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State or Private ownership - The impact on performance and dividend payout

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Abstract

This paper explores the impact state and private ownership have on return on assets and dividend payouts on a large sample of private and public limited liability companies in Norway. We test the impact using random-effects models on data for the time period 2002-2015. Our results are consistent with theory, which suggests that state ownership offers lower profitability and dividend payouts. We find that state-owned enterprises offer an average return on assets of 4.3192% while private-owned enterprises offer an average return on assets of 8.4738%. State-owned enterprises yield an average dividend payout ratio of 10.8798% while privately owned enterprises yield 24.4069%. By controlling for other factors, we find that state ownership negatively impacts return on assets and dividend payouts.

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1. Introduction

The belief that state ownership is less efficient and has disadvantages compared to private ownership is not new. In 1776, Adam Smith argued that if the crowns land becomes privately owned it would become well improved and cultivated within few years (Sheshinski and Calva, 2003). It seems that many countries have been inspired by Adam Smith's arguments. Between 1970 and 2000, Ronald Reagan and Margaret Thatcher started a trend of privatizing the state-owned enterprises and pruning the welfare state across the West (The Economist, 2012).

There has been a long-lasting debate regarding the advantages and disadvantages of government control over enterprises (Goldeng, Grünfeld and Benito, 2008; Megginson and Netter, 2001). State-owned enterprises (SOEs) have been defended on the basis that government control is needed to overcome market failures — notably prevention of abuse of market position. Government control has been regarded as necessary to reach non-economic goals such as the need for public control over employment, regional policies, natural resources and social issues (Grout and Stevens, 2003).

Private ownership is the most dominant form of ownership in marked-based societies. However, it is easy to find cases of SOEs within many countries. In Norway, the presence of state ownership in regular markets is particularly strong. SOEs are well represented in many sectors (Goldeng et. al., 2008). In recent decades, the corporate governance of state-owned enterprises has been a subject of major public interest and political debate in Norway. "Left-wing parties emphasize the need for political control; right-wing parties tend to argue that political matters should not be confused with business concerns" (Ludvigsen, 2010, p. 2). If a certain type of ownership frequently shows greater economic performance compared to others, it seems reasonable to expect a shift toward the most efficient one (Goldeng et. al., 2008).

Dividend payouts are seen as a viable governance mechanism for reducing conflicts of interests between shareholders and self-seeking managers. The SOEs often pursue a variety of goals other than profit maximization. However, they can

potentially generate large profits. Like private shareholders, the state needs to decide whether or not to force SOEs to disgorge their earnings. The dividend argument is therefore equally valid for both ownership types. The dividend issue has been little explored in terms of dividend payouts in SOEs (Ludvigsen, 2010).

In light of the debate, we test whether the two ownership types impact profitability and dividend payouts differently. We use return on assets (ROA) to measure profitability and a dividend payout ratio (DPR) for dividends.

The thesis contributes to the growing research within corporate governance and finance. It tests the impact of ownership by using random-effects models that run on the time period 2002-2015. It provides new evidence regarding firm performance and dividend payouts with respect to private and state ownership. Literature and theory suggest that private ownership is superior to state ownership. Many see this as common knowledge, but we argue that not enough evidence has been put forward. This lack motivates us to do empirical research within this area.

Research question 1
What is the financial impact in terms of ROA of a company being state-owned or privately owned?

Research question 2
What is the impact on DPR for a company which is either state-owned or privately owned?

We find that state ownership negatively impacts ROA and DPR, while private ownership positively impacts ROA and DPR. SOEs offers a lower ROA and DPR than private owned enterprises (POEs) on an average. Our evidence is consistent with literature and theory suggesting that SOEs are less profitable and has lower dividend payouts.

To make sure that our results are consistent, we perform different robustness tests. We check for robustness by testing if changing our definitions of SOEs and POEs can provide different results. As we do not allow companies to change from SOEs to POEs and vice versa, such companies are included in an additional robustness

test. In the main regression, companies that do not pay dividends are included. Thus, we perform a robustness test with only dividend-paying firms. Finally, a test where changing our measures for profitability and dividends is performed. The robustness tests support our findings, as well as indicating that SOEs has a lower profit margin and earnings over free cash flow than POEs.

The rest of the paper is structured as follows: *Chapter 2* presents literature and theory of importance for the thesis. It presents definitions of SOEs and POEs, and provides arguments for the financial measures used in the research questions. *Chapter 3* presents the methodology applied in our research. Hypotheses and models are created to answer the research questions. *Chapter 4* explains how the data is retrieved, and how variables are calculated. It provides a description of criteria used to create the data sample, as well as descriptive statistics. *Chapter 5* presents the results and outputs from the models. It gives likely explanations for our results. *Chapter 6* includes robustness tests. Finally, the paper concludes in *Chapter 7*.

2. Theoretical framework

In this section, we discuss literature and theories which are relevant to our thesis. The theoretical framework is collected from contributors across the world. It is important to keep in mind that there are noticeable differences between countries. Many studies show that corporate governance is affected by laws, politics, accounting laws, etc. Hence, differences between countries make it doubtful that empirical results will automatically apply for Norway (Randøy and Koekebakker, 2002).

2.1 Brief introduction to corporate governance

Corporate governance copes with how suppliers of finances to companies assure themselves of getting returns on their assets. Most advanced-market economies have solved the issue of corporate governance in a reasonable manner, in that they have guaranteed the flow of large amounts of capital to enterprises and actual repatriation of profits to the providers of finance. However, this does not imply that corporate-governance problems are perfectly solved or that they cannot be

improved. Thus, the subject of corporate governance is still of great practical importance. There is a great deal of disagreement about how good or bad the existing governance mechanisms are in advanced-market economies (Shleifner and Vishny, 1997). Shleifner and Vishny´s (1997) view of corporate governance is a straightforward agency perspective, which is sometimes referred to as separation of ownership and control. At a general level, corporate governance can be described as a problem which involves an agent (the CEO of the company) and multiple principals (such as shareholders, creditors, suppliers, employees, etc.) (Becht, Bolton and Röell, 2003). Agency theory is of great importance to this thesis. The next step is therefore to outline this perspective.

2.2 Agency theory

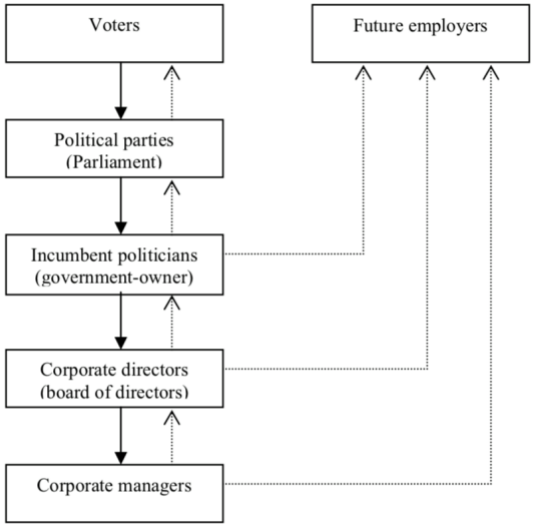
Agency theory attempts to describe the relationship between a principal and an agent (Eisenhardt, 1989). Jensen and Meckling (1976, p. 308) define this relationship as "a contract in which one or more persons (the principals) engage another person (the agent) to perform some service on their behalf which involves delegating some decision-making authority to the agent." The theory is concerned with resolving two issues that can arise due to the relationship. The first problem arises when the desires or goals of the principal and the agent diverge. The second problem is the difficulty or cost involved if the principal would verify what the agent is doing (Eisenhardt, 1989). Jensen and Meckling (1976) argues that if both the principal and the agent are seeking to maximize their utility, then the principal is exposed to an agent that might not act in his best interest. The costs related to the agency problem are defined as the loss to shareholders involved in controlling agency behavior (Manos, 2001). Shareholders can limit divergences that occurs when the managers act in their own interest. By establishing appropriate incentives for the managers, shareholders incur monitoring costs which are designed to reduce divergent behavior (Jensen and Meckling, 1976).

In terms of agency theory, a horizontal conflict exists as well. Companies often have multiple owners, which can create conflicts of interest. Large owners (with more than 50%) can use their controlling rights to extract private benefits from the firm at the expense of small shareholders (Shleifer and Vishny, 1997). Such benefits can impact the profitability and dividend payouts of a firm.

2.3 Hierarchy of a state-owned enterprise

Before identifying literature regarding the two ownership types, we start by illustrating the state-owned firm's hierarchy. Ludvigsen (2010) illustrated the hierarchy using a five-step model. We use this figure, as it illustrates the complexity and the possibly large number of principal-agent dilemmas that can occur in SOEs.

Figure 1: The firm hierarchy for SOEs



(Ludvigsen, 2010, p. 9)

According to the figure, state ownership is characterized by a multi-layered delegation structure. There is a comprehensive delegation of control rights from the voters all the way down to the managers of SOEs, as shown by the dense arrow lines. The citizens (voters) are the ultimate owners of state-owned enterprises. They vote for political parties and politicians to represent their interests. The party with the most parliamentary seats appoints a government with chosen politicians to act on the voters' behalf. Thus, the government is often referred to as the actual owner of SOEs. Superiors hold the actors accountable for their actions, as shown by the dotted arrow lines. Additionally, the actors are held accountable by future employees, as their accomplishments are assessed by the external job market. It should also be noted that the firm hierarchy is even more complex due to bureaucrats. By *bureaucrats* we mean someone within an institution of the government who keep track of the state ownership portfolio on a regular basis (Ludvigsen, 2010).

2.4 Agency-based corporate governance literature

This section highlights the literature and evidence which can explain differences between SOEs and POEs. The first section focusses on profitability, while the second section focusses on dividends.

2.4.1 Profitability

The SOEs has often been criticized for being highly inefficient and less profitable than the POEs. There are a number of possible explanations for this. State-owned enterprises can be concerned with both economic and social-welfare goals, as they are owned by the citizens. In turn, politicians have different types of motivation that may impact firms (Ludvigsen, 2010). Politicians strive to remain in power and enjoy the perks of office. Since an important goal of any government is to maintain political support, governments throughout the world often offer benefits to their supporters. The benefits can include excess employment and jobs above market wages. From this it has been argued that SOEs deliberately transfer resources to their supporters (Shleifer, 1998). In addition, politicians can be motivated by reputation and ideological concerns. Therefore, SOEs might have to utilize strategies that are politically driven (Ludvigsen, 2010). These arguments can make SOEs inefficient, as they employ a firm's resources to pursue goals that are not profit maximizing.

In terms of the agent, corporate managers of SOEs can impact the profitability of a firm. The managers can seek political careers themselves and focus on interests other than increasing efficiency and profitability (Sheshinski and Calva, 2003). Public managers have weak incentives to make investments that increase cost efficiency and quality. Managers are not owners and therefore receive only a fraction of the return (Shleifer, 1998). Managers of SOEs face softer budget constraints than POEs (Kornai, 1979). Sheshinski and Calva (2003) argues that soft budget constraints arises since bankruptcy is not a plausible threat to managers of SOEs. In their interest, the central government will bail a company out by using the public budget. A bankruptcy can harm a politician's career while a bailout can be spread over the taxpayers. This could lead to excessive risk taking (Sheshinski and Calva, 2003). Thus, it has been argued that managers of SOEs have greater discretion to chase their own objectives and that moral hazard problems will be more likely than with respect to POEs (Rygh, 2016).

Consistent with the horizontal agency conflict, controlling shareholders can exploit minority shareholders who often prefer higher profits. Arguably, this can come at the expense of profitability (Shleifer and Vishny, 1997). Depending on its fraction of ownership, the state can thus extract benefits.

Boardman and Vinning (1989) conducted one of the first systematic empirical studies of the differences between SOEs and POEs. They analyzed papers on the differences between SOEs and POEs. According to them, previous studies focus on heavily regulated companies and/or industries in which monopolies or duopolies occur. They find almost no study in which the effect of ownership is tested in competitive environments. In light of this, they compare the performances of SOEs, POEs and mixed-ownership firms among the 500 largest non-U.S. industrial firms. These distinctions are highly appropriate, as these firms compete in international markets with the primary objective of profitability. The study uses return on equity, return on assets, return on sales and net income as measures. They find evidence that SOEs perform substantially worse than POEs in terms of profitability.

Shirley and Walsh (2000) examine 52 studies that compared SOEs and POEs. Five of these indicate that SOEs outperform POEs. However, the five studies were of monopoly firms in the utility sector. In 32 studies, POEs outperformed SOEs. The remaining 15 studies indicate no significant performance differences. Most of the empirical evidence is of before-and-after comparisons of a company that is privatized. Therefore, it might not capture any change in government preferences nor control for changes in the market. Shirley and Walsh argue that more empirical evidence is needed to determine whether there is a difference in performance.

Dewenter and Malatesta (2001) report empirical evidence regarding the efficiency of SOEs and POEs. The comparison is very similar to that of Boardman and Vinning (1989), but Dewenter and Malatesta's sample is larger and includes three different time periods which span 20-years each. They examine three general aspects in their sample: profitability, leverage and labor intensity. Their profitability measures are return on sales, return on assets, and return on equity. The dataset includes the 500 largest companies in the world in terms of sales. They conclude that SOEs are significantly less profitable then POEs. Much of the evidence is taken from firms that have been state-owned prior to privatization.

Goldeng et al. (2008) test the performance differences in SOEs and POEs. They measure performance in terms of ROA and operational costs as an alternative measure. Their paper covers all registered companies in Norway during the 1990s in markets where SOEs and POEs competed with each other. They find that SOEs have lower ROAs and higher costs. On this basis, they argue that POEs outperform SOEs.

2.4.2 Dividend payout

Dividend policies address agency problems between corporate insiders and outside shareholders. Shareholders can discipline managers by extracting cash from a firm. It is argued that if profits are not extracted then a manager can use the money for personal use or invest in unprofitable projects that provides personal benefits (La Porta, Lopez-de-Silanes, Shleifer and Vishny, 2000). Rozeff (1982) argues that higher dividends can force a company to obtain funds from the capital market. Such an action would increase and potentially improve the monitoring of a company as capital contributors are seen as great monitors of managers (Rozeff, 1982). These are some of the reasons why dividend payouts are seen as a useful mechanism which can reduce any conflicts of interests between shareholders and self-seeking managers (Ludvigsen, 2010).

The dividend argument is valid regarding horizontal conflicts between shareholders. Large shareholders can use their controlling rights to extract private benefits and to finance them with lower dividend payouts. In contrast, they can choose to pay high dividends to mitigate this problem and build trust with minority shareholders (Barclay and Holderness, 1989).

Megginson, Nash and Van Randenborgh (1994) studied the dividend payout, pre- and post-privatization, of 61 companies from 18 countries. Their study includes 32 industries that experienced full or partial privatization through public share offerings from 1961 to 1990. They find significant increases in dividends when SOEs are privatized. The authors argue that the state views SOEs as investments to channel cash rather than as assets to generate a financial return. Additionally, fully state-owned enterprises cannot sell equity to the capital market. Thus, the state would have to compensate for high dividend payouts by making funds available for the company in the future.

The findings from Megginson et al. (1994) can be interpreted in a different way. Bhattacharya (1979) developed a model in which dividends serve as a signal for an insider's anticipation of a firm's future performance. Bhattacharya was one of the first to use signaling theory to describe how managers can convey information to investors in a credible manner. One possible explanation is that new private firms increase dividends by trying to signal higher expected profitability rather than that politicians have a weak preference for dividends.

Ludvigsen (2010) wrote a dissertation regarding state ownership and corporate governance. It targets SOEs in Norway and Sweden from 2000 to 2005. One research area is the difference in dividend payouts dependent on the fraction of shares the state owns in a company. The theoretical framework tries to determine whether we should expect politicians to prefer dividends over retained earnings.

In an attempt to deal with the principal agent problem, politicians should prefer the earnings paid out as dividends. However, as politicians are often concerned with their reputations, they emphasize other factors. Such criteria can be growth and a rate of return which can reduce the request for dividend payouts. In some cases, the state is the only owner of a company. Thus, the state is the single provider of capital to the company. Receiving capital from the state can be highly unpredictable as they have to compete with other spending areas. Hence, one can expect that politicians who seek to appear competent often prefer lower dividend payouts than private investors would. It might be that interest groups such as employees of SOEs and their trade unions prefer less dividends. They can benefit from retained earnings by making the firm financially capable of avoiding dismissals or salary cuts. To please these groups, the politicians might prefer a lower dividend payout.

On a general basis, politicians might seek low dividend payouts to make SOEs financially capable of implementing the government policies that benefit the voters. Ludvigsen (2010) argues that the problem with this view is that politicians might not believe that managers will align their interests. Corporate managers can potentially spend the retained earnings to fulfill their own interests. Thus, they might need to be financially disciplined. The argument above could therefore suggest that politicians who seek to stay in office should prefer dividends to mitigate the agency problem. High dividends can potentially help politicians in

terms of voter support. Politicians act under short-run political pressure, and they therefore need capital to spend on objectives that voters prefer. Accordingly, politicians are not willing to wait for retained earnings to create large dividends at a later stage. In addition, it might be that high dividend payouts are used as a tool to convince citizens that SOEs are performing well.

Taken together, the arguments of Ludvigsen (2010) suggests that politicians are likely to have preferences when it comes to dividend payouts. Her dissertation finds that fully SOEs have higher dividend payouts than partial SOEs. There is weak support that political influence negatively impacts dividend payouts in partially SOEs. It is possible that politicians prefer earnings to be kept within SOEs rather than being paid out to private co-investors.

2.5 Defining state and private ownership

We want to offer clear definitions of state-owned enterprises and privately owned enterprises. The definitions of an SOE varies within different research and literature, and between countries. The Norwegian Private Limited Liability Companies Act (13. June 1997 no. 44) and The Norwegian Public Limited Liability Companies Act (13. June 1997 no. 45) are very similar in regard of the provisions relevant for our paper. Thus, we choose to refer to the Private Limited Liability Companies Act.

For the purpose of this thesis, we adopt the definition offered by the Organisation for Economic Co-operation and Development (OECD) of SOEs. The OECD defines an SOE as any corporate entity which is recognized by national law as an enterprise and in which the state has significant control through full majority or significant minority ownership (OECD, 2015). In this definition, we include SOEs which are owned by the central or federal government and SOEs which are owned by regional and local governments. The definition does not specifically define *significant minority ownership*. We need to decide on the minimum fraction of shares they need to possess to be called an SOE.

The Norwegian Private Limited Liability Companies Act (13. June 1997 no. 44), §5-18(1), states that "A resolution to amend the articles of association shall be adopted by the general meeting, except as otherwise provided by the statue. The

resolution requires the support of at least two-thirds of the votes cast and of the share capital represented at the general meeting."

Hence, with a negative majority, a shareholder can stop resolutions regarding the articles of association. It seems reasonable that possessing more than 1/3 (33.33%) of a company's shares gives the state sufficient control over a company's activities. Thus, our definition is as follows:

> *State owned enterprises is any corporate entity where the state possesses more than 33.33 percent of a company's equity.*

Privately owned enterprises are corporate entities owned by individual people or other companies. We define privately owned enterprises as enterprises that do not meet the requirements we have set to be defined as an SOE. The state does not have a negative majority of shares, which means that private entities have significant control over the company.

We argue that the definition is optimal if we are to see the effect of state ownership. However, we know that some problems may occur with the definition. There are different kinds of shares that provide different voting rights. We cannot gain the required information to address this issue, but the most common practice is a one-share one-vote arrangement. We therefore assume that the fraction of shares owned gives the same amount of voting rights. Second, for some companies, the articles of association state that the required number of shares to stop a resolution can be lower than 1/3. We cannot obtain such information, so we assume that companies have not changed the articles of association to allow turning down resolutions with less than 1/3 of ownership. Third, in some cases, the state abstain participation in business decisions by refusing to sit on the board. By the Norwegian Private Limited Liability Companies Act (13. June 1997 no. 44) §6-13 shall the board supervise the day-to-day management of the business, and they may issue instructions to the general manager. §6-3 states that shareholders have the right to decide who can be members of the board. It therefore seems reasonable that the members of the board are influenced by the state if they have a large number of voting shares. The state can influence the operations of a firm though it is not represented on the board. §8-2 states that the board proposes the distribution of

dividend. The general assembly has to approve of the proposal. The general assembly cannot increase the payout, but it can reject it or have it decreased. They state can influence a company through the general assembly, so we argue that it does not need to sit on the board to influence a company. Thus, we argue that these issues will not influence our results significantly.

2.6 Research questions

In this section, we justify our measures for profitability and dividend payouts. We repeat the research questions.

Market values are often seen as superior when comparing firm profitability (Seth, 1990). Our sample consists of private firms which we cannot obtain market values from. This leaves us with accounting-based measures. ROA is one of the most used accounting measures for performance in financial research (Cable and Mueller, 2008). It measures the efficiency with which a firm uses its existing assets to generate earnings (Davis, 2006). Most companies carry assets that have little to do with their operations. ROA includes such assets, which might give wrong indications of their profitability. However, all measures we have considered using has some weaknesses. Thus, we argue that ROA is the most fitted measure on profitability for our research.

Research question 1

> *What is the financial impact in terms of ROA of a company being state-owned or privately owned?*

Since we are looking at both publicly traded and non-publicly traded companies, we need a ratio that does not have the number of shares in the denominator. We choose a dividend payout ratio that is based on annual accounting data and shows a percentage of earnings paid out as dividends. The ratio gives an indication of how much earnings that is retained in a company, which in light of discussed theory is of interest when comparing SOEs and POEs. The chosen ratio is the most commonly used to measure dividends. The issue with our ratio is that it can be manipulated by accounting tricks. Additionally, the distribution of resources may occur before earnings. In this case, the ratio would be unprecise in the estimation of the true earnings paid out as dividends. However, such a problem is hard to deal

with even if we apply a different ratio (La Porta et. al., 2000). Thus, we argue that our dividend payout ratio is the most fitted measure for our research.

Research question 2

> *What is the impact on DPR for a company which is either state-owned or privately owned?*

The chapter has provided the relevant literature and theory. The theoretical framework often suggests that SOEs has lower profitability and dividend payouts. We have created clear definitions of SOEs and POEs. We have presented our research questions.

3. Methodology

In this section, we create our models for testing and develop hypotheses for each model. We explain the control variables we use and argue that it is optimal to include them.

To answer the research questions, we apply the method of multiple linear regression. This is a valuable tool for controlling for the effect of different variables. We use panel data, which can be analyzed by using pooled OLS, a fixed-effects model or a random-effects model. Pooling the data assumes that the mean values of the variables and their relationships are constant through time and across all the cross-sectional units in the data sample (Brooks, 2014). The pooled OLS regression would not reflect the fact that some of the observations come from the same firm. Fixed-effect and random-effect models consider the presence of firm-specific effects. These models are therefore more relevant to our thesis. Fixed-effect models makes intra-firm comparisons. They consider the impact of moving from one state to another (Ludvigsen, 2010). It is therefore not a good model for us, as some of the variables we use are time-invariant. Variables such as state ownership and private ownership are time-invariant and will be omitted if we use the fixed-effect model. The random-effect model allows us to use time-invariant variables. Similar to the fixed effect, the random effect involves intercepts that are constant over time and different for each entity (Brooks, 2014). Unlike the OLS, the random-effects

estimator accounts for the fact that some of our observations refers to the same company. The random-effect model is therefore applied to the regressions considered in this thesis.

Research question 1

We run a regression with ROA as dependent and SOEs as independent. Second, we run the same regression but with POEs instead. We cannot run these two dummies in the same regression, as they are perfectly negatively correlated. We run the regression twice, including each dummy. Both regressions are used to answer the research questions.

Hypothesis 1

H0: State ownership has a negative impact on ROA.

HA: State ownership does not have a negative impact on ROA.

Model 1

$$\begin{aligned}\widehat{ROA}_{i,t} = \ & \alpha_0 + \gamma_1 State\ Ownership_{i,t} + \gamma_2 Publicly\ listed_{i,t-1} + \beta_3 Growth_{i,t} \\ & + \beta_4 Size_{i,t} + \beta_5 Age_{i,t} + \beta_6 Market\ share_{i,t-1} \\ & + \beta_7 Debt\ to\ Assets_{i,t-1} + \gamma_8 City_{i,t} \\ & + \sum_k \gamma_k Industry_{i,k} + \varepsilon_{i,t} \quad i \in N, t = [2002,2015]\end{aligned}$$

The model is created to answer Research Question 1 and Hypothesis 1, where i is an index over firms, N is the full set of firms, and k = A,…,U, which is the different main industries from SN2007 (see Appendix 2). γ characterizes a dummy variable.

Hypothesis 2

H0: Private ownership has a positive impact on ROA.

HA: Private ownership does not have a positive impact on ROA.

Model 2

$$\widehat{ROA}_{i,t} = \alpha_0 + \gamma_1 Private\ Ownership_{i,t} + \gamma_2 Publicly\ listed_{i,t-1} + \beta_3 Growth_{i,t} + \beta_4 Size_{i,t} + \beta_5 Age_{i,t} + \beta_6 Market\ share_{i,t-1} + \beta_7 Debt\ to\ Assets_{i,t-1} + \gamma_8 City_{i,t} + \sum_k \gamma_k Industry_{i,k} + \varepsilon_{i,t} \quad i \in N, t = [2002,2015]$$

The model is created to answer Research Question 1, and Hypothesis 2, where i is an index over firms, N is the full set of firms, and k = A,…,U, which is the different main industries from SN2007 (see Appendix 2). γ characterizes a dummy variable.

According to the literature, SOEs are concerned with more than financial goals. Similar research has been done, and much of the evidence indicates that POEs outperform SOEs. We therefore expect to keep H0 for Hypothesis 1 and H0 for Hypothesis 2.

Research question 2

To answer the second research question, we run the regression with DPR as the dependent variable. The regression is tested for SOEs and POEs separately for the same reason as mentioned for the first research question. Both regressions are used to answer the research question.

Hypothesis 3

H0: State ownership has a negative impact on DPR.

HA State ownership does not have a negative impact on DPR.

Model 3

$$\widehat{DPR}_{i,t} = \alpha_0 + \gamma_1 State\ Ownership_{i,t} + \gamma_2 Pretax_{i,t} + \gamma_3 Publicly\ listed_{i,t-1} + \beta_4 Growth_{i,t} + \beta_5 Size_{i,t} + \beta_6 Age_{i,t} + \beta_7 Ownership\ concentration_{i,t-1} + \beta_8 Debt\ to\ Assets_{i,t-1} + \beta_9 FCF_{i,t-1} + \beta_{10} FCF_{i,t-1} * Pretax_{i,t} + \gamma_{11} City_{i,t} + \sum_k \gamma_k Industry_{i,k} + \varepsilon_{i,t} \quad i \in N, t = [2002,2015]$$

The model is created to answer Research Question 2, and Hypothesis 3, where i is an index over firms, N is the full set of firms, and k = A,…,U, which is the different main industries from SN2007 (see Appendix 2). γ characterizes a dummy variable.

Hypothesis 4

H0: Private ownership has a positive impact on DPR.

HA: Private ownership does not have a positive impact on DPR.

Model 4

$$\begin{aligned}\widehat{DPR}_{i,t} = \ & \alpha_0 + \gamma_1 Private\ Ownership_{i,t} + \gamma_2 Pretax_{i,t} + \gamma_3 Publicly\ listed_{i,t-1} \\ & + \beta_4 Growth_{i,t} + \beta_5 Size_{i,t} + \beta_6 Age_{i,t} \\ & + \beta_7 Ownership\ concentration_{i,t-1} + \beta_8 Debt\ to\ Assets_{i,t-1} \\ & + \beta_9 FCF_{i,t-1} + \beta_{10} FCF_{i,t-1} * Pretax_{i,t} + \gamma_{11} City_{i,t} \\ & + \sum_k \gamma_k Industry_{i,k} + \varepsilon_{i,t} \quad i \in N, t = [2002{,}2015\ ]\end{aligned}$$

The model is created to answer Research Question 2, and Hypothesis 4, where i is an index over firms, N is the full set of firms, and k = A,…,U, which is the different main industries from SN2007 (see Appendix 2). γ characterizes a dummy variable.

Little research has been done on the difference in dividend payouts between SOEs and POEs. Megginson et al. (1994) report an increase in dividend payouts when firms are privatized. We believe that that politicians prefer retained earnings over dividend. Thus, we expect to keep H0 for Hypothesis 3 and H0 for Hypothesis 4.

Control variables included in the models

As illustrated by models 1-4, we include a large number of independent variables to create the best fitted models. The literature suggests a number of factors that can influence ROA and DPR. To create the best possible models, we include variables that can explain such factors. We lag the control variables, which possibly takes time to impact the dependent variables: DPR and ROA. These variables are as follows: publicly listed, market share, ownership concentration, debt to assets, and free-cash flow. Lagged values are also likely to reduce the autocorrelation in the models (Brooks, 2014).

For models 1-2, we include the following variables: publicly listed, growth, size, age, market share, debt to assets, city, and industry.

According to Goldeng et al. (2008), the value of a company's assets may be more correctly valued when listed, and consequently closer to their market values, than unlisted companies. Also, publicly traded companies in Norway were, from 2005,

obliged to follow International Financial Reporting Standards (IFRS.org). Gjerde, Knivsflå and Saettem (2008) report evidence that the IFRS standards are marginally value relevant by examining publicly traded companies on the Oslo Stock Exchange. Thus, we believe that a majority of companies in Norway have a higher asset value. We predict that publicly listed companies have a negative coefficient ($\gamma_2 < 0$).

The literature suggests that growing firms generally exhibit higher profitability than firms that do not grow (Wiklund, 1999). We predict a positive coefficient for growth ($\beta_3 > 0$). One of the early themes of the relationship between size and profitability is economies of scale. Hall and Weiss (1967) find a positive but decreasing relationship between size and profitability. We accordingly predict a positive coefficient for size ($\beta_4 > 0$). New companies often have an establishment period where profitability is low, since attention is given to getting the enterprise up and going (Goldeng et. al., 2008). We therefore predict a positive coefficient for age ($\beta_5 > 0$). A high market share should imply advantages that contribute to higher revenue and positive cost effects relative to competitors (Narver and Slater, 1990). We thus predict a positive coefficient for market share ($\beta_6 > 0$). Frank and Goyal (2009) argue that high profitable firms tend to have lower leverage. We thus predict a positive coefficient for debt to assets ($\beta_7 > 0$). We believe that location of companies can be a factor impacting their performance. Companies which operate in cities are closer to large groups of customers and suppliers. The ones outside cities can have large transport costs due to being further away. We accordingly predict a positive coefficient for city ($\gamma_8 > 0$). Some industries are capital intensive, while others are not. For example, service-oriented firms (lawyers, mechanics etc.) often have fewer assets than capital-intensive firms (construction and manufacturing). Companies have characteristics that are unique to their industry, which can impact ROA (Davis, 2006). We predict different coefficients for each industry.

For models 3-4, we include the following variables: pretax, publicly listed, growth, size, age, ownership concentration, debt to assets, free cash flow, free cash flow∗pretax, city, and industry.

In 2004, a tax reform was announced by the Ministry of Finance. The purpose of the reform was to create a more equal taxation of labor income and investment income. The reform was implemented on January 1, 2006. The reform increased the total sum of taxation on dividends for the firm and the investor. Previously, they paid a total of 28% in taxes. The reform increased the total taxation to 48% (Thoresen, Bø, Fjærli and Halvorsen, 2010). Some scholars argue that a decrease in taxation of dividends increases dividend payout. Poterba (2004) finds evidence that dividends are influenced by taxation. We expect to see a higher dividend payout prior to the tax reform, as there is lower taxation on paying dividends. We predict a positive coefficient for pretax ($\gamma_2 > 0$). Brav, Graham, Harvey and Michaely (2005) state that listed firms tend to have more predictable and stable dividend-payout policies than non-listed firms, as they are more reluctant to reduce dividend payouts. We predict a positive coefficient for publicly listed firms ($\gamma_3 > 0$). Rozeff (1982) finds evidence that firms pay lower dividends when they are experiencing or predicting higher revenue growth. The growth entails higher investment expenditures. We predict a negative coefficient for growth ($\beta_4 < 0$).

Financial constraints can impact a company's payout decision. Companies low in funds might not have an opportunity for a high dividend payout. Hadlock and Pierce (2010) argue that age and size are quality measures for financial constraints. They find that an increase in age and size tends to improve the constraints. There are additional arguments for why these variables could be included. The idea that size has an impact on dividend has been generally accepted by financial economists. Redding (1997) offers an argument which is consistent with much of previous literature. First, he argues that large investors care more about transaction costs than do small investors. Transaction costs are often lower for large corporations, as their shares are more liquid. Therefore, large investors choose to invest in large corporations. Second, he argues that large investors prefer dividends, which makes the large corporations pay more in dividends (Redding, 1997). Large firms often do not have the same investment opportunities as smaller firms, which have large growth opportunities. A large corporation often pays dividends to make sure that managers do not overinvest in mature businesses (Barclay, Smith and Watts, 1995). As a firm grows older, its investment opportunities decline. Hence, age can consequently reduce the funds needed for capital expenditures. The funds can be

used for dividend payouts instead (Nizar Al-Malkawi, 2007). In accord with the above, we predict a positive coefficient for both size ($\beta_5 > 0$) and age ($\beta_6 > 0$).

Dispersion of ownership among shareholders can influence the dividend payout. Rozeff (1982) states that shares held by fewer stockholders make ownership more concentrated, which can lead to lower agency costs, which leads to a lower optimal dividend payout. More dispersion leads to higher dividend payout. We thus predict a positive coefficient for ownership concentration ($\beta_7 > 0$).

Brav et al. (2005) find that paying down debt is prioritized rather than paying out dividends, though most executives are reluctant to reduce dividends. We predict debt to assets to have a negative coefficient ($\beta_8 < 0$). Free cash flow (FCF) can either be retained in a company or paid out. Jensen (1986) argues that the conflict of interest between shareholders and managers over payout policies is especially severe when companies generate large free cash flows. Since dividend payment is a way of mitigating managers, we predict a positive coefficient for FCF ($\beta_9 > 0$). We create the variable FCF∗Pretax to catch the difference in cash flow before and after the tax reform. It is cheaper to pay out cash flow as dividends prior to the tax reform. We expect that companies will try to increase their cash flows prior to the reform, so as to pay out as much as possible. We predict a positive coefficient for FCF∗Pretax ($\beta_{10} > 0$).

John, Knyazeva and Knyazeva (2011) find that geographic factors impact dividends. They find that remotely located firms pay higher dividends. They argue that shareholders are often further away from remote companies, which increases the agency conflict. We believe that companies within Norwegian cities are often close to their shareholders. We accordingly predict a negative coefficient for city ($\gamma_{11} < 0$). Lintner (1956) suggests that dividends can be impacted by what industry the company operates in. Industries can reflect factors such as investment opportunities, earnings and other firm specifics that are unique to each industry. He also argues that companies often try to maintain a dividend equal to other companies within the industry. We expect to see different coefficients for each industry.

Our sample period includes the financial crisis. The Norwegian economy was not impacted as much as that of many other countries due to high oil prices during the crisis (Statistisk Sentralbyrå, 2017). Thus, we are confident that a variable is not needed to identify the crisis.

We have created models with a large number of control variables. This will increase the explanatory power of the models, and we argue that it will remove much of the omitted variable bias. We believe that our models are well fitted to answer our research questions.

4. Data

In this section, we discuss how the data is collected, calculated, and filtered to create our sample.

4.1 Sources of data

The data is obtained from The Centre for Corporate Governance Research (CCGR) database. The CCGR is an organization which is funded by the business community, The Research Council of Norway and BI Norwegian Business School (CCGR, 2018). They focus on empirical research and studies of Norwegian firms. The data is based on information the state receives from companies in Norway. The Norwegian Accounting Act (17. July 1998 no. 56) states that limited liability companies (AS) and public limited liability companies (ASA) in Norway are obliged to hand in accounting data every year. If companies do not follow these regulations, then they risk being liquidated. The information is received by the state agency *Brønnøysundregisteret*. Additional information such as the owners fraction of equity is also handed in. The CCGR database is constructed around data from *Brønnøysundregisteret* (Berzins, Bøhren, & Rydland, 2008). It provides us with all the corporate-governance and accounting data we need to implement our research questions. The accounting law in Norway creates great transparency, which makes it easy to argue that the CCGR database is of great quality.

We noticed that the identification of the fraction of shares held by the state was in some cases missing from the CCGR database. To improve the identification of state

ownership, we received a variable from our supervisor. The variable is received from an unpublished paper entitled "The Performance Premium of Family Firms: New Evidence from Population Data." We are thankful for being given this variable by Janis Berzins, Øyvind Bøhren and Bogdan Stacescu. This significantly improves the identification of state ownership.

The dataset is organized as panel data, which is a combination of time series and cross-sectional data. It is unbalanced and includes 3 316 306 observations for 468 778 unique firms. The data covers a 15-year time period from 2001-2015. The data from CCGR includes 48 variables (See Appendix 1). Analysis of the data was done in STATA 15. After merging the datasets together and making sure that STATA understood that it was panel data, we calculated the variables for our models.

4.2 Variables

In this section, we show the calculations of the variables in our models. The item numbers are retrieved from the CCGR database (see Appendix 1).

4.2.1 Dependent variables

Return on assets

We include interest expenses in the numerator, as the assets in the denominator are often funded by both equity and debt. Hence, we include cash flow from the tax shield in ROA to capture some of the capital structure by excluding tax from interest expense (Berk and DeMarzo, 2014). ROA is calculated as follows:

$$ROA_t = \left(\frac{EBI}{Total\ Assets_t}\right) * 100,$$

where *t* = time period, *earnings before interest (EBI)* = income before extraordinary items (item_35) + interest expense (item_29) + other interest expense (item_30), *Total Assets* = total fixed assets (item_63) + total current assets (item_78).

Dividend payout ratio

The dividend payout ratio (DPR) is calculated as follows:

$$DPR_t = \left(\frac{Dividends_t}{Income\ before\ Extraordinary\ Items_t}\right) * 100,$$

where *Dividends* = dividends payable (item_105 if positive, else item_41), *Income before Extraordinary Items* = net income (item_39) + extraordinary revenue (item_36) + extraordinary expenses (item_37) + tax on extraordinary income (item_38).

4.2.2 Independent variables

Ownership identity

In our models, we refer to these variables as state ownership and private ownership. On the basis of our definition of SOE, we created two dummy variables that distinguish between the two ownership types. The two dummies are calculated from the variable received from the unpublished paper, "The Performance Premium of Family Firms: New Evidence from Population Data."

Pretax

To deal with the tax reform, we created a dummy variable for the period before 2006. The CCGR is based on accounting data. The dividend payout occurs one time period after the accounting year. Thus, when a company has accounted for a dividend payout in 2004, it pays out in 2005. Hence, the last year before the tax reform is 2004. The variable pretax gives the value 1 if the year is equal to 2002, 2003 or 2004.

Publicly listed

We use a dummy variable from CCGR (item_17002) which receives the value 1 if the company is present on the Oslo Stock Exchange or Oslo Axcess. It contains information about the listing status for each specific company in our dataset.

Growth

We calculate growth as the yearly percentage difference in total operating revenue for each specific company:

$$Growth_t = \left(\frac{Tot.operating\ revenue_t - Tot.operating\ revenue_{t-1}}{Tot.operating\ revenue_{t-1}}\right) * 100,$$

where *Total operating revenue* stands for the total operating revenue (item_11).

Size

Size measures the value of each company's assets, given in millions. It is calculated as follows:

$$Size_t = log(Total\ assets_t),$$

where *Total assets* = total fixed assets (item_63) + total current assets (item_78).

Age

Age is defined as the founding year subtracted from the present year. It is retrieved from item_13420.

Industry (A-U)

The industry variable is a set of dummies that distinguishes between every main industry in Norway by the SN2007 segmentation. The SN2007 is an industry classification from Statistics Norway (SSB) (Statistisk Sentralbyrå, 2018), which follows international standards. It is designed for use in Norway´s official statistics. The SN2007 was first used in 2008. Prior to this, our dataset uses an industry classification from SSB called SN2002 (Statistisk Sentralbyrå, 2018). To solve this, we converted these industry codes to be consistent with the SN2007. Hence, all consecutive years in our dataset are classified by the SN2007. We calculate the main industries, using item_50108. The variable gives us the five-digit code the companies operate within. Prior to restrictions on the sample, this gives us 1456 sub-classed industries. We converted these sub-classes into the companies' two-digit level (industry divisions). This is an industry classification used by the Statistics Norway, which includes 99 divisions. We converted the 99 divisions into main sectors, which gives us 21 industries from A-U (see Appendix 2). The variable places the companies in the industry where their main activities are located. We use the main sectors as variables to control for industry characteristics.

Market share

We calculate market share by dividing each company's revenue by the total revenue within each industry at the two-digit level (see Appendix 2). The total industry revenue is calculated before restrictions and data sampling to obtain the most realistic market share for each company. We calculate the measure for revenue in a different manner than we calculate our growth variable. This can

reduce autocorrelation. The different revenue measurements can also increase the explanatory power of our model by identifying other firm characteristics. Market share is calculated as follows:

$$Market\ share_t = \left(\frac{Revenue_t}{Total\ industry\ revenue_t}\right) * 100,$$

where *Revenue* = total operating revenue (item_11) + other interest income (item_24) + other financial income (item_25), *Total industry revenue* = ∑(total operating revenue (item_11) + other interest income (item_24) + other financial income (item_25) for every firm in industry A-U.

Ownership concentration

Ownership concentration is calculated as the number of owners with a minimum 5% ownership fraction. In Norway, owners with less than five percent are often anonymous owners, which makes it difficult to obtain data on such owners. We feel that this is an optimal measure if we are to see the impact of ownership concentration. The data is retrieved from item_14026.

Debt to assets

The debt to assets ratio defines the amount of debt relative to assets. We calculate it as follows:

$$Debt\ to\ Assets_t = \left(\frac{Debt_t}{Total\ Assets_t}\right) * 100,$$

where *Debt* = total provisions (item_91) + total other long-term liabilities (item_98) + total current liabilities (item_109). *Total assets* = total fixed assets (item_63) + total current assets (item_78).

Free cash flow (FCF)

Free cash flow measures how much cash a company generates after subtracting for capital expenditures. The cash can be used for investments, dividends and reducing debt. We exclude cash flow from non-operational and extraordinary items to get a picture of the cash flow being generated by operating activities. We divide it by total assets to create a ratio. We calculate it as follows:

$$FCF_t = \left(\frac{FCF\ excluding\ nonoperating_t\ and\ extraordinary\ items_{\ t}}{Total\ Assets_t}\right) * 100,$$

where *Free cash flow* = operating income (item_19) * (1-tax) – depreciation (item_15) – write-down of fixed and intangible assets (item_16) – Δtotal fixed assets item_63) – Δ inventory (item_64) – Δaccount receivables (item_65) + Δaccount payable (item_102) + Δtax payable (item_103) + Δdeferred tax (item_89) – Δdeferred tax assets (item_45). *Total assets* = total fixed assets (item_63) + total current assets (item_78).

Free cash flow (FCF)∗Pretax

To include the difference in cash flow due to the tax reform, we multiply pretax by free-cash flow. The variable includes a firm's free cash flow when the year is 2002, 2003 or 2004.

City

We use business zip codes to distinguish between companies which have headquarters in one of the ten most-populated cities in Norway (See Appendix 4). The city variable is a dummy, which gives the value 1 if a company has a business zip code in one of the cities. Item_50102 is used to identify the locations of the companies.

4.3 Sample selection

To analyze the data successfully, we implemented restrictions to make the data fit our research questions. The criteria are used for models 1-4.

Criteria 1

Originally, the dataset included 21 different organizational forms (e.g., SF, KOMM, STAT, AS, etc.). We experienced many missing values from companies that were not AS or ASA, especially in regard to identifying the owners. These organizational forms have less strict rules of accounting than AS and ASA, which may explain the high number of missing values regarding ownership identity. To be sure that we have correctly and precisely identified state and private ownership, we exclude observations of other organizational forms than AS and ASA. The filter will also

exclude many companies that do not concern themselves with profitability and paying dividends, such as hospitals and schools.

Criteria 2

It is possible that the dataset from CCGR contains a number of companies that are not currently active. These companies can influence the results of our models. In addition, the criteria will arguably exclude companies that are likely to be holding companies which do not produce goods or services themselves. Companies with more than 5 000 000 in annual revenue must have an auditor, which can arguably be an assurance of quality reporting. Lack of employees is a sign of a company without activity. We accordingly exclude companies which have fewer than 5 000 000 *kroners* in annual revenue and fewer than five employees.

Criteria 3

The industry variables from CCGR (item_50108) occasionally do not classify a firm within an industry by giving it the value 0. To make sure all companies belong to an industry, we exclude a company's observation for the year the issue occurs. In total, the criteria excludes 188 observations for 150 different firms.

Criteria 4

From microeconomics, we know that monopolies can create financial benefits for companies. We do not include monopolies or duopolies as a control variable, and we therefore exclude firms which operate within such markets. We exclude companies with more than 80 % market share. To create competition for all firms, we make a restriction that each industry must include a minimum of five SOEs and 10 POEs each year. The criteria fully exclude industries O, T and U and their companies. We argue that these criteria fully exclude companies with financial benefits due to less competition.

Criteria 5

The banking and finance sectors report accounts in a different way than other industries. This sector is often excluded from studies when one relies upon accounting data (Goldeng et. al., 2008). For comparative reasons, industry K is excluded.

Criteria 6

Historically, there exists a tendency to privatize SOEs. It can be argued that there exists an upward bias: i.e., that high-performing SOEs are being turned in to POEs. There is also the possibility of a downward bias: i.e., that low-performing POEs are sometimes turned into SOEs (Goldeng et. al., 2008). We exclude SOEs and POEs that change ownership structure within our time period. This criterion excludes 1290 companies, which amounts to 1.5822% of firms in the dataset, after criteria 1-5 are applied.

Criteria 7

We implement criteria for the dependent variables ROA and DPR. If the ROA is higher than 100%, it means that the profit is at least equal to its assets, which again means that the company has doubled the value of its assets. If the ROA is equal to -100%, the company has lost value equal to all its assets. We allow values inside the range [-100%, 100%]. We allow DPR within the range [0%, 200%]. The SOEs sometimes pay out large one-time dividends. The set range includes these companies and those which use retained earnings from earlier years. We include companies that pay more dividends than they have in earnings.

Criteria 8

The Norwegian accounting act (17. July 1998 no. 56) states that all ASAs, together with large ASs, have to report an income statement, balance sheet, cash flow statement and notes (§3-2). However small companies do not need to hand in a cash flow statement. The CCGR successfully gives us data on many of the firms. However, we observe that some companies have missing data on variables for some years. From this, it seems like CCGR do not have data for all years on small companies. To deal with the issue we exclude observations in which missing data occur.

4.4 Collinearity

Multicollinearity occurs when two or more of the explanatory variables are highly correlated with each other. The correlation can cause biases in the significance of the variables (Brooks, 2014). To make sure that this does not exist in our analysis, we perform a correlation matrix (see Appendix 3). The SOEs and POEs are perfectly negatively correlated. We do not include them in the same regression, and

we therefore solve the collinearity problem for these two variables. For the other variables, we find no large correlation. Hence, we do not consider multicollinearity to be of much concern for our models.

4.5 Descriptive statistics

This section presents relevant statistics to describe the basic features of our data sample. Since we are working with a large data set, it is useful to describe the central tendency of each variable.

Table 1 contains information about the main variables used in models 1-4, for the year 2015. We have a total of 30 903 observations for all variables. Panel B shows that we have a large number of observations when the dummy variables are equal to 1. The average ROA is 8.1459%, with a median of 8.1414%. The DPR has a mean of 22.2633%, with a median of 0%. The median indicates that a large number of the firms do not pay out dividends. We choose 2015 as a representative year, since it is late in our sample.

Table 1: Descriptive statistics for variables using the representative year of 2015

The tables reports summary statistics on variables used in models 1-4, for the repsesentative year 2015 of our sample. Panel A provides the mean, median, maximum value, minimimum value, standard deviation and number of observations (N), for each variable not characterized as a dummy variable. The variables that are ratios are in percentage. Size is reported in millions. The variables Growth, Size, Age, Debt to Assets and FCF are winsorized at 1% and 99% tails. Pretax*FCF and Pretax are not included since they do not impact the year 2015. Panel B provides statistics for the dummy variables State ownership, Private ownership, Publicly listed, City and indstries from A-U (See Appendix 2 for industry description) for year 2015. N(D=1) reports the number of observations when the variable equals one. %-obs. (D=1) Reports the % of total observations, when the variable equals 1.

Panel A

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	N
ROA_t	8.1459 %	8.1414 %	96.0276 %	-99.5109 %	15.8618 %	30 903
DPR_t	22.2633 %	0.0000 %	200.0000 %	0.0000 %	39.5649 %	30 903
$Growth_t$	6.8675 %	3.8983 %	116.4702 %	-45.9973 %	23.7441 %	30 903
$Size_t$	42.7623	9.1050	932.1800	1.1340	128.0384	30 903
Age_t	17.1927	15.0000	70.0000	2.0000	12.1481	30 903
$Market\ share_{t-1}$	0.1600 %	0.0191 %	61.4071 %	0.0007 %	1.1737 %	30 903
$Ownership\ concentration_{t-1}$	2.5299	2.0000	18.0000	0.0000	1.8368	30 903
$Debt\ to\ Assets_{t-1}$	70.7653 %	71.4500 %	159.1328 %	20.1445 %	24.5862 %	30 903
FCF_{t-1}	10.4158 %	10.6192 %	73.9542 %	-59.3615 %	22.5391 %	30 903

Panel B

	State Ownership	Private Ownership	Publicly Listed$_{t-1}$	City$_t$	A	B	C	D	E	F	G	H	I	J	L	M	N	P	Q	R	S
N (D = 1)	608	30 295	49	14 885	455	214	3 492	135	186	6 005	9 613	1 654	1 697	1 394	409	2 465	1 349	239	937	322	337
% -Obs. (D = 1)	1.9674 %	98.0326 %	0.1586 %	48.1668 %	1.4723 %	0.6925 %	11.2999 %	0.4369 %	0.6019 %	19.4318 %	31.1070 %	5.3522 %	5.4914 %	4.5109 %	1.3235 %	7.9766 %	4.3653 %	0.7734 %	3.0321 %	1.0420 %	1.0905 %

We have created a similar table as the one above that includes the mean values using the whole time period (see Appendix 5). The average values using the whole-time period is often close to the values in table 1, indicating that 2015 is a good representative year for our sample. In addition, we have created yearly means for variables in model 1-4 (see Appendix 6).

Tables 2 and 3 present average values for the whole time period. The values are divided into our two ownership types. We include ROA and DPR and the variables used to calculate them. For SOEs, the average ROA is 4.3192%, and 10.8798% in DPR. The average ROA for POEs is 8.4738% and 24.4069% in DPR. There is a significant difference in the average values of ROA and DPR between the two ownership types. The earnings before interest are higher for SOEs than POEs. The SOEs also have more assets, which results in a lower ROA. The SOEs pay higher dividends on average, but due to higher earnings before extraordinary items, they also have lower DPR than POEs. The standard deviation is higher for POEs on both ROA and DPR.

Table 2: Statistics on the calculations of ROA and DPR for SOEs

The table reports statistics on the dependent variables (ROA & DPR) for all SOEs in the sample, thus including the time period 2002-2015. It includes summary statistics for the variables used to calculate the dependent variables. ROA and DPR are reported in %. Earnings Before Interest, Total Assets, Dividend and Income before extraordinary items are reported in millions.

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	N
ROA_t	4.3192 %	4.4359 %	93.0109 %	-99.6477 %	11.2982 %	6 457
$Earnings\ Before\ Interest_t$	153 000.0000	1 271.0000	73 600 000.0000	-8 060 000.0000	1 990 000.0000	6 457
$Total\ Assets_t$	1 920 000.0000	34 000.0000	780 000 000.0000	643.0000	22 000 000.0000	6 457
DPR_t	10.8798 %	0.0000 %	199.9469 %	0.0000 %	28.0255 %	6 457
$Dividend_t$	46 600.0000	0.0000	27 100 000.0000	0.0000	807 000.0000	6 457
$Income\ before\ Extraordinary\ Items_t$	135 000.0000	934.0000	70 000 000.0000	-8 060 000.0000	1 870 000.0000	6 457

Table 3: Statistics on the calculations of ROA and DPR for POEs

The table reports statistics on the dependent variables (ROA & DPR) for all POEs in the sample, thus including the time period 2002-2015. It includes summary statistics for the variables used to calculate the dependent variables. ROA and DPR are reported in %. Earnings Before Interest, Total Assets, Dividend and Income before extraordinary items are reported in millions.

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	N
ROA_t	8.4738 %	8.5579 %	99.1837 %	-100.0000 %	15.2210 %	352 347
$Earnings\ Before\ Interest_t$	4 262.0580	671.0000	13 600 000.0000	-7 540 000.0000	81 700.0000	352 347
$Total\ Assets_t$	63 000.0000	8 085.0000	822 000 000.0000	41.0000	1 560 000.0000	352 347
DPR_t	24.4069 %	0.0000 %	200.0000 %	0.0000 %	42.1775 %	352 347
$Dividend_t$	1 552.8430	0.0000	9 600 000.0000	0.0000	52 000.0000	352 347
$Income\ before\ Extraordinary\ Items_t$	3 533.5890	548.0000	13 600 000.0000	-8 160 000.0000	80 100.0000	352 347

Table 4 presents the number of firms that are defined as state-owned or privately owned each year. There is a total of 894 SOEs, with 6 457 observations and 55 228 POEs with 352 347 observations. The number of SOEs and POEs for each year is on average much lower than the total number of companies, which indicates that we do not have data for the whole period on a large portion of the companies. The number of SOEs and POEs increases as years goes by. We argue that the CCGR have improved their data collection during our time period. The lowest number of SOEs for a year is 252, and 15 301 for POEs.

Table 4: Number of firms and observations

The table reports the number of firms as SOEs and POEs in our sample, thus including the years 2002-2015. It includes the total number of SOEs and POEs, as well as the total number of observations for the two ownership types.

Year	SOE	POE	Number of firms
2002	252	15 301	15 553
2003	322	19 799	20 121
2004	342	19 791	20 133
2005	369	23 072	23 441
2006	427	23 788	24 215
2007	441	25 203	25 644
2008	449	26 095	26 544
2009	474	26 749	27 223
2010	510	27 488	27 998
2011	541	28 029	28 570
2012	562	28 448	29 010
2013	584	28 878	29 462
2014	576	29 411	29 987
2015	608	30 295	30 903
Total number of unique firms	*894*	*55 228*	*56 122*
Total observations	*6 457*	*352 347*	*358 804*

Figure 2 presents the average ROA for SOEs and POEs for each year. The highest average ROA for POEs occurs in 2007, with a value of 11.2017%. The highest for SOEs is in 2007, with a value of 5.5755%. The ROA is higher for POEs for all years. As shown by the graph, ROA drops slightly for both ownership types during the financial crisis. The POEs are more impacted by the crisis, but there is no significant change in ROA compared to many other years. The figure indicates that SOEs are less impacted by the crisis. The findings support our arguments for not including a dummy for the financial crisis. The figure is created using Appendix 7 and 8, which also contains yearly means on other variables dependent on state and private ownership.

Figure 2: ROA for SOEs and POEs (graphed)

The figure shows the yearly average ROA for SOEs and POEs, for the whole period in our sample. The vertical axis shows the average ROA. The horizontal axis presents each year in the data sample.

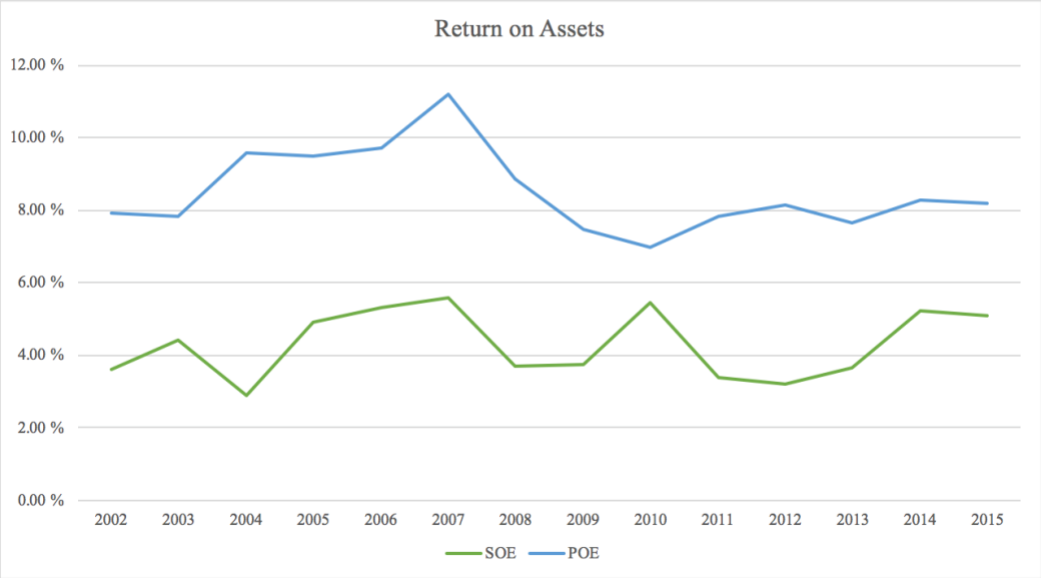


Figure 3 presents the average DPR for SOEs and POEs each year. The figure illustrates that POEs exhibit a higher DPR for all years except 2005. Prior to 2005, one can clearly see an abnormally high DPR for POEs. In 2004, POEs had a DPR of 50.7051%. This indicates that many POEs wants to pay out dividends prior to the tax reform. It is likely that investors prefer receiving more dividends prior to the reform due taxes. In 2005, POEs had a DPR of 11.8768%, which is the lowest DPR for POEs during the time period. This is expected, as it is likely that the immense dividend payouts prior to the reform have reduced the probability that the companies have retained earnings and have a lower free cash flow. After 2005, one can see that DPR for POEs increases and becomes more stable. The SOEs have a much more stable DPR for the time period. They were not allowed to take advantage of the change in taxes by their owners. It can also by argued that the change in taxes does not change the payment to the state, as taxes also are seen as income for the state. From the figure, it is clear that a dummy variable for pretax should have explanatory power for DPR. The figure is created using Appendix 7 and 8, which also contains yearly means on other variables dependent on state and private ownership.

Figure 3: DPR for SOEs and POEs

The figure shows the yearly average DPR for SOEs and POEs, for the whole time period. The vertical axis shows the average DPR. The horizontal axis presents each year in the data sample.

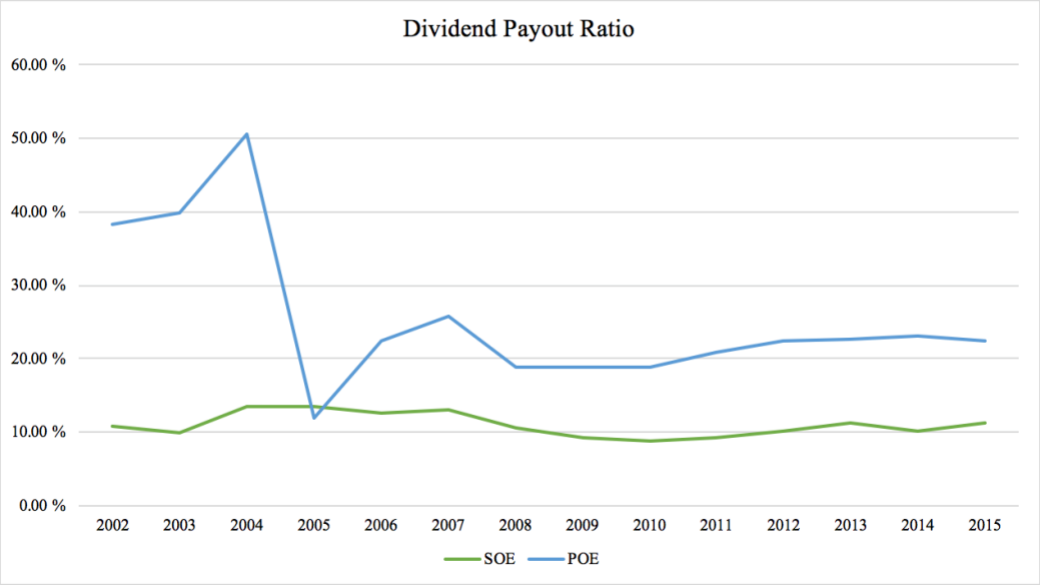


Figure 4 reports the average ROA when the state has different ownership fractions in a company. By our definition of SOEs and POEs, the figure also includes SOEs. State ownership is divided into four different brackets. We use the Norwegian Private Limited Liability Companies Act (13. June 1997 no. 44) to justify the fractions of ownership within each bracket. The state has negative majority when possessing 33.34% to 50% of the shares (§5-18(1)), thus giving them the right to stop resolutions regarding the articles of association. Between 50.01%-66.66%, they have majority ownership (§5-17(1)), thus giving the state major control to push through resolutions. Between 66.67%-99.99%, they have the ability to change resolutions regarding the articles of association (§5-18(1)). When they own 100%, the company is fully state-owned. When a company is privately owned, the state owns less than or equal to 33.33%, giving the state little power over a company's operations, if they have some fraction of ownership. Most of the companies within this bracket are 0% owned by the state. From the figure, one can see that POEs have a higher ROA than all the different brackets of SOEs. The SOEs have the highest ROA of 4.9048% when they own 33.34% to 50%. The second highest ROA for SOEs is when they own 100% of a company, which gives a ROA of 4.4315%. The two fractions that gives the lowest ROA is when the state has majority, and at the same time are partially owned by the

private. The second lowest gives a ROA of 4.0922% when the state owns 66.67% to 99.99%. The lowest ROA is 3.1769%, when the state owns 50.01%-66.6%.

Figure 4: ROA for different fractions of ownership

The figure shows the average ROA for different fractions of ownership. The vertical axis shows the average ROA for the whole sample period, thus including years 2002-2015. The horizontal axis reports the fraction of ownership the state holds, given in %. By our defionitions of SOEs and POEs, the blue column reports the average ROA for POEs, while the green columns reports different ROA dependent on the states ownership fraction.

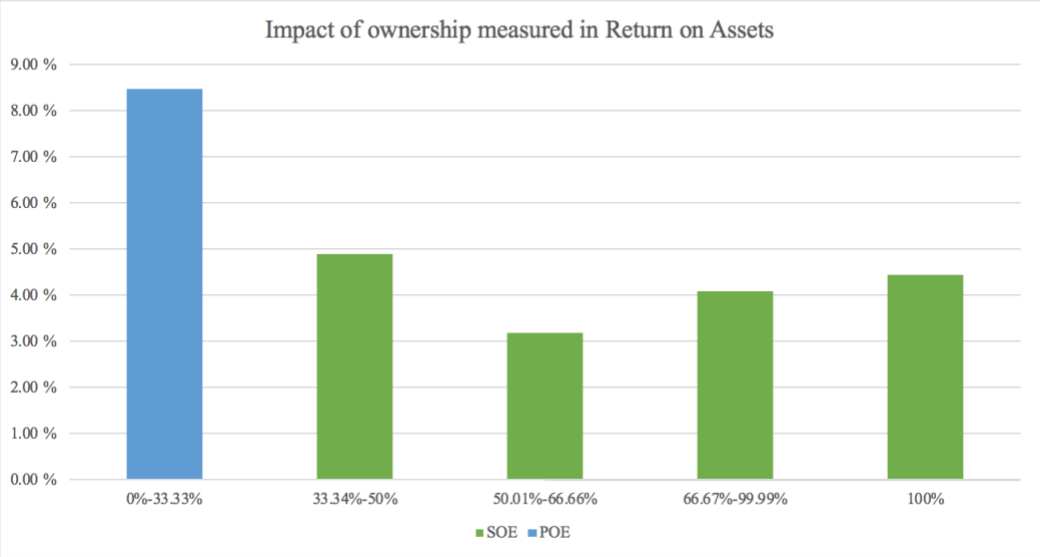
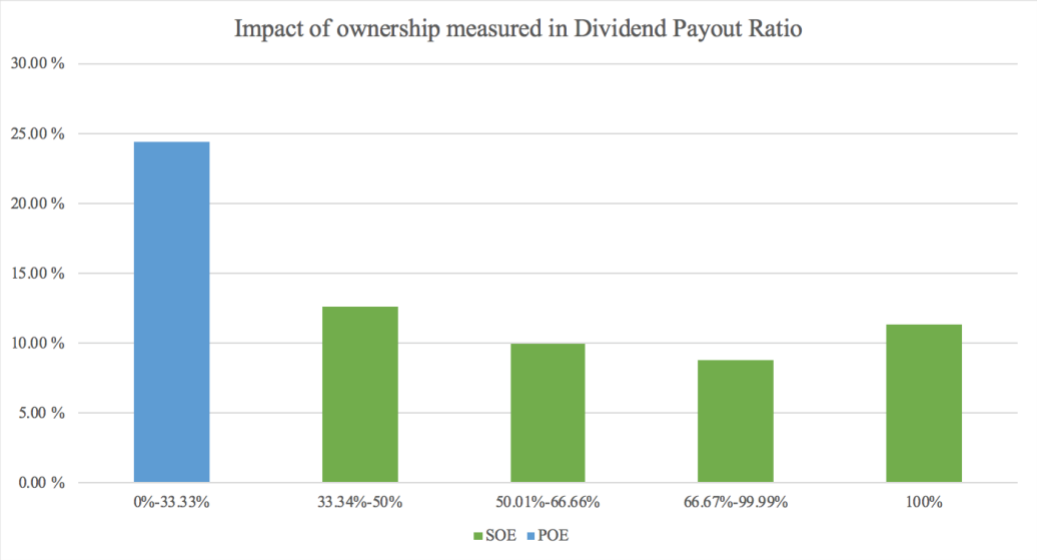


Figure 5 reports the average DPR when the state has different ownership fractions and including private ownership. The fractions of ownership are in the same brackets as in Figure 4, using the latter arguments. The POEs exhibit a higher DPR than all the different brackets of SOE. The SOEs have the highest DPR of 12.5580%, when they own between 33.34% and 50%. The second highest is when the state owns 100%, which yields a DPR of 11.3106%. The two brackets that give the lowest DPR occur when the state has a majority of shares and at the same time are partially owned by the private. The second lowest is of 9.9005% when the states owns 50.01% to 66.6%. The lowest DPR is 8.8092% when the state owns 66.67% to 99.99%.

Figure 5: DPR for different fractions of ownership

The figure reports the average DPR for different fractions of ownership. The vertical axis shows the average DPR for the whole sample period, thus including the years 2002-2015. The horizontal axis reports the fraction of ownership the state holds in a company. By the defionition of SOEs and POEs, the blue column reports the average DPR for POEs, while the green columns reports different DPR dependent on the states ownership fraction.



5. Results

This section presents our findings from models 1-4. As described in methodology section, we created a model for each hypothesis. We highlight the results and discuss the economic implications of each variable for the control variables. Later on, we discuss the impact of the two different forms of ownership on ROA and DPR, and we try to explain our findings.

5.1 Results for model 1-2

Model 1-2 runs with ROA as the dependent variable. The SOEs and POEs are identified with the dummy variables State and Private Ownership. The table below shows the output for both models, which we use two answer hypotheses 1 and 2.

Table 5: Regression for ROA

The table reports regression output for model 1-2, using random-effects model. The regression is on the whole data sample, thus including the years 2002 - 2015. The letters A-R are industry classification codes (see Appendix 2). Industry S is omitted due to multicollinearity. The variables Public Listed, Market Share and Debt to Assets are lagged one time period. Size and Age are logged values. Growth, Size, Age and Debt to Assets are winsorized at the 1% and 99% tails. The tables presents the coefficiants. Standard errors are in parenthesis. Statistical significance is reported as: *** p<0.01, ** p<0.05, * p<0.10.

Dependent variable:	ROA_t	
Regression nr:	(1)	(2)
State Ownership	-5.327***	
	(0.478)	
Private Ownership		5.327***
		(0.478)
$Publicly\ Listed_{t-1}$	-6.7107***	-6.7107***
	(0.8486)	(0.8486)
$Growth_t$	0.1244***	0.1244***
	(0.0009)	(0.0009)
$Size_t$	1.2657***	1.2657***
	(0.0389)	(0.0389)
Age_t	-0.3073***	-0.3073***
	(0.0515)	(0.0515)
$Market\ share_{t-1}$	0.0369	0.0369
	(0.0317)	(0.0317)
$Debt\ to\ Assets_{t-1}$	0.0633***	0.0633***
	(0.0014)	(0.0014)
$City_t$	-0.1519	-0.1519
	(0.1066)	(0.1066)
A	-6.8672**	-6.8672**
	(0.7284)	(0.7284)
B	-8.4378***	-8.4378***
	(0.8841)	(0.8841)
C	-6.2043***	-6.2043***
	(0.5585)	(0.5585)
D	-7.218***	-7.218***
	(1.1015)	(1.1015)
E	-4.3040***	-4.3040***
	(0.935)	(0.935)
F	-3.6087***	-3.6087***
	(0.5498)	(0.5498)
G	-4.6592***	-4.6592***
	(0.5413)	(0.5413)
H	-6.4315***	-6.4315***
	(0.5864)	(0.5864)
I	-6.3716***	-6.3716***
	(0.5834)	(0.5834)
J	-3.2321***	-3.2321***
	(0.6042)	(0.6042)
L	-2.169**	-2.169**
	(0.7074)	(0.7074)
M	0.6233	0.6233
	(0.5744)	(0.5744)
N	-4.5319***	-4.5319***
	(0.5854)	(0.5854)
P	-3.2279***	-3.2279***
	(0.8931)	(0.8931)
Q	0.4896	0.4896
	(0.634)	(0.634)
R	-6.4678***	-6.4678***
	(0.7929)	(0.7929)
Constant	3.7883***	-1.5387
	(0.5646)	(0.7301)
Number of obs.	358 804	358 804
Number of firms	56 122	56 122
Obs. For each firm		
min.	1	1
avg.	6.4	6.4
max.	14	14
R-squared (within)	0.0896	0.0896

Model 1 shows that SOEs are statistically significant with respect to ROA at the 1% level. The coefficient is negative with a value of -5.327. This finding indicates that, if a company is state owned then ROA decreases by -5.327%. Model 2 shows that POEs are statistically significant with respect to ROA at the 1% level. The coefficient is positive with a value of 5.327, which indicates that SOEs increase ROA by 5.327%. The variables state ownership and private ownership support the theory suggesting that SOEs performs worse than POEs.

We have included other variables that should impact ROA. Being publicly listed has a significantly negative impact on ROA. This is consistent with our expectations, which indicates that IFRS standards are value relevant. The publicly listed companies have more correctly valued assets than non-listed companies, thereby increasing their asset value. Growth has a significantly positive impact on ROA. Consistent with our expectations, we find that growing firms exhibit higher profitability. Size is statistically significant, with a positive impact on ROA. As expected, larger firms have higher ROAs. This supports theories which suggest that larger companies experiences economy of scale. Age is significant and negative, thereby indicating that younger firms have higher ROAs than older firms. Out of line with expectations, it seems that younger firms do not experience an incubation time. Loderer and Waelchli (2010) find that old firms are less efficient than their peers. The reason for this is higher cost, slower growth, older assets, and reduced research and development and investment activities. Our findings are consistent with this theory. Market share has a positive relationship with ROA. It is not statistically significant, so we cannot conclude that a high market share implies advantages that contribute to higher revenue and positive cost effects. Debt to assets is significant with a positive impact on ROA. Out of line with expectations, we find no evidence supporting theory that profitable firms have less leverage. Market timing suggests that companies choose capital structure determined by a trade-off between the benefits of debt and the cost of debt (Frank and Goyal, 2009). In support of this, the interest rates in Norway during much our sample period can be seen as quite low (Norges Bank, 2018). Profitable firms can more easily receive loans from creditors than low-performing firms. We argue that market timing can explain our findings. Furthermore, the tax rate in Norway is high compared to that of many other countries, which allows companies to create a high tax shield from the debt. Location (city) is not statistically significant and has negative coefficient.

We cannot conclude that companies which are located in cities have superior profitability. Industry has a large number of statistically significant variables. As expected, the coefficients have different values. This indicates that ROA is dependent on an industry's characteristics.

We have a high R-squared of 8.96%, thereby indicating that our model offers good explanatory power for ROA. We argue that the models are fitted to determine the impact of state and private ownership on ROA. We keep H0 for Hypothesis 1. From Model 2, we keep H0 for Hypothesis 2. State ownership negatively impacts ROA. Private ownership positively impacts ROA.

5.2 Results for model 3-4

Models 3-4 run with DPR as the dependent variable. The SOEs are identified with the dummy variable State Ownership, and POEs are identified with the dummy variable Private Ownership. The table below shows the output for both models, which are used two answer hypotheses 3 and 4.

Table 6: Regression for DPR

The table reports regression output for model 3-4, using random-effect models. The regression is on the whole data sample, thus including the years 2002 - 2015. The letters A-R are industry classification codes (see Appendix 2). Industry S is omitted due to multicollinearity. The variables Public Listed. Debt to Assets. Free Cash Flow and Free Cash Flow*Pretax and ownership concentration are lagged one time period. Size and Age are logged values. Growth, Size, Age, Debt to Assets and Free Cash Flow are winsorized at the 1% and 99% tails. The tables presents the coefficiants. Standard errors are in parenthesis. Statistical significance is reported as: *** p<0.01, ** p<0.05, * p<0.10.

Dependent variable:	DPR_t	
Regression nr:	(3)	(4)
State Ownership	-14.3345***	
	(0.9563)	
Private Ownership		14.3345***
		(0.9563)
$Pretax_t$	24.0523***	24.0523***
	(0.1866)	(0.1866)
$Publicly\ Listed_{t-1}$	3.2805	3.2805
	(2.0823)	(2.0823)
$Growth_t$	0.0968***	0.0968***
	(0.0025)	(0.0025)
$Size_t$	-0.5978***	-0.5978***
	(0.088)	(0.088)
Age_t	2.6563***	2.6563***
	(0.127)	(0.127)
$Ownership\ concentration_{t-1}$	0.3401***	0.3401***
	(0.0488)	(0.0488)
$Debt\ to\ Assets_{t-1}$	-0.1444***	-0.1444***
	(0.0036)	(0.0036)
FCF_{t-1}	0.1289***	0.1289***
	(0.003)	(0.003)
$Pretax * FCF_{t-1}$	0.1757***	0.1757***
	(0.007)	(0.007)
$City_t$	2.1926***	2.1926***
	(0.226)	(0.226)
A	-18.3717***	-18.3717***
	(1.4945)	(1.4945)
B	-11.3815***	-11.3815***
	(1.7869)	(1.7869)
C	-12.7711***	-12.7711***
	(1.1328)	(1.1328)
D	9.751***	9.751***
	(2.1862)	(2.1862)
E	-9.6341***	-9.6341***
	(1.8693)	(1.8693)
F	-2.9944*	-2.9944*
	(1.1151)	(1.1151)
G	-6.2977***	-6.2977***
	(1.098)	(1.098)
H	-12.9702***	-12.9702***
	(1.1895)	(1.1895)
I	-10.5324***	-10.5324***
	(1.1844)	(1.1844)
J	-6.2539***	-6.2539***
	(1.2228)	(1.2228)
L	-0.1131	-0.1131
	(1.4561)	(1.4561)
M	4.7586***	4.7586***
	(1.1648)	(1.1648)
N	-6.0008**	-6.0008**
	(1.1914)	(1.1914)
P	-6.0861**	-6.0861**
	(1.8176)	(1.8176)
Q	-8.3337***	-8.3337***
	(1.2885)	(1.2885)
R	-12.2945***	-12.2945***
	(1.6042)	(1.6042)
Constant	27.2829***	12.9484***
	(1.1883)	(1.5033)
Number of obs.	358 804	358 804
Number of firms	56 122	56 122
Obs. For each firm		
min.	1	1
avg.	6.4	6.4
max.	14	14
R-squared (within)	0.079	0.079

Model 3 shows that SOEs are statistically significant on DPR at the 1% level. The coefficient is negative with the value of 14.3345. The coefficient indicates that, if state ownership occurs in a company, then DPR decreases by 14.3345%. The high coefficient suggests that SOEs have a considerably negative impact on DPR. The results for Model 4 show that POEs are statistically significant on DPR at the 1% level. The coefficient is positive with a value of 14.3345. The model increases DPR by 14.3345% if a company is privately owned.

We include other variables that can impact DPR. Pretax has a significant impact on DPR. Consistent with our expectations, companies have a higher DPR prior to the tax reform in Norway. Publicly listed companies have a positive, but not significantly positive impact on DPR. We cannot conclude that listed companies have a higher DPR than non-listed companies. We find that size has a negative impact, while age has a positive impact on DPR. Both are statistically significant, which gives mixed results for the argument regarding financial constraints. Age tend to improve financial constraints, which is consistent with our expectations. Size is negative, which indicates that an increase in size does not improve financial constraints. One argument for the surprising impact of size can be that our sample contains some company groups. Our filter has probably excluded some of them, but the result indicates that there is a significant number left in our sample. Subsidiaries often pay much of their excess cash to the parent company. Such a practice would potentially create a negative relationship between size and DPR. We cannot fully conclude that financial constraints increase DPR due to our results. However, we believe that both size and age would have been positive if company groups were not included. Growth is significant with a positive coefficient. This is not consistent with theories which suggest that growing firms pay less dividends due to high capital expenditures. Arnott and Asness (2003) find that future earnings growth is associated with higher current payout rates. Their evidence contradicts theory by suggesting that lower dividends are signs of future earnings. Zhou and Ruland (2006) find supporting evidence. They suggest that their evidence can be explained by free cash flow theory. As growth takes place, cash flow increases. Thus, the payout increases to reduce agency conflict. Our findings may be explained by this, as increased revenue can increase free cash flow.

Ownership concentration is significant, with a positive impact on DPR. This is consistent with our expectations, as it indicates that fewer owners reduces agency costs, and thereby reducing the dividend payout. As the number of owners increases, the dividend increases. Debt to assets has a significantly negative impact on DPR. This is consistent with our expectations, thereby indicating that firms prioritize paying debt before paying dividends. Free cash flow is positive and significant on DPR. This is consistent with theories which state that the conflict of interest is larger when FCF is high. The shareholders choose to mitigate the managers with dividends. The same relationship is found between DPR and FCF∗Pretax. Consistent with our expectations, companies choose to pay out more of their free cash when it is cheaper to do so. They increase their free-cash flow prior to the reform. We see that the influence of location (city) is positive and significant, which is not consistent with our expectations. One possible explanation is that large investors which prefer dividends choose companies close by. Hedge funds and private-capital companies often operate within cities. Such owners are said to prefer to increase the dividend payout from their target companies (Klein and Zur, 2009).

The coefficients for each industry are different from other industry coefficients, thereby indicating that DPR varies among industries. This is consistent with our expectation that DPR varies due to industry characteristics. One can see that most industries have a significant impact.

Many of the variables applied in models 3-4 are consistent with expectations and theory. We have a high R-squared of 7.9%, thereby indicating that our model has good explanatory power for DPR. Thus, we argue that the models can be used to determine the impact of SOEs and POEs on DPR. From the result obtained for Model 3, we retain H0 for Hypothesis 3, stating that state ownership has a negative impact on DPR. From Model 4, We keep H0 for Hypothesis 4. Private ownership has a positive impact on DPR.

5.3 Likely explanations for the impact of state ownership

In this section, we apply theory and literature to offer likely explanations of our findings. We discuss different arguments and analyze those which are consistent with our results.

5.3.1 Return on assets

The state argues that many of its companies focus on creating a rate of return on the state's investments. However, we believe that politics can also be implemented by a high number of SOEs. One example is provided by the creation of excess employment. Numbers for the year 2015 shows that the state employs around 690 000 people (DIFI, 2018), which is very high compared to the low population in Norway. Critics of the SOEs have often argued that such a strategy is implemented by many SOEs. We believe that excess employment provides a valid argument for explaining our findings. The cost can be higher for SOEs than POEs, thereby reducing ROA.

Some argue that the state can provide jobs above market wages. This might be the case abroad, but in Norway, the SSB reports a relatively equal wage between state-owned and privately owned enterprises. In 2015, the average monthly salary in the private sector was 43 200 *kroners*. The average in SOEs owned by the federal or central government was 45 700 *kroners*, while it was 38 600 *kroners* for those owned by regional and local governments (Statistisk Sentralbyrå, 2017). We therefore argue that such a strategy is not likely in Norway, thus not explaining our results.

Many of the strategies politicians implement likely reduce ROA for SOEs. Our filters should exclude companies that only focus on welfare goals, but we still believe that many of the companies which are supposed to be for financial purposes are influenced by politicians. As politicians are concerned with reputations and staying in office, it is hard to deny that they can influence SOEs to implement political strategies. Using excess employment as evidence, we argue that many SOEs have lower profitability thanks to politicians who implement such strategies.

From the evidence on DPR, it is clear that SOEs keep much of their earnings. The managers therefore have a lot of money that can be used. From this, it is likely that the managers of SOEs can be responsible for the results of lower ROA as well as the managers.

Theory suggests that SOE managers have fewer incentives to increase efficiency and reduce costs. The state has regulations for the financial compensations given to

managers. For fully state-owned and partially state-owned companies, the government states that compensations should be competitive but not market leading. For publicly traded SOEs, the bonus given shall not exceed 30% of the base salary (*Fiskeridepartementet*, 2015). According to such restrictions, the managers of POEs often have higher salaries than the managers of SOEs. We argue that politicians can struggle more than private owners to align their interests with their company managers. The managers of SOEs often receive a smaller fraction of the return than the managers of POEs if profitability and efficiency increase. Salaries can give SOEs managers fewer incentives such that they focus on things other than profitable actions. Lower salaries might also make good managers favor working for POEs, as salary is important to many managers. We argue that lower manager salaries can potentially explain our results.

As if lower salaries were not creating enough problems to aligning interests, we also argue that the managers of SOEs may themselves seek political careers. Many of the managers of SOEs in Norway have ties to different political parties; thus, it is possible that decisions are based on boosting political careers in the managers' own interest rather than on increasing profitability. We believe that political managers potentially explain our results. The managers can use resources to benefit themselves politically instead of making firms more profitable.

Evidence exists of SOEs in Norway receiving funding to survive. In 2014, "*Det Store Norske Spitsbergen Kullkompani*", was close to bankruptcy. It asked for a bailout from the state of approximately 500 million Norwegian *kroners* (Kramviken, 2015). Funds were granted by the government, which enabled the company to continue its operations. Such a bailout seems less likely to happen to a private company unless the owners think profitability can be restored to the company. Such a practice can make non-profitable firms continue operations rather than create space for new companies that are profitable. As the state is willing to bail out companies from bankruptcy, we argue that SOEs have soft budgets. They are potentially afraid of losing political support, as a bankruptcy can make voters lose their jobs. The cost of a bailout can be spread over many taxpayers, thereby making it hard for voters to see the impact of soft budgets. Such soft budgets could lead to managers taking excessive risks. The consequences of risk-taking are smaller if the managers do not face bankruptcy and have soft budgets. From this,

we find it likely that soft budgets plus excessive risk taking from SOEs managers are potential explanations of our results.

Figure 4 shows that ROA differs when the fraction of state ownership changes. The state is less profitable when it holds enough shares to have a majority of votes. From this it seems that the state can push through decisions such as excess employment and political strategies that could reduce ROA. When the state has minority rights, one can see a slightly higher ROA. The state can then not push through such decisions, as the majority shareholders are often not interested in accepting activities that reduce ROA. The profitability of SOEs when the state has a negative majority does, however, still have lower ROA than POEs. This can indicate that managers drive down profitability due to lower salaries, as partially state-owned companies are still restricted to state salaries.

The office of the auditor general (Riksrevisjonen, 2016) investigates SOEs controlled by the departments in Norway. It finds that some of the SOEs have not been performing as expected. One explanation is that the managers do not collect information enough to compare a company with its peers. As a consequence, the companies have not managed to be as effective as their competitors. In addition, the board of SOEs lacks the competence needed to make the most profitable decisions. This gives further evidence to our arguments that both the principal and the agent generate less profitability for SOEs.

There may be a number of explanations, and we admit that the difference in ROA between SOEs and POEs might be caused by other factors as well. However, we find it likely that the peculiarities mentioned are likely explanations and note that they are somewhat documented. The finding is consistent with previous empirical evidence we have discussed.

5.3.2 Dividend payout ratio

Dividends provide a way to discipline managers, so it is valid in the cases of SOEs and POEs. We see that the SOEs have large earnings on an average, which gives them a choice in if they should pay dividend or let the companies keep their earnings. In light of discussed theory, we create arguments that is likely to explain the low DPR for SOEs.

SOEs in Norway where the state is the single owner cannot float new securities by turning to the capital market. Capital infusions from the state can be hard to receive, as they need to compete with a large number of spending areas. As mentioned earlier, SOEs want to avoid bankruptcy. It therefore seems reasonable to argue that the owners let SOEs keep their earnings so they do not go bankrupt or need funding to keep operating. The same can be argued for partially state-owned companies, as the state needs to help fund such companies together with private ones, if needed.

Trade unions and interest groups such as employees have a strong position in Norway. They can quickly get media attention and inform people about their views of an issue. They have a history of acting if a majority of their members are dissatisfied. If such groups can benefit from making a company keep earnings as discussed in theory, then we should expect to see a drop in the dividend payout. These groups are fully aware of the politician's role as owners in Norway. We therefore find it likely that politicians prefer lower dividends to satisfy such groups. We argue that such an issue is less severe for POEs, as the owners do not need to concern themselves with being reelected.

Theory argues that politicians prefer earnings to be retained, hoping thereby to create an increased rate of return. The ROA is lower for SOEs though the DPR is lower, so we cannot conclude that politicians let them keep earnings to get a higher rate of return. We find it more likely the cash is used to satisfy voters, as discussed earlier. Our findings are consistent with arguments that politicians seek low dividend payouts to make SOEs financially capable of implementing government policies. Many SOEs are motivated to help create a welfare state, and allowing companies to keep earnings is arguably necessary to implementing such strategies.

Evidence does not support theories which argue that politicians use dividends to attract voters. Rather, it seems that SOEs keep their earnings so the politicians can attract voters and maintain good reputations. Norwegian voters do not have any direct cash flow rights, as the cash goes into the national budget. Thus, we argue that they do not have any preference for dividends which may influence politicians to allow SOEs to keep their earnings.

Principal agent theory argues that owners can align managers' interests with their own through dividend payouts. We argue that it is in the interest of politicians to let SOEs keep their earnings, thereby to gain political support and be reelected. This can make it harder for the owners of SOEs to deal with the principal-agent problem, as voters prefer the cash to stay within the SOEs. The main objective of the owners of POEs is to receive a profit for their investments. We argue that they can more effectively deal with the principal-agent problem by financially disciplining their managers, thus providing POEs with a higher DPR.

Figure 5 shows that the lowest DPR occurs when the state has a majority vote in SOEs and when private owners are minority holders. From this observation, one could argue that the state owners exploit minority shareholders to receive private benefits. They do not want to share earnings with co-investors, thereby reducing the dividend payouts. One can see that DPR increases when the state has no co-investors, which gives further evidence to this argument. Exploiting minority shareholders will create a lower DPR on average for SOEs.

We argue that the principals of SOEs act in their own interests and thus cannot focus on the principal-agent problem to the same extent as private owners. In addition, it seems they do not share earnings with co-investors, which should decrease the DPR of SOEs. We admit that some of the reasons might have to do with factors other than mentioned. However, we find it likely that these peculiarities are likely explanations and are somewhat documented. The finding is consistent with empirical evidence.

6. Robustness

To evaluate the validity and quality of our results, we have conducted a number of additional tests.

6.1 Allowing change in ownership

The sample selection excludes companies that changes from SOEs to POEs, and vice versa. We perform robustness tests where we include companies that change ownership structure to see if it impacts our results (see Appendix 9 and 10). We

only allow one change in ownership, as multiple changes seem unreasonable within the time period of 14 years. We include the same criteria's, expect criteria 6 in the sample. Excluding criteria 6 together with including only one change in ownership increases the sample with 812 firms. All else is equal to model 1-4. For the ROA regression we find that state ownership is statistically significant at the 1% level with a coefficient of -3.6576. Private ownership is statistically significant at the 1% level with a coefficient of 3.6576. For DPR, we find that the coefficient is statistically significant at the 1% level with a value of -10.8847 for state ownership. The coefficient for private ownership is statistically significant with the value of 10.8847. The regressions show that there is less difference in ROA and DPR between SOEs and POEs, compared to model 1-4. The results can potentially be explained by the argument of a downward bias; Low performing POEs are turned into SOEs. The results are in line with Model 1-4, indicating that SOEs negatively impacts ROA and DPR, while POEs positively impacts ROA and DPR.

6.2 Changing the definitions of SOEs and POEs

There exists a number of different definitions of an SOE. Thus, we decide to change the definition of an SOE and a POE to see if such a change would yield a different result (see Appendix 11 and 12). We define an SOE as any entity of which the state owns more than 50%. Thus, the state will have majority in all companies. The sample is equal to the one used for model 1-4. For ROA, state ownership has a negative coefficient with the value of -4.9642, while private ownership has a positive coefficient of 4.9643. Both are statistically significant at the 1% level. The tests indicate that there is a smaller difference in ROA and DPR between SOEs and POEs, compared to model 1-4. We argue that the reason for the smaller impact of SOEs is that the private ownership variable now includes companies in which the state has a negative majority. The evidence is, however, consistent with results from models 1-4.

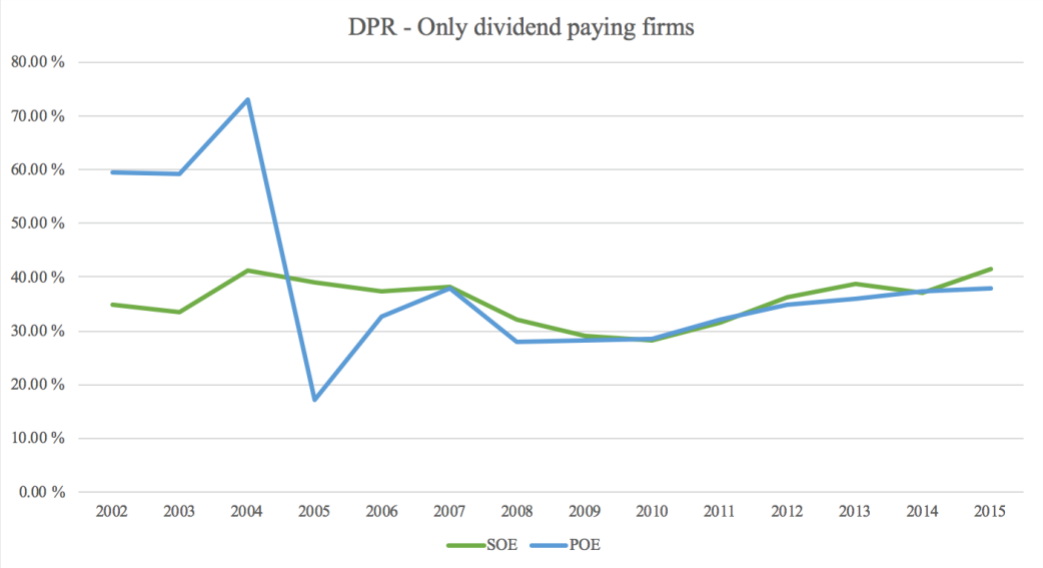
6.3 Only dividend-paying firms

The sample includes both dividend paying and non-dividend paying firms. We decide to run a robustness test where we only include dividend paying firms. A company has to pay dividend at least one time during the sample period to be included. From the output (see Appendix 13), we observe a coefficient of -5.0730 for State Ownership, and 5.0730 for Private Ownership. State and private

ownership are no longer statistically significant at any level. This indicates that the ownership types do not impact DPR for dividend paying firms significantly. For further investigation, we created a graph to exhibit the differences.

Figure 6: DPR for only dividend paying firms.

The figure shows the yearly average DPR for only dividend paying SOEs and POEs, for the whole time period. Companies are included if they pay out dividend at least once, during the time period. The vertical axis shows the average DPR. The horizontal axis presents each year in the data sample.



SOEs have higher DPRs than POEs for the following years: 2005, 2006,2007, 2008, 2009, 2012, and 2013. It is clear that the dividend payouts between SOEs and POEs is overall relatively even after the tax reform in 2006. One might say that this contradicts previous results. However, we argue that it does not.

Only 24% of SOEs pay dividends in our sample. For POEs, 51% of the companies pay dividends at least once. This indicates that being state owned should decrease the DPR of companies. This is consistent with arguments which suggest that SOEs prefers earnings to be retained rather than paid out. Also, we know that some SOEs can pay immense one-time dividends, which can influence the total average DPR for SOEs, thereby creating no significant difference between being state owned or privately owned. Interestingly, we find that 121 SOEs pay dividends when the state has 100% ownership, while 63 of them pays when they have negative majority. Only 31 SOEs pay dividends when the state has majority, and minority owners exist. From this, it seems that SOEs mainly pay dividends when they do not have the ability to exploit other shareholders. As so few SOEs pay dividends, together

with insignificant answers from the test, we argue that the results do not contradict the results of models 3-4.

6.4 Changing the profitability and dividends measure

We argue that ROA and DPR is optimal measures for profitability and dividends even though they have weaknesses. Thus, we change measures for profitability and dividends, to make sure that ROA and DPR are consistent with other measures (see Appendix 13 and 14). For profitability, we use a profit margin ratio. We calculate profit margin as: earnings before extraordinary items divided by revenues. For dividends, we create the measure: dividends divided by free cash flow. There exists the possibility that controlling shareholders underreport earnings in order to increase the dividend payout ratio. In an attempt to deal with the issue, we use free cash flow instead of earnings. From the regression using profit margin, State ownership has a coefficient of -2.082, while private ownership has a coefficient of 2.0820. Both are statistically significant at the 1% level. For dividends over free cash flow, state ownership has a negative coefficient of -9.2522, while private ownership has a coefficient of 9.2522. Both are statistically significant at the 1% level. The results are in line with evidence from model 1-4. We argue that our measures are of quality, and changing them do not give any other results.

7. Conclusion

The main purpose of this thesis is to investigate the impact of state and private ownership on return on assets and dividend payouts in Norway. There is a long-standing debate on the performance of state-owned enterprises, and we argue that not enough evidence has been put forward regarding the subjects. Thus, we want to contribute to the research.

First, we conducted a multiple regression analysis with random effects on both the return on assets and dividend payout ratio. The random-effects model was the most appropriate, as we have a large number of time-invariant variables. We have a large dataset with a total of 894 state-owned enterprises and 55 228 privately owned enterprises, for the years 2002-2015. The definitions of *state ownership* vary across

research papers, so we chose a definition that fits our study. We define state-owned enterprises as any corporate entity in which the state owns more than 33.33%.

We find evidence that being state owned negatively impacts a company's return on assets and dividend pay-out ratio. Private ownership positively impacts the return on assets and the dividend pay-out ratio. State-owned enterprises have an average return on assets of 4.3192%, while privately owned enterprises have 8.4738%. We find that state-owned enterprises have an average dividend payout ratio of 10.8798%, while the privately owned enterprises have 24.4069%. State-owned enterprises have the lowest return on assets when they possess between 50,01%-66,66% of a company's shares. State-owned enterprises have the lowest dividend payout ratios when the state possesses majority rights and have minority shareholders that they can potentially exploit. We find that privately owned enterprises have immense dividend payout ratios prior to the tax reform in 2006. After the tax reform, there is a significant decrease in dividend payout ratios for privately owned enterprises.

To control for other factors than ownership, we include a number of explanatory variables for the regressions on return on assets and our dividend payout ratio. We find evidence that growth, size, and debt to assets positively impacts return on assets. Age and listed companies negatively impacts return on assets. Additionally, the industry a company operates in impacts return on assets. We find evidence that growth, age, ownership concentration, free cash flow, free cash flow prior to the tax reform and companies within cities has a positive impact on our dividend payout ratio. Additionally, our dummy variable that takes the tax reform into account indicates that the dividend payout ratio is higher prior to the tax reform. We find evidence that size and debt to assets negatively impacts our dividend payout ratio. The regressions indicate that industries impact the dividend payout ratio differently.

We performed additional tests to validate our results. Theory and literature has different definitions of state ownership. Thus, we change the definition of state ownership to see if it provides different results. For additional testing, we include companies that changes from state-owned enterprises to privately owned enterprises, and vice versa. These tests give the same results as our main models. We also include a test with only dividend paying firms. The results indicate that

there is no significant difference in dividend payout ratios between the two ownership types. Finally, we changed our measure for profitability and dividends. The results indicate that state ownership negatively impacts a profit margin and dividends over free cash flow, while private ownership positively impacts the two measures.

We conclude that state ownership negatively impacts the return on assets and the dividend payout ratio for a company. In addition, private ownership positively impacts the return on assets and dividend pay-out ratio. The evidence is consistent with theory and literature, thus suggesting that state ownership is less profitable and exhibits a lower dividend pay-out ratio. We argue that voters, politicians and managers of SOEs are reasons for the negative impact on ROA and DPR. We argue that the principals of SOEs act in their own interest and thus cannot focus on the principal-agent problem to the same extent as private owners.

7.1 Limitations and recommendations for further research

Our results highlights questions that have to be left for future research. First and foremost, what causes the negative impact of SOEs? We have provided arguments for what we find most likely to drive down ROA and DPR for SOEs. However, more specific testing is needed to justify these arguments. We explicitly focus on Norway in this study. As stated earlier, differences between countries make it doubtful that empirical results automatically apply for all countries. Thus, testing within other nations should be performed. We only include AS and ASA firm's due to missing data on ownership for other organizational forms. Including multiple organizational forms would likely increase the number of SOEs in our data set. We know that many SOEs in Norway, such as schools and hospitals often have other organizational forms. Including such companies could potentially influence our results.

We argue that we have a representative sample and created good models to answer our research questions. However, future testing should be performed in order to fully conclude that SOEs has lower dividends and underperforms compared to POEs.

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9. Appendices

Appendix 1: Items received from the CCGR database

This list reports the item number and variable name, recieved from the CCGR database.	
CCGR item_#	**Variable list**
item_9	Revenue
item_11	Total operating revenue
item_15	Depreciation
item_16	Impairment,write-down of fixed assets and intangible assets
item_19	Operating income
item_24	Other interest income
item_25	Other financial income
item_29	Interests expense paid to companies in the same group
item_30	Other interest expenses
item_35	Income before extraordinary items
item_36	Extraordinary revenue
item_37	Extraordinary expenses
item_38	Tax on extraordinary income
item_39	Net Income
item_41	Dividends
item_45	Deferred tax asset
item_63	Total fixed assets
item_64	Inventory
item_65	Account receivable
item_78	Total current assets
item_89	Deferred tax
item_91	Total provisions
item_98	Total other long-term liabilities
item_102	Account payable
item_103	Tax payable
item_105	Dividends payable
item_109	Total current liabilities
item_122	Debt level
item_127	ROA
item_404	OBI company id
item_11103	Industry codes at level two
item_15401	OBI CID
item_13420	Company age
item_14017	Aggregated Fraction held by Of Owners With Unspecified Type (ultmate ownership)
item_14018	Aggregated Fraction held by Institutional Owners (ultmate ownership)
item_14019	Aggregated Fraction held by Personal Owners (ultmate ownership)
item_14022	Aggregated Fraction held by State Owners (ultmate ownership)
item_14023	Aggregated Fraction held by International Owners (ultmate ownership)
item_14024	Aggregated Fraction held by Industrial Owners (ultmate ownership)
item_14025	Herfindahl (based on ultimate ownership) (ultmate ownership)
item_14026	Number of owners with more than 5% share (ultmate ownership)
item_17002	Listing status on Oslo Børs or Oslo Axcess
item_50100	name
item_50102	Business zip code
item_50108	Industry code (SN2007)
item_50109	Number of employees
item_50110	Organisation form
item_50111	Sector code

Appendix 2: Industry distribution (SN2007)

The table presents the industry classification from SN2007. It gives a brief explanation of the industries within the 2-digit levels. It reports which 2-digit industries that are within the main industrial section. The main industrial section are the variables used in the models.

Main Industrial Section	*Division (2-digit level)*	*Brief explanation*
A	01-03	Agriculture, forestry and fishing
B	05-09	Mining and quarrying
C	10-33	Manufacturing
D	35	Electricity, gas, steam and air conditioning supply
E	36-39	Water supply: sewerage, waste management and remediation activities
F	41-43	Construction
G	45-47	Wholesale and retail trade: repair of motor vehicles and motorcycles
H	49-53	Transportation and storage
I	55-56	Accommodation and food service activities
J	58-63	Information and communication
K	64-66	Financial and insurance activities
L	68	Real estate activities
M	69-75	Professional, scientific and technical activities
N	77-82	Administrative and support service activities
O	84	Public administration and defense: compulsory social security
P	85	Education
Q	86-88	Human health and social work activities
R	90-93	Arts, entertainment and recreation
S	94-96	Other service activities
T	97	Activities of household as employers: undifferentiated goods- and services-producing activities of households for own account
U	99	Activities of extraterritorial organizations and bodies

Appendix 3: Correlation matrix

The matrix reports the correlation between variables used in model 1-4. It is performed on the whole sample, thus including the years 2002-2015.

Part 1 of 3

	ROA_t	DPR_t	State Ownership	Private Ownership	$Growth_t$	$Market\ share_{t-1}$	$Size_t$	Age_t	$Publicly\ Listed_{t-1}$	$Ownerhip\ concentration_{t-1}$	$Debt\ to\ Assets_{t-1}$
ROA_t	1.0000										
DPR_t	0.3469	1.0000									
State Ownership	-0.0364	-0.0428	1.0000								
Private Ownership	0.0364	0.0428	-1.0000	1.0000							
$Growth_t$	0.2088	0.0363	-0.0042	0.0042	1.0000						
$Market\ share_{t-1}$	-0.0065	-0.0216	0.0883	-0.0883	-0.0131	1.0000					
$Size_t$	0.0159	-0.0484	0.1436	-0.1436	0.1009	0.2501	1.0000				
Age_t	0.0120	0.0288	0.0184	-0.0184	-0.1107	0.0504	0.2228	1.0000			
$Publicly\ Listed_{t-1}$	-0.0211	0.0009	0.0208	-0.0208	0.0073	0.1107	0.1257	0.0283	1.0000		
$Ownership\ concentration_{t-1}$	0.0120	0.0241	-0.0475	0.0475	0.0183	-0.0131	0.0756	-0.0011	0.0069	1.0000	
$Debt\ to\ Assets_{t-1}$	-0.0663	-0.0543	-0.0879	0.0879	0.0336	-0.0347	-0.2373	-0.2274	-0.0489	-0.0637	1.0000
FCF_{t-1}	0.2774	0.1790	-0.0302	0.0302	-0.1392	-0.0026	-0.0815	0.0476	-0.0209	-0.0117	-0.0736
$Pretax_t$	0.0003	0.1912	-0.0051	0.0051	-0.0104	-0.0067	-0.0578	-0.0828	0.0045	-0.0090	0.1044
$FCF_{t-1} * Pretax_t$	0.0936	0.1634	-0.0125	0.0125	-0.0513	-0.0049	-0.0523	-0.0151	-0.0031	-0.0073	0.0239
City	0.0406	0.0517	-0.0123	0.0123	0.0110	0.0363	0.1025	0.0157	0.0268	-0.0195	0.0262
A	-0.0080	-0.0280	-0.0076	0.0076	0.0195	0.0183	0.0631	-0.0025	0.0031	0.0141	-0.0162
B	-0.0082	-0.0160	-0.0047	0.0047	0.0128	0.0793	0.1065	0.0163	0.0270	-0.0049	-0.0212
C	-0.0388	-0.0494	-0.0348	0.0348	-0.0042	0.0928	0.1572	0.0773	0.0314	0.0686	-0.0722
D	-0.0136	0.0141	0.3232	-0.3232	-0.0007	0.0188	0.1673	0.0072	0.0131	0.0053	-0.0629
E	-0.0024	-0.0124	0.0800	-0.0800	0.0083	0.0776	0.0519	-0.0045	-0.0034	0.0118	-0.0202
F	0.0300	0.0400	-0.0538	0.0538	0.0659	-0.0480	-0.0690	-0.0408	-0.0172	-0.0000	-0.0042
G	-0.0288	0.0133	-0.0924	0.0924	-0.0800	-0.0742	-0.0776	0.0686	-0.0285	-0.0974	0.0286
H	-0.0292	-0.0400	0.0091	-0.0091	0.0105	0.0023	0.0277	0.0060	0.0095	-0.0214	0.0237
I	-0.0337	-0.0322	-0.0118	0.0118	-0.0275	-0.0158	-0.1314	-0.0746	-0.0087	-0.0246	0.1214
J	0.0156	-0.0034	0.0380	-0.0380	0.0238	0.0211	0.0722	-0.0176	0.0278	0.0789	-0.0609
L	0.0212	0.0143	0.0093	-0.0093	0.0089	-0.0093	0.0465	-0.0056	0.0002	0.0204	-0.0059
M	0.0785	0.0692	-0.0062	0.0062	0.0237	-0.0041	-0.0293	-0.0207	0.0131	0.0776	-0.0135
N	0.0073	0.0068	-0.0059	0.0059	0.0207	0.0130	0.0003	-0.0608	-0.0034	-0.0077	0.0299
P	0.0005	-0.0066	0.0626	-0.0626	-0.0013	0.0046	-0.0268	-0.0160	-0.0031	-0.0005	-0.0040
Q	0.0283	-0.0256	0.2146	-0.2146	0.0039	0.0031	-0.0077	-0.0403	-0.0067	-0.0216	-0.0172
R	-0.0089	-0.0232	0.0697	-0.0697	-0.0029	0.0233	-0.0116	-0.0116	-0.0020	0.0103	0.0180
S	0.0229	0.0235	0.0086	-0.0086	-0.0112	0.0185	-0.0545	-0.0023	-0.0044	-0.0211	0.0147

Part 2 of 3 (Correlation Matrix)

	FCF_{t-1}	$Pretax_t$	$FCF_{t-1} * Pretax_t$	$City_t$	A	B	C	D	E	F	G
ROA_t											
DPR_t											
State Ownership											
Private Ownership											
$Growth_t$											
$Market\ share_{t-1}$											
$Size_t$											
Age_t											
Publicly Listed $_{t-1}$											
$Ownership\ concentration_{t-1}$											
$Debt\ to\ Assets_{t-1}$											
FCF_{t-1}	1.0000										
$Pretax_t$	0.0095	1.0000									
$FCF_{t-1} * Pretax_t$	0.3763	0.3813	1.0000								
City	0.0231	0.0111	0.0120	1.0000							
A	-0.0141	0.0104	-0.0083	-0.0674	1.0000						
B	-0.0041	-0.0330	-0.0126	0.0047	-0.0075	1.0000					
C	-0.0166	0.0284	0.0076	-0.1150	-0.0389	-0.0306	1.0000				
D	-0.0155	0.0020	-0.0048	-0.0281	-0.0067	-0.0053	-0.0273	1.0000			
E	0.0092	-0.0004	0.0044	-0.0212	-0.0076	-0.0060	-0.0308	-0.0053	1.0000		
F	-0.0088	-0.0277	-0.0080	-0.0768	-0.0453	-0.0356	-0.1844	-0.0317	-0.0359	1.0000	
G	-0.0339	0.0461	0.0075	0.0092	-0.0723	-0.0569	-0.2947	-0.0507	-0.0573	-0.3431	1.0000
H	0.0174	-0.0054	0.0061	-0.0424	-0.0225	-0.0177	-0.0916	-0.0158	-0.0178	-0.1066	-0.1703
I	0.0372	-0.0021	0.0048	0.0308	-0.0223	-0.0176	-0.0909	-0.0156	-0.0177	-0.1058	-0.1690
J	-0.0058	-0.0233	-0.0122	0.1159	-0.0203	-0.0160	-0.0828	-0.0142	-0.0161	-0.0964	-0.1540
L	-0.0090	-0.0091	-0.0042	0.0407	-0.0098	-0.0077	-0.0399	-0.0069	-0.0078	-0.0464	-0.0742
M	0.0390	-0.0393	-0.0065	0.1065	-0.0257	-0.0203	-0.1048	-0.0180	-0.0204	-0.1220	-0.1950
N	-0.0050	0.0129	0.0034	0.0892	-0.0207	-0.0163	-0.0841	-0.0145	-0.0164	-0.0979	-0.1565
P	0.0114	-0.0176	-0.0047	0.0156	-0.0071	-0.0056	-0.0287	-0.0049	-0.0056	-0.0335	-0.0535
Q	0.0236	-0.0202	-0.0034	-0.0053	-0.0152	-0.0120	-0.0619	-0.0106	-0.0120	-0.0720	-0.1151
R	0.0185	-0.0140	-0.0027	0.0101	-0.0091	-0.0072	-0.0371	-0.0064	-0.0072	-0.0432	-0.0691
S	0.0273	0.0007	0.0107	0.0399	-0.0099	-0.0078	-0.0404	-0.0070	-0.0079	-0.0471	-0.0752

Part 3 of 3 (Correlation Matrix)

	H	I	J	L	M	N	P	Q	R	S
ROA_t										
DPR_t										
State Ownership										
Private Ownership										
$Growth_t$										
$Market\ share_{t-1}$										
$Size_t$										
Age_t										
$Publicly\ Listed_{t-1}$										
$Ownership\ concentration_{t-1}$										
$Debt\ to\ Assets_{t-1}$										
FCF_{t-1}										
$Pretax_t$										
$FCF_{t-1} * Pretax_t$										
City										
A										
B										
C										
D										
E										
F										
G										
H	1.0000									
I	-0.0525	1.0000								
J	-0.0479	-0.0475	1.0000							
L	-0.0230	-0.0229	-0.0208	1.0000						
M	-0.0606	-0.0601	-0.0548	-0.0264	1.0000					
N	-0.0486	-0.0483	-0.0440	-0.0212	-0.0557	1.0000				
P	-0.0166	-0.0165	-0.0150	-0.0072	-0.0190	-0.0153	1.0000			
Q	-0.0358	-0.0355	-0.0323	-0.0156	-0.0409	-0.0329	-0.0112	1.0000		
R	-0.0215	-0.0213	-0.0194	-0.0093	-0.0246	-0.0197	-0.0067	-0.0145	1.0000	
S	-0.0234	-0.0232	-0.0211	-0.0102	-0.0267	-0.0215	-0.0073	-0.0158	-0.0095	1.0000

Appendix 4: Cities included in *City Variable*

The table presents how we created the City variable by zip-code. The cities are sorted by size (population) in chronological order. The data is gathered from SSB.

City	Zip-codes	Population
Oslo	0001-1299, 1300-1369, 1371-1399, 1465-1467, 2001-2004, 2007, 2010-2013, 2015, 2019-2021, 2023, 2026-2028, 1468-1479, 1410-1421, 2005-2006, 2008-2009, 2014, 2018, 2025, 1400-1406, 1408-1409, 1480-1488, 1920-1928, 2016-2017	988 873
Bergen	5003-5176, 5178-5184, 5221-5269, 5802-5899	254 235
Stavanger/Sandens	4001-4049, 4064-4069, 4076-4096, 4099, 4154, 4301-4329, 4332, 4336-4338, 4391-4398, 4050-4059, 4097-4098, 4070-4074, 4096	220 943
Trondheim	7003-7099, 7400-7498	180 557
Drammen	3001-3048, 3050-3058, 3300-3330, 3401-3429, 7882-7884, 3430-3474, 3477-3479, 3401-3428	116 446
Fredrikstad	1601-1640, 1650-1680, 1701-1747	111 267
Porsgrunn	3701-3747, 3785-3787, 3792, 3796-3799, 3901-3950, 3991, 3996-3998, 3960-3970, 3993-3995, 3999	92 753
Kristiansand	4604-4639, 4656-4679, 4686-4699	61 536
Ålesund	6001-6028, 6044-6048, 6057, 6030-6039	52 163
Tønsberg	3101-3105, 3107-3119, 3122-3127, 3129, 3150-3157, 3166, 3170-3173, 3106, 3120-3121, 3128, 3131-3148, 3165	51 571

Appendix 5: Main sample descriptive statistics

The tables reports summary statistics on variables used in models 1-4. The values are created using the whole data sample, thus including the time period 2002-2015. Panel A provides the mean, median, maximum value, minimimum value, standard deviation and number of observations (N) for the variables not characterized as a dummy. The variables in percentage are ratios. Size is reported in millions. The variables Growth, Size, Age, Debt to Assets and FCF are winsorized at the 1% and 99% tails. The reported numbers for FCF*Pretax is calculated when Pretax =1 (2002-2004). Panel B provides statistics for the dummy variables State ownership, Private ownership, Publicly listed, City and indstries from A-U (See Appendix 2 for industry description). N(D=1) reports the number of observations when the variable equals one. %-obs. (D=1) Reports the % of total observations, when the variable equals 1.

Panel A

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	N
ROA_t	8.3990 %	8.4440 %	99.1837 %	-100.0000 %	15.1694 %	358 804
DPR_t	24.1635 %	0.0000 %	200.0000 %	0.0000 %	42.0035 %	358 804
$Growth_t$	7.9815 %	4.6593 %	116.4702 %	-45.9973 %	24.1769 %	358 804
$Size_t$	37.9781	8.2240	932.1800	1.1340	118.3282	358 804
Age_t	15.7249	13.0000	70.0000	2.0000	11.8742	358 804
$Market\ share_{t-1}$	0.1550 %	0.0180 %	78.4833 %	0.0005 %	1.1717 %	358 804
$Ownership\ concentration_{t-1}$	2.5866	2.0000	19.0000	0.0000	1.7779	358 804
$Debt\ to\ Assets_{t-1}$	74.9302 %	77.2316 %	159.1328 %	20.1445 %	22.5499 %	358 804
FCF_{t-1}	9.8535 %	10.1558 %	73.9542 %	-59.3615 %	22.5676 %	358 804
$FCF_{t-1} * Pretax_t$	10.3545 %	10.9012 %	73.9542 %	-59.3615 %	23.0674 %	55 807

Panel B

	State Ownership	*Private Ownership*	*Publicly Listed*$_{t-1}$	*Pretax*$_t$	*City*$_t$	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*L*	*M*	*N*	*P*	*Q*	*R*	*S*
N (D = 1)	6 457	352 347	674	55 807	173 636	3 393	2 110	49 061	1 675	2 137	63 422	127 050	18 035	17 777	14 882	3 563	23 269	15 346	1 861	8 463	3 096	3 664
% -Obs. (D = 1)	1.7996 %	98.2004 %	0.1878 %	15.5536 %	48.3930 %	0.9456 %	0.5881 %	13.6735 %	0.4668 %	0.5956 %	17.6759 %	35.4093 %	5.0264 %	4.9545 %	4.1477 %	0.9930 %	6.4852 %	4.2770 %	0.5187 %	2.3587 %	0.8629 %	1.0212 %

Appendix 6: Main sample yearly descriptive statistics (means)

The table reports the mean values for each year, on variables used in models 1-4. The variables in percentage are ratios. Size is reported in millions. The variables Growth, Size, Age, Debt to Assets and FCF are winsorized at the 1% and 99% tails. The reported numbers for FCF*Pretax is calculated when Pretax =1 (2002-2004). N reports the total number of observations for each variable.

Variables	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
N	15 553	20 121	20 133	23 441	24 215	25 644	26 544	27 223	27 998	28 570	29 010	29 462	29 987	30 903
ROA_t	7.8580 %	7.7771 %	9.4720 %	9.4162 %	9.6502 %	11.1049 %	8.7812 %	7.3978 %	6.9514 %	7.7396 %	8.0301 %	7.5766 %	8.2331 %	8.1459 %
DPR_t	37.9324 %	39.5096 %	50.0714 %	11.9032 %	22.2862 %	25.6727 %	18.7792 %	18.7324 %	18.6824 %	20.5845 %	22.1899 %	22.5447 %	22.8221 %	22.2633 %
$Growth_t$	6.5545 %	4.5698 %	10.8725 %	9.7068 %	13.1401 %	15.2545 %	8.5283 %	-0.4841 %	6.4594 %	9.8816 %	8.0328 %	6.2144 %	6.9829 %	6.8675 %
$Size_t$	28.3640	30.6338	32.0845	32.5413	34.6184	37.4976	38.3887	37.6510	39.5307	40.6660	41.6486	42.5056	42.2169	42.7623
Age_t	12.2546	14.2785	14.4550	14.9760	15.1542	15.2484	15.3734	15.6430	15.9705	16.2531	16.5248	16.8499	17.0630	17.1927
$Market\ share_{t-1}$	0.1301 %	0.1397 %	0.1387 %	0.1413 %	0.1266 %	0.1290 %	0.1211 %	0.1746 %	0.1826 %	0.1698 %	0.1769 %	0.1721 %	0.1738 %	0.1600 %
$Ownership\ concentration_{t-1}$	2.5535	2.5382	2.5574	2.5711	2.5517	2.3953	2.6112	2.6394	2.6559	2.6056	2.6113	2.6789	2.6504	2.5299
$Debt\ to\ Assets_{t-1}$	79.2012 %	80.2254 %	81.5390 %	82.6295 %	77.6664 %	76.9809 %	74.9125 %	73.8685 %	72.3778 %	72.2516 %	72.1009 %	71.4363 %	71.1192 %	70.7653 %
FCF_{t-1}	8.2460 %	10.8373 %	11.5008 %	10.6467 %	9.8988 %	9.2816 %	10.3183 %	9.3648 %	11.2112 %	8.8392 %	8.6669 %	9.4815 %	9.4183 %	10.4158 %
$FCF_{t-1} * Pretax_t$	8.2460 %	10.8373 %	11.5008 %	-	-	-	-	-	-	-	-	-	-	-

Appendix 7: Main sample yearly descriptive statistics (means for SOEs)

The table reports the mean values for variables when state ownership occur (when dummy State Ownership = 1). It reports mean values for each year on variables used in model 1-4. The variables in percentage are ratios. Size is reported in millions. The variables Growth, Size, Age, Debt to Assets and FCF are winsorized at the 1% and 99% tails. The reported numbers for FCF*Pretax is calculated when Pretax =1 (2002-2004). N reports the total number of observations for each variable.

	Variables	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*
	N	252	322	342	369	427	441	449	474	510	541	562	584	576	608
SOE	ROA_t	3.5876 %	4.4119 %	2.8967 %	4.8901 %	5.3028 %	5.5755 %	3.6823 %	3.7355 %	5.4426 %	3.3645 %	3.1833 %	3.6404 %	5.2279 %	5.0984 %
	DPR_t	10.8939 %	9.8762 %	13.3972 %	13.5541 %	12.5902 %	13.0968 %	10.7003 %	9.3246 %	8.8771 %	9.1857 %	10.0679 %	11.1689 %	10.2408 %	11.1671 %
	$Growth_t$	5.2940 %	10.7299 %	6.9605 %	8.0643 %	12.3699 %	8.6567 %	12.2632 %	4.2797 %	11.8377 %	4.8658 %	3.6856 %	5.3639 %	4.8662 %	5.2867 %
	$Size_t$	154.5843	153.8453	162.6122	168.6458	163.2451	169.8245	170.8095	166.8755	163.7759	163.0877	160.2430	157.5956	153.7401	153.6424
	Age_t	15.1508	15.8727	17.0409	16.8672	17.0515	17.5510	17.3987	17.7954	18.0333	18.1848	18.4609	19.1866	19.5920	20.3947
	$Market\ share_{t-1}$	0.8028 %	0.8394 %	0.8354 %	1.0070 %	0.8320 %	0.8189 %	0.8790 %	1.0556 %	1.0759 %	0.9731 %	0.9851 %	0.9798 %	0.9330 %	0.7530 %
	$Ownership\ concentration_{t-1}$	1.9643	1.9534	1.9474	1.9268	1.9274	1.8095	1.9354	1.9430	1.9725	1.9686	1.9591	2.0154	2.0538	2.0181
	$Debt\ to\ Assets_{t-1}$	60.4191 %	60.7463 %	58.6196 %	61.2174 %	58.8671 %	59.0993 %	59.3401 %	61.5425 %	62.2843 %	60.8745 %	61.3976 %	61.2248 %	59.7198 %	58.4114 %
	FCF_{t-1}	4.8070 %	4.8257 %	5.1852 %	3.8987 %	3.9872 %	5.0039 %	5.0029 %	1.3715 %	5.2320 %	5.6310 %	5.0281 %	5.0684 %	6.4712 %	5.0493 %
	$FCF_{t-1} * Pretax_t$	4.8070 %	4.8257 %	5.1852 %	-	-	-	-	-	-	-	-	-	-	-

Appendix 8: Main sample yearly descriptive statistics (means for POEs)

The table reports the mean values for variables when private ownership occur (when dummy Private Ownership = 1). It reports mean values for each year on variables used in model 1-4. The variables in percentage are ratios. Size is reported in millions. The variables Growth, Size, Age, Debt to Assets and FCF are winsorized at the 1% and 99% tails. The reported numbers for FCF*Pretax is calculated when Pretax =1 (2002-2004). N reports the total number of observations for each variable.

	Variables	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
	N	15 301	19 799	19 791	23 072	23 788	25 203	26 095	26 749	27 488	28 029	28 448	28 878	29 411	30 295
POE	ROA_t	7.9283 %	7.8318 %	9.5856 %	9.4886 %	9.7282 %	11.2017 %	8.8689 %	7.4627 %	6.9794 %	7.8240 %	8.1259 %	7.6462 %	8.2920 %	8.2071 %
	DPR_t	38.3777 %	39.9915 %	50.7051 %	11.8768 %	22.4602 %	25.8927 %	18.9182 %	18.8991 %	18.8643 %	20.8046 %	22.4294 %	22.7748 %	23.0685 %	22.4860 %
	$Growth_t$	6.5753 %	4.4697 %	10.9401 %	9.7331 %	13.1539 %	15.3700 %	8.4640 %	-0.5685 %	6.3596 %	9.9784 %	8.1186 %	6.2316 %	7.0244 %	6.8992 %
	$Size_t$	26.2852	28.6300	29.8289	30.3645	32.3095	35.1822	36.1102	35.3612	37.2255	38.3031	39.3057	40.1782	40.0327	40.5370
	Age_t	12.2069	14.2525	14.4103	14.9457	15.1201	15.2081	15.3386	15.6049	15.9322	16.2158	16.4865	16.8027	17.0135	17.1284
	$Market\ share_{t-1}$	0.1190 %	0.1283 %	0.1267 %	0.1274 %	0.1140 %	0.1169 %	0.1080 %	0.1590 %	0.1660 %	0.1543 %	0.1610 %	0.1558 %	0.1589 %	0.1481 %
	$Ownership\ concentration_{t-1}$	2.5632	2.5477	2.5680	2.5814	2.5629	2.4056	2.6229	2.6518	2.6686	2.6179	2.6242	2.6924	2.6621	2.5402
	$Debt\ to\ Assets_{t-1}$	79.5105 %	80.5422 %	81.9351 %	82.9720 %	78.0039 %	77.2938 %	75.1805 %	74.0869 %	72.5650 %	72.4712 %	72.3123 %	71.6429 %	71.3425 %	71.0133 %
	FCF_{t-1}	8.3027 %	10.9351 %	11.6100 %	10.7546 %	10.0049 %	9.3565 %	10.4097 %	9.5065 %	11.3221 %	8.9011 %	8.7388 %	9.5707 %	9.4760 %	10.5235 %
	$FCF_{t-1} * Pretax_t$	8.3027 %	10.9351 %	11.6100 %	-	-	-	-	-	-	-	-	-	-	-

Appendix 9: Robustness test (1) for ROA: Allowing change in ownership

The table reports regression output for robustness test on model 1-2, using random-effects model. The test includes companies that change ownership one time during the time period, and the ones with constant ownership. The sample is created by using all criterias (see Data section), except criteria 6. We exclude companies with more than one change in ownership. It includes years 2002 - 2015. The letters A-R are industry classification codes (see Appendix 2). The variables Public Listed, Market Share and Debt to Assets are lagged one time period. Size and Age are logged values. Growth, Size, Age and Debt to Assets are winsorized at the 1% and 99% tails. The tables presents the coefficiants. Standard errors are in parenthesis. Statistical significance is reported as: *** p<0.01, ** p<0.05, * p<0.10.

Dependent variable:	ROA_t	
Regression nr:	(5)	(6)
State Ownership	-3.6576***	
	(0.2870)	
Private Ownership		3.6576***
		(0.28)
$Publicly\ Listed_{t-1}$	-6.3556***	-2.0128
	(0.8283)	(0.9072)
$Growth_t$	0.1241***	0.0407***
	(0.0008)	(0.0010)
$Size_t$	-1.2360***	-1.0738***
	(0.0384)	(0.0392)
Age_t	-0.2751***	-0.0399***
	(0.0510)	(0.0041)
$Market\ share_{t-1}$	0.0299	0.1295***
	(0.0312)	(0.0333)
$Debt\ to\ Assets_{t-1}$	0.0632***	0.0356***
	(0.0014)	(0.0010)
$City_t$	-0.1594	0.7256***
	(0.1058)	(0.1095)
A	-6.6678***	-3.6606**
	(0.7240)	(1.1931)
B	-8.2035***	-2.9900
	(0.8800)	(1.2971)
C	-6.0800***	-4.9478***
	(0.5555)	(1.0930)
D	-7.5308***	-0.3334
	(0.9950)	(1.3803)
E	-4.3674***	-2.8159
	(0.9097)	(1.3146)
F	-3.4304***	-3.7562**
	(0.5471)	(1.0897)
G	-4.4727***	-5.2857***
	(0.5386)	(1.0897)
H	-6.2921***	-5.7732***
	(0.5827)	(1.1086)
I	-6.2464***	-8.4570***
	(0.5807)	(1.1086)
J	-3.2422***	-2.4301
	(0.5982)	(1.1152)
L	-2.0356**	-0.2495
	(0.7035)	(1.1867)
M	0.6320	0.1301
	(0.5714)	(1.1019)
N	-4.3987***	-4.2761***
	(0.5821)	(1.1096)
P	-3.5218***	-5.2693***
	(0.8634)	(1.2867)
Q	0.1802	-0.5069
	(0.6263)	(1.1350)
R	-6.8704***	-7.6878***
	(0.7842)	(1.2312)
Constant	3.5943***	-0.0633
	(0.5613)	(0.6258)
Number of obs.	364 810	364 810
Number of firms	56 934	56 934
Obs. For each firm		
min.	1	1
avg.	6.4	6.4
max.	14	14
R-squared (within)	0.0887	0.0887

Appendix 10: Robustness test (2) for DPR: Allowing change in ownership

The table reports regression output for robustness test on model 3-4, using random-effects model. The test includes companies that change ownership one time during the time period, and the ones with constant ownership. The sample is created by using all criterias (see Data section), except criteria 6. We exclude companies with more than one change in ownership. It includes years 2002 - 2015. The letters A-R are industry classification codes (see Appendix 2). Industry S is omitted due to multicollinearity. The variables Public Listed, Debt to Assets, Free Cash Flow and Free Cash Flow*Pretax and ownership concentration are lagged one time period. Size and Age are logged values. Growth, Size, Age, Debt to Assets and Free Cash Flow are winsorized at the 1% and 99% tails. The tables presents the coefficiants. Standard errors are in parenthesis. Statistical significance is reported as: *** p<0.01, ** p<0.05, * p<0.10.

Dependent variable:	DPR_t	
Regression nr:	(7)	(8)
State Ownership	-10.8847***	
	(0.6719)	
Private Ownership		10.8847***
		(0.6719)
$Pretax_t$	23.6146***	23.6146***
	(0.1839)	(0.1839)
$Publicly\ Listed_{t-1}$	3.1814	3.1814
	(2.0320)	(2.0320)
$Growth_t$	0.0960***	0.0960***
	(0.0025)	(0.0025)
$Size_t$	-0.6675***	-0.6675***
	(0.0863)	(0.0863)
Age_t	2.6236***	2.6236***
	(0.1254)	(0.1254)
$Ownership\ concentration_{t-1}$	0.3581***	0.3581***
	(0.0482)	(0.0482)
$Debt\ to\ Assets_{t-1}$	-0.1410***	-0.1410***
	(0.0036)	(0.0036)
FCF_{t-1}	0.1279***	0.1279***
	(0.0029)	(0.0029)
$FCF_{t-1} * Pretax_t$	0.1755***	0.1755***
	(0.0069)	(0.0069)
$City_t$	2.2447***	2.2447***
	(0.2236)	(0.2236)
A	-17.8778***	-17.8778***
	(1.4793)	(1.4793)
B	-10.9789***	-10.9789***
	(1.7720)	(1.7720)
C	-12.4253***	-12.4253***
	(1.1226)	(1.1226)
D	6.5312**	6.5312**
	(1.9827)	(1.9827)
E	-9.7938***	-9.7938***
	(1.8115)	(1.8115)
F	-2.6830	-2.6830
	(1.1055)	(1.1055)
G	-5.9202***	-5.9202***
	(1.0884)	(1.0884)
H	-12.6627***	-12.6627***
	(1.1775)	(1.1775)
I	-10.3653***	-10.3653***
	(1.1745)	(1.1745)
J	-6.6085***	-6.6085***
	(1.2059)	(1.2059)
L	0.0731	0.0731
	(1.4422)	(1.4422)
M	4.7156***	4.7156***
	(1.1544)	(1.1544)
N	-5.9662***	-5.9662***
	(1.1802)	(1.1802)
P	-7.2123***	-7.2123***
	(1.7502)	(1.7502)
Q	-9.0817***	-9.0817***
	(1.2682)	(1.2682)
R	-12.4315***	-12.4315***
	(1.5808)	(1.5808)
Constant	26.8722***	15.9875***
	(1.1766)	(1.3403)
Number of obs.	364 810	364 810
Number of firms	56 934	56 934
Obs. For each firm		
min.	1	1
avg.	6	6
max.	14	14
R-squared (within)	0.0773	0.0773

Appendix 11: Robustness test (3) for ROA: Changing the definitions of SOEs and POEs

The table reports regression output for robustness test on model 1-2, using random-effects model. We change our definition of state ownership: SOEs are companies where the state has more than 50 % ownership, POEs are companies where the state has equal to or less than 50 % ownership. The regression is on the whole data sample, thus including the years 2002 - 2015. The letters B-R are industry classification codes (see Appendix 2). Industry A, O, T and U is omitted by criteria 4. Industry K is omitted by criteria 5. Industry S is omitted due to multicollinearity. The variables Public Listed, Market Share and Debt to Assets are lagged one time period. Size and Age are logged values. Growth, Size, Age and Debt to Assets are winsorized at the 1% and 99% tails. The tables presents the coefficiants. Standard errors are in parenthesis. Statistical significance is reported as: *** p<0.01, ** p<0.05, * p<0.10.

Dependent variable:	ROA_t	
Regression nr:	(9)	(10)
State Ownership	-4.9643***	
	(0.5466)	
Private Ownership		4.9643***
		(0.5466)
$Publicly\ Listed_{t-1}$	-6.5415	-6.5415
	(0.8469)	(0.8469)
$Growth_t$	0.1250***	0.1250***
	(0.0086)	(0.0086)
$Size_t$	-1.2700***	-1.2700***
	(0.0392)	(0.0392)
Age_t	-0.3163***	-0.3163***
	(0.0517)	(0.0517)
$Market\ share_{t-1}$	0.0143	0.0143
	(0.0320)	(0.0320)
$Debt\ to\ Assets_{t-1}$	0.0639***	0.0639***
	(0.0014)	(0.0014)
$City_t$	-0.1685	-0.1685
	(0.1072)	(0.1072)
B	-8.3860***	-8.3860***
	(0.8858)	(0.8858)
C	-6.1719***	-6.1719***
	(0.5591)	(0.5591)
D	-8.0151***	-8.0151***
	(1.0886)	(1.0886)
E	-4.3490***	-4.3490***
	(0.9265)	(0.9265)
F	-3.5333***	-3.5333***
	(0.5505)	(0.5505)
G	-4.5720***	-4.5720***
	(0.5420)	(0.5420)
H	-6.3521***	-6.3521***
	(0.5872)	(0.5872)
I	-6.3061***	-6.3061***
	(0.5843)	(0.5843)
J	-3.5511***	-3.5511***
	(0.6041)	(0.6041)
L	-2.1940**	-2.1940**
	(0.7083)	(0.7083)
M	0.6254	0.6254
	(0.5752)	(0.5752)
N	-4.4917***	-4.4917***
	(0.5860)	(0.5860)
P	-3.1253***	-3.1253***
	(0.8909)	(0.8909)
Q	0.5410	0.5410
	(0.6344)	(0.6344)
R	-6.4348***	-6.4348***
	(0.7934)	(0.7934)
Constant	3.6656***	-1.2988
	(0.5654)	(0.7751)
Number of obs.	357 162	357 162
Number of firms	55 589	55 589
Obs. For each firm		
min.	1	1
avg.	6.4	6.4
max.	14	14
R-squared (within)	0.0898	0.0898

Appendix 12: Robustness test (4) for DPR: Changing the definitions of SOEs and POEs.

The table reports regression output for robustness test on model 3-4, using random-effects model. We change our definition of state ownership: SOEs are companies where the state has more than 50 % ownership, POEs are companies where the state has equal to or less than 50 % ownership. The regression is on the whole data sample, thus including the years 2002 - 2015. The letters B-R are industry classification codes (see Appendix 2). Industry A, O, T and U is omitted by criteria 4. Industry K is omitted by criteria 5. Industry S is omitted due to multicollinearity. The variables Public Listed, Debt to Assets, Free Cash Flow, Free Cash Flow*Pretax and ownership concentration are lagged one time period. Size and Age are logged values. Growth, Size, Age, Debt to Assets and Free Cash Flow are winsorized at the 1% and 99% tails. The tables presents the coefficiants. Standard errors are in parenthesis. Statistical significance is reported as: *** p<0.01, ** p<0.05, * p<0.10.

Dependent variable:	DPR_t	
Regression nr:	(11)	(12)
State Ownership	-13.2089***	
	(1.0946)	
Private Ownership		13.2089***
		(1.0946)
$Pretax_t$	24.0747	24.0747
	(0.1874)	(0.1874)
$Publicly\ Listed_{t-1}$	2.7000	2.7000
	(2.0905)	(2.0905)
$Growth_t$	0.0979***	0.0979***
	(0.0025)	(0.0025)
$Size_t$	-0.6876***	-0.6876***
	(0.0886)	(0.0886)
Age_t	2.6883***	2.6883***
	(0.127)	(0.127)
$Ownership\ concentration_{t-1}$	0.3335***	0.3335***
	(0.0490)	(0.0490)
$Debt\ to\ Assets_{t-1}$	-0.1441***	-0.1441***
	(0.0036)	(0.0036)
FCF_{t-1}	0.1287***	0.1287***
	(0.0030)	(0.0030)
$FCF_{t-1} * Pretax_t$	0.1722***	0.1722***
	(0.0070)	(0.0070)
$City_t$	2.2570***	2.2570***
	(0.2272)	(0.2272)
B	-10.8574***	-10.8574***
	(1.7905)	(1.7905)
C	-12.4959***	-12.4959***
	(1.1342)	(1.1342)
D	6.6595**	6.6595**
	(2.1608)	(2.1608)
E	-9.6289***	-9.6289***
	(1.8524)	(1.8524)
F	-2.6379	-2.6379
	(1.1166)	(1.1166)
G	-5.9071***	-5.9071***
	(1.0994)	(1.0994)
H	-12.6006***	-12.6006***
	(1.1912)	(1.1912)
I	-10.2106***	-10.2106***
	(1.1862)	(1.1862)
J	-6.3364***	-6.3364***
	(1.2229)	(1.2229)
L	-0.0733	-0.0733
	(1.4579)	(1.4579)
M	5.0119***	5.0119***
	(1.1666)	(1.1666)
N	-5.7649***	-5.7649***
	(1.1925)	(1.1925)
P	-6.1112**	-6.1112**
	(1.8175)	(1.8175)
Q	-8.3349***	-8.3349***
	(1.2894)	(1.2894)
R	-12.2230***	-12.2230***
	(1.6052)	(1.6052)
Constant	26.9400***	13.7311***
	(1.1906)	(1.5910)
Number of obs.	357 162	357 162
Number of firms	55 589	55 589
Obs. For each firm		
min.	1	1
avg.	6.4	6.4
max.	14	14
R-squared (within)	0.0787	0.0787

Appendix 13: Robustness test (5) for DPR: Only dividend-paying firms.

The table reports regression output for robustness test on model 3-4, using random-effects model. We only include companies that pays dividend at least one time during our time period. We use all of our criterias (see Data section). It includes years 2002 - 2015. The letters A-R are industry classification codes (see Appendix 2). Industry O, T and U is omitted by criteria 4. Industry K is omitted by criteria 5. Industry S is omitted due to multicollinearity. The variables Public Listed, Debt to Assets, Free Cash Flow, Free Cash Flow*Pretax and ownership concentration are lagged one time period. Size and Age are logged values. Growth, Size, Age, Debt to Assets and Free Cash Flow are winsorized at the 1% and 99% tails. The tables presents the coefficiants. Standard errors are in parenthesis. Statistical significance is reported as: *** p<0.01, ** p<0.05, * p<0.10.

Dependent variable:	DPR_t	
Regression nr:	(13)	(14)
State Ownership	-5.0730	
	(2.0451)	
Private Ownershp		5.0729
		(2.0451)
$Pretax_t$	33.3698***	33.3698***
	(0.2838)	(0.2838)
$Publicly\ Listed_{t-1}$	13.0648***	13.0648***
	(3.2187)	(3.2187)
$Growth_t$	0.1278***	0.1278***
	(0.0038)	(0.0038)
$Size_t$	-0.5434***	-0.5434***
	(0.1300)	(0.1300)
Age_t	-0.9249***	-0.9249***
	(0.1924)	(0.1924)
$Ownership\ concentration_{t-1}$	0.2131**	0.2131**
	(0.0046)	(0.0046)
$Debt\ to\ Assets_{t-1}$	-0.1686***	-0.1686***
	(0.0059)	(0.0059)
FCF_{t-1}	0.1929***	0.1929***
	(0.0046)	(0.0046)
$FCF_{t-1} * Pretax_t$	0.1091***	0.1091***
	(0.1078)	(0.1078)
$City_t$	3.7263***	3.7263***
	(0.3140)	(0.3140)
A	-19954***	-19954***
	(2.2905)	(2.2905)
B	-12.5850***	-12.5850***
	(2.6252)	(2.6252)
C	-17.2616***	-17.2616***
	(1.5226)	(1.5226)
D	1.0543	1.0543
	(3.0082)	(3.0082)
E	-16.5541***	-16.5541***
	(2.5818)	(2.5818)
F	9.3520***	9.3520***
	(1.4912)	(1.4912)
G	-8.9388***	-8.9388***
	(1.4727)	(1.4727)
H	-15.5074***	-15.5074***
	(1.6307)	(1.6307)
I	-7.6462***	-7.6462***
	(1.6529)	(1.6529)
J	-7.7736***	-7.7736***
	(1.6604)	(1.6604)
L	-4.1981	-4.1981
	(2.0239)	(2.0239)
M	-2.6303	-2.6303
	(1.5531)	(1.5531)
N	-4.9100**	-4.9100**
	(1.6232)	(1.6232)
P	-7.1650*	-7.1650*
	(2.6666)	(2.6666)
Q	-3.6043	-3.6043
	(1.8734)	(1.8734)
R	-10.7420***	-10.7420***
	(2.5466)	(2.5466)
Constant	52.4129***	47.3400***
	(1.6375)	(2.5848)
Number of obs.	233 068	233 068
Number of firms	28 391	28 391
Obs. For each firm		
min.	1	1
avg.	8.2	8.2
max.	14	14
R-squared (within)	0.1071	0.1071

Appendix 14: Robustness test (6) for profitability: Profit margin

The table reports regression output for robustness test using random-effects model. It is similar to model 1-2, but we use a profit margin instead of ROA as dependent variable. The test is performed the same data sample, using all of our criterias (see Data section). It includes years 2002 - 2015. The letters A-R are industry classification codes (see Appendix 2). Industry O, T and U is omitted by criteria 4. Industry K is omitted by criteria 5. Industry S is omitted due to multicollinearity. The variables Public Listed, Market Share and Debt to Assets are lagged one time period. Size and Age are logged values. Profit Margin, Growth, Size, Age and Debt to Assets are winsorized at the 1% and 99% tails. The tables presents the coefficiants. Standard errors are in parenthesis. Statistical significance is reported as: *** p<0.01, ** p<0.05, * p<0.10.

Dependent variable:	$Profit\ Margin_t$	
Regression nr:	(15)	(16)
State Ownership	-2.0820***	
	(0.2430)	
Private Ownership		2.0820***
		(0.2430)
$Publicly\ Listed_{t-1}$	-1.8541***	-1.8541***
	(0.4177)	(0.4177)
$Growth_t$	0.0544***	0.0544***
	(0.0004)	(0.0004)
$Size_t$	1.1295***	1.1295***
	(0.0193)	(0.0193)
Age_t	-0.0424	-0.0424
	(0.0254)	(0.0254)
$Market\ share_{t-1}$	0.0159	0.0159
	(0.0155)	(0.0155)
$Debt\ to\ Assets_{t-1}$	-0.0016	-0.0016
	(0.0007)	(0.0007)
$City_t$	-0.0385	-0.0385
	(0.0536)	(0.0536)
A	-2.4271***	-2.4271***
	(0.3694)	(0.3694)
B	-4.3960***	-4.3960***
	(0.4490)	(0.4490)
C	-3.8482***	-3.8482***
	(0.2835)	(0.2835)
D	-2.8629***	-2.8629***
	(0.5604)	(0.5604)
E	-2.0415***	-2.0415***
	(0.4753)	(0.4753)
F	-2.0090***	-2.0090***
	(0.2791)	(0.2791)
G	-3.3104***	-3.3104***
	(0.2748)	(0.2748)
H	-2.7763***	-2.7763***
	(0.2977)	(0.2977)
I	-2.978***	-2.978***
	(0.2961)	(0.2961)
J	-1.1354***	-1.1354***
	(0.3068)	(0.3068)
L	-2.1594***	-2.1594***
	(0.3586)	(0.3586)
M	0.5874	0.5874
	(0.2916)	(0.2916)
N	-1.9630***	-1.9630***
	(0.2971)	(0.2971)
P	-1.1075	-1.1075
	(0.4533)	(0.4533)
Q	1.5220***	1.5220***
	(0.3218)	(0.3218)
R	-2.8352***	-2.8352***
	(0.4027)	(0.4027)
Constant	2.9056***	0.8235
	(0.2856)	(0.3701)
Number of obs.	358 804	358 804
Number of firms	56 122	56 122
Obs. For each firm		
min.	1	1
avg.	6.4	6.4
max.	14	14
R-squared (within)	0.0689	0.0689

Appendix 15: Robustness test (7) for dividend payout: Earnings divided by Free cash flow

The table reports regression output for robustness test using random-effects model. It is similar to model 3-4, but we use earnings before extraordinary items divided by Free Cash Flow as a ratio instead. The test is performed on the same data sample, using all of our criterias (see Data section). It includes years 2002 - 2015. The letters A-R are industry classification codes (see Appendix 2). Industry O, T and U is omitted by criteria 4. Industry K is omitted by criteria 5. Industry S is omitted due to multicollinearity. The variables Public Listed, Debt to Assets, Free Cash Flow and Free Cash Flow*Pretax and ownership concentration are lagged one time period. Size and Age are logged values. Earnings/FCF, Growth, Size, Age, Debt to Assets and Free Cash Flow are winsorized at the 1% and 99% tails. The tables presents the coefficiants. Standard errors are in parenthesis. Statistical significance is reported as: *** p<0.01, ** p<0.05, * p<0.10.

Dependent variable:	DPR_t	
Regression nr:	(17)	(18)
State ownership	-9.2522***	
	(0.9874)	
Private Ownership		9.2522***
		(0.9874)
$Pretax_t$	12.0157***	12.0157***
	(0.3604)	(0.3604)
$Publicly\ Listed_{t-1}$	-14.1911***	-14.1911***
	(2.7528)	(2.7528)
$Growth_t$	0.1235***	0.1235***
	(0.0050)	(0.0050)
$Size_t$	-1.6894***	-1.6894***
	(0.1013)	(0.1013)
Age_t	1.6944***	1.6944***
	(0.164)	(0.164)
$Ownership\ concentration_{t-1}$	0.6572***	0.6572***
	(0.0676)	(0.0676)
$Debt\ to\ Assets_{t-1}$	-0.0882***	-0.0882***
	(0.0056)	(0.0056)
FCF_{t-1}	0.2881***	0.2881***
	(0.0058)	(0.0058)
$FCF_{t-1} * Pretax_t$	0.0786***	0.0786***
	(0.0142)	(0.0142)
$City_t$	4.1199***	4.1199***
	(0.2467)	(0.2467)
A	-12.1207***	-12.1207***
	(1.7003)	(1.7003)
B	-11.1075***	-11.1075***
	(1.9505)	(1.9505)
C	-9.0138***	-9.0138***
	(1.2226)	(1.2226)
D	1.2855	1.2855
	(2.2007)	(2.2007)
E	-10.8887***	-10.8887***
	(1.9379)	(1.9379)
F	-3.6018**	-3.6018**
	(1.2065)	(1.2065)
G	-4.1819***	-4.1819***
	(1.1889)	(1.1889)
H	-12.1005***	-12.1005***
	(1.2874)	(1.2874)
I	-9.858***	-9.858***
	(1.2852)	(1.2852)
J	-3.022	-3.022
	(1.312)	(1.312)
L	2.8533	2.8533
	(1.6703)	(1.6703)
M	6.4687 ***	6.4687 ***
	(1.2603)	(1.2603)
N	-5.2301***	-5.2301***
	(1.3039)	(1.3039)
P	-8.3404***	-8.3404***
	(2.0171)	(2.0171)
Q	-7.5827***	-7.5827***
	(1.4118)	(1.4118)
R	-13.1082***	-13.1082***
	(1.7308)	(1.7308)
Constant	19.3339***	10.0817***
	(3.9619)	(1.6543)
Number of obs.	358 804	358 804
Number of firms	56 122	56 122
Obs. For each firm		
min.	1	1
avg.	6.4	6.4
max.	14	14
R-squared (within)	0.0043	0.0043