussion

In this chapter we will investigate our results further and look at possible explanations. We will start with the already included variables, before addressing the endogeneity problem by discussing several omitted variables that could impact the explanatory power of government ownership. This discussion will serve as the foundation for our overall conclusion.

5.1 Government Ownership

Running the RE-model, government ownership seems to have a non-significant effect. This means that we, on the basis of our regression, cannot conclude that government ownership has had a systematic impact on Cermaq's performance.

The selection of time period is crucial and if the data sample is not representative, our overall conclusion can turn out to be wrong. Until now we have analyzed the time period as a whole but we will in the following identify different intervals and investigate these individually. Given the cyclicality of the aquaculture industry we would like to find out if the effect of government ownership changes over time.

In earlier decades, decease-outbreaks led to erratic supply, and it was not until vaccines were introduced during the 1990's that supply became stable and one was made aware of this cyclicality (Andersen, Tveterås, and Roll, 2008). The cyclicality is mainly explained by a relatively constant cost structure, and varying retail prices (Øglend and Sikveland, 2008). In total, these two effects result in a fluctuating EBIT-margin, meaning that the real return per kg of salmon is cyclical. Biological limitations will amplify this effect, as it will typically take 2-3 years before one can harvest a fully-grown salmon. This is putting constraints on short-term supply, and fish farmers setting out smolt, will not be able to reap the economic profit until several years later. This time lag can also cause producers to overestimate future supply, driving down future prices. The aquaculture industry is in most countries strictly regulated due to environmental concerns. In Norway, one of the most important limitations

is the one related to the allowed biomass per square feet (MTB). These regulations[18] limit the opportunity to stockpile fish in anticipation of higher prices, possibly causing misalignment between supply and demand. Seasonal effect will also affect the supply-demand equilibrium, as smolt usually is released into the pens during late summer and autumn, when growth conditions are optimal.

A cycle within the salmon farming industry is typically 6 years from peak to peak, or 3 years from peak to trough. Consensus among analysts seems to be that 2006 and 2011 where peaks in terms of EBIT/kg, and using this cycle framework we define 3 different periods: (i) peak-to-trough, (ii) through-to-peak and (iii) peak-to-peak. Table 7 shows our periodic results with return on assets as the dependent variable.

Table 8: Random Effects Model for Different Business Cycles

	(1)	(2)	(3)
	ROA, 2006-2008	ROA, 2009-2011	ROA 2006-2011
Hf	-0.040	-0.030	0.020
	(0.029)	(0.061)	(0.041)
Insider ownership	0.170***	-0.085	-0.041
	(0.060)	(0.128)	(0.086)
Insider ownership^2	-0.250**	0.184	0.055
	(0.103)	(0.199)	(0.150)
State	0.025***	-0.012	-0.016
	(0.009)	(0.029)	(0.032)
Lnmcap	-0.002	0.014**	0.017***
	(0.005)	(0.006)	(0.005)
Constant	0.022	-0.078	-0.122***
	(0.048)	(0.057)	(0.043)
Observations	51	84	132
Adjusted R^2	0.050	0.104	0.126

Note: Regression 1: peak to trough. Regression 2: trough to peak. Regression 3: peak to peak. The results for the dependent variable ROA (net income/average total assets) using all other owners as reference. Explanatory variables: Hf (Herfindahl index, sum of squared ownership top 20 owners) Insider ownership is measured as fraction shares owned by the board and management. The insider squared is meant to pick up any nonlinear effects of insider ownership. State is the only ownership identity variable. Ln mcap is the natural logarithm of the companies' market capitalization measured in million NOK. Results are based on a group of companies, consisting of CEQ, MHG, LSG, SALM, NRS, AUSS, BAKKA, GSF, HFISK, SSC and COP. Standard errors in parentheses: * $p < .10$, ** $p < .05$, *** $p < .01$

[18] As of today, the allowed biomass is limited to no more than 65 tons of fish per 1000 m3. A standard license of 1200m3 therefore equals 78 tons. Troms and Finnmark have higher limits due to lower organic growth.

During the first period (column 1 in Table 8), lasting from 2006 until 2008, government ownership displays a positive and statistically significant effect on return on assets. This is interesting as it tells us that government ownership will be preferred during down-cycles, and could be related to the fact that the government is a stable owner that does not stress performance-measures during a period where profits are low. Private investors may become impatient as the company delivers a result below their required return, especially if these down-cycles correspond with recessions in the economy (as was the case in 2008). Publically owned companies will not experience the same kind of pressure and sense of discontent, as their largest shareholder has the necessary financial strength and time horizon. Being owned by the government could also be interpreted as having an implicit government guarantee, which would be especially valuable in periods when profits are low.

Looking at the second period of 2009-2011 (column 2 in Table 8), the effect of government ownership is no longer significant. From peak to peak (column 3 in Table 8), the effect is line with our previous presented results, thus not-significant in any direction. Results for Tobin's Q were non-significant and are provided in Appendix 8.

We observe that financial owners are the only ownership identity to have a significantly positive effect on performance. Havfisk, among the companies performing worst in terms of Tobin's Q, is the only company having a financial owner. Considering the other characteristics of Havfisk, we suspect that this observed positive relationship between financial ownership and performance is manipulated by other firm specific factors rather than the identity of the largest shareholder. Having a small market capitalization and high ownership concentration, which both point in the direction of a low Tobin's Q, the model may have assigned the identity variable excessive explanatory power. This highlights the weakness of having a small number of observations as the model may indicate spurious relationships.

Another quite striking finding is that international ownership displays a significantly negative effect, but in this case with respects to the return on assets. International owners are for a number of reasons assumed to be passive owners, thus theory suggests a negative effect on corporate governance and performance. Using a statistical test, we were able to trace the larger part of this negative effect back to Marine Harvest, one out of two companies having

foreign owners (SSC is the second). Marine Harvest is 23.1 percent owned by Geveran Trading Ltd[19], a holding company that through a crafty ownership structure is owned and controlled by, former Norwegian turned Cypriot, business magnate John Fredriksen. Fredriksen is known as a shareholder-friendly owner; perhaps more concerned with continuous dividend payments than year-to-year profits. The last couple of years, Marine Harvest have also been among the most active acquirers within the industry and this is believed to have negative effects on short-term performance. This once again reminds us of the importance of the number of observations. Although the number is satisfactory on an aggregate level, this will not necessarily be the case if studying specific ownership identities. As we have argued, company-specific characteristics can influence the explanatory power of a whole identity-group.

We will not elaborate further, on results of ownership identities, but we will revert to other aspects of Cermaq's business environment, which may or may not affect the impact of government ownership in a way that our model has not picked up.

5.2 Other Ownership Characteristics

Our model displays a negative relationship between ownership concentration and performance, but the effect is small and not statistically significant. The theory regarding ownership concentration is indecisive, but there seems to be a common understanding that concentration will have positive effects up until a certain level (Schleifer and Vishny, 1996).

The average Herfindahl index for the entire peer group is 0.251, with the largest owner holding an average of 43.7 percent (both figures excluding CEQ). These numbers are high compared to the Oslo Stock Exchange All, where these numbers are 0.15 and 27.6 percent, respectively. The slightly negative effect on Tobin's Q, can be interpreted as a possible minority discount, signalizing that the market believes the concentration is somewhat to high. A similar effect is seen on return on assets, indicating that ownership concentration has influenced decision-making. But as neither of these effects (-0.084 on Tobin's Q, and -0.024 on ROA) are statistically significant we will be careful with making any sort of conclusions, especially given the high standard deviation.

[19] Geveran Trading Ltd. is a holding company based in Limasol, Cyprus. It is operated as a subsidiary of Greenwich Holding Ltd., and controlled by John Fredriksen.

Insider ownership is a way of aligning incentives and as it reduces problems related to moral hazard, the theory suggests a positive relationship between insider ownership and performance. We find a positive link, but the results are only statistically significant for Tobin's Q. The market regards it as positive if insiders own shares in their own company. With Tobin's Q taking the market value into account, it therefore makes sense that we observe a stronger relationship with this performance measure, than with return on assets.

In the aquaculture industry, the high degree of insider ownership can be explained by the fact that several companies are family owned, and that these families also are represented at the management- or board-level. Cermaq has a small share of 0.5 percent insider ownership. This could possibly be explained by the restrictive use of option schemes and share based remuneration, but the obvious explanation is the absence of family ownership. In comparison the peer group has an average insider holding of 21.7 percent (excluded CEQ), meaning that this variable alone would imply a lower Tobin's Q for Cermaq.

Our model finds that the market capitalization of the firm has a statistically significant effect on both performance-measures (0.338 for Tobin's Q and 0.008 for return on assets). Although it might be difficult to spot the immediate effect that size will have on performance, the aquaculture industry is characterized by a high degree of consolidation. This suggests that there is some kind of threshold with regards to size; unless a firm is of a certain size it will likely be difficult to compete with the larger and more established firms. Benefitting from economies of scale will have obvious effects on performance, improving effectiveness and resulting in both increased return on assets and market to book ratios. To demonstrate this fact we divide the peer group into two brackets: (i) large-cap with a market value of more than NOK 4 bn, and (ii) small-cap with a market value less than NOK 4 bn. Looking at return on assets, large-cap performs significantly[20] better than small-cap, boasting an average ROA of 8.5 percent (vs 3.2 percent). The effect is similar with regards to Tobin's Q.

The last twelve months have been quite fast paced with respect to consolidation and acquisitions. Marine Harvest acquired Morpol in 2012 and attempted to acquire Cermaq in mid-2013. China Fishery Group successfully acquired Copeinca, after Cermaq's proposed

[20] We run a "ttest" command in stata, testing if the return on assets of large companies is statistically different from that of small companies. We reject the null hypothesis that these are equal, based on a t-value of 5.06.

acquisition attempt was voted down[21]. These cases illustrate how important consolidation is within this particular industry. If growth is driven by constant acquisitions, this may have negative effects on performance. In the short run, implementation will be time consuming, thus preventing the company from focusing solely on maximizing profits. In the long run it may have obvious negative effects if it turns out that the acquirer has paid out a too large premium, compared to the actual synergies. Geographical (horizontal) expansion is found to lower production risk and risk on returns in the aquaculture industry (Tveterås and Asche, 2011) .

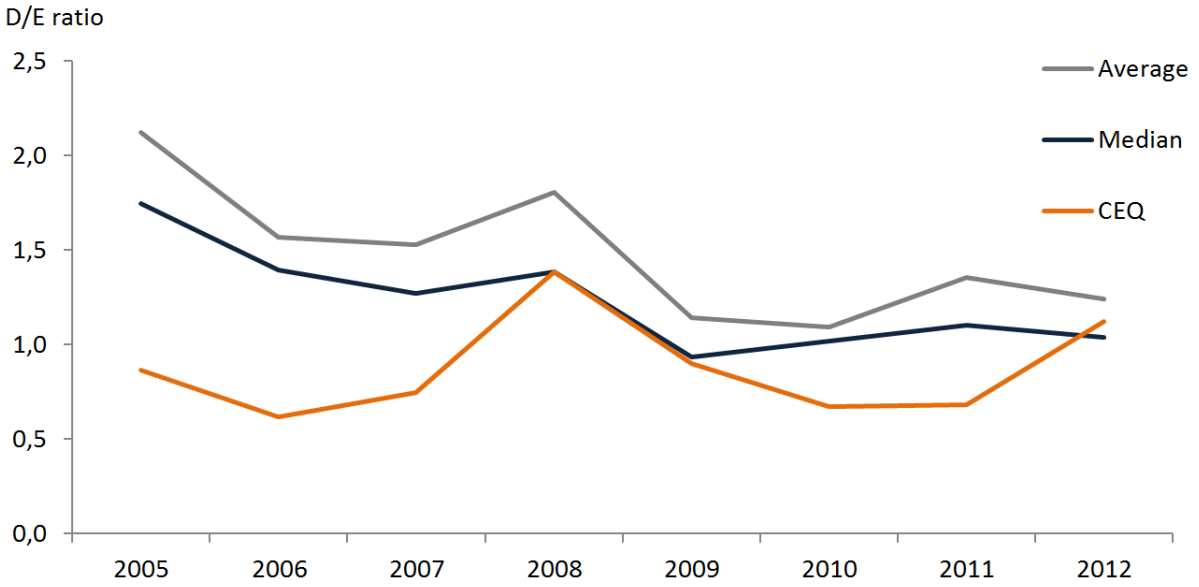
Market capitalization constitutes, together with debt, the denominator of Tobin's Q. It is therefore highly anticipated that our model will detect a positive relationship. This is undoubtedly a weakness. That being said we prove a strong relationship between size and return on assets, a performance measure which in principle is not dependent on the market capitalization. This means that there are advantages to size, although they are not as large as the coefficient implies.

5.3 Capital Structure and Dividend Policy

As we are measuring relative performance we are interested in how Cermaq is capitalized compared to its peers, and if the company due to its capital structure either has a competitive advantage or disadvantage. In terms of capital structure Cermaq is among the least levered companies within the peer group, exhibiting a low debt-to-equity ratio. This is not surprising, as the government repeatedly has expressed their preference for a solid and reasonable capital structure. Theoretically, a lower leverage ratio would imply that Cermaq has a larger free cash flow problem and hence higher agency costs than its competitors and this should have a negative effect on performance. Figure 4 displays the debt-to-equity ratio, plotting Cermaq against the median and average of the peer group.

[21]After submitting an offer for Cermaq, Marine Harvest managed to gather enough support to block the share issue that was necessary for financing the acquisition of Copeinca.

Figure 4: Debt-to-Equity Ratio



Note: The debt to equity ratio is defined as total book value of debt divided by stockholder's equity and can be understood as the proportions of equity and debt the company uses to finance its assets. We have computed an average, including all companies except CEQ. The median is based on all companies, including CEQ.

Despite Miller and Modigliani (1958) claiming that capitalization is irrelevant, it can be argued that every company has an optimal capital structure[22], determined by the trade-off between the positive and negative effects of debt. If Cermaq does have a less than ideal debt ratio, then the peer group must on an average have a close-to-optimal capital structure if it is going to impact the relative performance negatively. If we divide the peer group into three brackets (high, medium and low) based on the debt ratio, we see that the largest and perhaps most comparable companies in terms of size, type of business and maturity are found together with Cermaq in the bracket with the lowest debt ratio. Based on these observations, Cermaq seems to have a reasonable capital structure and since firm specific characteristics will impact the optimal level of debt, this will probably justify a lower leverage ratio. Furthermore, both the average and median debt-to-equity ratio seem to display a downward

[22] Based on the acknowledged theory by Miller & Modigliani (1958), firm value is unaffected by the leverage ratio since the intrinsic firm value is determined by its assets and the fact that all financing activities have an NPV equal to zero. However, this theory is derived upon a set of assumptions (for example neutral taxation and no bankruptcy costs) that does not hold empirically. In fact, the violation of two of these assumptions has become known as the classic tradeoff theory of debt, the tradeoff being value added from tax shield (and reduced agency costs) versus bankruptcy costs that are both positively correlated with the leverage ratio. This trade off determines the optimal capital structure. As leveraging the company increases the risk of default, the negative effects of debt will at a certain point outweigh the positive effects. Since we assume that capital markets are efficient, this will be reflected in the market price/share price.

trend, approaching Cermaq's leverage ratio. We would therefore not expect our results to be biased in either direction. See Appendix 9.

As a closing remark on capital structure, it is also worth mentioning that companies with unusual debt values may have artificially volatile or stable Tobin's Q multiples. If the amount of debt is small, then the multiple will fluctuate with the market cap, displaying a correspondingly volatile pattern. If the amount of debt on the other hand is extensive, then Tobin's Q is likely to be artificially stable, as fluctuations in market value only will have a limited effect. However, this will not apply to the companies in our peer group.

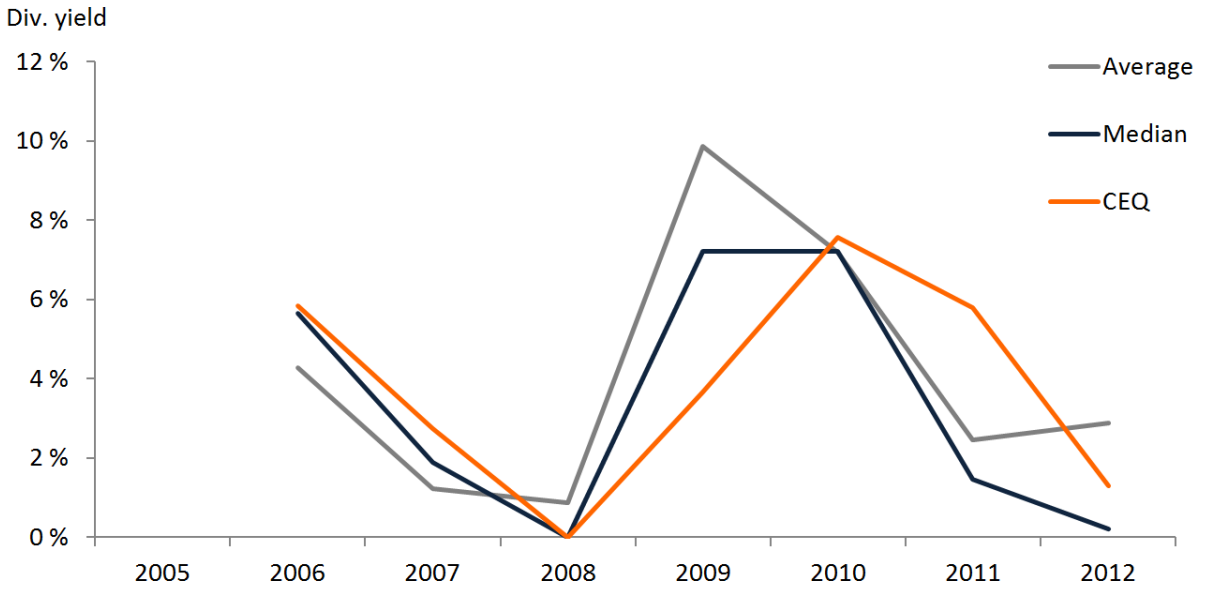
Another topic closely related to capital structure is the company's dividend payments. Dividend payments have proven to be a sweetener making shares with high dividend yields and payout ratios more attractive, and hence increasing market capitalization[23]. In this context we are interested in whether the dividend policy of Cermaq is systematically different from that of the other companies within the peer group. We have analyzed each company's dividend policy in terms of both payout ratio and dividend yield.

Historically Cermaq has been roughly in line with the median in terms of payout ratio. During 2011 and 2012 however, Cermaq has paid out a significantly larger percentage of net profits. This can possibly be explained by the fact that the board in December 2010 revised the company's dividend policy, raising the targeted payout ratio from 30 percent to a range of 30-50 percent. However, looking at the annual payout ratio in an industry as cyclical as fish farming can be quite deceiving, as profits are likely to be volatile, resulting in discontinuous dividend payments. Looking at accumulated dividend payments, as a percentage of net total profits Cermaq is in line with the median, having distributed 39.2 percent.

The dividend yield is perhaps a more reliable benchmark since it is measured against the current share price. Figure 5 plots the dividend yield of Cermaq against the peer group. A complete overview of dividend policies is provided in Appendix 10.

[23] Companies controlled by John Fredriksen are often known for their generous dividend policy, paying out unnecessary equity as dividends and financing operations through extensive lending.

Figure 5: Dividend Yield



Note: Dividend yield for companies within Cermaq's peer group. The dividend yield is calculated as annual (total) dividend payments divided by the average market value (average of opening and closing market value of the company's equity). The average is calculated based on all companies, except CEQ.

All in all, peers seem to be quite evenly distributed around Cermaq in terms of dividend payments. This leads us to believe that Cermaq's dividend policy will not affect our results, as the company does not stand out in any particular direction. In a similar way, arguments relating to the disciplining effect of dividend payments will be irrelevant, as Cermaq's dividend payments are normal.

5.4 Liquidity

With government ownership often being of a certain magnitude, it will possibly affect the turnover rate as the number of free floating[24] shares decreases. A lower turnover rate can in turn affect the market capitalization because the share becomes less liquid (Bøhren, 2005). Illiquid shares are usually trading at a discount, reflecting the fact that the investment cannot easily be sold at a competitive market price. However, concentrated long-term ownership does not necessarily have to affect the turnover rate, as trade in the remaining shares may pick up.

[24] The number of free floating shares is calculated by comparing the shares readily available in the market relative to the total amount of shares outstanding.

What we are trying to say is that illiquid companies may have an artificially low Tobin's Q, as the market value component is traded at a discount that does not necessarily reflect underlying performance. Looking at the annualized turnover rate[25] provided by the Oslo Stock Exchange, the degree of ownership concentration and turnover seem to be negatively correlated[26], meaning that companies controlled by one large owner will have a low turnover rate. In that sense, Cermaq is surprisingly liquid with a turnover rate in 2013 of 64.6 percent, a sign that government ownership does not affect the turnover negatively compared to other companies in the industry. However, the observed rate may be biased by unusually high turnover in association with the rally following Marine Harvests acquisition attempt, and the government increasing its ownership. But the turnover rate for other companies is likely to be biased in the same direction[27], as they have been part of a rallying Seafood Index. Measures of turnover are summarized in Table 9.

Table 9: Turnover Measures for Cermaq and Peers

Company	Mcap	Daily turnover	Ann. Turnover	Largest owner
MHG	26 029	108,8	124,6 %	23,1 %
COP	4 756	1,5	119,2 %	32,7 %
BAKKA	4 141	0,7	64,6 %	25,2 %
CEQ	**9 805**	**11,0**	**64,6 %**	**56,7 %**
GSF	1 998	0,7	62,3 %	50,0 %
SALM	8 225	0,7	50,6 %	53,4 %
NRS	1 372	0,1	38,0 %	14,5 %
AUSS	7 541	2,1	22,2 %	55,6 %
LSG	9 765	2,0	15,7 %	62,6 %
SSC	634	0,0	9,2 %	69,1 %
HFISK	558	0,1	3,7 %	73,3 %

Note: Measures describing the daily and annual turnover for CEQ and peers, sorted by turnover rate. Mcap and daily turnover is measured in NOK million, Largest owner is the ownership share of the largest shareholder as of 31.10.2013. Both daily turnover and annual turnover rate has been gathered from Oslo Stock Exchange.

[25] The annual turnover rate is calculated as the number of shares traded so far this year (annualized) as a percentage of the number of registered shares (as of 11. November 2013).
[26] Testing the relationship in Stata we find a negative correlation of 0.66. A regression using only turnover and largest shareholder displays a significant negative effect of ownership concentration (Coefficient of -1.37 with a t-value -2.68 and a constant of 1.17).
[27] Marine Harvest acquired more than 25 percent of the shares in Grieg Seafood in November 2013, and China Fishery Group bought all outstanding shares in Copeinca.

Liquidity will only impact our results if a low turnover rate has resulted in a lower market capitalization. As Cermaq is among the largest seafood companies on the Oslo Stock Exchange and seem to have a turnover rate that is among the best within its peer group, we conclude that liquidity is no issue and that our results in this respect should be reliable.

5.5 Incentive Schemes

In the aftermath of the financial crisis, remuneration of executive managers has been devoted much attention, and the government has urged companies to show moderation concerning this matter, especially those being publically owned. If this means that companies such as Cermaq are obstructed from offering executive managers and other key personnel competitive conditions, they risk (i) not getting hold of qualified employees, and (ii) not properly incentivizing current management. In order to discuss potential differences, we have studied the four largest companies measured in terms of market capitalization: Marine Harvest, Cermaq, Lerøy and SalMar.

Looking at the fixed annual salary, Cermaq is the company that pays the lowest compensation. But in order to get a sense of how different the respective remuneration-policies really are[28], we turn to the information that the companies have disclosed in their annual reports. Table 10 summarizes these differences while a complete overview is provided in Appendix 11.

Table 10: Executive Remuneration Policies

Company	Ann. bonus	Bonus limit	Option scheme	Share-program	Severance limit	Basic salary	Cash bonus	
							NOK	%
CEQ	**Yes**	**30 %**	**Yes**	**No**	**n/a**	**2 485**	**0**	**0,0 %**
MHG	Yes	30-50 %	Yes	Yes	n/a	4 750	1 563	32,9 %
LSG	Yes	100 %	No	n/a	24 mo.	2 772	1 400	50,5 %
SALM	Yes	50 %	Yes	Yes	6-12 mo.	2 917	250	8,6 %

Note: Policies regarding executive remuneration for CEQ, MHG, LSG and SALM. Bonus limit is the maximum cash bonus, measured as a percentage of the annual base salary. Option scheme is whether the company practices option programs where executive managers are given options. The same analogy goes for share programs. Severance limit is the maximum amount which can be given as severance payment, measured as the normal monthly salary. All numbers are gathered from the respective 2012 Annual Reports.

[28] These figures are gathered from the 2012 annual reports and the CEO of Cermaq, Jon Hindar, did not take office until the 19th of March that year. The base salaries in both Lerøy (+12%) and Salmar (+17%) are roughly in line with Cermaq, but we will not read too much into this as the figure for Cermaq likely is biased.

Most striking is the difference with regards to limitations on the cash bonus. While Lerøy can pay an annual performance-based bonus equal to 100 percent of the fixed salary, Cermaq on the other hand, can only pay a bonus constituting maximum 30 percent. In Marine Harvest, executive managers may through a share price based scheme receive an annual total bonus, accounting for as much as 200 percent of their annual fixed salary. SalMar has a more similar policy, but the tendency is that Cermaq offers less generous remuneration-terms than its competitors. This becomes even more evident as we consider the fact that Cermaq utilizes few option schemes and no share based remuneration

Variations in performance-based compensation mean that we quite possibly have managers that are not equally incentivized. This would imply that Cermaq, due to its less lucrative bonus scheme, should perform worse than its competitors. But incentive schemes may also have less fortunate effects such as risk-taking, and this must be considered when evaluating the different remuneration policies.

We know that the government will try to act as a professional owner, letting the management and the board run the company. This being said, there are several examples of the government intervening when the company's actions are in violation with their guidelines. This was the case when Cermaq was attempted acquired by Marine Harvest previously this year[29].

It is obvious why managers in publically owned companies generally would want to follow the guidelines laid down by the government. Too much negative publicity may result in a loss of reputation, but perhaps more importantly the loss of focus, which will impact daily operations. The possible negative effects resulting from Cermaq's executive remuneration policy, will likely have been influenced by the government and may have impacted performance.

[29] In connection with the sale of EWOS, the group management was given success-based stay-onboard bonuses equaling 6 months' salary. This bonus came in addition to the ordinary annual bonus of 30 percent of annual salary, bringing the potential bonus for 2013 to a maximum of 80 percent. This conflicted with the government's guidelines, and to make matters worse, the government was not informed. Consulting with their own legal advisors, the company had decided that it was not necessary to inform the shareholders about this extraordinary bonus at the general meeting.

5.6 Limitations

In working with this paper, we have noticed how complex the issue of different ownership identities is. There are countless unobservable time fixed effects, which could have been accounted for using a Fixed Effects model. However, since the government ownership share is constant throughout the whole period this is no option, but we recognize that this could have improved the quality and accuracy of our results.

Furthermore, the identity of owners is not as clear-cut as we have portrayed it in this paper. We have used a relatively simple classification framework, and this means that a specific owner appearing to be of a certain type could have been given a different classification. But it is hard to defend a complex classification with a limited number of observations. An example is Austevoll Seafood, which is 55.6 percent owned by Laco AS. This may at a first sight seem like a financial owner, but as we investigate further we come to realize that LACO is the private investment company of the Møgster family. This means that LACO in our classification framework has been classified as individual, while one could also argue that it is financial owner.

In our paper we have only measured insider holdings as shares held my members of management and the board. The Oslo Stock Exchange operates with a much broader definition, comprising accountants, legal and financial advisors, firms with representatives on the board etc. This is another simplification that may have affected our results, and could have been solved by looking at mandatory notifications of trade. An example is once again Austevoll, which because of its ownership is an insider in Lerøy Seafood Group, under the label "Firms represented on the board".

Another weakness is the fact that ownership can be distributed over several different shareholdings in the same company. Investors may have numerous reasons for disguising the real extent of their ownership, and investing through several different companies mean that ownership is more concentrated than it would appear. Investors may also hold shares through nominee accounts, meaning that an investment bank will be listed as the owner of these shares.

It is a chance that capital markets may overreact, referred to as noise. This is a weakness in empirical studies that are using market values. One can also imagine a situation where it is

the share price that determines the identity of the largest shareholder, not the other way around.

5.7 Suggestions for Future Research

Common for all previous studies on government ownership, is that it takes on the shareholder perspective. We have argued that it would have been ideal to study this issue from a broader social economic perspective, and this is an interesting basis for future research. Such a study could provide much needed empirical evidence on how government ownership affects the society as a whole, taking several aspects, externalities and stakeholders into account when measuring the effects.

Earlier research generally investigates the effects of government ownership through more comprehensive corporate governance studies. We have tried to go as in-depth as possible, by focusing on only one publically owned company in one industry. This means that it is possible to perform the same kind of study in different industries, perhaps focusing on a sector which the government is even more attached to and likely to conduct an active ownership policy in.

It could also be interesting to empirically study how government ownership is exercised in different countries. It would be preferable to look at comparable countries, with somewhat similar attitudes towards ownership – for example the Scandinavian countries.

Finally, we have only studied the effects of government ownership after the company was listed. It could therefore have been interesting to look closer at the process of privatization, studying effects pre- and post-listing. Being a wholly owned public company is very different from being exposed to market competition, and by looking at the effects of such a listing, one could get a clear indication of how these different ownership structures affect performance.

6. Conclusion

In this paper we have empirically investigated the effects of government ownership on financial performance. We have done this by examining two different performance measures, namely Tobin's Q and the return on assets, for the period of 2005-2012. Our research is based on quarterly data from 11 different seafood companies listed on the Oslo Stock Exchange.

We run a Random Effects model and our results do not indicate that government ownership has any significant effect on performance. When dividing into different time intervals, based on business cycles, we see that government ownership will have a positive effect on return on assets during down-cycles. As theory suggests a negative relationship between government ownership and performance, our results indicate that The Ministry of Trade and Industry through its ownership in Cermaq have been successful at conducting a hands-off policy in line with what they have stated in the 2012 State Ownership Report. We cannot predict how government ownership will influence performance in other industries, but within aquaculture we can conclude that there will not be any difference associated with being publically owned.

Since we started writing this paper the Norwegian people has elected a new government, which supposedly is more restrictive in its attitude towards government ownership. If the new government chooses to reduce its shareholdings in certain companies, it will be interesting to study the observed effect on financial performance. This kind of study could provide additional understanding on the effects of government ownership.

Appendices

Appendix 1: Definitions and Vocabulary

In the following we have supplied a brief explanation of some of the words and phrases used in this paper. We assume that this vocabulary will be well-known to the average reader, and it is only included for pedagogical purposes. Definitions are freely reproduced, using Investopedia as the primary source.

A-shares and B-shares: Securities can be issued in different formats and may have different characteristics. The most common distinction is that between *A-shares*, which have voting rights and *B-shares*, which typically have no voting rights.

Asset substitution: Asset substitution occurs when the management is incentivized to take on risk, while having limited exposure to the downside. The company exchanges its low-risk assets (typically cash) for high-risk investments and this transfers value from the bondholders to the shareholders.

Autocorrelation: This occurs if observations over time are dependent on previous observations, and is a common problem when studying time series.

Causality: Causality refers to situations where one event is caused by a second effect, hence the event can be understood as a consequence.

Controlling minority: A controlling minority controls no less than one third of the company and can block decisions that require 2/3 of the votes at the general meeting.

Corporate Governance: Corporate governance is related to how investors may protect their invested capital. The quality of the current corporate governance is determined by the statutory shareholder protection and characteristics of several government mechanisms, such as insider ownership, ownership concentration and financial policy.

Corporate Social Responsibility (CSR): CSR relates to the corporate initiative to assess and take responsibility for the company's effects on the environment and impact on social welfare. It is usually not used to describe efforts that are required by law.

Debt-to-Equity Ratio: This is a measure of the company's financial leverage, and indicates the proportion of debt to equity. A ratio of for example 3:1 means that the company is financed with 3 dollars of debt for every dollar of equity.

EBIT-margin: The EBIT-margin is the company's operating income measured as a percentage of revenues. The company's Earnings Before Interest and Taxes (EBIT) is a well-suited measure for comparing companies, mainly because it does not take into account how the company is financed.

Endogeniety: Endogeniety arises when explanatory variables in the regression are correlated with the error term (*the remainder term*).

Entrenchment effect: Describing the entrenchment effect we find it best to cite Shleifer and Vishny (1989): *"By making manager-specific investments, managers can reduce the probability of being replaced, extract higher wages and larger perquisites from shareholders, and obtain more latitude in determining corporate strategy."*

Fish farming: Is the main form of aquaculture, where fish is bred in tanks or enclosures. This reduces problems related to overfishing, but disease outbreaks may represent a threat to the wild stock.

Follow or explain principle: Publically owned companies are expected to either follow the guidelines laid out by the government, or on their own initiative explain why they have deviated from them.

Free Cash Flow: The free cash flow is the cash flow available to all stakeholders, including both shareholders and creditors. It is calculated as the tax-adjusted operating profit before depreciation and amortization (EBITDA) subtracted capital expenditure (CAPEX) and net change in working capital.

Free cash flow problem: This problem arises when the free cash flow is large, and the management is tempted to invest in projects that have a return that is less than the investor's required return, meaning the return of the best alternative investment.

Free floating shares: The number of free-floating shares is calculated as shares readily available in the market as a percentage of total shares outstanding. This will serve as a measure of how liquid the company is.

Free rider problem: The free rider problem describes a situation where some individuals either consume more than their fair share of a common resource, or pay less than their share of the cost. Considering corporate governance, this relates to the fact that investors holding a small ownership share will not have the necessary incentives for carrying out active monitoring, but will benefit from the fact that larger investors do.

Hedge fund: A hedge fund is a certain type of fund, which aggressively manages its portfolio of investments. In order to generate high returns, a hedge fund utilizes advanced investment strategies such as levered, long, short and derivative positions.

Herfindahl index: Most commonly used as a measure of ownership concentration. It is calculated as the sum of the squared ownerships of all stockholders in a company.

Heteroskedasticity: Means that two variables are different and is within econometrics used to describe whether the error term is constant or varies with observations.

IFRS accounting standard: International Financial Reporting Standards (IFRS) is a common international accounting standard dictating how different items should be treated in the financial statement.

Insider: An insider is anyone who possesses more information about a specific company than the rest of the capital market. Primary insiders are usually members of management and the board of directors, but other insiders may include lawyers, financial consultants etc.

Interpolating: Interpolating is a method of estimating unknown observations in between two observed values. One could increase the dataset by assuming a linear relationship between the two observed values.

Intrinsic value: An asset's intrinsic value represents its actual (underlying) value. This value can be different than the market value and investors can earn a return by identifying companies that are not correctly priced.

Leverage ratio: There are several different ratios used when addressing a company's capital structure. Leverage ratio usually refers to the ratio between debt and total assets, interpreted as the amount of debt that is used to finance the company's assets.

Market efficiency: There are different degrees of market efficiency, depending on how much information that is reflected in the share price. Different theories claim that financial market efficiency is weak, semi-strong or strong.

Market failure: Market failure is defined as a situation where the quantity of a product demanded by the consumers does not equal the quantity supplied by producers. Hence, the free market cannot provide an efficient allocation of goods and services. Market failure is a reason for government intervention.

Minority interest: A minority interest in a company is a significant but non-controlling ownership of less than 50 percent of a company's voting shares. These shares can be held either by a private investor or another company.

Moral hazard: A concept closely related to the principal agent problem. It revolves around the fact that a party to a transaction knows very little about the incentives of the other party. The risk is that this party has not entered into the contract in good faith, has provided misleading information or has an incentive to take unnecessary risks.

Multicollinearity: This is the case if two or more of the explanatory variables in a regression are highly correlated. This may cause unreliable results that may seem strange when looking at the variables individually.

NBIM: Norges Bank Investment Management (NBIM) is the asset management unit of the Norwegian central bank. It is responsible for managing the Government Pension Fund Global, which currently has a market value close to NOK 5,000 billion, in addition to most of the central bank's foreign exchange reserves.

Pension fund Established by an employer in order to organize the investment of retirement funds. The fund is meant to generate stable growth and has a long time-horizon, providing pensions for employees when they reach retirement.

Principal-Agent Relationship: This relates to an arrangement where one entity legally appoints another to act on its behalf. In a business setting, the agent will typically be the company's management while the principal are the shareholders. The relationship is determined using written contracts, so that the agent will act in the principal's best interest.

Private Equity fund: A private equity fund uses a cash pool raised from retail- and institutional investors to invest directly into companies. This is done in several ways with direct investments in private companies and leveraged buyouts of listed companies being among the most common. The time horizon of such an investment is typically 4-7 years, after which the target either is sold off or (re)listed.

Risk aversion: This relates to how willing an investor is to take on risk. We usually distinguish between three different degrees of risk tolerance: A *risk averse* investor will, when faced with two investments with a similar expected return, prefer the one with the lower risk. A *risk loving* investor is willing to take on additional risk for an investment that has a relatively low expected return. Finally, a *risk neutral* investor is indifferent if investments have the same expected return.

Spillover effects: Spillover effects can be thought of as externalities of economic activity, and in our case it is associated with international owners that potentially could bring with them for example advanced technology.

Strategic ownership: Related to ownership by other companies, which through the ownership seek to secure some sort of competitive advantage. This can be related to benefits such as cost reductions through strategic alliances or diversification.

Turnover Rate: The turnover rate is the number of shares traded annually, as a percentage of all outstanding shares. It will be a good indicator of the company's liquidity, but should be seen in connection with the number of free-floating shares.

Appendix 2: Peer Group

In the following we have provided a brief description of the companies in the peer group:

Marine Harvest (MHG):

Marine Harvest is the world's largest farmer of Atlantic salmon, supplying 25% of the global harvesting volume. The company has operations in 18 countries and is by far the largest seafood company in terms of market value, being priced at NOK 26,029 million.

Lerøy Seafood (LSG):

Lerøy Seafood Group is engaged in both farming and processing of salmon, trout and some other species. The Group has subsidiaries in several European countries and is an important player within the aquaculture industry. The company's market capitalization of NOK 9,765 million is fairly similar to that of Cermaq.

SalMar (SALM):

SalMar focuses on the production of Atlantic salmon and has a large harvesting and value adding processing facility in Norway where the company also is headquartered. The company is also engaged in operations outside Norway, with ownership in Bakkafrost and fish farms in Scotland. In terms of size, the company has a market capitalization of NOK 8,057 million.

Norway Royal Salmon (NRS):

Norway Royal Salmon has operations ranging from smolt production to harvesting. The company operates in Norway where it currently holds 25 licenses for farming of salmon. Through an in-house sales organization SalMar supplies salmon to 50 countries.

Austevoll Seafood (AUSS):

Austevoll Seafood is among the world's largest producers of fishmeal and fish oil. In addition, the company is engaged in farming and processing activities in several countries. Austevoll currently holds 125 salmon farming licenses in Norwa, and has a market capitalization of NOK 7,075 million.

Grieg Seafood (GSF):

Grieg Seafood is an integrated aquaculture company headquartered in Bergen, with operations in Norway, Canada and the UK. The company focuses on farming and processing of salmon and trout, and has a market capitalization of NOK 1,998 million.

Bakkafrost (BAKKA):

Bakkafrost is vertically integrated seafood company and is engaged in all stages of the value chain, from the production of fish feed and farming to value added products. The company is located on the Faroe Islands and has market capitalization of NOK 4,336 million.

Havfisk (HFISK):

Havfisk is a harvesting company with several vessels operating in Norwegian coastal territories. Neither being engaged in fish feed or harvesting, Havfisk is not among the most comparable companies, but we believe it will provide the peer group with some much needed diversity, as companies engaged in fish farming are overrepresented. As Cermaq up until now mainly has been a fish feed company, this could possibly provide us with more reliable results. Havfisk is among the smallest companies on the Oslo Seafood Index, with a market capitalization of no more than NOK 685 million.

Scottish Salmon Company (SSC):

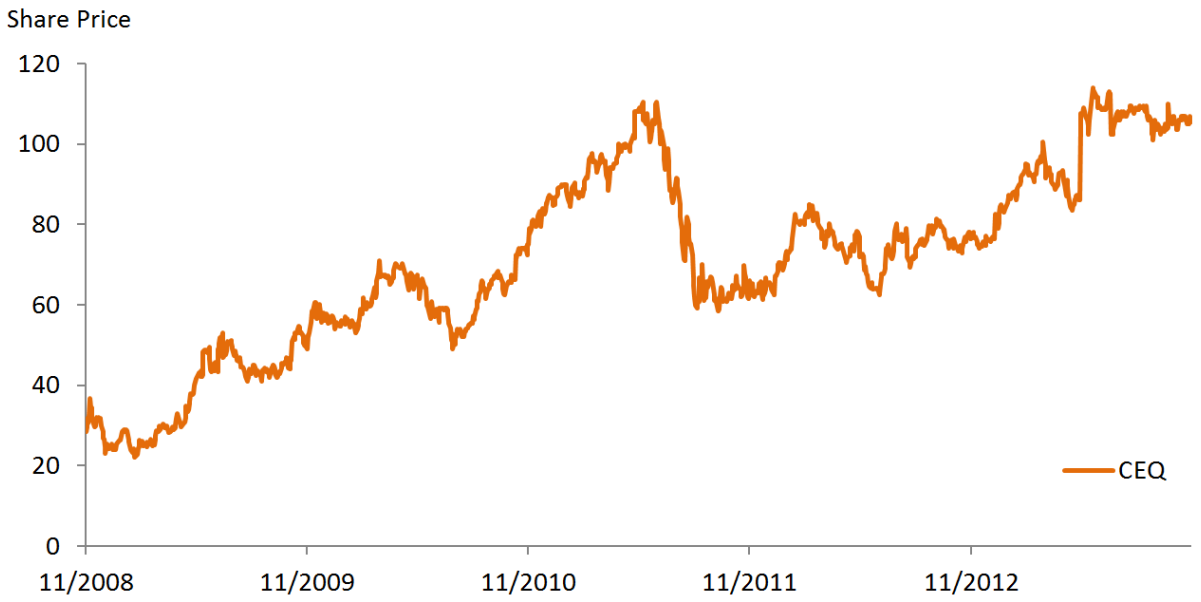
Scottish Salmon Company is the leading producer of Scottish salmon and accounts for more than 20 percent of the total Scottish salmon production. The company operates more than 40 fish farms and has a market capitalization of NOK 689 million.

Copeinca (COP):

Copeinca is a Peruvian producer of fishmeal and fish oil. The company is closely related to Cermaq in terms of operations, but being located in Peru the Copeinca the business climate is different. The companyis listed on Oslo Stock Exchange and has a market capitalization of NOK 4,756 million.

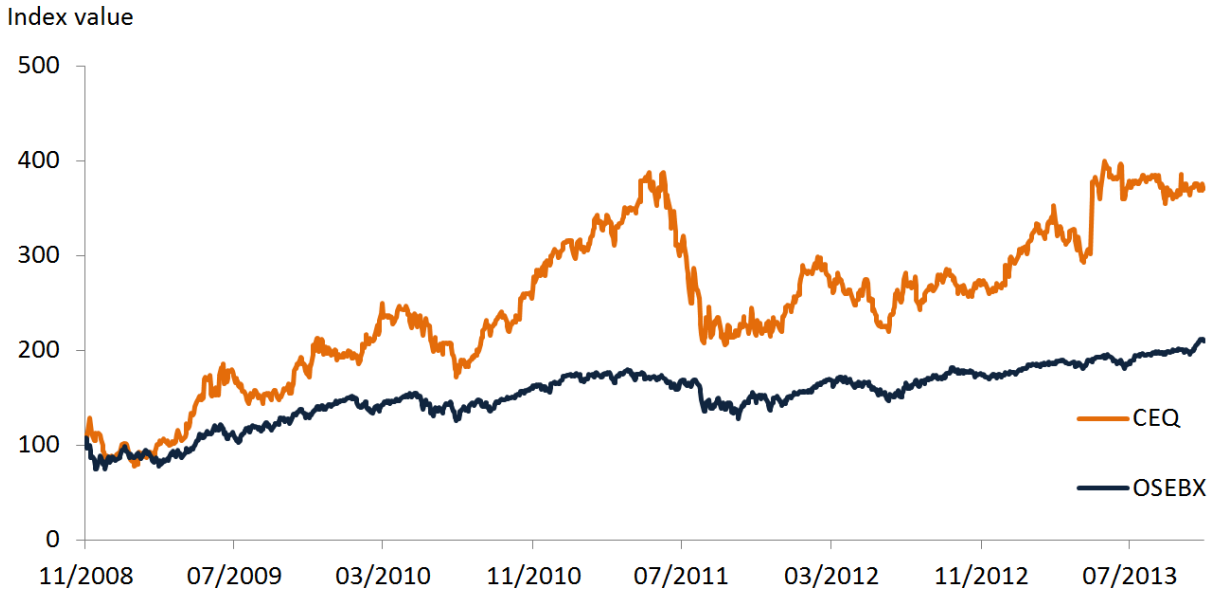
Appendix 3: Share Performance

Figure A2.1: CEQ Share Performance



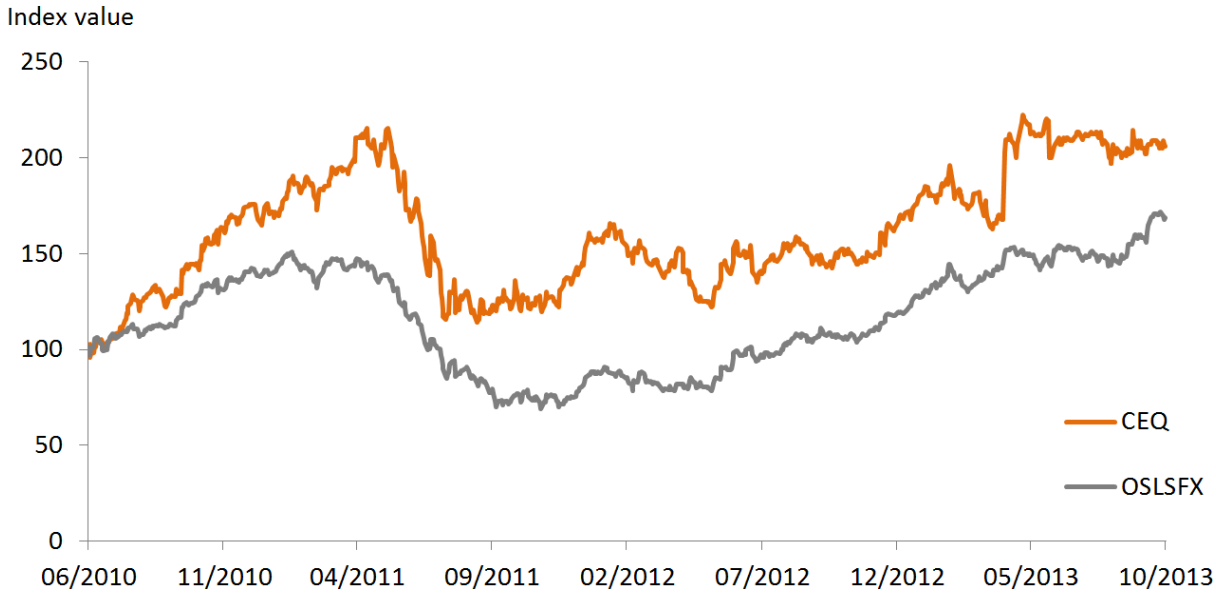
Note: CEQ's absolute share performance from 03.11.2008 until 03.11.2013. Quotes are obtained from Oslo Stock Exchange.

Figure A2.2: Cermaq vs. Oslo Stock Exchange Benchmark Index (OSEBX)



Note: CEQ's share performance versus Oslo Stock Exchange Benchmark Index, rebased at 100 as of 01.11.2008. OSEBX is an investable index consisting of a representative sample of all shares listed on the Oslo Stock Exchange. OSEBX is revised 01.12 and 01.06 each year and is adjusted for free-floating shares and dividends.

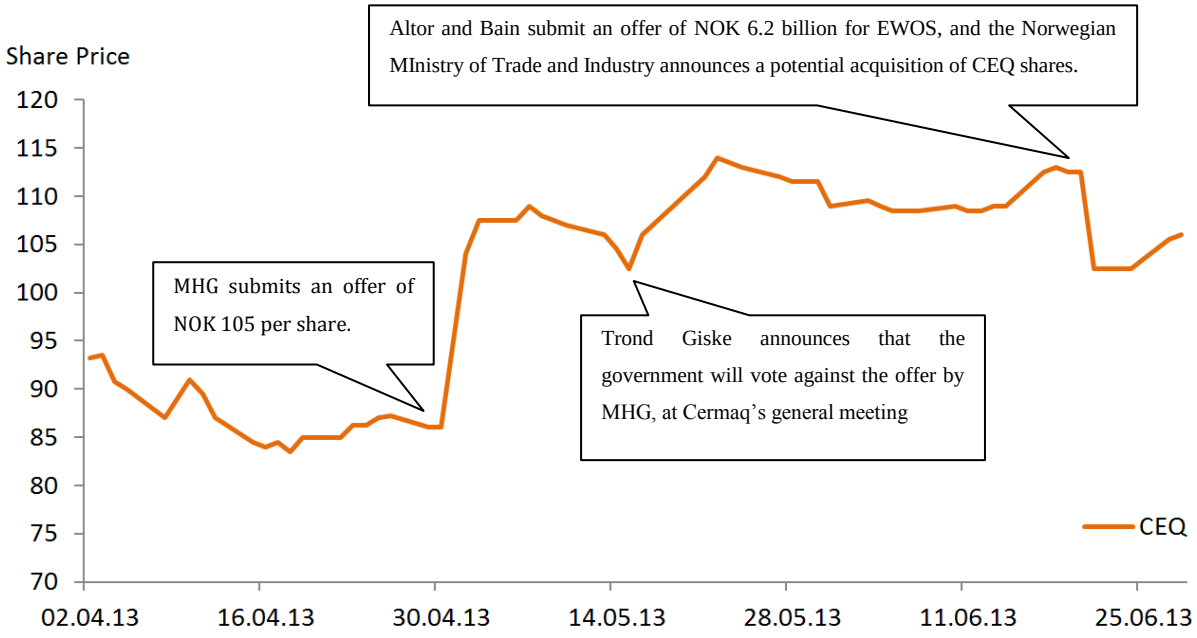
Figure A2.3: Cermaq vs. Oslo Seafood Index (OSLSFX)



Note: CEQ's share performance versus Oslo Seafood Index, rebased at 100 as of 26.06.2010. OSLSFX consists as of 01.11.13 of 14 companies operating within the seafood sector: AKVA Group (AKVA), Austevoll Seafood (AUSS), Bakkafrost (BAKKA), Cermaq (CEQ), Domstin (DOM), Grieg Seafood (GSF), Hofseth BioCare (HBC), Havfisk (HFISK), Learøy Seafood Group (LSG), Marine Harvest (MHG), Norway Royal Salmon (NRS), SalMar (SALM), The Scottish Salmon Company (SSC) and Sølvtrans (STRANS). The index includes listings on Oslo Stock Exchange and Oslo Axess and is adjusted for company-specific events and dividends on a daily basis.

Appendix 4: Case Study

Figure A3.1: CEQ Share Performance in the Period of 01.04.13-30.06.13



Summary and Timeline

On the 30th of April 2013, Marine Harvest announced an offer to acquire all outstanding shares in Cermaq. This marked the beginning of a couple of turbulent months resulting in Cermaq selling of its fish feed business (EWOS) to Altor and Bain Capital. We will in the following supply a brief, chronological overview of the entire process:

30.04 Marine Harvest offers NOK 105 per share in Cermaq with the purpose of "creating a global industry leader based upon a complete footprint along the Norwegian coast". The offer represents a 22% premium above the Cermaq closing price.

02.05 Cermaq's Board of Directors unanimously concludes that the bid by Marine Harvest does not reflect the values and synergies of the proposal, and urges shareholders to support the completion of the Copeinca process.

07.05 Marine Harvest sends an open letter to the Cermaq shareholders explaining their bid and why the Company thinks Copeinca would be a move in the wrong direction.

10.05 Cermaq sends an open letter to its shareholders, as a direct response to the letter sent by Marine Harvest, explaining why the Copeinca transaction is beneficial.

14.05 The minister of Trade and industry, Trond Giske, announces that the Government will vote in favor of the Copeinca transaction at the General Meeting on May 21st. He also states that the offer by Marine Harvest is to low, and that it would not be accepted.

21.05 The Annual General Meeting in Cermaq is held and the rights issue in order to finance the acquisition of Copeinca does not get the required 2/3 majority (only 62,5%).

23.05 The Board of Directors announces that the voluntary offer on all shares in Copeinca will not be completed.

31.05 Marine Harvest announces its final bid of NOK 107 per share and claims that it was prepared to raise the bid even more, but that it was not possible to receive support from Cermaq board and management. At the same time Cermaq announces that the discussions have been terminated. The board maintains its conclusion that the new offer significantly undervalues Cermaq. The Company engages additional financial advisors in order to evaluate other strategic options

06.06 The offer document for the voluntary offer by Marine Harvest is approved by the Oslo Stock Exchange.

10.06 Cermaq recommends against the voluntary offer by Marine Harvest, and urges shareholders to await potential alternative solutions.

17.06 Altor and Bain Capital submit an offer for EWOS, valuing the business at NOK 6.2 billion (enterprise value)

20.06 The Norwegian Ministry of Trade and Industry announces a potential purchase of shares in Cermaq through a reverse Dutch auction, possibly bringing the government's stake to a maximum of 65.0%.

21.06 Expiry of the offer period for the voluntary offer by Marine Harvest, with acceptance below the 33.4% set as a condition.

25.06 The Norwegian Ministry of Trade and Industry announces that it has bought 9.46 million shares at NOK 108, bringing its total holdings in Cermaq to 53.77%. Up to 5 million additional shares might be purchased in the market at the same price.

11.07 Extraordinary General Meeting: The General Meeting granted with more than 2/3 majority the Board of Directors the authorization to sell all or parts of the company's fish feed business EWOS.

18.07 Definite agreement for the sale of EWOS at an enterprise value of NOK 6.5 billion reached with Altor and Bain Capital.

Appendix 5: Ownership Classification

Ownership identities

The largest shareholder in each company at the end of a quarter, is divided into one out of five categories. We utilize an identification framework, provided by the Norwegian Statistical Agency, and published by Oslo VPS. The ownership structure of each single company within the peer group is found in the respective annual reports. In order to trace the identity of the different owners we have uses Oslo VPS Arena and forvalt.no.

Tabell A2.1: Ownership Classification Framework

Financial Ownership			
210	Commercial banks	*390*	Other financial enterprises
250	Savings banks	*410*	Life insurance / private pension funds
310	Credit companies	*470*	Non-life insurance companies
370	Finance companies	*490*	Financial auxiliaries
380	Mutual funds		
State Ownership			
110	Central government administration	*550*	Municipalities
111	Folketrygdfondet	*610*	Central government administration
112	Ministry of trade and industry	*630*	State-owned PLCs
113	Ministry of petroleum and energy	*635*	Government companies
190	Government lending institutions	*660*	Local government administration
510	Counties	*680*	Autonomous municipal enterprises
Individual Ownership			
30	Private Investment Companies	*810*	Households
790	Private unincorporated enterprises		
International Ownership			
900	International	*991*	Nominee accounts
990	International physical persons		
Non-financial Ownership			
710	Limited companies etc.	*760*	Quasi-corporate enterprises etc.
740	Private enterprise based non-profits	*770*	Private consumer based non-profits

The first category, *individual owners*, includes ownership through private investment companies and is applicable to several of our companies. Individual ownership comprises family ownership, which is common within this industry. The second category, *non-financial owners*, includes limited companies, quasi-corporate enterprises and non-profit organizations. This will usually relate to strategic ownership by other operational firms. The third category, *financial owners*, includes financial holding companies, banks, mutual funds etc. The fourth category, *international owners*, includes foreign investors and private investors owning shares through nominee accounts in an international registered investment bank. The final category, *state ownership*, includes ownership on both a national and municipal level. This means that state ownership can be organized in several ways. In our case, state ownership will only relate to ownership by The Norwegian Ministry of Trade and Industry.

Justifying the Classification

CEQ: The largest owner is, throughout the whole period, The Ministry of Trade and Industry, with a constant ownership share of 43.5 percent. Ownership is categorized as *state ownership*.

MHG: For the entire period, Geveran Trading Co., Ltd (GT) is the largest owner. GT is based in Limassol, Cyprus, and operated as a subsidiary of Greenwich Holdings Limited, which also is registered in Cyprus. Ownership is categorized as *international ownership*.

LSG: The largest investor was Profond AS for the period of 2005-2006. Profond AS is a subsidiary of Profond Holding AS, a private limited investment company owned exclusively by the Lerøy family. Since 2006, the largest owner has been Austevoll Seafood ASA, a strategic owner operating within the same industry. Ownership is categorized as *individual ownership* for the period of 2005-2006 and *non-financial ownership* since 2006.

SALM: Throughout the whole period, the largest owner in SalMar is Kverva AS. This is a private investment company belonging to the Witzøe family. Ownership is categorized as *individual ownership*.

NRS: Since 2008 the largest owner has been Gåsø Næringsutvikling AS. This company is owned by family members Helge Gåsø, Christine Gåsø and Amders Gåsø. Ownership is categorized as *individual ownership*.

AUSS: Owned by Laco AS, the Møgster family's private investment company. Ownership is categorized as *individual ownership*.

BAKKA: The largest shareholder in Bakkafrost is SalMar ASA. Ownership is categorized as *non-financial ownership*.

GSF: Grieg Seafood is majority owned by Grieg Holding AS, a private investment company belonging to the Grieg family. Ownership is categorized as *individual ownership*.

HFISK: In the period of 2005-2008 the largest shareholder was Aker Seafoods Holding AS, a financial holding company. From 2009-2011 the largest owner was Convert Capital Fund AS, an investment company owned by Aker ASA. Since 2012, the company has been majority owned by Aker ASA directly. Ownership is categorized as *financial ownership* throughout the whole period

SSC: SIX SIS AG has been the largest owner in SSC during the whole period. SIX SIS AG is a company registered in Switzerland and since SSC operates in Scotland, ownership is categorized as *international ownership*.

COP: Dyer Coriat Holding, the largest shareholder in Copeinca, is a private limited company belonging to the Peruvian Dyer Coriat family. With Copeinca itself being based in Peru, ownership is categorized as *individual ownership*.

Appendix 6: Correlation Matrix

Table A6.1: Correlation Matrix

	tobinsq	roa	insider	state	ind.	int.	fin.	non-fin.	hf	top1	top3	top5	ins.^2	State*t1	fin*t1	non*t1	ind*t1	int*t1	lnmcap
tobinsq	1,000																		
roa	0,448	1,000																	
insider	0,142	0,029	1,000																
state	0,097	0,057	-0,325	1,000															
individual	0,032	0,037	0,839	-0,357	1,000														
international	-0,061	-0,120	-0,336	-0,174	-0,364	1,000													
financial	-0,263	-0,164	-0,478	-0,146	-0,304	-0,149	1,000												
nonfinancial	0,145	0,150	-0,250	-0,184	-0,385	-0,188	-0,157	1,000											
hf	-0,280	-0,126	-0,034	-0,179	-0,041	-0,342	0,544	0,096	1,000										
top1	-0,247	-0,111	-0,009	-0,069	-0,029	-0,340	0,453	0,050	0,976	1,000									
top3	-0,278	-0,121	0,164	-0,161	0,060	-0,458	0,534	0,063	0,943	0,939	1,000								
top5	-0,235	-0,107	0,244	-0,204	0,122	-0,508	0,539	0,066	0,903	0,883	0,985	1,000							
insider^2	0,105	0,002	0,969	-0,265	0,725	-0,271	-0,226	-0,262	0,018	0,056	0,233	0,300	1,000						
state*top1	0,097	0,057	-0,325	1,000	-0,357	-0,174	-0,146	-0,184	-0,179	-0,069	-0,161	-0,204	-0,265	1,000					
fin*top1	-0,265	-0,161	-0,278	-0,145	-0,304	-0,148	0,999	-0,157	0,549	0,456	0,536	0,539	-0,226	-0,145	1,000				
non*top1	0,018	0,093	-0,270	-0,169	-0,353	-0,172	-0,144	0,917	0,272	0,232	0,194	0,171	-0,250	-0,169	-0,144	1,000			
ind*top1	0,050	0,033	0,810	-0,327	0,918	-0,334	-0,279	-0,353	0,143	0,206	0,241	0,269	0.7244	-0,327	-0,279	-0,324	1,000		
int*top1	-0,116	-0,143	-0,295	-0,153	-0,320	-0,879	-0,131	-0,165	-0,110	-0,117	-0,223	-0,265	-0,238	-0,153	-0,130	-0,151	-0,293	1,000	
lnmcap	0,452	0,251	-0,245	0,235	-0,175	-0,333	-0,504	0,115	-0,370	-0,248	-0,467	-0,546	-0,250	0,235	-0,506	0,143	-0,036	0,082	1,000

Note: Correlation Matrix explaining the correlation between all dependent-, independent- and interaction variables. Tobin's Q (market value of equity and debt/total assets), ROA (net income/average total assets), the identity of the company's largest shareholder, Herfindahl index (sum of squared ownership), and ownership of Top1, Top3 and Top5 largest shareholders. The insider squared is meant to pick up any nonlinear effects of insider ownership. The interaction variables are meant to revel the marginal effects of the different ownership identities. Ln mcap is the natural logarithm of the market value of equity measured in NOK million. Results are based on a group of companies, consisting of CEQ, MHG, LSG, SALM, NRS, AUSS, BAKKA, GSF, HFISK, SSC and COP.

Appendix 7: Impact of References and Measures

Table A7.1: RE-Model for Tobin's Q with Different Identities as Reference

	(Non-financial ref) Tobin's Q	(Financial ref) Tobin's Q	(International ref) Tobin's Q	(Individual ref) Tobin's Q
Hf	-0.084	-0.084	-0.084	-0.084
	(0.265)	(0.265)	(0.265)	(0.265)
Insider ownership	1.662***	1.662***	1.662***	1.662***
	(0.269)	(0.269)	(0.269)	(0.269)
Insider ownership^2	-0.624	-0.624	-0.624	-0.624
	(0.859)	(0.859)	(0.859)	(0.859)
State	0.318	-0.456***	-0.082	0.062
	(0.272)	(0.106)	(0.343)	(0.225)
Individual	0.256	-0.518**	-0.144	
	(0.162)	(0.209)	(0.411)	
International	0.401	-0.373		0.144
	(0.434)	(0.367)		(0.411)
Financial	0.774***		0.373	0.518**
	(0.238)		(0.367)	(0.209)
Lnmcap	0.338***	0.338***	0.338***	0.338***
	(0.052)	(0.052)	(0.052)	(0.052)
Non-financial		-0.774***	-0.401	-0.256
		(0.238)	(0.434)	(0.162)
Constant	-2.016***	-1.242***	-1.615***	-1.760***
	(0.571)	(0.415)	(0.615)	(0.498)
Observations	199	199	199	199
Adjusted R^2	0.188	0.188	0.188	0.188

Note: The dependent variable is Tobin's Q (market value equity and debt)/(tot assets). Regression 1: Non-financial owner as reference. Regression 2: Financial owner as reference. Regression 3: International owner as reference. Regression 4: Individual owner as reference. Explanatory variables: Hf (Herfindahl index is the sum of squared ownership shares for 20 largest shareholders), Insider ownership (shares held by members of management and the board/total shares outstanding), Insider ownership^2, Identity of largest shareholder, LnMcap (the natural logarithm of market cap measured in NOK million). Results are based on a group of companies, consisting of CEQ, MHG, LSG, SALM, NRS, AUSS, BAKKA, GSF, HFISK, SSC and COP. Standard errors in parentheses * $p < .10$, ** $p < .05$, *** $p < .01$

Table A7.2: RE-Model for ROA with Different Identities as Reference

	(Non-financial ref) ROA	(Financial ref) ROA	(International ref) ROA	(Individual ref) ROA
Hf	-0.024	-0.024	-0.024	-0.024
	(0.027)	(0.027)	(0.027)	(0.027)
Insider ownership	0.014	0.014	0.014	0.014
	(0.088)	(0.088)	(0.088)	(0.088)
Insider ownership^2	-0.011	-0.011	-0.011	-0.011
	(0.111)	(0.111)	(0.111)	(0.111)
State	-0.010	-0.008	0.014**	-0.002
	(0.008)	(0.011)	(0.006)	(0.015)
Individual	-0.008	-0.006	0.016	
	(0.019)	(0.016)	(0.018)	
International	-0.024**	-0.022		-0.016
	(0.012)	(0.017)		(0.018)
Financial	-0.002		0.022	0.006
	(0.010)		(0.017)	(0.016)
Lnmcap	0.008**	0.008**	0.008**	0.008**
	(0.003)	(0.003)	(0.003)	(0.003)
Non-financial		0.002	0.024**	0.008
		(0.010)	(0.012)	(0.019)
Constant	-0.035	-0.036	-0.059*	-0.042
	(0.033)	(0.025)	(0.034)	(0.036)
Observations	199	199	199	199
Adjusted R^2	0.057	0.057	0.057	0.057

Note: Dependent variable is return on assets (ROA) (net income)/(average total assets). Regression 1: Non-financial owner as reference. Regression 2: Financial owner as reference. Regression 3: International owner as reference. Regression 4: Individual owner as reference. Explanatory variables: Hf (Herfindahl index is the sum of squared ownership shares for 20 largest shareholders), Insider ownership (shares held by members of management and the board/total shares outstanding), Insider ownership^2, Identity of largest shareholder, LnMcap (the natural logarithm of market cap measured in NOK million). Results are based on a group of companies, consisting of CEQ, MHG, LSG, SALM, NRS, AUSS, BAKKA, GSF, HFISK, SSC and COP. Standard errors in parentheses * $p < .10$, ** $p < .05$, *** $p < .01$

Table A7.3 RE-Model (Tobin's Q) with Different Concentration Measures

	(1. HF) Tobin's Q	(2. Top 3 owners) Tobin's Q	(3. Top 5 owners) Tobin's Q
Hf	-0.084		
	(0.265)		
Top3ownership		-0.411	
		(0.326)	
Top5ownership			-0.260
			(0.332)
Insider ownership	1.662***	1.291***	1.477***
	(0.269)	(0.218)	(0.250)
Insider ownership^2	-0.624	0.099	-0.217
	(0.859)	(0.807)	(0.868)
State	0.318	0.234	0.274
	(0.272)	(0.254)	(0.246)
Individual	0.256	0.178	0.220
	(0.162)	(0.191)	(0.177)
International	0.401	0.315	0.355
	(0.434)	(0.456)	(0.440)
Financial	0.774***	0.782***	0.782***
	(0.238)	(0.222)	(0.233)
Lnmcap	0.338***	0.335***	0.338***
	(0.052)	(0.051)	(0.052)
Constant	-2.016***	-1.700***	-1.832***
	(0.571)	(0.588)	(0.634)
Observations	199	199	199
Adjusted R^2	0.188	0.213	0.195

Note: The dependent variable is Tobin's Q (market value equity and debt)/(tot assets). Regression 1: Non-financial owner as reference. Regression 2: Financial owner as reference. Regression 3: International owner as reference. Regression 4: Individual owner as reference. Explanatory variables: Hf (Herfindahl index is the sum of squared ownership shares for 20 largest shareholders), Ownership share of Top3 and Top5 largest shareholders, Insider ownership (shares held by members of management and the board/total shares outstanding), Insider ownership^2, Identity of largest shareholder, LnMcap (the natural logarithm of market cap measured in NOK million). Results are based on a group of companies, consisting of CEQ, MHG, LSG, SALM, NRS, AUSS, BAKKA, GSF, HFISK, SSC and COP. Standard errors in parentheses* $p < .10$, ** $p < .05$, *** $p < .01$

Appendix 8: Periodic Random Effects Model

Table A8.1: Cyclical RE-Model; Effects on Tobin's Q in Different Business Cycles

	(1) Tobin's Q, 2006-2008	(2) Tobin's Q, 2009-2011	(3) Tobin's Q, 2006-2011
Hf	-0.386	-0.348	0.021
	(0.745)	(0.594)	(0.260)
Insider ownership	1.688	-0.148	1.267**
	(2.958)	(0.882)	(0.531)
Insider ownership^2	0.266	0.797	0.249
	(4.550)	(1.190)	(0.970)
State	0.304	-0.265	0.010
	(0.703)	(0.511)	(0.503)
LnMcap	0.522***	0.260***	0.343***
	(0.073)	(0.039)	(0.029)
Constant	-3.390***	-0.800*	-1.778***
	(0.761)	(0.444)	(0.306)
Observations	51	84	132
Adjusted R^2	0.245	0.246	0.304

Note: Regression 1: peak to trough. Regression 2: trough to peak. Regression 3: peak to peak. The results for the dependent variableTobin's Q (market value of equity and debt/total assets) using all other owners as reference. Explanatory variables: Hf (Herfindahl index, sum of squared ownership top 20 owners) Insider ownership is measured as fraction shares owned by the board and management. The insider squared is meant to pick up any nonlinear effects of insider ownership. State is the only ownership identity variable. Ln mcap is the natural logarithm of the companies' market capitalization measured in million NOK. Results are based on a group of companies, consisting of CEQ, MHG, LSG, SALM, NRS, AUSS, BAKKA, GSF, HFISK, SSC and COP. Standard errors in parentheses: * $p < .10$, ** $p < .05$, *** $p < .01$

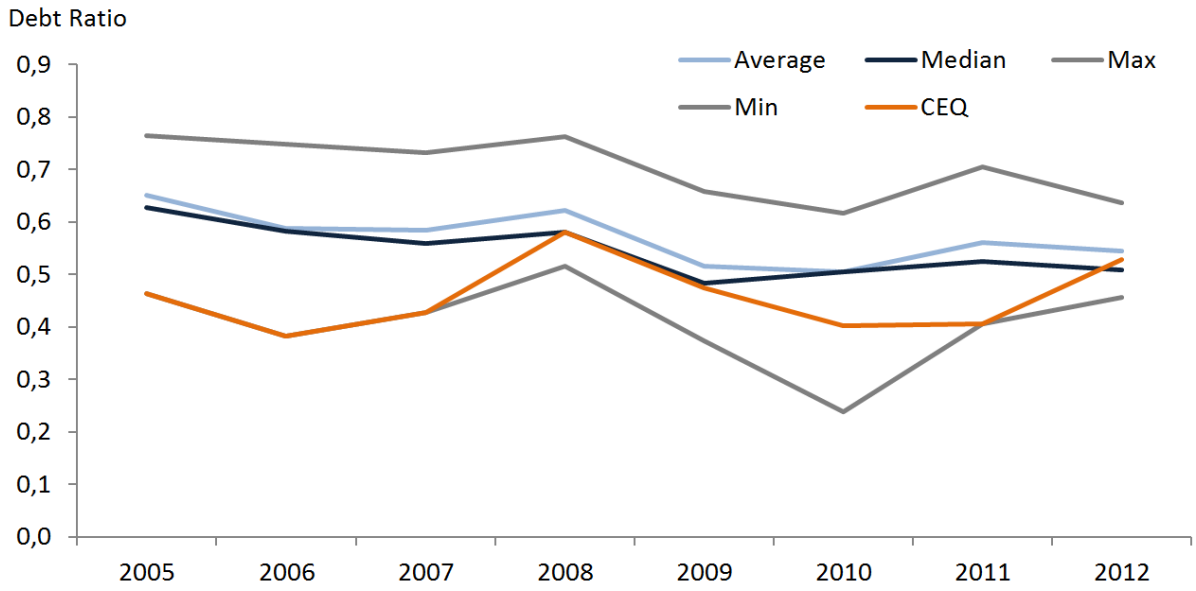
Table A8.2: Cyclical RE-Mode; Effects on ROA in Different Business Cycles

	(1) ROA, 2006-2008	(2) ROA, 2009-2011	(3) ROA 2006-2011
Hf	-0.040	-0.030	0.020
	(0.029)	(0.061)	(0.041)
Insider ownership	0.170***	-0.085	-0.041
	(0.060)	(0.128)	(0.086)
Insider ownership^2	-0.250**	0.184	0.055
	(0.103)	(0.199)	(0.150)
State	0.025***	-0.012	-0.016
	(0.009)	(0.029)	(0.032)
Lnmcap	-0.002	0.014**	0.017***
	(0.005)	(0.006)	(0.005)
Constant	0.022	-0.078	-0.122***
	(0.048)	(0.057)	(0.043)
Observations	51	84	132
Adjusted R^2	0.050	0.104	0.126

Note: Regression 1: peak to trough. Regression 2: trough to peak. Regression 3: peak to peak. The results for the dependent variable ROA (net income/average total assets) using all other owners as reference. Explanatory variables: Hf (Herfindahl index, sum of squared ownership top 20 owners) Insider ownership is measured as fraction shares owned by the board and management. The insider squared is meant to pick up any nonlinear effects of insider ownership. State is the only ownership identity variable. Ln mcap is the natural logarithm of the companies' market capitalization measured in million NOK. Results are based on a group of companies, consisting of CEQ, MHG, LSG, SALM, NRS, AUSS, BAKKA, GSF, HFISK, SSC and COP. Standard errors in parentheses: * $p < .10$, ** $p < .05$, *** $p < .01$

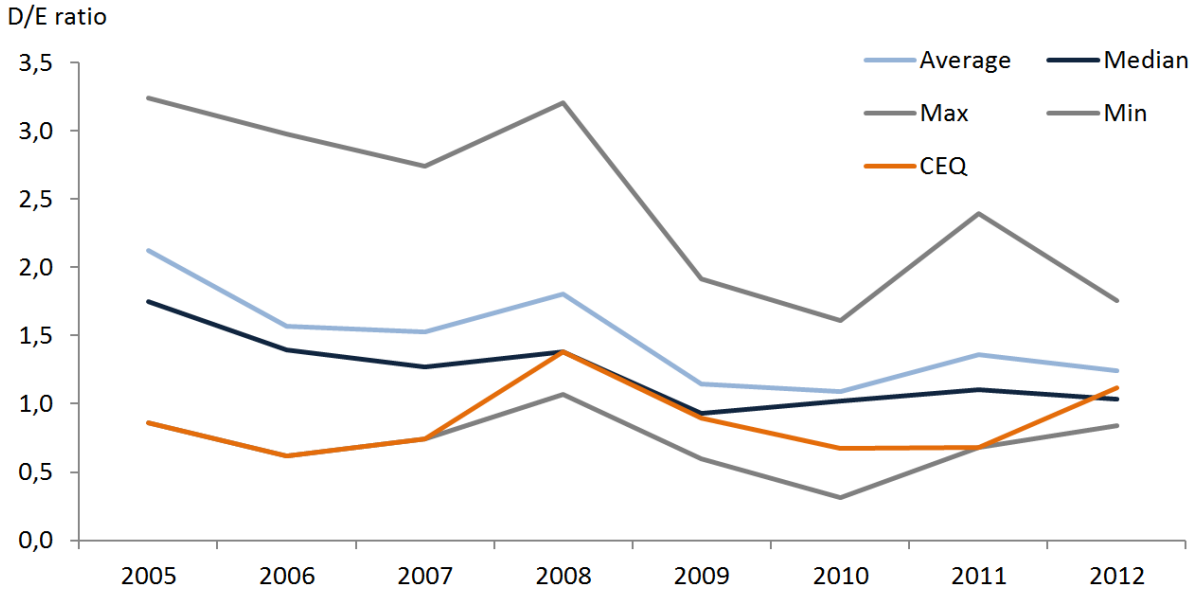
Appendix 9: Capital Structure

Figure A9.1: Debt Ratio



Note: The debt ratio is defined as the total book value of debt divided by the total assets, and can be understood as the share of the company's assets that is financed using debt. We have computed an average, including all companies except CEQ, as well as the max/min band displaying the variation. The median is based on all companies (including CEQ).

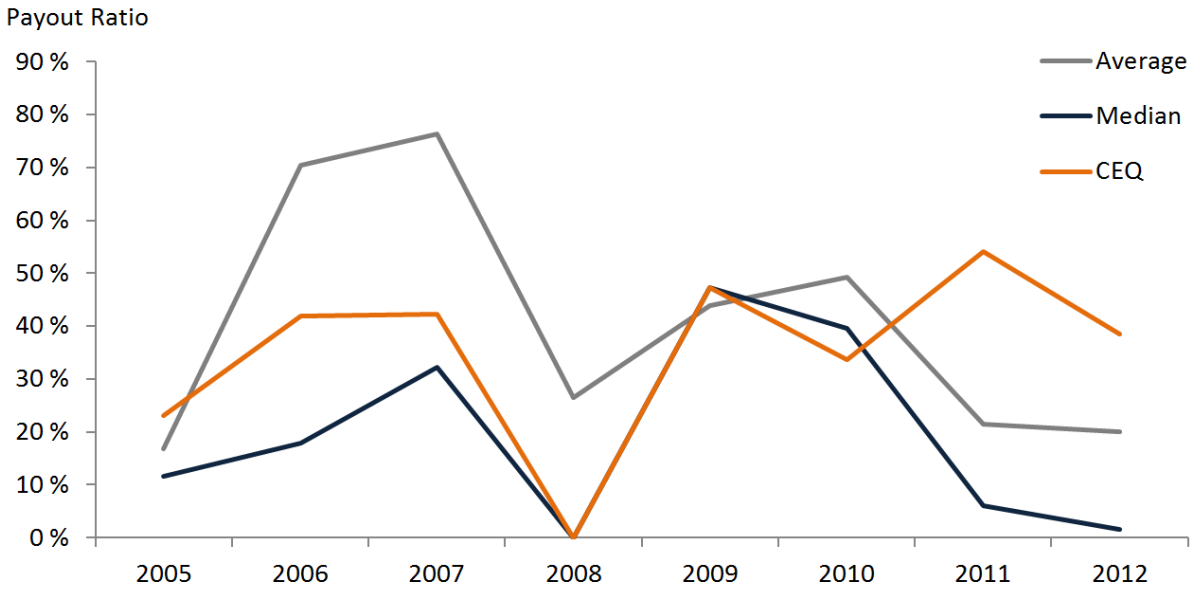
Figure A9.2: Debt-to-Equity Ratio



Note: The debt to equity ratio is defined as total book value of debt divided by stockholders equity and can be understood as the proportions of equity and debt the company uses to finance its assets. We have computed an average, including all companies except CEQ, as well as ta max/min band displaying the variation. The median is based on all companies (including CEQ).

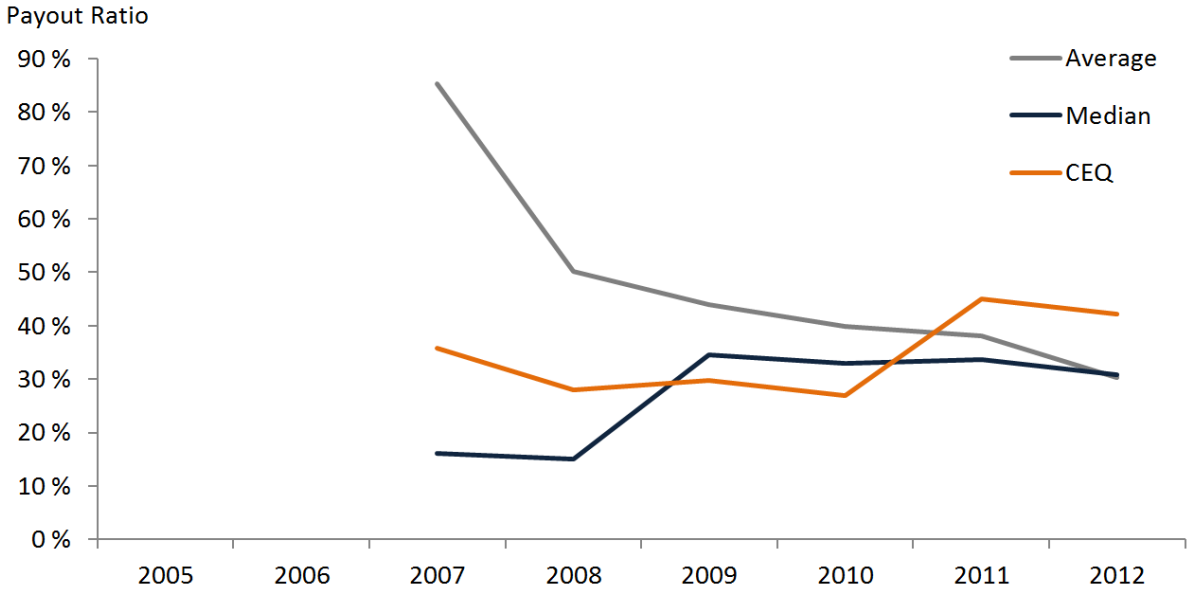
Appendix 10: Dividend Policy

Figure A10.1: Annual Payout Ratio



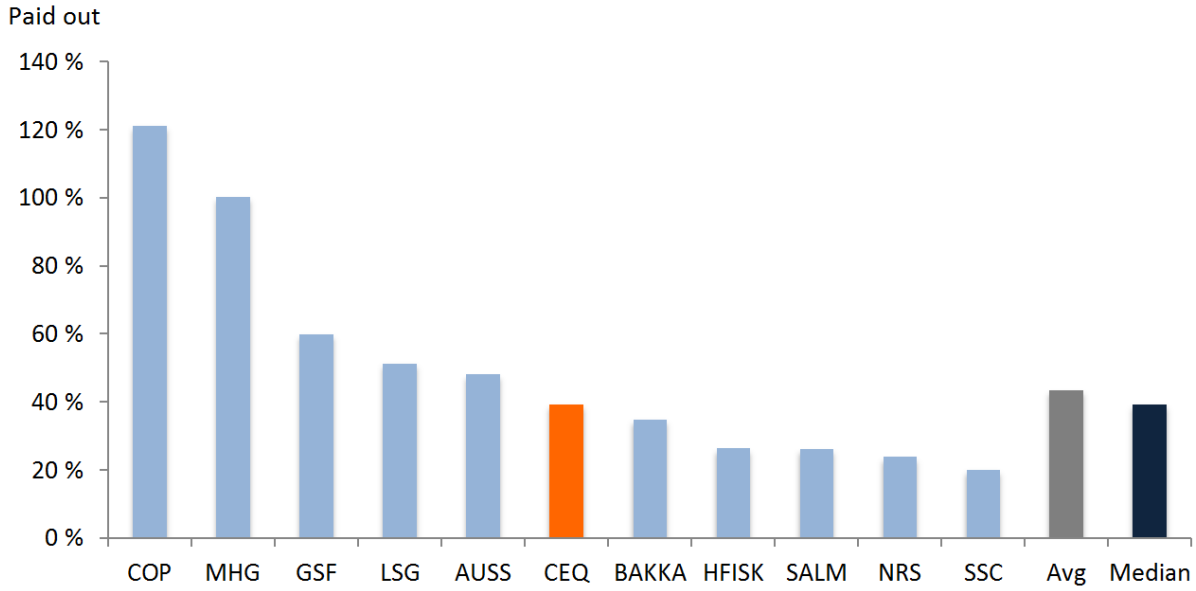
Note: Annual Payout Ratio, defined as dividends paid as a percentage of net income. The average includes all companies within the peer-group excluding Cermaq and Copeinca. For the latter, large and irregular dividend payments combined with a low net income resulted in sky-high payout ratios indicating that the dividend policy is not necessarily connected to the level of profits. We have therefore excluded it from our sample as it only adds noise that manipulates the average.

Figure A.10.2: Average 3 Year Trailing Payout Ratio



Note: Payout Ratio calculated as a 3 year trailing average. This will have a smoothing effect, giving a better impression of how the dividend policy has evolved over time. We have, also in this case, excluded Cermaq and Copeinca from the calculated average. The high initial average is biased by unusually large dividend payments in Havfisk and Norway Royal Salmon, but will converge towards a more normalized level, close to that of Cermaq.

Figure A10.3: Aggregate Payout Ratio



Note: The payout ratio based on aggregated dividend payments and net aggregated income. This will provide us with a more nuanced picture, since dividend payments will be dependent on the company's overall financial position, and not only current year's profits. Cermaq and Copeinca are excluded from the average.

Appendix 11: Executive Remuneration

Figure A11.1: Executive Remuneration Policies

Company	Ann. bonus	Bonus limit	Option scheme	Share-program	Severance limit	Basic salary	Cash bonus NOK	Cash bonus %
CEQ	**Yes**	**30 %**	**Yes**	**No**	**n/a**	**2 485**	**0**	**0,0 %**
MHG	Yes	30-50 %	Yes	Yes	n/a	4 750	1 563	32,9 %
LSG	Yes	100 %	No	n/a	24 mo.	2 772	1 400	50,5 %
SALM	Yes	50 %	Yes	Yes	6-12 mo.	2 917	250	8,6 %

Note: Policies regarding executive remuneration for Cermaq, Marine Harvest, Lerøy Seafood Group and SalMar. Bonus limit is the maximum cash bonus, measured as a percentage of the annual base salary. Option scheme is whether the company practices option programs where executive managers are given options. The same analogy goes for share programs. Severance limit is the maximum amount which can be given as severance payment, measured as the normal monthly salary. All numbers are gathered from the respective 2012 Annual Reports.

Cermaq

Cermaq's executive remuneration and bonus schemes are based on recommendations from a remuneration committee. The company pays a variable salary to senior management but this has been limited to 30 percent of the annual base salary. The company established an option scheme in 2006, in which 38 individuals are still involved. None of the directors have any share-based remuneration agreements.

Marine Harvest

Marine Harvest's executive remuneration program includes fixed salaries, bonus, benefits in kind, pension, severance pay and a share based incentive schemes. The cash bonus is linked to both group targets (70%) and individual achievements (30%) and is in the case of the CEO capped at 50 percent of the fixed salary. The share price based scheme assigns each individual entitled to bonus a number of calculatory units corresponding to Marine Harvest shares with a specific base value. 3 years after allotment the recipient is paid a cash bonus determined by the difference between current share price and the base value, which must be invested in MHG shares at market value and held for at least 12 months before being sold. This bonus amount is for each individual limited to 2 years salary.

Lerøy Seafood Group

In addition to the annual salary, Lerøy Seafoood also pays performance-based bonuses, lump sum payments, sign-on fees, arranged leave of absence, educational opportunities and option agreements. There are no limits to non-pecuniary benefits and employees have in the case of

public share issues been offered a limited number of shares at a 20 percent discount. The company has traditionally utilized option schemes, but currently there are no outstanding option agreements. The base salary is considered the main element of the senior executive's salary, and performance-based bonuses have been limited to one year's salary. Severance pay is capped at two years salary.

SalMar

SalMar's compensation of executive managers is divided into three and comprises a fixed salary, a performance-related bonus and a share option scheme. Annual performance-based bonuses are capped at a half-year's salary. The company utilizes forms of remuneration that involves senior executives receiving shares, subscription rights or option. Severance pay is limited to a period of 6-12 months.

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