# GRA 19703

Master Thesis

Ownership Identity's Effect on Firm Performance

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Start: 15.01.2020 09.00

Finish: 01.09.2020 12.00

# Ownership Identity´s Effect on Firm Performance

**Hand-in date:**
**01.07.2020**

**Campus:**
**BI Oslo**

**Examination code and name:**
**GRA 19703**, Thesis MSc

**Programme:**
**Master of Science in Business major in Accounting and Business Control**

**Supervisor:**
**John Christian Langli**

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# Abstract

This thesis is a research on differences in performance between state owned and privately owned companies in Norway, including all registered companies in the time period between 2000 and 2017. Norway is a country where the state plays an important role in regular markets due to their significant share of ownership in the country. Hence, the management of state ownership in Norway is important for the trust in the Norwegian capital market. Previous research suggest that state ownership have a negative impact on firm performance as governments are also expected to use their influence to reach sociopolitical goals that are not profit maximizing. This thesis hypothesize that state owned firms have lower performance than private firms, as private investors commonly focus more on efficiency, profit maximizing and personal gain.

Through a cross-sectional analysis, the hypotheses are investigated simultaneously. Firm performance is defined as return on assets, and the impact by state owned and privately owned firms are tested by defining variables for ownership identity in five different intervals, as well as corporate governance and firm effects.

The results show that state owned firms have lower performance than privately owned firms, which was further confirmed when testing for the effects on performance of firms having the state as a large blockholder compared to non-state blockholders. Higher number of blockholders affect firm performance positively, while a higher number of board members have a negative impact on performance in a firm. In addition, we find that the control variables of our analysis have a high degree of explanatory power, giving them a relative importance when studying firm performance in terms of ownership identity. Moreover, state owned companies are found to be associated with a more negative firm performance, both when holding a small stake of a company as well as when being a large blockholder.

# Acknowledgements

# 1. Introduction to Research Topic

Norway has a significant state ownership. In 2019 the state was the direct sole or co-owner of over 70 companies in the country (Ministry of Trade, Industry and Fisheries[1], 2020). As described by Christensen (2018), a key characteristic of Norwegian businesses and society is the extensive state ownership, especially in listed companies.

As a significant shareholder in seven of the largest companies on the Oslo Stock Exchange, the state owns approximately one third of the market value on the stock exchange. These seven companies are DNB ASA, Kongsberg Gruppen ASA, Norsk Hydro ASA, Equinor ASA, Telenor ASA, Yara International ASA, and Entra ASA (MTIF, 2020). The state has direct ownership in these companies, as well as indirect ownership in three additional companies through Aker Kværner Holding (MTIF, 2020).

Although there is great support regarding the significant state ownership, existing literature discuss whether state ownership affect firm performance negatively compared to private ownership. This thesis investigates the relationship between ownership identity and its effect on firm performance. Taken into consideration the state´s contribution to social benefits and its investment horizon compared to investors in private companies, we will study how this affects firm performance in a long-term perspective of 17 years. Ownership structure can be an important aspect of how businesses perform, and it is therefore essential to explore how and why this is. Presenting our research question - *Does ownership identity affect firm performance?* - the objective of the thesis is to make a conclusion on whether privately owned companies perform better than state owned companies or the opposite, and to find some reason behind the results. We have reason to believe that companies with state ownership focus less on performance than privately owned companies, as the focus from the state as an owner tends to be to maintain sociopolitical goals (MTIF, 2020). State ownership has been criticized for not being sufficiently focused on efficiency and profitability as they lack pecuniary self-interest and they are vulnerable to pressure from different stakeholders

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[1] Further abbreviated as MTIF

(Boycko, Shleifer & Vishny, 1996; Djankov & Murrell, 2002; Boubakri, Guedhami, Kwok & Saffar, 2016; Yang & Meyer, 2019).

## 2. Motivation

Provided with data consisting of all public and private firms from the Centre for Corporate Governance Research (CCGR), investigating the development of performance in private and state owned enterprises can provide new insights regarding factors affecting firms' value creation. There are several studies discussing whether state ownership is less effective than private ownership, as governments are expected to use their ownership stake to reach sociopolitical goals that are not profit maximizing. Hence, we want to examine whether we can reveal interesting contexts and important explanatory variables providing more insight on the relation between ownership identity and firm performance.

To the best of our knowledge, there is no recent research that covers the whole population of registered companies in Norway comparing performance of the ownership identities, looking at the ultimate ownership of the state in combination with accounting data and corporate governance in a long-term perspective. The closest to a similar study was made by Goldeng et al. (2008) on all registered companies in Norway in the 1990´s, testing whether managers in state owned enterprises may learn from managers in privately owned enterprises in environments with stronger competition. Defining state ownership as a dummy variable that takes 1 if the firm is state owned, and 0 otherwise, their findings shows a significant relationship between ownership identity and firm performance. They find results indicating that ownership identity has a surprisingly strong effect on ROA, and that privately owned enterprises outperform state owned enterprises. Defining state ownership as a dummy variable removes possible effects caused by the stake of ownership from the state. Therefore, we find it interesting to look at different fractions of ownership intervals in response to how it might affect firm performance, and further interact these ownership intervals with our state ownership dummy variable.

As Goldeng et al. (2008) employs a different time period, we believe it will be of interest to see whether the expanded time period causes the results to differ. It

could be that certain factors like investment-horizons and volatility of firm performance might affect the results looking at a longer time-horizon. We have reason to believe that in a long-term perspective the economy of state owned enterprises is more stable than for private companies because of investment horizons, as the state primarily invest in firms with no shorter than a time-horizon of ten years (MTIF, 2020). Further, we believe that for many private companies, except family firms, new owners will appear more rapidly as the investors often chase high returns and yearly results, rather than stable economy over time. Therefore, this research is based on a time-horizon of almost twenty years, giving basis for exploring the effects of volatility in firm performance between the ownership identities.

Another study conducted by Anderson and Reeb (2003) investigates the relation between founding family firms and firm performance, finding that family firms perform better than non-family firms. As we will discuss later, family and state ownership have common characteristics in many ways. Hence, we chose to replicate this study and compare our results. The comparison between the state as an owner and family ownership is mainly justified by the fact that both state and family firms are long-term investors. As a long-term investor, the securing of sustainable value creation in the long future is a higher priority than for private, non-family firm investors that rather search to achieve more rapid bonuses and higher yearly results. Although their study is on listed companies on the S&P 500 we believe there are some interesting distinctions between the studies, and that it is applicable for replication.

In 2015, Che and Langli also presented a research on Norwegian family firms and how it affect firm performance. Their results show that there is a U-shaped relationship between family ownership and firm performance, and that the second largest owner have a high impact on performance. Further, they study board characteristics and find that the size and members of the board influence firm performance. As their study is on Norwegian firms and the relationship between family ownership and firm performance, we also use this article for replication based on the same grounds as explained above regarding the comparison between family and state ownership.

By studying all registered firms in Norway over the past twenty years, looking at different fractions of state ownership´s effect on firm performance, we believe that we can provide new contributions to the literature concerning ownership identities and firm performance.

# 3. Existing Literature & Theory

### 3.1 State Ownership and Firm Performance

There is a large amount of existing literature on state ownership and private companies, and numbers of researches done on the effects of competition and corporate governance on firm performance. The objective of this thesis is to make a conclusion on whether private companies perform better than state owned companies or the opposite, and to find some reason behind our results. The following part presents existing literature and theory explaining why our research question is "*Does ownership identity affect firm performance*", with the corresponding hypothesis as follows:

### Hypothesis 1

*"Firms with state ownership have lower performance than firms with non-state ownership".*

As previously mentioned, state ownership has been criticized for not being sufficiently focused on efficiency and profitability as they lack pecuniary self-interest and are vulnerable to pressure from different stakeholders (Boycko et al., 1996; Djankov & Murrell, 2002; Boubakri et al., 2016; Yang & Meyer, 2019). Throughout the literature review we argue on the basis of earlier research that companies with state ownership focus less on performance than privately owned companies.

In general, the state as an owner has been accused of being inefficient as a result of pursuing strategies that satisfy the political objectives of politicians who control them (Boycko et al., 1996; Boubakri et al., 2016; Yang & Meyer, 2019).

Djankov & Murrell (2002) also show that the economic effects of privatization often are large on the enterprise growth rates in the positive direction, and that state ownership proves to be less effective than all other ownership types, except for worker-owners. This is further argued by Yang & Meyer (2019) who states that privately owned firms are better than state owned firms in translating competitive actions to growth.

As stated in the MTIF (2020) the state has clear set expectations that needs to be fulfilled by the companies in which the state has ownership. These expectations concern sustainable value creation, managing firms' resources, overall goals, expectations to the Board of Directors, corporate governance and gender distribution in the management, to mention some (MTIF, 2020). This goes for every company regardless of the stake of ownership from the state, from one percent to complete ownership. These companies are categorized in three different categories based on the state's overall objectives of their ownership. For the firms in category 1 the state has no other objectives than to achieve highest possible returns over time, while in category 2 there is special reasons for their ownership in addition to highest possible returns. Category 3 consists of firms where the state has ownership to effectively achieve sociopolitical goals (MTIF, 2020). Out of the seven largest firms owned by the state, that is listed on the Oslo Stock Exchange, Entra ASA is in category 1, and the six others[2] are in category 2. Aker Kværner Holding also belongs to category 2 (MTIF, 2020). As the government uses a lot of resources to finance non-excludable public goods such as law enforcement, defense, health care, and public administration, paying for it on behalf of all consumers and usually also produces some of these services, state ownership has been regarded as an instrument for the attainment of non-economic goals (Grout & Stevens, 2003; Goldeng et al., 2008).

This is further emphasized by Huang and Xiao (2012) who established a model which derives the net effect of the "helping hand" and "grabbing hand" of government ownership with focus on firm profitability and labour productivity.

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[2] DNB ASA, Kongsberg Gruppen ASA, Norsk Hydro ASA, Equinor ASA, Telenor ASA and Yara International

The "helping hand" refers to the capital subsidy provided by the government, and the "grabbing hand" represents the government's claim on a proportion of the firm's profits (Huang & Xiao, 2012). The model is based on objectives such as employment, revenue and profit. Huang and Xiao (2012) argue that state owned companies strive to promote social stability and is therefore needed for their continuing role of providing social welfare. Thus, in times of high unemployment and social tension, focus on employment and social stability is more present in a firm with high government ownership. Based on this model government ownership has a negative effect on labour productivity and profitability, as a result of increased focus on employment. Hence, the model argues that reduction in government ownership will lead to increased productivity and profitability.

Christensen (2018) states that a complaint against state ownership has been concerning lack of ambitious private owners who want returns on their invested capital. A consequence of this has been that state owned companies are seen to lack sufficient focus on efficiency and profitability, and as a result they would be value destroying as firm resources rather could have been applied to other directives that would increase value. Boycko et al. (1996) models that state owned companies tend to use more labour than private companies, and Dewenter & Malatesta (2001) argue that state owned companies are pressured to hire politically connected people rather than the most qualified ones. This gives basis to believe that the political objectives of state owned companies implies unclear incentives for the company's priorities, such as misallocation of resources and inefficient operations.

The state has other reasons for their ownership than private owners, and even though their goal as an owner in competitive markets is highest possible returns over time, their ownership is not motivated based on asset management and savings (MTIF, 2020). State owned companies are often thought to sacrifice maximum profit in the pursuit of social and political objectives such as wealth distribution, which again leads to the expectation that these companies are less efficient and profitable (Dewenter & Malatesta, 2001).

### *3.2 Corporate Governance*

Previous research on corporate governance suggests that concentration and identity of owners affect the performance of companies (Shleifer & Vishny, 1997; Thomsen & Pedersen, 2000; Januszewski et.al., 2002; Goldeng et al., 2008). This is also shown in evidence from empirical studies which indicate that firm effects in combination with identity of ownership are important explanatory factors and key drivers of firm performance (Huang & Xiao, 2012; Fitza & Tihanyi, 2017; Yang & Meyer, 2019). According to governance theory, firm performance will depend upon how the firm is managed and owned. There are several perspectives in which corporate governance can be defined, but in general it can be defined as the system by which companies are directed and controlled (Tricker & Tricker, 2015). Within corporate governance there are several actors that contributes to the procedures and processes where an organization is directed and controlled, such as the board of directors, shareholders and the management, and they all have different roles. The distribution of rights and responsibilities between the actors in the organization, and rules and procedures for decision-making are specified by the structure of corporate governance with the goal of above average performance (Tricker & Tricker, 2015). Agency theory is one of several schools of thought on how the management of a firm will behave, and this theory expect managers to be selfish individuals who search to maximize their own objectives. Thus, they need incentives to make sure that they first and foremost will maximize shareholder value and act in the interest of the owner (Jensen & Mecklin, 1976). An agency theory on state versus private ownership states that economic performance levels mainly are the result of management incentives, costs and exposure to market forces implied by the different ownership structures (Goldeng et al., 2008).

### *3.2.1 Large Blockholders*

Different owners of firms have different goals and preferences that shapes the firm's strategy, which in turn can influence firm performance (Fitza & Tihanyi , 2017). Large shareholders may affect the performance and progress of companies because of their amount of control, and role in monitoring and disciplining managers. Pagano and Roell (1998) study how the presence of other large blockholders can reduce the concerns of controlling shareholder wealth

expropriation and find that large blockholders may affect firm performance as they often have stronger pecuniary self-interest and will monitor the controlling owners closely. Literature often distinguishes between different types of blockholders, and some typical classifications are family, industrial and institutional to mention a few. Pedersen and Thomsen (2003) did a study on five main types of blockholders on firm performance and find that different blockholder identities affected performance in contrasting ways. If the largest owner is a financial institution or another corporation, they find that this would affect firm performance positively, individual blockholders showed no significance, and if the largest blockholder is government the effect is negative. On the contrary, Chaganti and Damanpour (1991) studied ownership structure on total stock returns without finding significance. However, their results showed that institutional blockholders were related to lower debt-equity ratios and higher returns on equity.

Another aspect is the effects of multiple simultaneous blockholders. There are numbers of researches on the field, but the evidences on the effects on firm performance of having several blockholders are ambiguous. Supported by numbers of evidence, the presence of several blockholders in firms is normal (Laeven & Levine, 2008; Holderness, 2009). While blockholders traditionally are criticized for their ability to extract private benefits of control, they are also worshipped for their incentive to devote more time on monitoring the management than other shareholders. Findings from Edmans (2014) show that having multiple blockholders, even with sub-optimal performance, makes it less likely that each blockholder will intervene with management. On the contrary, Laeven and Levine (2008) finds positive effects of having several blockholders as it increases the probability that the extraction of private benefits of control is reduced caused by that the smaller blockholders work together to monitor the largest. The effects of having multiple blockholders can be positive if there is one controlling blockholder and several smaller ones. However, if they have equal amounts of control, there might not be incentives to monitor management and the effects are not necessarily positive.

Previous studies agree on the fact that large blockholders affect firm performance. Further, findings show that government blockholders tend to have a negative relation to firm performance (Pedersen & Thomsen, 2003). As for the number of blockholders earlier studies disagree on the effect on firm performance, but there is reason to believe that it does have an impact. Based on the discussion above we have reason to believe that blockholders have a positive relation with firm performance, but when the state is a large blockholder it affects firm performance negatively. We also believe that the number of blockholders will affect firm performance.

***Hypothesis 2***

*"There is a negative relation between state blockholders and firm performance"*

***Hypothesis 3***

*"Number of blockholders has an impact on firm performance"*

*3.2.2 Board Size*

Corporate governance also concerns board characteristics, and evidence from previous research find that the characteristics of the Board of Directors affect firm performance as it reduces agency problems (Horváth & Spirollari, 2012). It is well documented that board size affect firm performance (Yermack, 1996; Huther, 1997; Álvarez et al., 1998; Eisenberg et al.,1998; Jaskiewicz & Klein, 2007). Results from several studies find that smaller boards is more effective because of coordinating and decision-making problems as the size of the board increases, indicating a negative relationship between board size and firm performance (Yermack, 1996; Huther, 1997; Eisenberg et al.,1998). In Norway, the state exercises its ownership through the General Meeting as they have no seats in the Board of Directors in any company of their ownership.

***Hypothesis 4***

*"There is a negative relationship between board size and firm performance"*

Another corporate governance matter concerns management. Earlier research has shown that it is a connection between diversity in management and a company's

profitability and development, and that the gender of CEO affects firm performance (Jalbert et al., 2013; Khan & Vieito, 2013). Khan and Vieito (2013) find that firms managed by a female CEO perform better than firms with a male CEO, as the firm risk level is smaller in firms with female CEOs. On the grounds of gender equality and utilization of valuable resources, the government has ambitions of at least 40 percent male and females in the Board of Directors in state owned companies (MTIF, 2020). As the state is associated with being one of the most secure and stable investors in a firm, the expectations set by the government are commonly closely followed by the firms of their ownership. As of this, the expectation of gender distribution in the top management is expected to affect firm performance. Hence, we chose to look at female CEO´s effect on firm performance.

***Hypothesis 5***

*"There is a positive relation between CEOfemale and firm performance"*

Despite state ownership being accused for being less effective, there is broad support for large state enterprises as state ownership aim to increase social benefits in the community (Lie, 2016). Christensen (2018) supports this further by arguing that one of the state's most important reasons for ownership is to ensure a long-term perspective, by which the attainment of non-economic goals creates a high level of trust in the state as a protector of common interests. The reason being that they prevent headquarters and strategic functions linked to the firm from being outsourced to other countries, ensuring that job opportunities continue and that the social benefits of companies remain. As the state approaches long-term ownership, this creates grounds for a sustainable value creation. Investor horizons can differ between ownership identities, and as a result of different maturities in liabilities, which can have a great impact on corporate behaviour. Research by Derrien et al. (2013) is based around the idea that short-term investors influence managers to pursue corporate policies that has a long-term negative effect on firm performance, and that public firms invest less than private firms. A shorter time perspective when investing can thus influence investment decisions in a company to generate quick dividends and returns, rather than securing a sustainable value development for the firm over time.

In summary, based on the research discussed above, we expect results supporting that firm performance in state owned companies is lower than for privately owned companies, grounded on the state´s highly focus on sociopolitical benefits and common interests of the community. When the state is a blockholder we expect this to negatively affect firm performance. Further, we expect a negative relationship between board size and firm performance. At last, we expect it to be a higher share of female CEOs in state owned companies, and that the relationship between a female CEO and firm performance is positive.

# 4. Data, Methodology & Empirical Proxies

### 4.1 Sample & Data filters

The data needed for this research is provided by the Centre for Corporate Governance Research (CCGR) at BI Norwegian Business School. The whole population examined is registered firms in Norway in the time period between 2000 and 2017, and the dataset contains of financial information and governance data.

To ensure comparability of the firms as well as to identify the sample, some filters and requirements are applied to the population. Firms within bank and finance are excluded, as different regulations in these industries potentially have an effect on performance. Public utility firms are also removed due to the large presence of public sector regulations. As we compare non-state owned companies with state owned companies, further filtering of the data was needed to make the sample more comparable. To ensure comparability between different industries, an requirement that both state owned and private firms in an industry group must represent at least 10 percent of the firms was set, following Goldeng et al. (2008). Companies with non-state owners have a significantly larger presence in the dataset, making the distribution of the sample uneven. Following Che & Langli (2015) we set a requirement that non-state owned firms must have at least 10 million in operating revenue and total assets to ensure that our results are not driven by a large number of small private firms. This limited the private companies and made them more similar to the state-owned companies, as well as ensuring that all firms were active throughout the sample period. After applying

the filters and requirements, our sample consists of 28,526 different Norwegian firms with 130,914 firm-year observations.

To control for large outliers in our sample, the variables *ROA1*, *ROA2*, *DebtRatio*, *GrowthOpportunities* and the aggregated fractions of different ownership identities were winsorized. This resulted in replacing all outliers below and above -100 and 100 percent to the accepted range. We also trimmed the variables for largest blockholder in rank 1 to 5 for all values above 100 percent to remove the unreasonably high ownership percentages.

CCGR provided us with account data for all firms and consolidated account data for some. Therefore, the accounting data was replaced with consolidated numbers for the firms with information on both. To ensure that the numbers were not counted twice in our analysis we disregarded companies that were organized as co-operative ventures or as groups. As our research focuses on the ultimate ownership, companies that had firms as their owner or firms that were part of a holding company was excluded (Goldeng et al. 2008).

### 4.2 Variables & Methodology

In our analysis a firm is defined as state owned as long as the state has shares in the company based on ultimate ownership. As previously mentioned, and stated in the MTIF (2020), the state has expectations for companies regardless of the percentage of ownership. Therefore, it is reasonable to define a firm as state owned as long as the state has any shares, as we believe it will impact the company's management from the first percent. Using the following regression all hypotheses will be tested simultaneously:

$$
\begin{aligned}
Firm\ &Performance \\
&= \beta_1 + \beta_2\,Own0to33_{i,t} + \beta_3\,Own33to50_{i,t} + \beta_4\,Own50to67_{i,t} \\
&+ \beta_5\,Own67to99_{i,t} + \beta_6\,Own100_{i,t} + \beta_7 StateOwned_{i,t} \\
&+ \beta_{8-12} StateOwned_{i,t}\ x\ (Own0to33_{i,t} + Own33to50_{i,t} \\
&+ Own50to67_{i,t} + Own67to99_{i,t} + Own100_{i,t}) \\
&+ \beta_{13} Blockholders_{i,t} + \beta_{14} StateBlockholder_{i,t} \\
&+ \beta_{15}(Blockholders_{i,t}\ x\ StateBlockholder_{i,t}) \\
&+ \beta_{16} NoBlockholders_{i,t} + \beta_{17} lnBoardSize_{i,t} + \beta_{18} CEOfemale_{i,t} \\
&+ \beta_{19} lnFirmAge_{i,t-1} + \beta_{20} lnAssets_{i,t-1} + \beta_{21}\ lnSales_{i,t-1} \\
&+ \beta_{22} DebtRatio_{i,t-1} + \beta_{23} GrowthOpportunities_{i,t-1} \\
&+ \beta_{24} IndustryRisk_{i,t-1} + \beta_{25} PublicListing_{i,t-1}, + \beta_{26} ROA_{i,t-1} \\
&+ \sum \beta_{27,y}\ Year_y + \ \varepsilon_{i,t}
\end{aligned}
$$

*4.2.1 Test Variables*

*Measuring Firm Performance*

Firm performance is the dependent variable in our analysis and is measured by return on assets (ROA) computed in two ways, following Anderson and Reeb (2003). This will be used as our performance measure in markets where state owned enterprises and privately owned enterprises compete with each other. The first approach for measuring ROA is earnings before interest, tax, depreciation and amortization (EBITDA) divided by total assets, while the second approach is net income divided by total assets (Anderson & Reeb, 2003). When looking at how companies generate returns on their assets, it is reasonable to employ a measure that shows how effectively a firm utilizes its assets unaffected by the cost of debt financing and tax positions, due to the variance in tax levels across countries. This increases the basis for comparing our results with similar studies outside Norway. Hence, it is reasonable to use ROA based on EBITDA as our main measure for firm performance. All variables are defined in table 1.

*Measuring State Ownership*

Following Che and Langli (2015) we create one variable for each of five different intervals of ownership. These variables are generated as dummy variables, and they define the aggregated fractions of shares held by industrial, institutional, personal, state, international and unspecified owners (*Owners*) using ultimate ownership, retrieved from CCGR. The reasoning behind these break points when creating the categories is the different blocks stated in the MTIF (2020) of ownership intervals for state ownership. Within state owned firms municipalities, counties and directorates are all included. The ownership variables are defined, using ultimate ownership, as *Own0to33* if the ultimate owner holds one-third or less, *Own33to50* for owners holding above one-third to 50 percent, *Own50to67* for ownership above 50 percent but less than two-thirds, *Own67to99* if ultimate owner holds two-thirds or more, but less than 100 percent, and *Own100* which is complete ownership of 100 percent. The variables based on the aggregated fraction held by owners are constructed as follows:

| *Own0to33* | = 1 if $0 < Owners <= ⅓$ |
| | = 0 if $Owners = 0$ & $Owners > ⅓$ |
| | |
| *Own33to50* | = 0 if $Owners <= ⅓$ |
| | = 1 if $⅓ < Owners <= 0.5$ |
| | = 0 if $Owners > 0.5$ |
| | |
| *Own50to67* | = 0 if $Owners <= 0.5$ |
| | = 1 if $0.5 < Owners < ⅔$ |
| | = 0 if $Owners >= ⅔$ |
| | |
| *Own67to99* | = 0 if $Owners < ⅔$ |
| | = 1 if $⅔ <= Owners < 1.0$ |
| | = 0 if $Owners = 1.0$ |
| | |
| *Own100* | = 0 if $Owners < 1.0$ |
| | = 1 if $Owners = 1.0$ |

Further, a dummy variable called *StateOwned* was generated. This variable takes the value 1 if the state has ownership in the firm and 0 otherwise. To measure the degree to which state ownership affect firm performance, each ownership interval is interacted with *StateOwned* to see the actual effect the state has on firm performance within the different ownership intervals.

*Measuring Blockholders*

Large shareholders may also affect firm performance because of their role in monitoring and disciplining managers. Thus, *Blockholders* are identified, a variable equal to 1 for owners holding more than five percent equity stake in the firm, and 0 for owners holding no more than five percent. Defining this variable, the percentage of equity stake of the largest to the fifth largest blockholders in each firm is identified looking at ultimate ownership. *Blockholders* measures the percentage of equity held by ultimate owner with rank 1 to rank 5, retrieved from CCGR. Further, the variable *StateBlockholder* is identified, which equals 1 if the state is the largest blockholder of rank 1, and 0 if not. When interacting these

variables, the effects on firm performance when the state is the largest blockholder is tested. Furthermore, a variable indicating the number of blockholders in the firm is included. The variable *NoBlockholders* is defined as an integer ranging from one to five, where five indicate that the firm have at least five blockholders. *NoBlockholders* is constructed as follows:

*NoBlockholders* = 1 if *BlockholdersRank1* > 0.05
    = 2 if *BlockholdersRank1 & Rank2* > 0.05
    = 3 if *BlockholdersRank1 & Rank2 & Rank3* > 0.05
    = 4 if *BlockholdersRank1 & Rank2 & Rank3 & Rank4* > 0.05
    = 5 if *BlockholdersRank1 & Rank2 & Rank3 & Rank4 & Rank5* > 0.05

*Measuring Board Size & CEO female*

The variable board size is retrieved from CCGR and in the analysis *lnBoardSize* is used, defined as the natural logarithm of the number of board members. *CEOfemale* is included in the analysis as a dummy variable equaling 1 if the CEO is female and 0 otherwise.

*4.2.2 Control Variables*

To control for industry and firm characteristics several control variables are added to the analysis. Because of lagged correlation in return on assets, a one-year lagged ROA1(*l_ROA1*) is included in the analysis. New and young firms, meaning companies in the early stages of their life cycle often have low performance because of the incubation period where they rather focus on getting their company settled, than performance. To control for the age effect on firm performance *lnFirmAge* is included measured as the natural logarithm of the number of years since the firm's inception. Economies of scale and firm size are known to influence firm performance (Scherr & Hulburt, 2001; Anderson & Reeb, 2003; Goldeng et al., 2008; Che & Langli, 2015). Hence, following Che and Langli (2015) *lnAssets*, measured as the natural logarithm of total assets, and *lnSales* measured as the natural logarithm of sales are included in the analysis.

*DebtRatio* control for debt in the capital structure by the ratio of total debt to total assets. Previous studies find that more leveraged firms have higher performance and therefore this measure is included (Anderson & Reeb, 2003; Che & Langli,

2015). The different levels of companies´ growth opportunities may affect firm performance, and this is controlled for using *GrowthOpportunities*, measured as the ratio of research and development expenses to total sales (Scherr & Hulburt, 2001; Che & Langli, 2015).

The degree to which the industry is the reason for the variance in firm performance is captured from the industry effect variable, *IndustryRisk. IndustryRisk* is measured as the natural logarithm of the standard deviation to the mean of operating income, computed within each two-digit industry code for each year (Arnesen & Broeng, 2013).

We expect that publicly listed firms affect ROA negatively as it is likely that the value of assets in these companies are closer to the market value. Hence, as some of the companies in our sample are listed on the Oslo Stock Exchange a dummy variable, *PublicListing*, is included to control for this effect.

**Table 1: Variable Definitions**

| *Variable* | *Definition* |
|---|---|
| **Dependent Variable** | |
| *ROA1* | = Earnings before interest, tax, depreciation and amortization (EBITDA) divided by total assets |
| *ROA2* | = Net income divided by total assets |
| **Test Variables** | |
| *StateOwned* | = 1 if state ownership, 0 otherwise |
| *Own0to33* | = 1 if ultimate owner holds more than zero but less than or equal to one-third, 0 otherwise |
| *Own33to50* | = 1 if ultimate owner holds more than one-third but less than or equal to 0.5, 0 otherwise |
| *Own50to67* | = 1 if ultimate owner holds more than 0.5 but less than two-thirds, 0 |

| | |
|---|---|
| | otherwise |
| *Own67to99* | = 1 if ultimate owner holds two-thirds or above, but less than 1, 0 otherwise |
| *Own100* | = 1 if ultimate owner holds 1, 0 otherwise |
| *Blockholders* | = 1 if ultimate owner holds more than 5 percent of the shares, 0 otherwise |
| *StateBlockholder* | = 1 if the state holds more than 5 percent of the shares, 0 otherwise |
| *NoBlockholders* | = 1 if only the largest owner holds more than 5 percent of the shares<br>= 2 if the largest and second largest owner holds more than 5 percent of the shares<br>= 3 if the three largest owners hold more than 5 percent of the shares<br>= 4 if the four largest owners hold more than 5 percent of the shares<br>= 5 if all five largest owners hold more than 5 percent of the shares |
| *lnBoardSize* | = Natural logarithm of numbers of board members |
| *CEOfemale* | = 1 if the CEO is female, 0 if the CEO is male |

**Control Variables**

| | |
|---|---|
| *lnFirmAge* | = Natural logarithm of numbers of years since the firm's inception |
| *lnAssets* | = Natural logarithm of total assets in million NOK |
| *lnSales* | = Natural logarithm of total sales in million NOK |
| *DebtRatio* | = Total debt divided by total assets |
| *GrowthOpportunities* | = R&D expenses divided by total assets |
| *IndustryRisk* | = Natural logarithm of the standard deviation to the mean of operating income, computed within each industry code for each year |
| *PublicListing* | = 1 if the firm is publicly listed, 0 otherwise |

### 4.2.3 Regression

OLS regressions are used to test the hypotheses. Using cross-sectional regressions, the appropriate dependence relationships are determined based on similar previous studies. Using a multivariate analysis, our goal is to investigate the relation between ownership identity and its effect on firm performance. Multiple regression is a statistical technique that is used to assess the relationship between a single dependent variable to a set of independent variables. Therefore, a standard multiple regression is used to estimate the proportion of variance in the dependent variable, "Firm Performance", that can be attributed to ownership identity and the other firm specific control variables, as well as corporate governance.

Finally, all control variables are one-year lagged and to obtain robust variances adjusted for correlation within clusters we use the Huber-White Sandwich Estimator. This is, as we are working with panel data that consists of several observations per individual firm, each firm's error term might have some commonalities that are present for each time period from 2000 to 2017, due to the fact that the firms are somewhat dependent on previous years. Hence, the error terms for each firm may show intercorrelation within the "cluster" of observations. To control for this the Huber-White Sandwich Estimator is used clustered at company id, which will control for the assumptions of zero error correlation and homoscedasticity (Adkins & Hill, 2011).

# 5. Summary Statistics

In this section of the thesis, descriptive statistics on the data employed in our analysis for the time period from 2000 to 2017 is presented. Table 2 to 6 provide the number of observations, means, standard deviation and minimum and maximum values for the key variables in the sample. Table 2 shows the summary statistics of firm effects, table 3 is on firm performance, table 4 and 5 shows these statistics on corporate governance matters, while table 6 shows gender distribution between state and non-state firms. Table 7 provides difference of means test between state owned and non-state owned firms. At last, table 8 provides a simple correlation matrix for the key variables in the sample.

### 5.1 Firm Effects

Table 2 shows summary statistics for the firm effects in the population between year 2000 and 2017. *DebtRatio* is the ratio between total debt and total assets, *GrowthOpportunities* is the ratio between research and development expenses to total sales. *FirmAge* is the number of years since the firm's inception. Firm size is the natural logarithm of both total assets and total sales. *IndustryRisk* is the natural logarithm of the standard deviation to the mean of operating income for each two-digit SIC code. *PublicListing* takes the value 1 if the firm is publicly listed and 0 otherwise.

**Table 2: Descriptive Statistics for Firm Effects**

| Variable | N | Mean | Std.Dev. | Min | Max |
|---|---|---|---|---|---|
| DebtRatio | 122,803 | 61.94 | 25.69 | -95.03 | 99.99 |
| GrowthOpportunities | 108,554 | 1.47 | 7.88 | -15.81 | 99.99 |
| FirmAge | 124,186 | 16.22 | 16.13 | 0 | 165 |
| lnAssets | 130,914 | 16.87 | 1.93 | 6.91 | 27.51 |
| lnSales | 109,785 | 10.02 | 2.02 | 0 | 20.37 |
| IndustryRisk | 130,914 | 18.39 | 1.18 | 13.63 | 23.18 |
| PublicListing | 130,355 | 0.01 | 0.12 | 0 | 1 |

Notes: Table 2 provides descriptive statistics (mean and standard deviation) for firm effects. Please see table 1 for variable definitions.

Table 2 presents the description of key variables for firm effects. In the sample, the firms have an average debt ratio of 61.94% which suggest a rather high degree of debt financing, but as the standard deviation of 25.69 is high it implies that the range is wide. The proxy for firm growth opportunities describe that research and development expenses represent 1.47% of sales on average. While the average age of the firms is around 16 years, the spread is rather large going up to 165 years.

### 5.2 Firm Performance

Table 3 shows summary statistics of firm performance between the year 2000 and 2017. Performance is measured as return on assets, where *ROA1* is earnings before interest, tax, depreciation and amortization divided by total assets, and *ROA2* is net income divided by total assets.

**Table 3: Descriptive Statistics for Firm Performance**

| Variable | N | Mean | Std.Dev. | Min | Max |
|---|---|---|---|---|---|
| ROA1 | 129,315 | 8.87 | 16.89 | -99.62 | 99.89 |
| ROA2 | 129,189 | 5.07 | 16.94 | -99.94 | 99.89 |

Notes: Table 3 presents descriptive statistics (mean and standard deviation) for firm performance. Please see table 1 for variable definitions.

As presented above, the average for return on assets based on EBITDA (net income) is 8.87% (5.07%)

### 5.3 Corporate Governance

Table 4 shows summary statistics on variables for corporate governance in the sample. The variables for ownership intervals take the value 1 if an owner is present in the interval and zero otherwise. *StateOwned* equals 1 if the state has shares in a firm and zero otherwise. The variable *Blockholders* holds the value 1 if a firm has blockholders with an ownership stake of 5 percent or more and is defined by the 5 largest ranks of ownership. *NoBlockholders* is an integer variable holding values from 1 to 5, indicating the number of large blockholders in a firm. *BoardSize* is the number of board members, and *CEOfemale* is a variable that is 1 if the firm has a female CEO and 0 otherwise.

**Table 4: Descriptive Statistics for Corporate Governance**

| Variable | N | Mean | Std.Dev. | Min | Max |
|---|---|---|---|---|---|
| Own0to33 | 130,914 | 0.35 | 0.48 | 0 | 1 |
| Own33to50 | 130,914 | 0.13 | 0.34 | 0 | 1 |
| Own50to67 | 130,914 | 0.11 | 0.31 | 0 | 1 |
| Own67to99 | 130,914 | 0.25 | 0.43 | 0 | 1 |
| Own100 | 130,914 | 0.51 | 0.49 | 0 | 1 |
| StateOwned | 130,914 | 0.32 | 0.47 | 0 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| *Blockholders* | 130,914 | 0.99 | 0.07 | 0 | 1 |
| *NoBlockholders* | 130,914 | 2.56 | 1.51 | 0 | 5 |
| *BoardSize* | 129,784 | 3.87 | 1.79 | 1 | 16 |
| *CEOfemale* | 115,689 | 0.11 | 0.31 | 0 | 1 |

Notes: Table 4 presents descriptive statistics (mean and standard deviation) for the test variables of our study. See table 1 for variable definitions.

As shown in table 4, there are more owners in the interval between 0 and 33 percent and complete ownership of 100 percent than there are in the remaining ownership intervals. As for the amount of state owned firms in the sample, the descriptive statistics show that less than half of the population is state owned. Further, based on ultimate ownership of rank 1 to 5 there is an average number of 2.56 large blockholders in the firms. The average number of board members is 3.87 and there is a low presence of female CEO's as the mean is 0.11.

Table 5 shows summary statistics for the distribution of state owned firms within the different intervals of ownership in a firm. The statistics are based on the continuous variable for state ownership.

**Table 5: Descriptive Statistics for the Distribution of State Owned Firms**

| *Variable* | *Obs* | *Mean* | *Std.Dev.* | *Min* | *Max* |
|---|---|---|---|---|---|
| *Own0to33* | 17,528 | 10.64 | 9.55 | 0 | 33.33 |
| *Own33to50* | 4,467 | 41.97 | 5.96 | 33.33 | 50 |
| *Own50to67* | 2,908 | 57.27 | 5.39 | 50.001 | 66.67 |
| *Own67to99* | 4,514 | 85.11 | 10.22 | 66.677 | 99.999 |
| *Own100* | 12,113 | 100 | 0 | 100 | 100 |

Notes: Table 5 presents descriptive statistics (mean and standard deviation) for the distribution of state owned firms, meaning number of observations, mean and standard deviation for firms within the different intervals that are state owned. Please see table 1 for variable definitions.

In table 5, it is shown that the presence of state owners is largest in the interval from 0 to 33 percent and in 100 percent ownership.

## 5.4 Female CEO

Table 6 show the distribution of female CEOs between state owned and non-state owned firms.

**Table 6: Descriptive Statistics for *CEOfemale* in State Owned and Non-State Owned Firms**

| Variable | N | Mean | Std.Dev. | Min | Max |
|---|---|---|---|---|---|
| CEOfemale_State | 33,297 | 0.17 | 0.38 | 0 | 1 |
| CEOfemale_Private | 82,392 | 0.08 | 0.27 | 0 | 1 |

Notes: Table 6 presents descriptive statistics (mean and standard deviation) and difference of means on the gender distribution in state owned and non-state owned firms. Please see table 1 for definition of *CEOfemale*.

There is a generally lower presence of females in top management. However, the state has an ambition of a 40 percent distribution between men and women, and as presented in table 6, firms with state ownership does have a larger presence of female CEOs.

## 5.5 Difference of means Tests

Table 7 presents the difference of means for the key variables between firms where the state has ownership and firms with no state ownership.

**Table 7: Difference of Means Test**

| | State Owned Firms | Non State Owned Firms |
|---|---|---|
| Number of firms | 9,075 | 21,073 |
| DebtRatio | 51.10 | 66.69 |
| GrowthOpportunities | 1.17 | 1.56 |
| FirmAge | 14.63 | 16.94 |
| lnAssets | 15.57 | 17.47 |

| | | |
|---|---|---|
| *lnSales* | 8.12 | 10.66 |
| *IndustryRisk* | 18.38 | 18.40 |
| *PublicListing* | 0.02 | 0.01 |
| *ROA1* | 2.25 | 11.84 |
| *ROA2* | -1.30 | 7.93 |

Notes: Table 7 presents difference of means test between state owned firms and non-state owned firms for firm effects and firm performance. Please see table 1 for variable definitions.

From the difference in the average debt ratio, firms with no state ownership tend to use debt financing more than state owned firms; non state owned firms have an average debt ratio of 66.69% versus 51.10% for state owned firms. Further, on average, firms with no state ownership are somewhat larger in size, but they are comparable as there is not a substantial difference between them. From the performance measures, non-state owned firms on average have higher returns on assets, suggesting that these firms have better performance.

## 5.6 Correlation Matrix

Table 8 provides a correlation matrix for some of the key variables of our sample.

## Table 8: Correlation Matrix

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) ROA1 | 1.000 | | | | | | | | | | | | | | |
| (2) Own0to33 | -0.098 | 1.000 | | | | | | | | | | | | | |
| (3) Own33to50 | -0.063 | 0.174 | 1.000 | | | | | | | | | | | | |
| (4) Own50to67 | -0.033 | 0.192 | 0.325 | 1.000 | | | | | | | | | | | |
| (5) Own67to99 | 0.038 | 0.432 | -0.205 | -0.187 | 1.000 | | | | | | | | | | |
| (6) Own100 | 0.062 | -0.734 | -0.385 | -0.349 | -0.637 | 1.000 | | | | | | | | | |
| (7) BlockHolders | 0.011 | -0.086 | 0.001 | 0.002 | 0.022 | 0.072 | 1.000 | | | | | | | | |
| (8) NoBlockholders | 0.026 | 0.476 | 0.205 | 0.217 | 0.387 | -0.544 | 0.114 | 1.000 | | | | | | | |
| (9) lnBoardSize | -0.120 | 0.265 | 0.135 | 0.111 | 0.116 | -0.296 | -0.049 | 0.233 | 1.000 | | | | | | |
| (10) CEOfemale | -0.039 | 0.024 | 0.023 | 0.006 | -0.021 | -0.005 | -0.010 | -0.022 | 0.080 | 1.000 | | | | | |
| (11) l_DebtRatio | 0.073 | -0.091 | -0.049 | -0.048 | 0.019 | 0.069 | -0.001 | -0.004 | -0.085 | -0.054 | 1.000 | | | | |
| (12) l_GrowthOpportunities | -0.036 | 0.042 | 0.012 | 0.007 | -0.010 | -0.033 | 0.001 | 0.016 | 0.060 | -0.023 | 0.019 | 1.000 | | | |
| (13) l_lnFirmAge | 0.032 | -0.064 | -0.063 | -0.050 | 0.024 | 0.045 | 0.003 | -0.055 | 0.047 | -0.011 | -0.137 | -0.079 | 1.000 | | |
| (14) l_lnAssets | 0.019 | -0.089 | -0.050 | -0.052 | -0.032 | 0.079 | -0.011 | -0.118 | 0.185 | -0.119 | 0.118 | 0.149 | 0.201 | 1.000 | |
| (15) l_lnSales | 0.129 | -0.134 | -0.088 | -0.079 | -0.015 | 0.111 | -0.010 | -0.089 | 0.087 | -0.143 | 0.204 | 0.084 | 0.193 | 0.766 | 1.000 |

Notes: Table 8 presents the correlations among the variables in our analysis. *DebtRatio*, *GrowthOpportunities*, *FirmAge*, *lnAssets* and *lnSales* are one-year lagged. See Table 1 for variable definitions.

As seen in the correlation matrix the ownership intervals from 0 to 67 percent appear to have a negative correlation with the accounting measure of firm performance. The remaining intervals have a positive correlation. The ownership intervals have relatively high correlation with each other due to how the variables are constructed. As for blockholders and the number of blockholders, the correlation with firm performance is positive. The control variables for firm size, *ln_Assets* and *ln_Sales*, correlates at 76.6%, while the rest of the correlation coefficients are relatively low.

# 6. Main Results

**Table 9: Regression Results for Firm Performance on Test and Control Variables**

| Variable | Predicted sign | ROA1 [1] | ROA1 [2] | ROA2 [3] |
|---|---|---|---|---|
| Own0to33 | | -0.368* (-2.09) | | -0.469* (-2.55) |
| Own33to50 | | 0.215 (0.67) | | 0.096 (0.29) |
| Own50to67 | | 0.963** (3.08) | | 1.138*** (3.54) |
| Own67to99 | | 1.142** (3.17) | | 1.307*** (3.50) |
| Own100 | | 0.888* (2.27) | | 0.984* (2.44) |
| StateOwned | | -1.571* (-2.43) | | -1.790** (-2.73) |
| State_Own0to33 | - | -1.129** (-2.83) | | -1.094** (-2.75) |

| | | | | |
|---|---|---|---|---|
| State_Own33to50 | - | -0.084 | | -0.004 |
| | | (-0.16) | | (0.01) |
| State_Own50to67 | - | -0.011 | | -0.355 |
| | | (-0.02) | | (-0.70) |
| State_Own67to99 | - | -0.163 | | -0.028 |
| | | (0.30) | | (-0.05) |
| State_Own100 | - | 0.104 | | -0.017 |
| | | (0.15) | | (-0.02) |
| StateOwned100 | | | -1.580*** | |
| | | | (-5.05) | |
| MixedFirm | | | -2.850*** | |
| | | | (-14.68) | |
| Blockholders | | -1.402* | -0.571 | -1.907* |
| | | (-2.03) | (-0.84) | (-2.56) |
| StateBlockholder | | 2.192*** | 2.391*** | 2.386*** |
| | | (14.62) | (16.78) | (14.91) |
| State_Blockholders | - | -2.184*** | -2.381*** | -2.376*** |
| | | (-14.59) | (-16.73) | (-14.87) |
| NoBlockholders | | 0.349*** | 0.332*** | 0.395*** |
| | | (8.20) | (8.79) | (9.07) |
| lnBoardSize | - | -0.633*** | -0.675*** | -0.615*** |
| | | (-5.85) | (-6.34) | (-5.62) |
| CEOfemale | + | -0.002 | -0.018 | 0.215 |
| | | (0.01) | (-0.12) | (1.36) |
| l_lnFirmAge | | 0.309*** | 0.332*** | 0.356*** |
| | | (5.11) | (5.52) | (5.81) |

| | [1] | [2] | [3] |
|---|---|---|---|
| l_FirmSizeAssets | -0.366*** | -0.351*** | -0.458*** |
| | (-6.44) | (-6.21) | (-8.07) |
| l_FirmSizeSales | 0.359*** | 0.357*** | 0.401*** |
| | (7.25) | (7.20) | (8.01) |
| l_DebtRatio | 0.039*** | 0.040*** | 0.033*** |
| | (14.82) | (15.09) | (12.10) |
| GrowthOpportunitiess | -0.007 | -0.008 | -0.057*** |
| | (-1.03) | (-1.19) | (-7.63) |
| l_Industryrisk | 0.000 | -0.017 | -0.037 |
| | (0.00) | (-0.44) | (-0.94) |
| l_PublicListing | 0.700 | 0.039 | 0.458 |
| | (1.28) | (0.07) | (0.84) |
| l_ROA1 | 0.558*** | 0.559*** | |
| | (61.44) | (61.87) | |
| l_ROA2 | | | 0.544*** |
| | | | (57.44) |
| Constant | 3.311** | 3.359*** | 3.661** |
| | (2.96) | (3.04) | (3.19) |
| Number of observations | 68,308 | 68,308 | 68,264 |
| Adjusted $R^2$ | 0.330 | 0.329 | 0.319 |

Notes: The table presents results of regressing firm performance (ROA1 and ROA2), on test and control variables. The control variables with a "l_" are one-year lagged and the variables with "_" are interacted. All variables are defined in table 1. Column [1] reports the results for the main analysis defining ownership by intervals, column [2] reports the results using alternative definitions for ownership and column [3] use the same definitions of ownership as column [1] but use ROA2 as the performance measure. Indicator variables for years are included in all tests, but not presented in the results. T-values are presented below the coefficients in parentheses and are adjusted for correlation within clusters using the Huber-White Sandwich Estimator.
* p<0.05; ** p<0.01; *** p<0.001

In the analysis we regress firm performance on the different test and control

variables for ownership and test our hypotheses simultaneously. The main

analysis is based on the dependent variable *ROA1* (EBITDA) and the results are presented in column [1] of table 9.

As our main goal is to investigate the impact state ownership has on firm performance, the results from interacted variables are taken into account. The coefficients regarding the test variables on ownership is significant and negative at the 1% level for the variable *State_Own0to33*. This means that firms with state ownership behaves differently, and it indicates lower performance for firms with state ownership between 0 and 33 percent. By looking at the coefficient for *Own0to33* we see that it is negative and significant at the 5% level. However, the interaction term with the effect of state ownership, has a significantly lower coefficient suggesting that firms with state ownership at this interval in fact have lower performance than firms with non-state ownership, predicted by **Hypothesis 1.** The result support findings from previous research and existing literature suggesting that state owned firms have lower performance, even with a low ownership share. The remaining coefficients for ownership intervals are insignificant.

Further, the coefficient for *State_ Blockholders* is significant and negative at the 0.1% level, meaning that when the state is a blockholder in a firm it has a negative influence on the firm's performance. The result is in line with previous findings that if the state is a large blockholder the effect is negative (Pedersen & Thomsen, 2003), and it supports **Hypothesis 2** that there is a negative relationship between state blockholders and firm performance. The coefficient for *NoBlockholders* is significant and positive, which indicates that having several blockholders, up to 5, have a positive impact on firm performance. Previous research on the matter of several blockholders has been ambiguous, but our results find that it does have an impact, which is in line with **Hypothesis 3**, and the effect is positive.

The coefficient for *lnBoardSize* is negative and significant at the 0.1% level, which supports previous research that characteristics of the board of directors have an impact on firm performance, and that a smaller board is more effective due to the problems that arise regarding coordinating and decision-making when the number of board members increases (Yermack, 1996; Eisenberg, 1998). The result is as predicted in **Hypothesis 4,** and there is a negative relation between

board size and firm performance, suggesting that a larger number of people in the board have negative impact.

The coefficient for *CEOfemale* is insignificant. A possible explanation is due to contradicting theories regarding state ownership and having a female CEO. Previous research suggest that state ownership has negative impact on firm performance, and that having a female CEO will relate positively. As previously discussed in this thesis the state has ambitions of a 40 percent distribution between men and women (MTIF, 2020), giving reasons to believe that the presence of female CEO´s are higher in state owned firms. Confirmed by the summary statistics, state owned firms have a larger presence of female CEOs in our sample. Hence, the two theories are in contradiction with each other, which may result in the coefficient for *CEOfemale* being insignificant.

The coefficients for the control variables, *lnFirmAge*, firm size (*lnAssets* and *lnSales*), and *DebtRatio* are all significant. The results suggest that firm performance increases when a firm is older. *lnAssets* is negatively related to firm performance, while *lnSales* and *DebtRatio* affects firm performance positively. The results on firm's debt ratio supports findings of previous research by Anderson & Reeb (2004), that higher leveraged firms perform better. The one-year lagged ROA (*l_ROA1*) have a significant and positive coefficient and has high lagged correlation with the dependent variable. The variable controlling for industry risk, growth opportunities and whether or not a firm is publicly listed are insignificant.

### 6.1 Sensitivity Analysis

*6.1.1 Tests Using Alternative Definitions and Performance measures*

After finding results in the main analysis, we investigate whether the results can be influenced by different definitions of ownership. We therefore redefine ownership identities following Boardman & Vining (1989). Thus, a dummy variable, *StateOwned100,* is generated taking the value 1 if a firm is 100 percent state owned and 0 otherwise, followed by a dummy variable *MixedFirms* for mixed ownership taking the value 1 if a firm has both state and private ownership. The results for the alternative definitions of ownership are presented in column [2]

of table 9. The coefficients for the variables *StateOwned100* and *MixedFirms* are significant and negative at the 0.1% level which gives further support to the main results and our hypothesis that firms with state ownership has lower performance than firms with non-state ownership. It also gives reason to argue that regardless of ownership stake, the state will have a negative impact on firm performance.

For the results using the alternative performance measure, *ROA2*, presented in column [3] of table 9 we get the same results, except for a significant and negative coefficient for *GrowthOpportunities*. This implies that higher research and development expenses have a negative impact on firm performance measured by *ROA2* (see table 1 for variable definition).

In the main analysis there is a separation between all blockholders and the state as a blockholder. From the literature review, previous research find partly significance for blockholder identities´s effect on firm performance. To control for this, blockholders is divided into six different types; state, institutional, industrial, international, personal and unspecified blockholders and tested to investigate whether the different identities affect firm performance in contrasting ways. The results are shown in table 13 in the appendix, and we find that personal blockholders are significant and negative at the 0.1% level, while institutional and industrial are significant at the 10% level, negative for institutional and positive for industrial. The other blockholder identities were insignificant.

*6.1.2 Tests Using Alternative Control Variables*

To investigate whether the results for the test variables are affected by the control variables in the model we examine the sensitivity and robustness of our results by making changes in these variables. The results from the control regressions are presented in the appendix in columns [1] and [2] of table 14, [1] to [3] of table 15, and [1] to [4] of table 16.

While we control for firm age in our main model, we further investigate whether a "young" or "old" firm have any different impact on firm performance, based on a firm's life cycle. New and young firms in the early stages of their life cycle often have lower performance due to the incubation period, while a settled firm focus more on performance. The main results suggest that when a firm gets older it has

a positive impact on firm performance, which is in contradiction with the idea that a firm's life cycle often ends after maturity. This could be explained by the filter applied that ensures all firms to be active throughout the period, so that older firms in the end of their lifecycle, that are out of business, might have been excluded from the sample. Following Anderson & Reeb (2003), we classify "young" and "old" firms depending on if a firm is under or over 50 years. From the results of regressing *ROA1* with the variables for young and old firm, we find that they both are significantly positive with approximately same impact on firm performance. The results for the test variables remain the same regardless of firm age.

Further, we examine whether controlling for the main industry groups affect our main results. The industry groups which includes schooling and other services have no significant impact on firm performance. As for the other industry groups[3] we find a positive and significant relation with firm performance. However, the test variables' result remains the same as before.

As the state has focus on sustainable value creation and long-term investments, we have reason to believe that the state behaves differently than private firms in times of high volatility or financial crises. Based on this we wish to investigate whether the results differ taking the global financial crisis into account. We regress *ROA1* with the years before, during, after and without 2007-2009. By regressing firm performance with the years during the financial crisis, we see that year 2008 and 2009 have a negative impact on firm performance, but we find no significant changes in our results.

The variables defining firm size are both significant in the main results, but the coefficients have opposite signs. Therefore, we examine the effect of regressing *ROA1* with *lnAssets* and *lnSales* separately. The result of these tests shows no difference, suggesting that the main results are robust for changes in the control variables for size.

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[3] Agriculture, forestry and fishing, Mining and extraction, Industry, Construction, Transport and storage, Hotels and other lodging places, Information and communication, Real estate, Professional, scientific and technical service, Business services, Public administration, defense and social security, Health and social services, Culture, entertainment and recreational activities.

To see whether the control variables have an effect on test variables, we regress *ROA1* without including the control variables. As a result, we get additional significant negative impact on *ROA1* on the variable *State_Own50to67*, but the goodness of fit measured by the adjusted $R^2$ suggests that this model has low explanatory power, making the results unreliable.

Based on the sensitivity analysis, we have reason to argue that our main model is the best fitted one as it is robust to changes in some of the key control variables. Out of all the control regressions, there is no model with a better goodness of fit by the adjusted $R^2$. Hence, we choose to rely on the results from the main model.

### 6.2 Endogeneity

Causality between state ownership, board structure and firm performance is difficult to test as there is not a nature of causality between state ownership and firm performance. The analysis potentially suffer from an endogeneity problem as this is a common concern for studies focusing on a causal relationship between ownership and firm performance, because the ownership structure is endogenous. The potential endogeneity problems in the model can be blamed on the privatization caused by the fact that the government want private ownership to be the main approach in Norwegian businesses, and therefore strive to reduce state ownership as much as possible (MTIF, 2020). The government states in MTIF (2020) that the state only should hold shares in firms if it is the best solution to address various needs of the state. The potential upward bias caused by endogeneity effects driven by high performing state owned companies being turned into private companies might therefore be present in our study. On the other hand, sometimes privatization can be delayed or even refrained from if the public authorities have some reason to believe that the consequences of the firm being closed, relocated or similar are socially unacceptable. To adjust for such endogeneity as discussed throughout this paragraph, one could ideally estimate a selection model (e.g. a two-stage Heckman model) where firms that change from state owned to privately owned firms are identified in the first stage.

To test if there is reason to believe that our model suffers from endogeneity problems, the test variables are explored to see if they are constant over time for a company. A constant test variable indicate that it is not affected by firm

performance or other potential variables, and that the likeness of the causality going from the test variable to firm performance is present. Following Che and Langli (2015) the standard deviation is calculated for the test variables related to ownership and board structure for each firm to examine their stability. A result from the standard deviation equal to zero indicate that the variable is constant over time for our sample. As presented in table 10, the number of registered firms that shift ownership identity is quite small, due to high percentages of stability in the test variables. In column [1] of table 10 we see that there are 86,504 firm-year observations with constant state ownership, which equals to 70,8% of the sample. Column [2] - [4] of the table show the number and percentage of firm-year observations of the other test variables that are stable. For *Blockholders* and *CEOfemale* the percentages are very high, respectively 98,4% and 87%. For *BoardSize* the results are somewhat lower at 45.97%. Because of the the high overall degree of stability in the sample, it is not necessary and possible to identify a robust selection process to go through with a Heckman test or an instrumental variable regression.

**Table 10: Number and Percentage of Observations with Constant Test Variables**

|  | *State Ownership* [1] | *Blockholders* [2] | *Board Size* [3] | *CEO Female* [4] |
|---|---|---|---|---|
| *Number of observations* | 86,504 | 120,340 | 55,966 | 97,486 |
| *Percentage* | 70.77% | 98,45% | 45.97% | 87% |

Notes: The table presents the number and percentage of observation that have constant test variables in the sample period in the first row and second row respectively. Total number of firm-year observations is 130,914. In column [1] we present the number and percentage of firm-year observation that have constant state ownership. Column [2] - [4] presents the number and percentage of firm-year observation with constant variable of *Blockholders*, *BoardSize* and *CEOfemale*.

## 8. Discussion, Further Research & Limitations

As shown in the main results, state ownership between 0 and 33 percent has a significant and negative impact on firm performance, while the remaining

ownership intervals are insignificant. A possible explanation for the negative impact could be the expectations set by the state regardless of the ownership stake in a firm (MTIF, 2020) and that these expectations have an influence already from the first percent. From the regression using *StateOwned100* and *MixedFirms* as ownership definitions, the results are that they both have negative impact which supports the question of whether state ownership in fact has a negative influence from the first percent.

As previously discussed, the state has different reasons for their ownership than private shareholders. Some of them being that they have sociopolitical goals rather than focus on performance, or that some firms do not have an optimal financial basis to be privately owned. As mentioned earlier, the firms included in category 3 in MTIF (2020) are firms where the state have ownership because of non-financial objectives, which also commonly are companies that are unattractive for private ownership because of limited potential. These firms often have lower performance and limited possibilities of a financial turnover, but because of political reasons it is beneficial for the society that these firms exist. The firms of category 3 are most likely the firms who limits the overall firm performance of state owned companies. Since the state wants private ownership to be the main base of the Norwegian business (MTIF, 2020), companies with all business considerations is most likely private as this is to be seen as the main base for private ownership. In addition, the state has ambitions to reduce the ownership stake in companies within category 1, meaning to reduce the ownership in firms where the only objective is highest possible return over time, making it an important explanation factor for the lower performance of state owned firms. With this in mind, further research separating the different categories and comparing companies within category 1 and 2 with privately owned companies could be interesting. Recent numbers reveal that state owned companies within category 1 and 2 show high returns and firm performances (State Ownership Report, 2019), creating base for an interesting research question on whether the state owned companies that seeks to achieve maximum profit outperform privately owned companies.

When trying to find possible explanations for the negative impact state ownership has within the interval between 0 and 33 percent, we look at problems within

principal-agent theories. Principal-agent problems could arise due to the distribution of rights and responsibilities between the actors in the organization. The weak performance of companies where the state owns less than 33 percent could possibly be explained by that these companies end up being controlled by the administration and suffer from lack of ownership, grounded on the principal-agent problems.

Further, a potential explanation for the insignificant results could be that it is caused by limitations in the sample. Even though the means of the control variables for state and non-state owned companies were controlled, checking that they were comparable between the testing and controlling group, it could be explained by the fact that our sample consist of more private firms than state owned firms and that the two groups are not sufficiently comparable. The intervals have a lower presence of state owners, which could lower the impact these firms have on performance. One interesting factor could be to exclude Equinor from the sample of state owned companies to see if this affect the results in terms of significance. Accounting data on Equinor show that the firm's profit is unlike any other Norwegian firm, potentially causing the state to take in a special position because of the firm (State Ownership Report, 2019).

An interesting subject to further investigate in regard to the negative impact state ownership has on performance is the reasons for their ownership, as the state often have ownership or invest in firms without the optimal performance because of their social responsibility. Does the state as an owner have negative performance regardless of the basis of the firm they own, or could the reason be that the firm already has sub-optimal performance? Further research could be to investigate these kinds of firms, where the state invests or have ownership because of sub-optimal performance, and see if their performance change over time, either for the better or for the worse.

As discussed in previous parts of the thesis, earlier research discusses whether different blockholder identities affect firm performance in contrasting ways. In the sensitivity analysis we controlled for this effect and only found significance for institutional and industrial blockholders. In table 11 in the appendix, the distribution of the different blockholder identities is presented, while table 12 in

the appendix provide descriptive statistics on the different types of blockholders. From these tables it is shown that there is a relatively equal distribution of the different blockholder identities except for personal blockholers that is somewhat lower than the others. As for the distribution of ownership stake for the different blockholder identities there is a more unequal distribution, indicating that a more fitted way of measuring the blockholders effect on firm performance could be to separate them into different intervals. Based on this, a test on how a more equal ownership stake for each blockholder identity will affect firm performance could be performed, as the sample will be more comparable. Another limitation when it comes to the blockholders of the sample is that there only are observations for the five largest owners for each company. As a blockholder is defined as a shareholder having more than 5 percent equity stake in the firm, there is probably a significantly higher number of blockholders as there are a lot of observations exceeding 5 percent on the fifth largest owner in the sample. This might affect the significance of *NoBlockholders* in the main analysis, as our regression show a positive relation with number of blockholders and firm performance, indicating that a higher number of blockholders affect firm performance positively. As mentioned in the literature review, previous research discusses whether several blockholders affect firm performance positively or negatively, but as we are restricted to base our investigation on no more than five blockholders this limits our field of conclusion.

Further, the results regarding the test variable *CEOfemale* gave no significant result and therefore no support for our hypothesis. As mentioned, the distribution of male and female CEOs in the sample is uneven, as there is substantially more observations with male CEOs. Previous research by Khan & Vieito (2013) and Jalbert et al. (2013) find that the gender of the CEO affect firm performance. In the summary statistics, we saw that state owned companies have a larger presence of female CEOs. Further research on a more even sample when it comes to gender distribution within the different ownership identities could be to test the effects of firm performance, as existing theories contradict each other when it comes to state ownership and female CEOs effect on firm performance. Based on the fact that the state's ambition is to have at least 40 percent men and women in the top management, and top management generally have a larger share of men (MTIF,

2020), there is a gap in the literature regarding the context of females in top management, ownership identity and firm performance.

As briefly mentioned, we have reason to believe that the functions of state and family ownership have some similarities. The state is a long-term owner searching to achieve objectives over a longer horizon such as long-term sustainable economic growth, keeping headquarters from moving out of the country and reaching sociopolitical goals achieved by the company's existence (MTIF, 2020). Just like the state, family firms are long term investors as the firms often are kept in the family for generations (Anderson & Reeb, 2003). In this way, family ownership secures the existence of the company over a long time horizon and prevent international acquisitions, in addition to preventing headquarters from leaving the country, and securing employment. Both the state as an owner, and family firms are associated with being a protector of common interests with a high level of trust in the society (Anderson & Reeb, 2003; Che & Langli, 2015; Christensen, 2018).

Anderson and Reeb (2003) find that family ownership is more profitable than non-family ownership. This is further supported by Che and Langli (2015) on a study on Norwegian family firms relative to private ownership, showing that stronger family power and a higher percentage of family members in the boards is associated with higher performance. Earlier research has shown that there are three main elements explaining firm value, namely ownership, control and management (Villalonga & Amit, 2006). Results from this study indicate that value in family firms is created only when family ownership is combined with certain forms of family control and management, and when the founder serves as the CEO of the firm (Villalonga & Amit, 2006). Based on the similarities between state and family ownership, we believe that further research on these similarities and how the structure of state ownership can be translated into family ownership structure or the opposite, could lead to interesting findings. Are there some ways the state as an owner could learn from managers of family firms to improve performance and value creation, grounded on the fact that family ownership proves to be more efficient than non-family ownership?

Volatility in a firm can vary with ownership concentration, and over the past decades the real and financial volatility of public firms has increased while it has decreased for private firms (Thesmar & Thoeng, 2011). The research state that volatility in firms is affected by risk-taking, and that this variable is affected by risk-sharing among shareholders. An aspect worth investigating is whether financial volatility in a firm is dependent on ownership identity. The state as an owner is believed to focus on long-term sustainable value development rather than quick returns, whereas private, non-family investors have different incentives which often influences their level of risk-taking. Thesmar & Thoeng (2011) further argue that since there is an increase in risk sharing, through capital market integration or rising stock market participation, this can lead to opposite trends in volatility for private and public firms. A suggestion for further research regarding this subject could be to investigate the difference between volatility in state-owned and privately owned firms based on the levels of risk-taking between them, and find results on volatility in firm performance in a long-term perspective between the different ownership identities.

As the state ownership is relatively stable throughout the sample period, a fixed effects analysis is inappropriate. If there are substantial changes in ownership one could test a fixed effects regression where the dummy variables for each year of the sample are the fixed effects. Lastly, we make reservations regarding mistakes in the thesis that may appear due to incorrect programming or coding.

## 9. Conclusion

This thesis investigates the difference in performance between state owned and privately owned companies and adds contributions to the existing literature. In Norway, there is a substantial large presence of state ownership in firms, but limited understanding of how these firms behave. Therefore, this possibility is taken to add to the literature by investigating a sample containing detailed data for all registres firms in Norway in the time period from 2000 to 2017. The dataset contains information regarding ownership identity using ultimate ownership, corporate governance information such as board size and gender of the CEO, and accounting data. To the best of our knowledge, there is no recent research that

covers all registered firms in Norway investigating the performance differentials between ownership identities in a long-term perspective.

We have discussed whether or not the sociopolitical goals, reasons for ownership and the ambition of sustainable value creation in the state have a negative impact on firm performance, compared to private firms who often have focus on efficiency, profitability and personal gain. Through a cross-sectional analysis, using return on assets as a profitability measure of firm performance, we contribute with new evidence to the literature by finding that state owned firms have lower performance than non-state owned firms. Our main results show that when the state has a low ownership stake in a firm, in this case between 0 and 33 percent, it will have a negative impact on firm performance. Further, through alternative definitions of ownership, the results suggest that state ownership, regardless of stake, have a negative relation to firm performance. Our results also contribute to the literature regarding the state as a large blockholder, which has been found to have negative impact on firm performance and that having several blockholders in a firm has a positive impact. In addition, we find evidence that a larger number of board members in a firm is negatively related to firm performance.

We examine the robustness of our results by performing control regressions with alternative definitions and additions of control variables. Our findings show that the main model has the best fit and that it is robust to changes in control variables.

Finally, to answer the research question presented introductory - *Does ownership identity affect firm performance?* - we find significant evidence that ownership identity in fact affect firm performance, and that state ownership has a negative impact.

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# Appendix

## Table 11: Distribution of blockholders

| Variable | N |
|:---:|:---:|
| State Blockholders | 89,803 |
| Personal Blockholders | 59,615 |
| International Blockholders | 87,771 |
| Institutional Blockholders | 90,013 |
| Industrial Blockholders | 91,149 |
| Unspecified Blockholders | 97,514 |

Notes: The table exhibits number of observations within each blockholder identity of our sample. See Table 1 for definition of Blockholders.

## Table 12: Descriptive Statistics Blockholder Identity

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|:---:|:---:|:---:|:---:|:---:|:---:|
| InstitutionalBlockholders | 130914 | 1.227 | 9.307 | 0 | 100 |
| PersonalBlockholders | 130914 | 10.168 | 29.061 | 0 | 100 |
| InternationalBlockholder | 130913 | 8.123 | 26.731 | 0 | 100 |
| IndustrialBlockholders | 130914 | 5.889 | 21.474 | 0 | 100 |
| UnspecifiedBlockholders | 130914 | 7.374 | 21.158 | 0 | 100 |
| StateBlockholders | 130914 | 10.516 | 28.326 | 0 | 100 |

Notes: The table presents descriptive statistics (mean and standard deviation) for the different blockholder identities used in our sensitivity analysis. See Table 1 for definition of Blockholders

**Table 13: Control Regression for Sensitivity Regarding Blockholder Identity**

| Variable | Blockholders |
|---|---|
| *Own0to33* | -0.188 |
| | (-1.02) |
| *Own33to50* | 0.243 |
| | (0.77) |
| *Own50to67* | 0.920** |
| | (2.97) |
| *Own67to99* | 1.039** |
| | (2.93) |
| *Own100* | 0.794* |
| | (2.08) |
| *StateOwned* | -1.201 |
| | (-1.84) |
| *State_Own0to33* | -1.467*** |
| | (-3.48) |
| *State_Own33to50* | -0.105 |
| | (-0.20) |
| *State_Own50to67* | -0.003 |
| | (-0.01) |
| *State_Own67to99* | 0.279 |
| | (0.50) |
| *State_Own100* | 0.557 |
| | (0.84) |
| *BlockholdersInstitutional* | -0.872# |
| | (-1.86) |

| | |
|---|---|
| *BlockholdersPersonal* | -0.526*** |
| | (-3.59) |
| *BlockholdersInternational* | 1.169# |
| | (1.95) |
| *BlockholdersIndustrial* | -0.296 |
| | (-1.11) |
| *BlockholdersUnspecified* | 0.016 |
| | (0.09) |
| *BlockholdersState* | 0.374 |
| | (1.51) |
| *NoBlockholder* | 0.269*** |
| | (4.41) |
| *lnBoardSize* | -0.566*** |
| | (-5.19) |
| *CEOfemale* | 0.006 |
| | (0.04) |
| *Constant* | 1.885# |
| | (1.89) |
| *Number of observations* | 68,308 |
| *Adjusted R²* | 0.330 |

Notes: The table presents results of regressing firm performance (ROA1) on the different blockholder identities, Institutional Blockholders, Personal Blockholders, International Blockholders, Industrial Blockholders, Unspecified Blockholders and State Blockholders respectively. The variables with "_" are interacted. Indicator variables for years and control variables are included in the test, but not presented in the results. T-values are presented below the coefficients in parentheses and are adjusted for correlation within clusters using the Huber-White Sandwich Estimator.
#$p<0.10$; *$p<0.05$; **$p<0.01$; ***$p<0.001$

**Table 14: Control Regressions for Sensitivity**

| Variable | Young and Old Firms [1] | Industry Groups [2] |
|---|---|---|
| Own0to33 | -0.381* | -0.446* |
| | (-2.16) | (-2.54) |
| Own33to50 | 0.216 | 0.239 |
| | (0.67 | (0.75) |
| Own50to67 | 1.012** | 0.962** |
| | (3.22) | (3.08) |
| Own67to99 | 1.152** | 1.245*** |
| | (3.15) | (3.45) |
| Own100 | 0.905* | 0.969* |
| | (2.29) | (2.48) |
| StateOwned | -1.622* | -1.605* |
| | (-2.50) | (-2.47) |
| State_Own0to33 | -1.124** | -1.150** |
| | (-2.83) | (-2.86) |
| State_Own33to50 | -0.053 | -0.102 |
| | (-0.10) | (-0.20) |

| | | |
|---|---|---|
| *State_Own50to67* | -0.054 | 0.027 |
| | (-0.11) | (0.05) |
| *State_Own67to99* | 0.236 | 0.163 |
| | (0.42) | (0.30) |
| *State_Own100* | 0.114 | 0.147 |
| | (0.16) | (0.21) |
| *Blockholders* | -1.679* | -1.422* |
| | (-2.24) | (-2.05) |
| *StateBlockholders* | 2.131*** | 2.178*** |
| | (12.69) | (14.26) |
| *State_Blockholders* | -2.123*** | -2.169*** |
| | (-12.65) | (-14.23) |
| *NoBlockholders* | 0.349*** | 0.381*** |
| | (8.16) | (8.85) |
| *lnBoardSize* | -0.641*** | -0.715*** |
| | (-5.92) | (-6.51) |
| *CEOfemale* | -0.024 | 0.141 |
| | (-0.15) | (-0.88) |
| *Constant* | 3.576** | 2.572 |
| | (3.07) | (1.64) |

| | | |
|---|---|---|
| *Number of observations* | 68,535 | 68,308 |
| *Adjusted R²* | 0.330 | 0.330 |

Notes: The table presents results of regressing firm performance (ROA1), on test and alternative control variables. The variables with "_" are interacted. All variables are defined in Table 1. Column [1] reports the results for the test variables using "young" and "old" firm. Column [2] reports the results when industry groups are included. Indicator variables for years and control variables are included in all tests, but not presented in the results. T-values are presented below the coefficients in parentheses and are adjusted for correlation within clusters using the Huber-White Sandwich Estimator.
*p<0.05; **p<0.01; ***p<0.001

## Table 15: Control Regressions for Sensitivity

| *Variable* | *(lnAssets)* | *(lnSales)* | *Test-variables* |
|---|---|---|---|
| | *[1]* | *[2]* | *[3]* |
| *Own0to33* | -0.355* | -0.388* | -1.269*** |
| | (-2.02) | (-2.20) | (-5.11) |
| *Own33to50* | 0.215 | 0.130 | 0.614** |
| | (0.68) | (0.41) | (1.42) |
| *Own50to67* | 1.005** | 0.926** | 1.905*** |
| | (3.22) | (2.97) | (4.64) |
| *Own67to99* | 1.178** | 1.071** | 3.408*** |
| | (3.27) | (2.98) | (6.92) |
| *Own100* | 0.949* | 0.795* | 2.608*** |
| | (2.43) | (2.04) | (4.94) |
| *StateOwned* | 1.865** | -1.571* | -5.806*** |
| | (-2.89) | (-2.43) | (-6.79) |

| | | | |
|---|---|---|---|
| *State_Own0to33* | -1.139** | -1072* | -2.402*** |
| | (-2.86) | (-2.70) | (-4.53) |
| *State_Own33to50* | -0.102 | -0.049 | -1.025 |
| | (-0.20) | (-0.10) | (-1.62) |
| *State_Own50to67* | -0.116 | -0.048 | -1.260* |
| | (-0.24) | (-0.10) | (-2.08) |
| *State_Own67to99* | 0.082 | 0.142 | -1.388 |
| | (0.15) | (0.26) | (-1.93) |
| *State_Own100* | 0.059 | 0.140 | -1.281 |
| | (0.09) | (0.20) | (-1.41) |
| *Blockholders* | -1.378* | -1.498* | -3.478** |
| | (-2.03) | (-2.19) | (-3.17) |
| *StateBlockholders* | 2.051*** | 2.064*** | 2.262*** |
| | (14.00) | (13.97) | (-9.84) |
| *State_Blockholders* | -2.045*** | -2.056*** | -2.243*** |
| | (-13.98) | (-13.94) | (-9.76) |
| *NoBlockholders* | 0.334*** | 0.382*** | 0.786*** |
| | (7.81) | (9.04) | (12.36) |
| *lnBoardSize* | -0.531*** | -0.766*** | -2.059*** |
| | (-4.94) | (-7.25) | (-13.92) |
| *CEOfemale* | -0.044 | 0.052 | 0.293 |
| | (-0.28) | (0.34) | (1.26) |

| | | | |
|---|---|---|---|
| *Constant* | 2.150 | 0.611 | 12.778*** |
| | (1.94) | (0.59) | (11.15) |
| *Number of observations* | 68,330 | 68,308 | 113,807 |
| *Adjusted R²* | 0.328 | 0.329 | 0.080 |

Notes: The table presents results of regressing firm performance (ROA1), on test and alternative control variables. The variables with "_" are interacted. All variables are defined in Table 1. Column [1] and [2] reports result when measuring firm size with ln(assets) and ln(sales) respectively. Indicator variables for years are included in all tests, but not presented in the results. Control variables are included in the tests from column [1] and [2]], but not reported. Column [3] reports results without control variables. T-values are presented below the coefficients in parentheses and are adjusted for correlation within clusters using the Huber-White Sandwich Estimator.
*p<0.05; **p<0.01; ***p<0.001

**Table 16: Control Regression for Sensitivity Regarding Financial Crisis**

| *Variable* | *Before crisis* [1] | *After crisis* [2] | *During crisis* [3] | *Without crisis* [4] |
|---|---|---|---|---|
| *Own0to33* | -0.330 | 0.438* | -0.406* | -0.380* |
| | (-1.88) | (-2.49) | (-2.33) | (-2.16) |
| *Own33to50* | 0.286 | 0.151 | 0.192 | 0.200 |
| | (0.90) | (0.47) | (0.61) | (0.63) |
| *Own50to67* | 1.032*** | 0.940** | 0.946** | 0.969** |
| | (3.31) | (3.00) | (3.04) | (3.10) |
| *Own67to99* | 1.239*** | 1.073** | 1.104** | 1.128** |
| | (3.46) | (2.98) | (3.09) | (3.13) |
| *Own100* | 1.011** | 0.788* | 0.834* | 0.867* |
| | (2.62) | (2.02) | (2.16) | (2.22) |
| *StateOwned* | -1.469* | -1.550* | -1.473* | -1.544* |
| | (2.28) | (-2.40) | (-2.28) | (-2.39) |

| | | | | |
|---|---|---|---|---|
| State_Own0to33 | -1.124** | -1.125** | -1.158** | -1.136** |
| | (-2.82) | (-2.83) | (-2.91) | (-2.85) |
| State_Own33to50 | -0.11 | -0.043 | -0.079 | -0.082 |
| | (-0.22) | (-0.08) | (-0.15) | (-0.16) |
| State_Own50to67 | -0.032 | -0.023 | -0.032 | -0.036 |
| | (-0.06) | (-0.05) | (-0.07) | (-0.07) |
| State_Own67to99 | 0.133 | 0.199 | 0.156 | 0.158 |
| | (0.24) | (0.36) | (0.28) | (0.29) |
| State_Own100 | 0.106 | 0.124 | 0.066 | 0.094 |
| | (0.15) | (0.18) | (0.09) | (0.14) |
| Blockholders | -1.538* | -1.483* | -1.463* | -1.392* |
| | (-2.23) | (-2.16) | (-2.13) | (-2.02) |
| StateBlockholders | 2.243*** | 2.171*** | 2.238*** | 1.194*** |
| | (-15.23) | (-14.55) | (15.26) | (14.63) |
| State_Blockholders | -2.235*** | -2.163*** | -2.230*** | -2.185*** |
| | (-15.20) | (-14.52) | (-15.23) | (-14.60) |
| NoBlockholders | 0.355*** | 0.348*** | 0.349*** | 0.349*** |
| | (8.35) | (8.15) | (8.24) | (8.19) |
| lnBoardSize | -0.662*** | -0.620*** | -0.627*** | -0.628*** |
| | (-6.15) | (-5.73) | (-5.86) | (8.19) |
| CEOfemale | 0.017 | -0.014 | -0.011 | -0.008 |
| | (0.11) | (-0.09) | (-0.07) | (-0.05) |
| Constant | 4.043*** | 4.527*** | 4.623*** | 4.1016*** |
| | (3.66) | (4.13) | (4.22) | (3.63) |
| Number of observations | 68,308 | 68,308 | 68,308 | 68,308 |

| | | | | |
|---|---|---|---|---|
| *Adjusted R²* | 0.328 | 0.328 | 0.329 | 0.329 |

Notes: The table presents results of regressing firm performance (ROA1), on the years before, after, during and without the global financial crisis of 2007-2009. The variables with "_" are interacted. All variables are defined in Table 1. Column [1] reports the results for the test variables using the years before the crisis. Column [2] reports the results using the years after the crisis. Column [3] reports the results using the years during the crisis. Column [4] reports the results when excluding the years of the crisis. Indicator variables for years and control variables are included in all tests, but not presented in the results. T-values are presented below the coefficients in parentheses and are adjusted for correlation within clusters using the Huber-White Sandwich Estimator.

*p<0.05; **p<0.01; ***p<0.001