

**The effects of post-privatization government
divestments on the financial and operating
performance of state owned enterprises in
Scandinavia.**

**Odd Kristian Ims and Torbjørn Stødle Seiffert
Supervisor: Mads Rømer Holm**

Master Thesis in Applied Finance

UNIVERSITY OF STAVANGER BUSINESS SCHOOL



Universitetet
i Stavanger

**FACULTY OF SOCIAL SCIENCES,
UIS BUSINESS SCHOOL**

MASTER'S THESIS

STUDY PROGRAM:

Økonomi og Administrasjon

Siviløkonom

THESIS IS WRITTEN IN THE FOLLOWING
SPECIALIZATION/SUBJECT:

Applied Finance

IS THE ASSIGNMENT CONFIDENTIAL?

No

TITLE:

The effects of post-privatization government divestments on the financial and operating performance of state owned enterprises in Scandinavia.

AUTHOR

ADVISOR:

Mads Rømer Holm

Student number:

795113

.....

207433

.....

Name:

Torbjørn S Seiffert

.....

Odd Kristian Ims

.....

ACKNOWLEDGE RECEIPT OF 2 BOUND COPIES OF THESIS

Stavanger,/..... 2015

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Abstract

This study empirically investigates the effects of ongoing privatization on 12 large Scandinavian firms. Using an array of different performance indicators we look at how government ownership affects factors related to financial and operating performance, using measures of profitability, output, investment, efficiency and financial performance and structure. The research is based on yearly accounting and stock data from between 1991 and 2013. We employed a fixed-effects model to estimate effects relating to both the rolling state share, and of a transfer of majority control. Our results indicate that in general, firm profitability, productivity and performance is not significantly influenced by further privatization. In the context of previous empirical studies, the results imply that the major effects on these factors happen primarily in the initial transition from state-owned enterprise into full or partial privatization. We find that there are statistically significant effects relating to capital investment, financial structure, and employment levels when the state divests its majority stake. We also find that dividends are correlated with the level of government ownership. Leverage levels were shown to increase, while capital investment, dividend payouts and employment levels decrease as the state divests its shares.

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Foreword

We wanted to look into the effects of further privatizations because it has been a frequent subject of debate in the Norwegian media over the last several years. This paper was a result of our interest in corporate governance, and our wish to add useful data to the ongoing debate. We knew going in that the paper was going to be a challenge, both in terms of scope and in terms of complexity.

Since its inception, our work has gone through a large number of changes and iterations, and has been a profound learning experience for both of us. We would like to extend our thanks to our supervisor, Mads Rømer Holm, for his valuable guidance and assistance. We would also like to acknowledge the staff at the University of Stavangers economics department for being available to assist in all manners of practical questions and concerns.

Finally we would like to extend our thanks to our families and friends, for their endless patience and support.

Stavanger, 11th june 2015.

Torbjørn Stødle Seiffert

Odd Kristian Ims

1 Introduction

1.1 Background

Since early in the 19th century, there has been an active debate on the privatization of state owned enterprises (Shirley & Walsh, 2000). In the last few decades, significant research has taken place to document and study the effects of state owned firms going private, by researchers such as Megginson, D'Souza, Shleifer, Ødegaard and many others across the world. Shirley and Walsh (2000) and Megginson and Netter (2001) have written extensive surveys of empirical literature, documenting the largely positive effects of privatizing government firms (Megginson & Netter, 2001; Shirley & Walsh, 2000), particularly in terms of the firms operating performance. Theoretical framework by Shleifer and Vishny (1997), Shleifer (1998) and Lülfesmann (2007) also stress the shortcomings of the state as a governing agent in a corporate governance context, and suggest increases in both productivity and consumer welfare in response to privatization.

1.2 Contribution

A frequently discussed problem in recent years is the issue of whether the state should further divest its holdings in firms that are already partially privatized, giving up a greater portion of its interest in and control of the companies and giving the market more influence. Surprisingly, the debate over follow-on privatization issues is not as well documented as that of the initial privatizations. While already privatized companies are not necessarily excluded from other studies, finding empirical work focused on the topic of follow-on privatizations is much more difficult. A large number of studies (Megginson & Netter, 2001; Shirley & Walsh, 2000) cover a great diversity of performance metrics in order to study the effects of privatizing state owned enterprises. The question of how follow-on privatizations affect these metrics, however, remains largely unanswered.

1.3 Research problem

Are post-privatization government divestments associated with effects on financial and operating performance in Scandinavian state owned enterprises?

As stated, little empirical work exists concerning this specific question. However, in a 2008 working paper by Wolf and Pollitt, “Privatising national oil companies: Assessing the impact on firm performance”, the authors suggest a model specifically for looking at follow-on offerings (Wolf & Pollitt, 2008, p. 29). Based on the framework of this model, and drawing on previous empirical research on privatization, we will study a number of partially privatized companies in Scandinavia. Our aim is to explore many of the metrics covered in other privatization studies, and examine effects that have a persistent relationship with government ownership, and to highlight potential avenues of future research. Our hope is that the study will provide new information to the Scandinavian debate on privatization, especially where the government stake in partially privatized enterprises is concerned.

1.4 Scope and limitations

A large number of studies already exist on the effects of privatizing state owned companies, and the results are extensively documented and published (Megginson & Netter, 2001; Shirley & Walsh, 1997; Shleifer 1998). This study aims to look at a large number of different performance metrics found to have effects in these studies, and explore how they apply to companies that are already partially privatized. These metrics measure the firm’s operating efficiency in terms of items such as sales, profits, and number of employees. Estimators of social welfare gains are outside the scope of this paper.

We concern ourselves exclusively with Scandinavian companies. As we will cover later, the corporate governance framework in Scandinavia is often referred to as the Nordic Model, and there are strong similarities in the legislatures between the different countries. Restricting the study to a more homogenous geographical zone means that the environment in which the companies operates should be comparable.

The study restricts itself to larger companies for which accurate financial data is easily available through Thomson Reuter’s Datastream, our primary source of financial data next to annual reports. The companies are all partially privatized and publically listed, as the aim is not to

compare privatized SOEs to private companies. One of the primary reasons for this focus on privatized firms is Megginson and Netter's (2001) contention that any comparison between private companies and SOEs will have issues in finding a proper basis for comparison. It is extremely difficult to find an appropriate benchmark for each SOE, and to control for the reasoning behind the SOEs being state-owned in the first place (Megginson & Netter, 2001, p. 332).

Finally, as opposed to Wolf and Pollitt's (2008) study, the aim of this study is not to study the effects of each follow-on offering, but rather the direct effects of state share and state control of the companies included. We therefore focus on effects related to the state's current percentage of shares, and the transfer of majority control rights away from the state.

1.5 Structure

This paper is organized as follows: Chapter 2 describes the theoretical framework that forms the basis for our analysis. Here we outline the theoretical background, and look at the legislative environments of Scandinavia in terms of corporate governance. We also divide our overall research problem into four tangible parts, in order to facilitate an empirical analysis.

Chapter 3 is concerned with the issues of data collection and research methodology. This chapter describes how firms were selected and data collected, and the statistical model used to perform the regressions. The chapter also defines the specific performance variables used to answer the questions posed in chapter 2.

Chapter 4 reports the results from the base regression model for all the chosen performance metrics. We also perform a series of follow-up regressions in order to see whether we can glean some insight into the mechanism behind the significant findings.

In Chapter 5 we revisit and discuss our results from the regression in the previous section. Here we attempt to tie our results together in order to answer our hypotheses. Finally, we propose a number of potential avenues of future research based on our findings.

Chapter 6 offers a brief summary of our research and concludes the paper.

2 Theoretical basis

There are several reasons as to why one might expect state ownership to have some bearing on operational efficiency, and in this chapter we attempt to cover some of the main motivations for this hypothesis. The general direction of the argument is that state-owned enterprises are insulated from many of the corporate governance forces that private firms are subject to, and that this protection may lead to bad oversight and consequently in negative effects on the performance of the firm (Shleifer & Vishny, 1997; Shirley & Walsh 2000).

2.1 Corporate governance and the principal agent problem

Corporate Governance is defined by Shleifer and Vishny (1997) as “...the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment” (p. 737). In effect, shareholders of a company are often not the ones in charge of the company’s operations. Instead, shareholders employ managers to serve their interests, and in so doing, effectively hand over significant influence of the company’s assets to the managers. This separation between managers and financiers is referred to as the Principal-Agent problem (Grossman & Hart, 1983).

This introduces the risk of moral hazard, in the form of managers using company assets to serve their own needs rather than create long-term value for their shareholders (Tirole 2006). Further, the shareholders’ ability to enforce their interests effectively on managers is entirely dependent on their share of the company. Large companies possess significant assets, but often have diffuse ownership, with few shareholders that are large enough to wield significant influence over board decisions or through regular votes. This raises serious concerns about managerial accountability, and questions about what effects shareholder activism might have on the operational performance of public firms.

Tirole (2006) and Eckbo (2006) go on to argue that corporate governance extends beyond the interests of the financiers of a corporation, and encompasses all stakeholders. Corporate governance is then a system put in place in order to force the management of a corporation to maximize the welfare of all its stakeholders – including employees, suppliers and customers. This expanded definition may be especially important when confronting governance problems in the context of state-owned enterprises in terms of determining non-financial gains or increases in social welfare due to a company’s operations. However, this paper is primarily concerned with studying the effects that state ownership has on the financial performance of

the firm. In terms of empirical analysis this paper will argue from Shleifer's definition of corporate governance.

2.2 The agency problem and moral hazard

When a manager raises capital from investors in order to produce goods or sell holdings, the financiers rely on the manager's specialization in managing that capital in order to get a good return. Likewise, the manager is reliant on the capital of the investors in order to be able to put his abilities to good use. The agency problem emerges from this dynamic as the problem of how the financiers can be certain that their invested funds are being used to maximize the value of their stake in the firm, rather than being put toward goals that only create value for the manager, possibly even at a cost to the financiers (Shleifer & Vishny, 1997, pp. 740-741; Tirole, 2006, p. 16). The contractual view of corporate governance is that the financiers and managers sign a contract that specifies what the manager can do with those funds, and also how the proceeds of the investments are to be divided between the two parties. Such a contract, however, will not be able to take into account every eventuality. One of the primary issues is that many circumstances can arise that are not possible to foresee, or even if it is technically foreseeable, the cost of mapping out every eventuality is prohibitively high. A solution to this might be to allocate residual control rights for circumstances that are not foreseeable (Grossman & Hart, 1986, p. 696). This would allow the financiers the right to decide how funds should be spent on any problem that is not covered by the contract. However, the financiers may not be the best qualified to make decisions as to how the capital should be utilized specifically – in fact, the manager's specialized skills in allocating capital internally in a project is the very reason why the manager is needed to begin with. This asymmetric information, both in terms of a detailed understanding of the company's inner workings, and in the actual skill set of the agents involved, lead to the manager being in possession of most of the residual control rights (Shleifer & Vishny, 1997, p. 741). In fact, since they do not have a way of influencing decisions made by the company sufficiently, small stakeholders do not have strong incentives for taking an active part in the governance of firms that they are financing (Shleifer & Vishny, 1997).

When they do not pay attention to decisions made by the managers, the residual control implied by their stake tends to fall to the manager. That is, with the free rider problem impairing the payoff of the monitoring activities of larger investors (and even dissuading them from actively

holding a large share at all), and impairing the interest of smaller investors in caring about active monitoring at all, much of the residual control ends up falling to the manager. This often leaves room for abuse. The managers might use their influence to expropriate funds, or extract funds through more elaborate schemes like transfer pricing, where they use their influence to give advantages to an independent company owned by the manager. Abuse will not necessarily take the form of taking out cash directly, however – managers generally have better information available than shareholders, and may use this to their advantage in negotiating his own contract, such as entrenching themselves in order to keep their jobs. Other forms of abuse include empire building, or investing in personal projects that do not benefit the shareholders. There is also a risk of ex post inefficiencies, where the manager may even choose to invest in projects that involve a cost to shareholders, but yield some benefit for the manager despite this (Jensen & Meckling, 1976; Shleifer & Vishny, 1997, p. 742). Such forms of abuse are often at least as costly as the more direct wealth extraction types, and can be difficult to detect and prevent.

Shleifer and Vishny (1997, p. 746) points out that diversification and growth are common managerial objectives, even when they may go against the goals of the shareholders. However, Shleifer and Vishny (1997, p. 746) points out that there is a lot of evidence that suggests that diversification has an adverse effect on company value, meaning it does not necessarily benefit shareholders (Comment & Jarrell, in Shleifer 1997; Lang & Stulz, in Shleifer 1997), and may even lead to future divestitures that further anchor the loss of the expansion.

2.3 Monitoring

2.3.1 Active monitoring

Tirole (2006, p. 334) divides monitoring into two separate forms: Active and speculative monitoring. Active monitoring means interfering with the management of a corporation in order to enhance the value of the firm. In this case, the monitor collects data on the firm and then takes action to influence the firm's activities based on the information gathered (Admati, Pfleiderer & Zechner, 1994, p. 1099; Tirole, 2006, p. 334). Active monitoring is forward-looking, and resource intensive. Furthermore, it involves a significant level of cost for the party that is performing the monitoring activity, as data has to be collected, studied and acted upon. Just attaining the required stake in the company needed to enforce monitoring activities has a cost associated with it, in that it locks up capital that could otherwise have been employed elsewhere, resulting in the investor's portfolio not being as diversified as it otherwise could

have been (Ødegaard, 2009). Even if the company is found to be using its resources efficiently, a cost has still incurred. Furthermore, while the party undertaking the monitoring activities has to take on the cost of doing so, the benefits of those activities enhance the value of the firm and in turn, the stock, meaning that all shareholders cash in on the profits. In the case of an active monitor, having a large shareholder might actually enhance the value of the stock, even for smaller shareholders. While this is beneficial for smaller stockholders, it does imply that active monitoring effects on the company's value have to be large enough to justify the cost of that monitoring in terms of the active monitor's stake, and not taking into account the increase in welfare to other stakeholders that cannot be captured by the active monitor. This means that even if active monitoring would be beneficial from society's viewpoint when looking at the company as a whole, it might not be enough to justify the costs when looking at the value gained for only that portion of a corporation that can be held by a potential monitor. This is the free rider problem, wherein the smaller investors who do not have control and are not investing in monitoring activities, still appropriate a portion of the monitoring gains proportional to their stake in the company. While this does not directly influence the profitability of the active monitor's current shares in the company, it does make it difficult for the monitor to double up on stocks to capture more on the value gains once the monitoring has started as these gains will be reflected in the stock price. The result is that the monitor has to take on a large portion of the company, as it needs, in order to recoup the costs associated with monitoring once the effects are in place. This means that it must take a larger initial stake and as a result, more of the risks involved (Admati et al., 1994).

2.3.2 Passive monitoring

The second form of monitoring that Tirole (2006) defines is called speculative monitoring. In this case, rather than collecting and analyzing data in order to make forward-looking interventions, the monitor studies the company's current situation and then adjusts his investment in the company in response. That is, rather than make interventions in the management of the company, the company instead sells off or buys stock based on its confidence in the company in order to reflect the costs of management. Tirole (2006) points out that speculative monitoring is not restricted merely to stock analysts, and that these judgments will be done by other creditors, credit rating agencies and investments banks as well. In effect, the idea of speculative monitoring is that the present achievements and position of the company reflects its value, and that investments made in the company should be made accordingly.

2.3.3 Takeovers

One mechanism for enforcing shareholder interests is the threat of takeovers. In the context of corporate governance, a takeover happens when an agent makes a bid to the otherwise dispersed stakeholders of a company that, if accepted, grants a controlling stake in the company (Shleifer & Vishny, 1997). Takeovers can threaten the top management of a company on a number of ways, but the most profound is that the change in shareholder concentration that results from a takeover can cost the managers their jobs, or at least the benefits of their control as takeover targets tend to be the object of close scrutiny. As discussed previously, scrutiny helps bridge the information gap between managers and shareholder, which reduces the managers' residual control (Shleifer & Vishny, 1997; Tirole 2006).

Takeovers are expensive for a number of reasons, the most important of which is that a majority of the stocks of the takeover target must be bought, and often at a premium. This premium arises from the necessity of gathering a large number of shares in a set period of time – these shares can be bought normally in the market, but news of large buyers in the market necessarily increases the asking price for the equity. To avoid this effect a tender offer, normally above market value is often made, which a requisite number of dispersed shareholders is asked to accept before the buyout process begins (Manne, 1965; Tirole 2006). Furthermore, if the manager is benefitting from this residual control, they may respond to this threat with resistance. Shleifer and Vishny (1997) argue that while the number of studies investigating the effects of managerial resistance to takeovers are too numerous to survey completely, it is clear that when management resists a takeover attempt, it comes at a cost to shareholders. While it is possible to put incentives in place, such as shares- or option-contracts, or change-of-control-clauses, in order to reduce the probability that the manager will resist the takeover- all of these instruments are costly. With takeovers being such an expensive way to enforce shareholder decisions, only major inefficiencies are likely to cause this sort of intervention (Shleifer & Vishny, 1997). When a takeover is undertaken, the agent that is making the bid is effectively performing an act of active monitoring, taking on the costs associated with such monitoring, as well as the costs involved in buying a high number of shares in a short period of time.

2.3.4 The cost of control

Numerous studies have found that there is a premium associated with corporate control, and based on our discussion in the previous section this is not surprising. Taking on this cost is only justified if that control is being used to enhance the value of the stock by a sufficient margin as to make up for the premium. In a situation where the manager is doing his job and perfectly representing the shareholders, we would expect this premium to be very low – that is to say, the control premium in many cases is representative of the agency costs associated with control. If there is no need to monitor, there is no incentive to pay a premium under normal circumstances. There are exceptions, obviously, such as acquisitions or takeovers, or where other motives exist for wanting a large portion of the company. Shleifer and Vishny's (1997) survey finds that their control premium varies significantly across different economies (Shleifer & Vishny, 1997, pp. 747-748).

2.3.5 Debt

Jean Tirole mentions several ways in which debt can function as a corporate control mechanism. Debt, by nature of requiring steady interest payments, tie up the cash flows of the firms and in turn reduces the managers' capacity to exploit those cash flows for personal gains (Jensen, 1986, p. 324). Furthermore, because creditors' claims must be met, it also requires the managers to work toward maintaining the cash flow needed to repay both the interest and the principal of the debt. In the event of financial distress that leaves the company unable to address its obligations to creditors, they can acquire control rights over the firm – effectively becoming an active monitor. Because creditors hold little upside risk beyond the repayment of their debt claims, they tend to be very conservative when evaluating which projects a company should undertake, taking measures to limit the risk of their investments by cutting investment and new projects. As such, debt incentivizes managers to maximize company performance and cash flows up to the point of being able to address their credit obligations.

However, debt as a control mechanism may also hamper firm operations. Tirole (2006) and Jensen (1986, p. 324) outlines two ways in which this might happen. The first is that the threat of low cash flows can deprive a company of the money it needs to invest in lucrative projects. That is, low cash flows do not merely disallow frivolous investments, but also hamper legitimate ones. The second point of contention concerning debt is bankruptcy costs, which are significant.

2.3.5.1 State ownership and debt costs

Borisova and Megginson (2011) argue in their paper that there are two sets of conflicting effects that might influence the cost of debt for State owned enterprises, and that we might expect to influence their leverage levels. On one hand, they argue state ownership may drive the cost of debt up, as a result of insulating the management of the company from disciplinary measures and risk, and from imposing social or political goals that are not profit-maximizing. On the other hand, government stakes may imply a guarantee to debtors that drives the price of corporate funding down, and indeed, their empirical results imply that this guarantee is the dominant effect, and that state owned enterprises enjoy a lower cost of debt than private firms.

2.4 Legal environment

Corporate governance models generally take the form of a board of directors elected by the shareholders, who are supposed to represent the interests of the owners. There are two common models, each applicable to a different judicial tradition. In the two-tier model, the system consists of a management and a supervisory board who exist side by side. The management board takes care of the day-to-day operations of the company, while the supervisory board is concerned with supervising the company's management and with long-term decision making. In the one-tier system, both of these functions are performed by the same entity. The two-tier system is commonly practiced in countries with a German judiciary tradition, while countries with an Anglo-Saxon tradition use the one-tier system (Jungmann, 2006, p. 427).

In a corporate governance context, it is common to consider Norway, Sweden, Denmark and Finland as a single region – that of Scandinavia. This is because the four countries have a very similar model for corporate governance (Piekkari, Oxelheim, & Randøy, 2015, p. 28). According to Lekvall (2014) in his work “The Nordic corporate governance model”, the model differs significantly from both the one- and two-tier governance systems (Lekvall, 2014, p. 62). From an empirical viewpoint, Nenova (2003) shows that the value of control blocs is significantly lower in in Scandinavia than the rest of her sample, which consists of 661 companies from 18 nations all over the world (Nenova, 2003, p. 327). Nenova also shows that the value of control-blocs among shareholders is negatively correlated with minority stockholder protections, the quality of law enforcement, and the strictness of takeover regulations (Nenova, 2003, p. 344).

2.4.1 Denmark

As with the Nordic model in general, Danish companies are governed by a board of directors, which is elected in a general meeting of the shareholders. The general meeting does not require due cause to replace a board member. Members of the company's management may sit in the board of directors, but they may not have a majority, and the chairman may not be part of the company. The board of directors is responsible for supervising the company's management, and has the authority to replace it if necessary (Hansen & Lønfeldt, 2014, p. 125).

The Election of board members is selected by a majority vote in the general shareholder meeting, with a majority defined by the number of votes shares represent, and not the actual number of shares. An important note is that while it is quite common for Danish firms to issue dual-class stock, this is not the case for the Danish company included in our study, CPH (Københavns Lufthavne AS, 2011). Each appointment on the board of directors requires a majority vote. Additionally, all companies with more than 35 employees are required to allow the employees of the company to appoint one third of the board, leaving the other two thirds to the shareholders. Minority shareholders enjoy several protections under Danish law. First of all, as long as at least 5% of the votes can be gathered, it is possible to demand an extraordinary meeting of the shareholders. Additionally, minority stakeholders have the option of demanding their own auditor for the firm, called a minority auditor. Finally, as long as 25% of the shareholder votes agree, it is possible to call for a full investigation of the financial affairs of the company and the conduct of the management (Hansen & Lønfeldt, 2014, p. 142)

However, Danish law does not guarantee a minimum dividend, which does give majority shareholders greater control over cash flows than in other Nordic countries (Hansen & Lønfeldt, 2014, p. 140).

2.4.2 Finland

The Finnish corporate governance structure places the shareholders on top, followed by a board of directors. Finnish shareholders also have the option of electing a supervisory board, as in the two-tier system, to supervise the governance practices of the company, but this is rarely done in practice (Airaksinen & Berglund, 2014, pp. 175-176). The majority of seats on the board should be unaffiliated with the company – meaning they should not be an employee of the company. Additionally, at least two of the board members should be unaffiliated with major

shareholders, defined as any shareholder with more than a 10% stake. Finnish boards do not tend to seat members of the company management, and the CEO of a company may not be chairman of the board (Airaksinen & Berglund, 2014, p. 186).

While Finnish companies may issue multiple classes of stock, normally shares and votes maintain a 1:1 ratio. For the companies in our sample, this is true for all of them except Stora Enso, which issues dual-class stock (Stora Enso, 2006, p. 45). As this paper views shareholder stakes in terms of its influence on corporate governance issues, Stora Enso's state share is measured by the state's voting rights, and not its relative share capital.

While some decisions require two thirds of the votes of the board to carry, a simple majority determines most decisions made by the board. The board itself is also elected based on a majority vote in the general meeting. For larger firms, the employees do have a right to elect a representative in either the board or in the company's management. This representative may be either a full member, or simply an observer (Airaksinen & Berglund, 2014, pp. 185-186).

Minority stakeholders have decent protections in Finland. As long as they can rally at least 10% of the total votes, shareholders can demand an extraordinary general meeting. They may also call for a special audit of the administration and accounts of the company, and finally, may demand that at least 50% of the company's profits be paid out as dividends (Airaksinen & Berglund, 2014, pp. 196).

2.4.3 Norway

As with the other Scandinavian countries, the stakeholders are at the top of the corporate chain of command in Norway, who exercise their rights through the general meeting. In principle, the shareholders through the general meeting have the authority to make decisions regarding any of the company's operations, but its main purpose is to elect or replace its board members. The shareholders are not required to give any reason for replacing a board member.

There are few regulatory limitations on who may sit on the board of directors in Norway – only that the CEO of a company may not also sit on the board. However, there exist guidelines laid out by NCCG (The Norwegian Code of Practice for Corporate Governance) stating that board members should be independent of the company's management and operations. In practice, Norwegian companies largely follow the guidelines laid out by the NCCG (Knudsen & Norvik, 2014, p. 227).

The board of directors governs by the majority principle, with board members being elected by and making decisions based on majority votes in either the general meeting or among board members. Some decisions, such as making changes to the firm's articles of association, or approving mergers and demergers, require a majority of two thirds. This implies that a one-thirds stake may also block such changes, which may be significant from a government's perspective. It is uncommon for Norwegian companies to issue dual-class stock (Knudsen & Norvik, 2014, p. 214), and all of the Norwegian companies in our sample have only common stock with equal voting rights.

If a company has more than 200 employees, the company and employees must appoint a corporate assembly. However, this obligation may be waived if the company and its employees agree to do so. The primary function of the corporate assembly is to appoint board members, but they may also weigh in on issues that directly affect the employees of the company. The employees may appoint one third of the members of the assembly, while the rest is appointed through the general meeting. Through the assembly, employees have a right to elect up to one third of the members of the board of directors. If the employees waive their right to a corporate assembly, they may still elect one member of the board of directors or two observers (Knudsen & Norvik, 2014, pp. 223-224).

Minority shareholders may call for a general meeting if they can rally at least 5% of the company's share votes. With at least 10% of the votes, they may also call for an investigation of the company's establishment, management or certain specified matters regarding the management or the accounts of the company by the district court. With at least 5% of the votes, the shareholders may also call for the district court to decide whether the majority shareholders' dividend payout is fair, or whether it must be increased (Knudsen & Norvik, 2014, pp. 244-245).

2.4.4 Sweden

The corporate governance environment of Sweden generally resembles that of the other countries. The stakeholders hold the highest authority over the company's management, through a general meeting in which they elect a board of directors. While the shareholders elect members of the board of directors, only one member of the company's management may sit the board (Skog & Sjöman, 2014, p. 252).

Members of the board are elected by a majority rule, and make most decisions according to the same rule. Again, some decisions such as changing the articles of association require a greater majority of two thirds. In cases where a greater majority is required, it is common to count the shareholders' actual stock holdings rather than the votes the stock represents (Skog & Sjöman, 2014, p. 278). However, for our study this is not a relevant distinction, as none of the Swedish companies in our sample have dual-class stock.

As long as a company has at least 25 employees, the employees may appoint two representatives on the board of directors. If the company has over 1000 employees, this number may increase to three (Skog & Sjöman, 2014, pp. 266-267).

Minority shareholders may demand an extraordinary general meeting, as long as they can back it by at least 10% of the votes. A 10% minority may also have the district court appoint an additional auditor for the company's financials, or a special investigator to look into particular situations (Skog & Sjöman, 2014, pp. 278-279).

2.5 The government stakeholder

2.5.1 The reasons for government ownership

One common reason for state ownership is in order to address market failures. A type of market failure that is often brought up in debates about privatization of state owned enterprises, is the case of the natural monopoly (Shirley & Walsh, 2000). In these cases, because there is limited competition to drive efficiency and dissuade abuses of monopoly power, the literature defines this as a choice between a state owned enterprise, and a regulated monopoly. Shirley and Walsh (2000) note that this is a question of contract completeness – if every eventuality can be put into a contract, then these two methods yield the same results. The results only differ in the presence of contract incompleteness, which as we mentioned previously, is the source of many of the universal corporate governance problems faced by any firm. Overcoming this problem means taking on monitoring costs, whichever route is chosen – whether as a stakeholder in a state owned enterprise, or as a regulatory institution, there are costs associated with oversight and enforcement of state objectives. These principles also tend to apply to other market failures, such as the case where a service must be delivered to a market that might not be tended under open market conditions because of prohibitive costs or some similar hindrance.

2.5.2 The government as a stakeholder

Shirley & Walsh (2000, pp. 31-32) presents two main approaches to how we should view the government as a stakeholder. One approach is to view the state as a single owner; the state often holds a large share in companies in which it has invested, and so in theory should have a lot of influence over the company's management. However, the second view questions this perspective. The government is not a single stakeholder – no single entity benefits from the value added from the monitoring activities, and because of this, no single entity – such as a government agent who has been put in charge - has incentives equivalent to that of a private monitor in performing his duties. In this view, the government share actually represents a stake in the company that is diffused across all of society with each citizen holding a small portion of it. In this case, government ownership is actually very diffuse, and we would expect little to no gains of monitoring, or at least some efficiency loss. This comes as a result of the diffusion of state ownership, because if the government cannot be seen as a large investor, but as a representative for a lot of smaller investors, then the government itself is an agent representing a disparate set of owners with varying goals. This introduces a new link in the principal-agent chain, where even more control is stripped from the public – the direct owners – and granted to the government institution or agent in charge of overseeing a state owned enterprises' operations. This idea, of the state as a separate agent, that has its own motivations that might differ from those of a concentrated stakeholder, who is a direct benefactor of the cash flows from its holdings, creates additional agency problems that need to be discussed.

2.5.3 Additional agency problems that need to be discussed

Shleifer (1998) argues that another possible way to consider the state is to take the view of a benevolent government versus a non-benevolent government. In this view, the benevolent government seeks to maximize social utility – to make a good service that is devoted to its consumers. The benevolent government, then, is analogous to the state as a direct welfare-maximizing owner, especially if we take the expanded view of corporate governance that includes all stakeholders. The non-benevolent government is any government that deviates from this goal, for instance where the government agents in charge of governing the state's share of an enterprise act out of personal motives rather than social ones.

It might seem that in the best-case scenario, that of a benevolent government, state-owned enterprises can reach an efficient outcome. However, even under the best circumstances the enterprise is still subject to weak incentives toward profit maximization and innovation (Kessler, Lulfesman & Myers, 2003; Shleifer, 1998). Shleifer (1998) argues that even in this case the government can achieve those goals by regulating effectively and still allowing the firms that deliver the service to be subject to market competition. Shirley and Walsh's (2000) survey of the privatization debate find that the empirical evidence largely agrees with this view.

In the case of the non-benevolent government, these arguments still stand. However, there exists the additional point of contention that the government agents in charge of administering the state's share in the enterprise may have their own goals, whether they are personal or political (Shirley & Walsh, 2000; Shleifer, 1998). In this case, what has been introduced is effectively a second agency problem. The extent of this problem is tied closely to the regulatory strength of the government that the agent presiding over the state share represents (Shleifer, 1998).

2.5.4 State ownership and ownership concentration

The state often owns a large share of companies in which it is invested, and this can lead to several issues (Borisova & Megginson, 2011; Shirley & Walsh, 2000). As we discussed earlier, monitoring is by definition closely linked to ownership concentration – that is, without garnering a sufficient amount of share votes either directly or by proxy, it is impossible for a monitor to enforce proper corporate governance on a manager. When the government has a larger stake, we would naturally expect that to displace the stake of other investors, because they can only buy the shares that the government is not holding. The fact that a company with a majority government stake is by definition impossible to control for other investors, means that such a stake might dissuade other investors from becoming involved, instead leaving the monitoring up to the government who is the only investor capable of proper enforcement. This effect could be mitigated by the government being open to cooperation with other investors, or giving other investors proxy power, but even if the government votes almost exclusively in line with other shareholders, the fact remains that much of the stakeholder powers rest with the largest investor. If the government is not an effective monitor, and owns a majority stake that displaces any other potential investors who might otherwise have an interest in performing monitoring activities, this will lead to inefficiencies. Say, for instance, that the government holds a large stake in a company, but is not an active monitoring, either on purpose, or as a result of weak incentives on the part of the government agent who is in charge of those activities

on behalf of the government. In this case, it stands to reason that a greater degree of residual control rests with the manager, and poses a risk for inefficiency in the company's operations and investing activities.

In discussions of State versus Private ownerships and which effects are to be expected from state ownership in an enterprise, it is also important to take note of the general circumstances of the agents involved. Not all states are the same, and not all countries have the same protections regarding shareholder rights.

2.5.5 Government effects on takeovers

Furthermore, government shares in SOEs often are not easily sold, and so there is no threat of takeovers when the company is not completely privatized – at least to the point where a private majority can arise. The effect of this is that SOEs enjoy a degree of insulation from takeover risks corresponding to the size of the government's share (Borisova & Megginson., 2011; Shirley & Walsh, 2000). This may be a competitive disadvantage when it comes to eliminating corporate governance problems, as competitors are not protected in the same way and thus are able to capitalize on the positive effects of this threat (Shirley & Walsh, 2000).

If the threat of takeovers does cause a noticeable effect on the efficiency of operations in non-state owned firms, this does add to the probability that a state-owned majority stake reduces value in state-owned companies.

2.6 Expectations and hypotheses

Our primary research question is: Are post-privatization government divestments associated with effects on financial and operating performance?

In order to provide an answer to this quite general question, we will need to partition it into smaller parts for which we can provide an empirically grounded answer. We therefore define four specific areas in which we might expect financial and operating effects to be present, and for which it is possible to select specific variables to use in a regression analysis. Since our study is mainly explorative in nature, we steer away from trying to make predictions about which direction these effects take, or their magnitude. Instead, we argue why we might expect there to be effects in either direction, and then revisit the subject once the statistical analysis is complete.

2.6.1 Profitability

Several empirical studies, including Megginson, Nash and Randenborgh (1994), Megginson and Netter (2001) and D'Souza, Megginson and Nash (2007) find significant effects on a company's profitability after privatization. If there is a persistent corporate governance issue relating to government ownership even after a company is privatized, we expect to find significant results relating to the level of government ownership. In terms of which direction we expect these effects to take, the empirical literature is quite clear: privatization has a positive influence on profitability. However, it is difficult to say whether these effects are associated primarily with the initial privatization, or whether the state influences profitability even after companies are listed. It is quite possible that there exist positive effects of government monitoring as well, if the government actively and efficiently exercises its ownership.

Hypothesis 1a: Profitability is correlated with government ownership

Hypothesis 1b: A transfer of control away from the state affects profitability

2.6.2 Output and investment

Finally, we expect there to be a connection between how firm funds are invested and the government's stake. The direction of this result is difficult to predict. Whether the state is an active monitor with long-term interests at heart, or an ineffective monitor allowing the manager to invest in personal projects, we may expect a positive relationship. On the other hand, if the state has a myopic investment horizon or overly constrains cash flows as a way of monitoring firms, we might expect a negative relationship instead. These perspectives also impact the growth prospects of the company, which we measure in terms of total output.

Hypothesis 2a: Investment and output are correlated with state share

Hypothesis 2b: A transfer of control away from the state affects investment and output

2.6.3 Operating efficiency

If the state's ability as a monitoring agent is qualitatively different from that of private investors, we expect there to be a correlation between a company's operating efficiency and the state's

level ownership in the company. Operating efficiency is here defined as a company's productivity in terms of its number of employees – companies that are more efficient require fewer employees to do the same amount of work.

Hypothesis 3a: Operating efficiency is correlated with government ownership

Hypothesis 3b: A transfer of control away from the state impacts operating efficiency

2.6.4 Financial performance and structure

This pertains to a company's financial performance in the market, by which we mean how a company's valuation is affected by its government ownership. This may relate both to investors expectations of the state as a monitor, as much as to the real effects of its monitoring on company operations. From our discussion of debt, we also expect that government ownership might have a significant impact on a firm's leverage levels. On the one hand, increased leverage may work as a replacement for the effect of government monitoring. On the other hand, lower debt costs associated with higher levels of government ownership may lead to higher leverage levels.

Hypothesis 4a: Financial performance and structure is correlated with government ownership

Hypothesis 4b: A transfer of control away from the state affects financial performance and structure

3 Methodology and data collection

3.1 Firm selection and sourcing

In order to study the effects of the privatizations that have taken place in Scandinavia in the previous decades, we needed to select viable firms for comparison across the constituent countries. In order to make sure we had enough data points to run a regression, we have used most of the companies available to us, and all four countries are represented in the dataset. To make sure that the companies selected were comparable, we used four criteria to decide which firms to use in our regression.

- The state's share in the company cannot remain constant, there must be a change in the government's stake in the company during the sample.
- The company must be of a certain size. The company should be categorized as a large firm by the EU's standards, meaning that it must have at least 250 employees, and generate at least 50€ million Euros in revenues, or maintain a balance of at least 43€ million (The commission of the European communities, 2003).
- The company must be partially privatized, and be exposed to market forces in the stock market.

For the most part all available companies were used, with two notable exceptions. Kongsberg Gruppen, a Norwegian weapons manufacturer, did satisfy the above criteria, but the changes in state share (less than half of a percentage point) were so small as to be negligible, and the company was excluded. The Danish telephone company TDC was also omitted, while TDC did satisfy the above conditions, but it was formed in 1990 and publicly listed in 1994. The company was then completely sold off over a period of three years (Finansministeriet, 2004, p. 58). We interpret this as the company being privatized completely in what is essentially a single lengthy issue. This makes it difficult to differentiate the effects of follow-on privatizations from the effects of the initial privatization. Further compounding the issue was the problem that the company enjoyed a monopoly during parts of this period, which we anticipated could have biased our regression. In this case, it was simpler to exclude the company than try to control for all of

these events. Table 1 includes relevant data from all of the companies included in the final regression, with a short overview over secondary offerings and initial and current state shares.

Table 1 - Firms included in sample

Company	Country	Included From Year	Initial State Ownership	State ownership in 2013
Telenor	Norway	2002	81,37 %	59,02 %
Hydro	Norway	1991	51 %	34,26 %
DNB	Norway	1995	73,98 %	39,95 %
Nordea	Sweden	2003	19,40 %	0 %
TeliaSonera	Sweden	2004	59,04 %	47,40 %
CPH	Denmark	1996	51 %	39,20 %
Outokumpo	Finland	1991	69,80 %	24,80 %
Kemira	Finland	1997	53,80 %	16,70 %
Fortum	Finland	2000	72,82 %	51,57 %
Finnair	Finland	1991	70,10 %	55,80 %
Rautaruukki	Finland	1993	81,10 %	39,67 %
Stora Enso	Finland	2000	32,80 %	35,20 %

Firm-Specific Notes:

1. TeliaSonera comes into existence as a merger between Telia and Sonera in 2002 (TeliaSonera AB, 2002, p. 2). We treat this as the founding and listing of the company, and omit the following year to avoid capturing effects of the merger.
2. While Rautaruukki was listed in 1989, getting an exact state share before 1993 proved difficult, and so the company is included from this year. Rautaruukki was acquired by SSSAB in 2014, but our dataset only includes data up to 2013.
3. Fortum divested its oil operations into Neste Oil in 2005 (Fortum Corporation, 2005, p. 4). We include the company for all years, but will include a control for this significant divestment.
4. Norsk Hydro divested its fertilizer operations in 2004 (Norsk Hydro ASA, 2004, p. 1) and its energy division in 2007 (Norsk Hydro ASA, 2007, p. 4). Only the energy divestment had a major effect on company operations. We include all years across the dataset, but control for the divestment of its energy division.
5. Nordea came into existence through several mergers in 1997-2000 (Nordea AB, 2001, p. 13), and we treat this as the initial listing of the company, omitting the following year. The company is included from 2003.

3.2 Data quality

The data was gathered primarily from Thomson Reuter's Datastream database, which supplies a wide range of financial data for many companies, including all of the companies in our database. We use annual data because while we know the year that a government transaction occurs, we do not know the exact date in which changes occurred. In order to perform this study with quarterly data, more detailed information on the timing of government ownership changes would have to be collected.

The data imported from Datastream is generally complete for all companies. In cases where data points are either missing, or a type of data is not available through Datastream, we retrieve the data from the companies' annual reports instead. The most important data gathered in this manner is information on the level of government ownership. A comprehensive list of data sources for government shares can be found in Appendix A.

In the case of Stora Enso, the State's number of shares differs significantly from its voting rights (Stora Enso, 2006, p. 45). We use the voting rights rather than the exact number of shares held by the state in this instance, as our theoretical framework concerns issues relating to corporate governance, which relies on how much influence the state has through its shares, not their actual stake. Actual stake in the company is not irrelevant in terms of corporate governance, as it determines a shareholders' claim on dividends. Concerning the effect of monitoring on general firm performance, however, we consider voting rights to be a more powerful driver of shareholder influence.

The State Share includes shares owned directly by the government. The shares for Norwegian and Finnish companies also include shares owned by Folketrygdfondet and the Social Insurance Fund of Finland as they tend to hold significant amounts of shares for long periods of time. These funds actively practice their ownership rights, and the guidelines for how these investments should be handled are put down by their respective governments (Folketrygdfondet, 2011; Kela, 2012). Other pension and retirement funds are not included, however, as accurate data on their holdings is difficult to find for all years, because these holdings are extremely small and usually not reported in the annual reports.

3.2.1 Outliers

Statistical outliers are extreme values that can bias an estimator because of their magnitude (Wooldridge, 2013, pp. 316-317), especially for small sample sizes. There are many possibilities for dealing with this issue, such as replacing the highest and lowest observation in each set, or performing different types of regression, such as a least absolute deviations estimation (Wooldridge, 2013, p. 321). Brown and Caylor (2006, p. 415), in their paper “Corporate Governance and Firm Valuation,” propose using a procedure called winsorising to deal with outliers. When data is winsorised, a confidence interval is calculated, and observations falling outside this interval are then set to the value of that percentile. In their paper, Brown and Caylor (2006) propose transforming observations falling outside the 1st or 99th percentile in this manner, and replacing them with the 1st percentile or 99th percentile value – equivalent to restricting the data to a 98% confidence interval. We perform this transformation on all our variables before running a regression on them, replacing those values that fall outside a 98% confidence interval within each company.

3.3 Statistical framework

When choosing a statistical model with which to analyze our dataset, our most important criteria is that it must allow us to control for firm-specific effects as we are interested in the effects of state ownership across all firms. Additionally, we want a model that can be made robust to issues relating to serial correlation and heteroscedasticity, as we cannot guarantee the absence of these issues in our data.

The fixed effects model is a panel-data regression model that is suited to control for differences in the average values between firms, while estimating effects across them. The model works by computing the means of each of the variables, and then regressing the variations around the means of the explanatory variables, on the variation around the mean of the independent variable.

In more formal terms, consider this model from Wooldridge (2013, p. 466).

$$y_{it} = \beta_1 x_{it} + a_i + u_{it} \text{ where } t = 1, 2, \dots, T$$

In this model, a_i is the unobserved effect, which captures all unobserved and time-constant factors that affect y_{it} . Averaging the variables and residuals over time for each i gives us the means.

$$\bar{y}_i = \beta_1 \bar{x}_i + a_i + \bar{u}_i$$

Performing the fixed-effects transformation is done by subtracting the second equation from the first, in order to get what is called the time-demeaned data for each variable.

$$y_{it} - \bar{y}_i = \beta_1(x_{it} - \bar{x}_i) + (a_i - a_i) + u_{it} - \bar{u}_i$$

The unobserved fixed effect cancels out because it is not time-dependent, while by subtracting the means from the other elements we have restricted the model to estimating within-firm action rather than between-firm action (Wooldridge, 2013, p. 468-469).

3.3.1 Heteroscedasticity and autocorrelation

The Fixed-Effects model, as with most other statistical models, hinges on the absence of both autocorrelation (Wooldridge, 2013, p. 424) and heteroscedasticity (Wooldridge, 2013, p. 258) in the data, since after the within-transformation the regression is essentially run as a pooled OLS. Our data is a panel-level data set that includes variables such as stock price and functions of firm revenue, we do expect there to be autocorrelation present in many of the regressions we use. Similarly, there is the possibility of our dataset containing heteroscedasticity, and so we need to use a model that is consistent in the presence of these problems. In Wolf and Pollitt's (2008) study of 28 NOCs, they formulate a similar model to ours on a comparable dataset, and uses Robust Standard errors to make their results robust to heteroscedasticity and autocorrelation (Wolf & Pollitt, 2008, p. 29). This correction relies on clustered standard errors to get reliable errors, and requires a large number of clusters – firms – in order to be consistent in the presence of serial correlation. Our dataset, however, has a fairly large T dimension with an average value of T=17, but only 12 firms. Wooldridge (2013, p. 691) points out that using clustered standard errors to account for serial correlation is not justifiable when the number of clusters is not significantly larger than the number of time periods in the panel. As this is the case for our dataset, we need to find a different way of estimating our model that does not rely on a large N.

A different method, called the Parks-Kmenta method, is an FGLS approach to estimating models on panel-level data where the T dimension is larger than the N dimension. However,

this approach has received criticism for creating standard errors that are too optimistic – and as such, will compromise the quality of inference based on the results (Beck & Katz, 1995, pp. 644-645). Another problem with the Parks-Kmenta method of analyzing this sort of data, is that the model only allows for balanced panels, and as our panel is unbalanced, this means it is not a good candidate for our regression. Hoechle (2007) instead suggests that the regression should be performed using an approach called Driscoll-Kraay. This method was also originally intended for balanced panels only, but has been adjusted in its implementation in STATA to make it suitable for unbalanced panels and panels with missing data (Hoechle, 2007, pp. 284-286). This method of estimating the model produces standard errors that are heteroscedasticity- and autocorrelation-consistent, and are also robust to cross-sectional dependence in the model. Rather than relying on either the T or N dimension being large in relation to the other, this model has asymptotic properties based on the T-dimension. As this method's consistency relies on a Large T rather than on a Large N, we consider this to be the best approach to estimating a model based on our dataset (Hoechle, 2007, p. 299).

The modified Driscoll-Kraay method automatically corrects for autocorrelation with a number of lags equal to $m(T) = \text{floor}[4(T/100)^{2/9}]$, where T is the average T of the dataset. In our case, this is a total of 2,7 lags. Hoechle (2007, p. 289) specifies that this method often chooses a lag that may be too small, and also advises that the chosen lag should not be close to the maximum lag of the set – in our case, 16. For our base regression we consider a reasonable compromise to be rounding the default calculation up to 3 lags to account for Hoechle's observation that it tends to be underestimated.

The average T of our dataset is 17, and it is difficult to argue that 17 is anywhere close to infinity. While a larger dataset in either dimension would clearly be more optimal, we believe we have chosen the most suitable model, considering the available alternatives and given the framework of our study. With a greater scope than that of this thesis, a larger study could expand the number of firms by looking at a larger part of the world – for instance by including companies from all across Europe. This could conceivably grow the number of firms to a point where using cluster-robust standard errors to correct for issues related to serial correlation and heteroscedasticity was justifiable. A different possibility to increasing the consistency of the model is to try to increase the average T of the dataset. There are two ways that we can see to do this: The first is to perform the study again in a few years, at which point the number of years of data available for most of the companies will naturally have increased. Another option

is to use quarterly data instead of annual data – however, this approach introduces issues of a different kind. The first issue is that the exact date of a government divestiture is often hard to pin down. Most of our data is gathered from annual reports, which list the stakes of the primary shareholders at the time of their publication, but do not generally supply an exact date for any changes.

3.3.2 Endogeneity

The Fixed Effects model hinges crucially on the strict exogeneity assumption. From Wooldridge (2013, p. 689) this assumption can be stated as:

$$E(u_{it} | \mathbf{X}_i, a_i) = 0$$

For each t , the expected value of the idiosyncratic error given the explanatory variables in all time periods and the unobserved effect is zero.

Essentially, this assumption states that all the explanatory variables and the unobserved effect must be uncorrelated with the error term in all time periods (Wooldridge, 2013, p. 689).

Wooldridge (2013, p. 82) lists several possible causes of exogeneity in a model. One source of possible exogeneity is if the model does not correctly specify the left-hand side and the right-hand side variables in the equation. This could happen if the true model should include a squared term of one of the explanatory variables, or when a variable is included as a log rather than a level or vice versa, when the other is what is more appropriate. The other most common source of exogeneity is when an important variable that is correlated with one of the explanatory variables is omitted. We do not see a reason to include squared terms in our regression analysis, and cannot find any precedent in the empirical literature for such control variables. In terms of logarithmic transformations, we find no reason to believe performing a logarithmic transformation of the regressed variables should increase their significance. Many of the variables take on extremely low values, or negative values, which also serves to make logarithmic transformations suboptimal or invalid. In some cases, the empirical literature proposes variables – particularly relating to Firm Size, that have undergone a log transformation. In these cases, we abide by the empirical literature and use the transformed variable.

Omitted variables can also cause a problem with exogeneity. Wooldridge (2013, pp. 82-83) states that in practical application it is very difficult to ascertain that a model includes all

relevant factors, and that the strict exogeneity assumption holds. Our basic regression model includes controls only for factors which we consider are relevant to control for across all performance metrics. Once we get the results from this base regression, we will take a closer look at any performance indicators that show significant results, and investigate the possibility of omitted variables and other controls that should be included in the model by looking at existing empirical literature.

In the Econometrics of Panel data (Boumahdi & Thomas, 2008 p. 89), the authors suggest one potential reason why the exogeneity assumption might be breached if there are measurement errors in the explanatory variables. While we do not consider the risk of our data set including measurement errors to be great, as Thomson's Reuter is a commonly cited data source. Nearly all data not directly retrieved from their database is gathered directly from annual reports, which we expect to be accurate, and the rest of generally gathered directly from company or government sources. A complete overview of sources can be found at the end of the paper.

3.3.3 Normality

For inference to be valid, the unobserved error must follow a normal distribution, conditional on the explanatory variables and the unobserved effect. From Wooldridge (2013) this can be stated more formally as:

Conditional on \mathbf{X}_i and a_i , the u_{it} are independent and identically distributed as $\text{Normal}(0, \sigma_u^2)$ (p. 690)

This assumption is necessary in order to gain valid inference from the regular F- and t- tests. A stronger claim to normality could be made by performing a follow-up study on a larger sample of companies, which would allow the distribution to be asymptotically approximated (Wooldridge, 2013, p. 690).

3.3.4 Working with unbalanced panel data

There is a high degree of variability in how many years each of the firms in our set has been in existence, and this causes us to have an unbalanced dataset. Wooldridge (2013, p. 473) states that Panel Data in which the number of periods for each firm is not identical, is an unbalanced panel. Generally, having an unbalanced panel does not have to be problematic, as long as the reason why the data is missing is uncorrelated with the idiosyncratic errors u_{it} (Wooldridge, 2013, p. 473). The example mentioned by Wooldridge is if firms were to exit the dataset because

of financial worries – effectively going bankrupt – this would be expected to have an effect on firm performance in the years leading up to the exit and as such be correlated with the observable factors in the model. In our case, we do not have any attrition of the companies – once they enter our set, they remain in the set until the end date, and so our main source of concern is whether effects predating their entry into the dataset carry over into the unobservable idiosyncratic error. The fixed effects regression does allow attrition to be correlated with unobserved effects, however (Wooldridge, 2013, pp. 473-474).

The most significant unobserved effect we anticipate is that we expect there to be a correlation between firm performance and the company's initial listing on the stock exchange – as such, we have omitted the year each company was listed, and the year following the listing. We also use this rule for companies formed as part of a merger that we consider disruptive on its operations. The idea is to make sure that companies have time to mature and stabilize before being included, reducing the impact of omitted years on the idiosyncratic error of the regression. We consider this preferable to forcing a balancing of the dataset by only using years for which we have all observations, or omitting companies for which we do not have data for all years. The reason is that cutting away so many observations would deteriorate the quality of the regression in other ways. This is the case because we are controlling for firm-specific effects rather than generalizing the firms into industries or sectors, which is necessary as there are not enough state-owned firms available to justify grouping them. Most industries, if this method was used, would consist of a single firm. Omitting firms instead of years does not solve the issue of our bias – we do not know why some companies are listed sooner rather than later, and if there is a reason why this is the case, that is correlated with our observed variables, excluding them from the dataset on this premise would not eliminate the bias. Furthermore, omitting these observations would remove much of the change in state share across the dataset, meaning that there would be far fewer observations of changes in state share, and divestitures of majority share to observe and use to explain changes in the company's operational efficiency. Similarly, not knowing the reason why our companies enter the stock market at different times makes it difficult for us to control for these effects in order to determine the direction of a possible bias and perhaps correct for it.

3.4 Variables used

3.4.1 Selection of performance indicators – the dependent variable

In order to map the effects of government ownership on the firms in our sample, we perform our base regression on a large number of different performance indicators, collected from several previous studies of privatization. While there is almost no end to the number of possible variables that could be taken into account, we focus on selecting an assortment of variables that will allow us to study all the general areas covered by Megginson et al. (1994), D'Souza et al. (2007) and Wolf & Pollitt (2008), since these studies form our primary basis for comparison. We do not expect there to be significant effects of state ownership on all of these variables, but as part of the reason for this study is to try to pin down avenues of potential future study, our objective here is to cast a wide net in order to pick up as many effects as possible. In addition to the variables covered by previous studies on initial privatization, we also include a number of variables to study the financial performance of the firms – mainly Tobin's Q and a stock return index. Tobin's Q is widely used to study financial performance in terms of corporate governance (Bøhren & Ødegaard, 2001, p. 22), while the stock return index is a general measure of actual market performance. These variables are not covered by research on initial privatization for obvious reasons: they require the company to be on the market in first place in order to establish a basis for comparison. Since we are looking only at follow-on privatizations, data on market performance is available to us for all years.

Most performance indicators represent a relationship between two nominal values, and in these cases we make no adjustment for inflation as the nominal traits of each variable should make it unnecessary (D'Souza et al., 2007, p. 164). In the case of three variables, however, we are not able to use nominal values in both the denominator and the numerator. These variables are Return on Sales, Relative Employment and Revenues per Employee. Here we run into an issue of differences in currency as well. In order to compensate for these effects, these variables are first adjusted for inflation using the consumer price index. We then index them using the methodology of Megginson et al. (1994, p. 422).

Table 2 - Overview of dependent variables

Dependent Variables	
Profitability	
Return on Sales	Calculated as Operating Profit divided by Total Sales (D'Souza et al., 2007, p. 171; D'Souza & Megginson, 1999, p. 1406; Megginson et al., 1994, p. 422; Wolf and Pollitt, 2008, p. 16).
Return on Assets	Calculated as Operating Profit divided by Total Assets. (D'Souza & Megginson, 1999, p. 1406; Megginson et al., 1994, p. 422; Wolf and Pollitt, 2008, p. 16).
Return on Equity	Calculated as Operation Profit divided by Equity. (D'Souza & Megginson, 1999, p. 1406; Megginson et al., 1994, p. 422; Wolf and Pollitt, 2008, p. 16).
Output and Investment	
Total Output	The natural logarithm of real total sales (D'Souza & Megginson, 1999, p. 1406; Megginson et al., 1994, p. 422; Wolf and Pollitt, 2008, p. 16)
Reinvestment Ratio	Capital Expenditures divided by Total Sales (D'Souza & Megginson, 1999, p. 1406; Megginson et al., 1994, p. 422; Wolf and Pollitt, 2008, p. 16)
Investment Ratio	Capital Expenditures to Assets (D'Souza & Megginson, 1999, p. 1406; Megginson et al., 1994)
Productivity and Employment	
Relative Employment	Employees divided by Real Assets, indexed to 100 for the first year of each company (Wolf and Pollitt, 2008, p. 16).
Employee Productivity	Real Total Sales divided Number of Employees (D'Souza & Megginson, 1999, p. 1406; Megginson et al., 1994, p. 422; Wolf and Pollitt, 2008, p. 16).
Financial Performance and Structure	
Tobin's Q	Market Value of Firm divided by Total Assets (Bøhren & Ødegaard, 2001, p. 22)
Financial Leverage	Debt divided by Assets (D'Souza et al., 2007, p. 171; D'Souza & Megginson, 1999, p. 1406; Megginson et al., 1994, p. 422; Wolf and Pollitt, 2008, p. 16).
Stock Return	Stock Return Index
Dividends to Sales	Total Dividends divided by Total Sales (D'Souza & Megginson, 1999, p. 1406; Megginson et al., 1994, p. 422; Wolf and Pollitt, 2008, p. 16).

3.4.2 Independent variables

In order to isolate the effects of State ownership, we select a number of control variables to make sure that the State Share do not accidentally capture normal market developments, both in terms of national market, and in terms of the firm's industry. Previous studies (D'souza et al., 2007; Megginson, 2001; Wolf & Pollitt, 2008) offer a wide range of possible factors to control for market cycles. These were used to formulate our base model, which we ran on all the performance indicators in our set in order to look for significant effects of state ownership.

3.4.2.1 Controlling for economic growth

We include GDP as our measure of economic growth. This variable is drawn from D'Souza et al's 2007 study, in which they include several variables to measure this effect, including GDP and GNI per capita. Between GDP and our index variables, economic cycles should be adequately controlled for. However, in cases where GNI per capita was shown to be particularly relevant we will return to this variable in our follow-up regressions.

3.4.2.2 Markets and comparable firms

Megginson & Netter (2001, p. 357) hail the practice of Laporta and Lopez-de-Silanes in controlling for comparable privatized firms when performing their study. While the optimal approach here would be to construct an index of comparable companies and include variables from the index that correspond to the dependent variable of each regression, the magnitude of this task falls outside the scope of this study. Instead, we will include a set of proxies to attempt to approximate this control, by including return indexes of each company's country and industry.

Table 3- Stock Indexes

Country	Index
Norway	Oslo Exchange All Share Index
Denmark	OMX Copenhagen 20 Index
Sweden	OMX Stockholm 30 Index
Finland	OMX Helsinki Index

Each index is a return index on the country's stock exchange. For Denmark and Sweden, the return index was not available as an all share index, and so the largest index available for each country was selected. Similarly, for Norway and Finland, the return index data was only available for the All Share indices. Both types of index should reflect the state of the country's current market.

In addition to controlling for effects that were specific to the country the company operates in, we also wanted to control for how the companies' industry trends affected the company's operations. Our companies are selected from a wide range of industries, and we expect that there are some industry-specific effects that are time-invariant. If this is the case, not controlling for these effects could cause an omitted variable bias. The database from which the company data was collected, Thomson Reuter's Datastream, conveniently reports index data from predefined industrial groups representing most industries, which we will refer to as sectors. Using this data, we selected relevant candidate sectors for each company based on its line of business as reported in the firm's annual reports. After collecting data for candidate sectors we performed a simple OLS regression on a firm-by-firm basis to find which sector was the closest match for each company with the firm's market performance as the dependent variable.

In some cases, such as Hydro and Fortum, the companies effectively change sector after their divestitures. In these cases, we created a composite index for the companies between the before-and-after industries of the firms, and then performed the same OLS regression on these companies to confirm that the composite sector was a match.

After finding the appropriate sector corresponding to each company, we performed a similar OLS analysis to find the geographic market which had the best fit. In general this was a choice between whether to use an index including all developed markets, or only European markets excluding emerging economies. The only exception is the choice of "Europe and the Far East" for Finnair, which is based on the fact that Finnair has a lot of flights going to Asia (Finnair Oyj, 2007, p. 5). Table 4 shows which sector corresponds to each company and what market it is based on, and a summary of the OLS regression results for the final sector and index choices are included in Appendix C.

Table 4 - Industrial sector and market overview

Industrial Sector and Market Overview		
Company	Market	Sector
Stora Enso	World	Pulp and Paper and Paper return indexes (TSEPUPR and PAPERDV).
Rautaruukki	Europe	Industrial Metals return index (INDMTEE)
Kemira	Europe	Chemical companies return index (CHMSPEE)
Finnair	Europe and Far East	Airlines Return Index (AIRLNEA)
Fortum	Developed World	Oil Industry return index (OILINDV), transitions to Conventional Electricity return index (CNVELEE) due to Neste Oil divestment.
Outokumpu	Europe	Industrial Metals return index (INDMTEE)
CPH	Europe	Transport Services return index (TRNSVEE)
Nordea	Europe	Banks return index (BANKSEE)
TeliaSonera	Europe	Mobile and Telecom return index (TELMBEE)
DNB	Europe	Banks return index (BANKSEE)
Telenor	Europe	Mobile and Telecom return index (TELMBEE)
Hydro	World	Oil Industry return index (OILINDV), transitions to Aluminum return index ALUMNDV when it divests energy operations.

3.4.2.3 Controlling for time trends

Including a trend variable in the equation recognizes the fact that the dependent variable may be increasing or decreasing over time, and that this movement might be unrelated to the explanatory variables in the model. If we do not add a trend variable, despite it being part of the true model, it will generally produce biased estimators. If any of the dependent variables are also trending, adding a time trend as a control variable is especially important (Wooldridge, 2013, pp. 354-355). On this basis, and knowing that state share generally moves in one direction, we add a time trend variable to our regression to avoid this spurious regression

problem. Adding a time trend is also consistent with the econometric model of Wolf and Pollitt (2008, p. 29) who perform a similar analysis to ours.

3.4.2.4 Controlling for divestitures

As covered in the first chapter of this study, two of our companies had major divestitures over the course of this study. Fortum divested its petroleum operations into Neste Oil, and Hydro divested its energy operations. We consider these events to be very significant for the companies' continued operations after the point of the divestiture, and therefore include dummy variables for all years including and after the point of divestiture. Adding a dummy variable for a single firm, and for a specified time period, takes out the fixed-effects of that time period in the same manner as the within-transformation does (Wooldridge, 2013, p. 470).

3.4.2.5 Government ownership

Two variables for government ownership are included: A rolling state share, and a dummy variable for the transfer of majority control away from the government. The data sources for these variables are extensively documented in Appendix A. As covered in the section on legislative environments, most shareholder decisions require a simple majority in order to pass, and as such we expect that the divestment of majority control may be the most significant variable relating to government ownership. Both variables are included both in the year the change occurred, and lagged by one year. Once the base regressions are performed, we choose either the lagged or nonlagged version of each variable based on which was found to be the most significant as our focus for further analysis.

3.4.3 Follow up regression analyses

Once the results from the base model are in, we continue performing regression analyses with a number of extra control variables drawn from empirical literature, in order to explore and validate our results. These extra variables are discussed in detail as they are included in the extra regressions. We note that many of these variables are firm-specific, and as such, even if they turn out to be more correlated with a given performance indicator than government ownership, this does not necessarily imply that government ownership is not a significant factor. In many cases, they may be more useful as a tool for understanding the mechanism through which corporate governance issues related to state share affect the dependent variable.

4 Regression results and analysis

4.1 Base regression model

In order to look for the significant effects of State Ownership, we define two models with which to make a general sweep through our results. The intention of the models is to uncover potential significant effects, and then take a closer look at any significant results with further regressions, in order to make sure as many significant factors as possible are controlled for. One of the benefits of a fixed effects framework is that it allows us to use proper control variables, and this model is intended to control for linear time trends that could impact the state share variable, as well as factors relating to industry-specific or country-specific economic effects. We also control for major divestments considered to have an impact on the company's financial operations, as discussed previously. Our model is based on a model used by Wolf and Pollitt (2008, p. 29) in their working paper "Privatising national oil companies: Assessing the impact on firm performance." In this paper, the authors study the effects of initial privatization on a sample of national oil companies using a model similar to that of Megginson et al. (1994) and D'Souza and Megginson (1999), in addition Wolf and Pollitt (2008) also investigate the effects of follow-on privatization in a fixed-effects framework.

There are some differences between our model and the model used by Wolf and Pollitt (2008) to look at effects of follow on offerings. The main differences is the set of dummies related to each individual offering – Wolf and Pollitt (2008) mainly seeks to address the effect of additional offerings by including a lagged set of 5 dummy variables in the years following each offering, and pairing them up with an interaction between the post-offering dummies and a time variable. This does not differentiate between different kinds of share issues, and whether they happen before or after control is transferred. They observed, however, that this setup is difficult to interpret as the post-offering dummies and their interactions move in opposite directions and cancel each other out. They find no significant results on their share issue variables (Wolf and Pollitt, 2008, pp. 30-31). We are mainly interested in whether there are any financial effects that scale with the actual level of government ownership, and whether there are effects related to the transfer of majority control away from the state. Our model will be restricted to including a continuous government ownership variable, and a dummy variable or the controlling share that is active for all years following the transfer of control away from the government. The authors (Wolf and Pollitt, 2008, p. 29) also finds that a lagged state share variable is more

significant than a contemporaneous one. We cannot say whether this is the case for our dataset, or for all variables in the dataset, and so we will estimate both models.

Model 1, with no lagged government share:

$$\begin{aligned} Perf_{it} = & \beta_1 GDP_{it} + \beta_2 INDEX_{it} + \beta_3 SECTOR_{it} + \beta_4 YEAR_{it} + \beta_5 DIVFORTUM_{it} \\ & + \beta_6 DIVHYDRO_{it} + \beta_7 SH_{it} + \beta_8 MAJTRANSPOST_{it} \end{aligned}$$

Model 2, with lagged government share:

$$\begin{aligned} Perf_{it} = & \beta_1 GDP_{it} + \beta_2 INDEX_{it} + \beta_3 SECTOR_{it} + \beta_4 YEAR_{it} + \beta_5 DIVFORTUM_{it} \\ & + \beta_6 DIVHYDRO_{it} + \beta_7 SHLAG_{it} + \beta_8 MAJTRANSPOSTLAGGED_{it} \end{aligned}$$

We first perform a regression with this model on all our performance variables. As mentioned previously, we then investigate significant results more closely, drawing on empirical research to find other possible explanatory variables and validate our results. Finally, we will attempt to analyze the end results and fit them into a theoretical context. First, we define the variables used in the base model:

Table 5 - Variable names

Variable Names	
GDP	An index of the real GDP of each company's home country.
SECTOR	The relevant sector return index as outlined in the methodology chapter.
INDEX	The return index of the stock exchange of the firm's home country, as described in the last chapter.
YEAR	A time trend variable that ranges from 1991-2013.
DIVHYDRO & DIVFORTUM	Dummy variables for the divestment of major business units in Hydro and Fortum respectively.
SH	The percentage ownership of the government.
SHLAG1	The lagged government ownership percentage variable.
MAJTRANSPOST	A dummy variable for when the state divests its majority. Is active for all years following a divestment of majority control for each company.
MAJTRANSPOSTLAGGED	The lagged version of the majority transfer variable.

4.2 Profitability

Table 6 - Regression output for profitability

	ROS	ROS	ROE	ROE	ROA	ROA
GDP	0,0007193 (0,0012274)	0,0007849 (0,0012052)	0,0011508 (0,0021695)	0,0010607 (0,0020594)	0,0011636 (0,0008298)	0,0011268 (0,0008046)
INDEX	0,00000593 (0,0000133)	0,00000453 (0,0000144)	0,0000234 (0,0000315)	0,0000216 (0,0000336)	0,00000654 (0,0000119)	0,00000646 (0,0000122)
SECTOR	0,000089* (0,0000478)	0,0000928* (0,0000492)	0,0002245*** (0,0000785)	0,0002389** (0,0000841)	0,0000847** (0,0000396)	0,0000869** (0,0000412)
YEAR	-0,0029144 (0,0025021)	-0,0028911 (0,0025398)	-0,0086745** (0,0031934)	-0,007823** (0,0033968)	-0,0040014** (0,0014423)	-0,0039515** (0,0014757)
DIVFORTUM	0,1882602*** (0,0232406)	0,1844467*** (0,0239393)	0,0465275 (0,0435416)	0,0431482 (0,0457979)	0,0251161 (0,0186591)	0,0233967 (0,0203514)
DIVHYDRO	-0,028649** (0,0133837)	-0,0281716** (0,0130422)	-0,0497004** (0,022256)	-0,0469876* (0,0230432)	-0,0149308 (0,0104641)	-0,0136852 (0,0098909)
SH	0,000106 (0,0007299)		-0,0011737 (0,0017762)		-0,00000664 (0,0004963)	
MAJTRANSPOST	-0,0130771 (0,0167759)		-0,0374108 (0,035836)		-0,0126568 (0,0124246)	
SHLAG1		-0,0000473 (0,0006168)		-0,0008105 (0,0014104)		-0,0000957 (0,0004485)
MAJTRANSPOST LAGGED		-0,0171027 (0,0156984)		-0,0479179 (0,0355292)		-0,0148172 (0,0130872)
_cons	5,828842 (4,919996)	5,783697 (5,004379)	17,38648** (6,231184)	15,67201** (6,679225)	7,929852** (2,824666)	7,837242** (2,902199)
N	205	203	205	203	205	203
F-test	170,88	141,72	16,49	19,07	13,43	13,24
Within R Squared	0,2532	0,2554	0,1268	0,1308	0,1418	0,1428
*** & ** denote significance at the 10%, 5% and 1% levels respectively.						

Running a regression on our three measures of firm profitability, we find that the SH variable is not generally significant on any of the performance indicators, which means the data does not imply that there is a running relationship between the current state share and the firm's profitability.

The regression finds no significant results in the transfer of control away from the state. While this may be more surprising, we do also note that the control variables for sector and index effects perform quite poorly in these instances. However, if there were significant changes in the firm's profitability before and after a control transfer, we would still expect the dummy variable to respond to them. While we cannot rule out that there exists some relationship that a

different type of analysis might detect, we cannot reject the null hypothesis: that there are no significant effects of state share or the transfer of control on firm profitability.

4.3 Output and investment

Table 7 – Regression output for output and investment

	Total Output		Reinvestment		Investment	
GDP	1,253803*** (0,316138)	1,173457*** (0,3320336)	0,0017794 (0,0013767)	0,0014192 (0,0014066)	0,0010922* (0,0005634)	0,0008327 (0,0006026)
INDEX	0,0096653 (0,0076324)	0,0112855 (0,0078587)	-0,00000416 (0,0000102)	0,000000663 (0,0000106)	0,000000428 (0,00000758)	0,00000366 (0,00000736)
SECTOR	-0,0107545 (0,031777)	-0,0156271 (0,0308855)	-0,0000335 (0,000025)	-0,0000361 (0,0000239)	-0,0000288** (0,0000108)	-0,0000319** (0,0000113)
YEAR	1,796093*** (0,5731473)	1,624559** (0,6595727)	-0,0041573 (0,0031538)	-0,0036415 (0,0031617)	-0,003085** (0,001125)	-0,0028109** (0,0011242)
DIVFORTUM	-70,38266*** (3,010676)	-67,72939*** (4,619739)	0,108495*** (0,0293986)	0,11684*** (0,0266316)	0,0111117 (0,0129285)	0,0173346 (0,0105512)
DIVHYDRO	-50,61799*** (9,509876)	-50,7987*** (9,030519)	-0,016598 (0,0298627)	-0,0148925 (0,031084)	-0,0203081 (0,0121466)	-0,0196744 (0,0119678)
SH	0,3218209 (0,2060895)		-0,0007418 (0,0005867)		-0,0002926 (0,0002777)	
MAJTRANSPOST	7,090189 (6,158108)		-0,074759** (0,0304293)		-0,030998** (0,0119613)	
SHLAGI		0,2670007 (0,2224423)		-0,000211 (0,0005965)		0,0000181 (0,0002253)
MAJTRANSPOST- LAGGED		11,52625 (9,213879)		-0,0631995** (0,0271568)		-0,0228936** (0,0105073)
_cons	-3602,679*** (1146,507)	-3250,682** (1317,752)	8,341616 (6,238272)	7,307912 (6,247584)	6,179739** (2,229619)	5,63495** (2,220013)
N	205	203	205	203	205	203
F-test	844,39	330,19	22,25	37,05	195,89	65,24
Within R Squared	0,4882	0,4769	0,2286	0,22	0,2492	0,2476

*** & ** denote significance at the 10%, 5% and 1% levels respectively.

Now we look at measures of Output, and the company's propensity for reinvestment. Again we find no significance on the SH variable. As we can see, neither state share nor the majority transfer appears to have any significant effects on real output at all, but there are some significant results in relation to the company's investment and reinvestment ratio calculated as functions of its capital expenditure. The findings on investment and reinvestment are consistent with each other. We do note that the majority transfer and rolling state share correlates in opposite directions, which may cause the estimators to be slightly inflated due to covariance.

We will study these findings in more detail later, to see if these findings stand up to closer scrutiny when we attempt some other control variables, and whether they retain their significance when each state share measure is regressed individually.

4.4 Operating efficiency and employment

Table 8 - Regression output for operating efficiency and employment

	Relative Employment		Employee Productivity	
GDP	0,1058174 (0,3785348)	-0,0328172 (0,4010783)	2,080735*** (0,6627351)	2,117876*** (0,6865617)
INDEX	-0,0082781 (0,0055505)	-0,0076682 (0,0056274)	0,0294245 (0,0201606)	0,0297065 (0,0198435)
SECTOR	0,0040324 (0,0098954)	0,0037495 (0,0101189)	0,0964019* (0,0475434)	0,0929048* (0,0453221)
YEAR	-1,338237* (0,6437439)	-1,199028* (0,6649012)	-0,5980613 (0,786792)	-0,7503604 (0,8730086)
DIVFORTUM	-15,95035*** (3,820953)	-14,22069*** (3,661337)	-69,30585*** (9,698847)	-73,05647*** (5,911056)
DIVHYDRO	21,28796*** (6,676187)	20,87421*** (6,807148)	-74,69682*** (7,348032)	-71,26039*** (8,438599)
SH	0,215578 (0,2174854)		0,5602605* (0,2811007)	
MAJTRANSPOST	-8,549631*** (2,392193)		15,39767 (10,68754)	
SHLAGI		0,241498 (0,1951039)		0,5140895* (0,2617887)
MAJTRANSPOST- LAGGED		-5,291823* (2,914194)		18,12411 (12,22798)
_cons	2745,997** (1271,374)	2476,21* (1310,87)	1094,484 (1559,031)	1397,969 (1723,685)
N	205	203	205	203
F-test	136,53	165,89	73,68	65,39
Within R Squared	0,4847	0,4909	0,5519	0,5476
*** & ** denote significance at the 10%, 5% and 1% levels respectively.				

In terms of operating efficiency and employment, we find that there are significant changes in employment levels in response to a transfer of majority control away from the state, and that these effects are most pronounced in the non-lagged variable, but are still significant in the non-lagged variable at the 10% level. Employee Productivity shows a slightly significant correlation associated with the rolling state share, and a non-significant but large movement in the opposite direction in response to a change in control. Since the effects are only significant at the 10% level, we will not spend much time focusing on this variable. However, in order to be thorough,

a set of follow-up regressions are included in Appendix B that find that neither the rolling state share nor the transfer of majority is significant on its own, and that the effects are likely just the result of a covariance between the two variables.

4.5 Financial performance and structure

Table 9 - Regression output for financial performance and structure

	Tobin's Q		Financial Leverage		Stock Return		Dividends to Sales	
GDP	-0,004032 (0,0092042)	-0,0045227 (0,0093166)	-0,0075575*** (0,0011191)	-0,0082*** (0,0014683)	-12,67171 (8,271658)	-13,36581 (8,143868)	-0,000825 (0,0011842)	-0,0009601 (0,0011589)
INDEX	-0,0001991** (0,0000915)	-0,0001841** (0,0000867)	-0,000052** (0,0000215)	-0,000048** (0,0000187)	-0,0493573 (0,0891493)	-0,0326866 (0,0774023)	-0,00000279 (0,00000823)	-0,00000163 (0,00000856)
SECTOR	0,0010387*** (0,0001834)	0,0009976*** (0,0001955)	-0,0001348*** (0,0000437)	-0,0001394*** (0,0000437)	1,092588*** (0,1749764)	1,042268*** (0,17529)	0,0000991*** (0,0000214)	0,0000952*** (0,0000214)
YEAR	-0,0013827 (0,0160469)	-0,001702 (0,0166257)	0,0123569*** (0,0021219)	0,0115866*** (0,0018012)	44,56252*** (13,88546)	42,3574*** (13,98289)	0,0024585 (0,0019012)	0,0023943 (0,0019125)
DIVFORTUM	0,4295642*** (0,1241572)	0,4643903*** (0,1466227)	0,0805358* (0,0416323)	0,0690563 (0,0433882)	349,443*** (71,76747)	372,0943*** (79,98578)	0,1464081*** (0,0273911)	0,1490521*** (0,0270703)
DIVHYDRO	-0,1404581* (0,0752188)	-0,1481615* (0,0841253)	-0,157593*** (0,0403689)	-0,1584019*** (0,0377598)	-28,0169 (50,45897)	-26,28202 (56,25727)	-0,016883 (0,0101397)	-0,0177873* (0,0101129)
SH	0,0002682 (0,001696)		0,0016866 (0,0014403)		3,113588 (2,275468)		0,0004739* (0,0002371)	
MAJTRANSPOST	-0,0802051 (0,0839686)		0,105639*** (0,0215829)		95,8096 (93,81467)		-0,0031581 (0,0135447)	
SHLAGI		0,0014846 (0,001616)		0,0009519 (0,0008087)		2,21899 (2,718603)		0,000408 (0,0003207)
MAJTRANSPOST- LAGGED		-0,0220243 (0,1032345)		0,078761*** (0,0239812)		132,9556 (97,51196)		0,0032926 (0,0132637)
-cons	3,877873 (31,38546)	4,485322 (32,58089)	-23,77132*** (4,22317)	-22,23814*** (3,591018)	-88090,35*** (27157,39)	-83575,25*** (27396,4)	-4,85118 (3,710066)	-4,70979 (3,736365)
N	205	203	205	203	205	203	204	202
F-test	28,33	31,45	93,74	71,1	411,3	249,17	45,29	51,56
Within R Squared	0,2363	0,02323	0,4282	0,4196	0,4853	0,4813	0,3242	0,322

* ** & *** denote significance at the 10%, 5% and 1% levels respectively.

We find that the company's financial leverage level increases as the state divests its controlling interest. We will come back to this result for a more detailed analysis later. The second finding is a reduction in dividends associated with the rolling state share variable, while no significant effect is found on the transfer of control. Before we move on to looking at the effects of majority transfers, where we had several findings, we will take a closer look at the effects of the rolling state share on dividends.

4.6 Dividends to sales

Our preliminary results indicate that there is a positive correlation between the state's share in an enterprise, and the dividends to sales payout ratio. This runs counter to the results found by Megginson et al. (1994), which indicated that privatization yielded a higher dividend. Megginson et al. (1994, p. 421) also points out the lack of theoretical basis for this expectation other than a reasonable assumption that before firms are privatized, the state normally does not require a dividend at all. This does not apply to our dataset, where all firms are already privatized when they first enter the dataset. Gugler (2003, p. 1318) argues that government owners frequently participate in what he called dividend-smoothing, which is the process of selecting a target dividend payout ratio and then insisting that firms stick to that ratio. This means that firms which may otherwise have profitable projects to invest in, may be forced to stick to their current payout ratio, even if there are other profitable projects that could be undertaken. In this view, we might expect the volatility of payouts to increase when the state's share diminishes. Gugler (2003, p. 1299) also points out that high dividends are often used as a monitoring device, also referencing Faccio's (Faccio, in Gugler, 2003) findings that corporations that exhibit a wider discrepancy between ownership and control pay higher dividends. If this is the case, and we expect based on Shleifer's (1998) theoretical framework that there are inherent governance issues with state ownership, that high levels of state ownership equate to a higher dividend payout ratio – at least when other factors are controlled for.

Before we move on to making specific inferences based on our results, however, it is pertinent to have a look at the chosen control variables and see whether they are sufficient. In their paper "Does corporate governance determine dividend payouts in Poland," by Kowalewski, Stesyuk and Talavera (2008) and Bøhren, Josefsen and Steen's (2012) paper "Stakeholder conflicts and

dividend policy” both sets of authors agree that it is relevant to control for firm size (Bøhren et al., 2012, p. 2859; Kowalewski et al., p. 207). Kowalewski et al (2008) also find that profitability is positively correlated with the dividend payout ratio, and is significant as a control variable. We use Bøhren et al’s (2012, p. 2859) method of including firm size as the natural logarithm of the company’s real assets. As a proxy for profitability we include a variable for the company’s return on sales. We expect, from Bøhren et al’s (2012, p. 2860) findings, that firm size has a negative relationship with dividend payout, while Kowalewski et al’s (2008, p. 213) research implies that return on sales should have a positive relationship with the payout ratio.

We estimate three models. First we check whether the SH variable is significant on its own or merely as an interaction with the MAJTRANS variable. While they moved in the same direction, the MAJTRANSPOST variable was not significant at any level of significance and may still affect the magnitude of the SH variable. Model 2 adds the discussed control variables, while Model 3 is estimated with all insignificant variables omitted, in order to make sure that variables are not only significant because of interactions with insignificant ones.

Table 10 - Regression output for dividends to sales ratio

	Dividends to Sales		
	Model 1	Model 2	Model 3
FIRMSIZE		-0,0265464*** (0,0075985)	-0,0274933*** (0,0068167)
ROS		0,3424644*** (0,0411077)	0,33617*** (0,0447888)
GDP	-0,0008388 (0,0011767)	-0,0009292 (0,0008402)	
INDEX	-0,00000223 (0,0000082)	-0,00000466 (0,00000704)	
SECTOR	0,000097*** (0,0000167)	0,0000691*** (0,0000178)	0,0000594*** (0,0000163)
YEAR	0,0024262 (0,0018954)	0,0039392*** (0,0012655)	0,0022855*** (0,0006208)
DIVFORTUM	0,1479997*** (0,0259186)	0,077282** (0,0303908)	0,0813125** (0,0302059)
DIVHYDRO	-0,0172415* (0,0094625)	-0,0306568* (0,0150503)	-0,031225** (0,0135658)
SH	0,0005371** (0,0002534)	0,0002591 (0,0002529)	0,0003573 (0,0002193)
_cons	-4,789178 (3,699694)	-7,364778*** (2,523232)	-4,121932*** (1,187392)
N	204	204	204
F-test	46,52	1280,83	440,7
Within R Squared	0,324	0,4716	0,4618
* * * & *** denote significance at the 10%, 5% and 1% levels respectively.			

Table 10 outlines the results of our regression with the added control variables. We see that while state share maintains its positive relationship with the dividend payout ratio, it is no longer significant. The new control variables are statistically significant at the 1% level, and both of them vary in the expected direction – we replicate Bøhren et al’s (2012) findings that firm size has a negative relationship with dividend payouts, and Kowalewski et al’s (2008) findings that the payout is positively related to the return on sales.

After we include the new variables, the results are not significant even at the 10% level. As such, we hesitate to conclude that there are real effects on dividend payouts from the rolling state share. In particular, we find that profitability and firm size are much better predictors of

dividend payouts than state share directly, which does not support the notion that the payout is a direct effect of the government's control, such as we might expect if the change was due to dividend smoothing. However, since the included variables are also functions of the company's operations, it is difficult to exclude the possibility that government ownership still has indirect influence. We did not find any significant indications of state share on profitability. However, if state-owned enterprises tend to exhibit greater growth than their privatized counterparts, this might be a mechanism through which the state influences dividend payouts.

4.7 Control transfer effects

We find several significant effects on the transfer of control away from the state, defined as the point where the state dips below 50% of the share votes. We find that, in general, our dataset yields more significant results on the non-lagged version of the variables than the lagged version.

While there are several significant effects to be found in the control transfer variable, as with the dividend payout ratio, we want to inspect the results before we start analyzing them in order to make sure that the model and dataset is properly configured for each of the regressions.

The main issue we run into when inspecting the control transfer variable, is that of the definition of the base group. The Fixed-Effects framework does not handle constant variables very well, due to the time demeaning transformation – any dummy variable that stays fixed throughout an entire cross-sectional observation, is effectively 0, regardless of whether its true value is actually 0 or 1. This means that in terms of the majority variable, the base group is actually poorly defined – some of our companies have not had a state majority at any point during the course of our sample, and these non-state-controlled firms are lumped into the model's base intercept together with firms that maintain a majority throughout the dataset. Ideally, if we want to estimate the effects of a transfer of control away from the state, a more well-defined base group would only include those companies and time periods where the state maintains a majority stake, while the dummy variable for control transfer is active in all cases where the state does not have a controlling interest.

Two of the companies in our dataset maintain a state share below 50% for the entirety of the sample – Stora Enso and Nordea. In order to make sure that the badly defined base group does not interfere with the results of our regression, we rerun our regression while omitting these companies. By omitting these companies, we define our base group to be the data points in which the state maintains a majority share, and the estimated dummy variable to be for years following a divestiture for companies where such a divestiture has taken place. While this further reduces our N, it also increases our average T somewhat – how, exactly, this impacts the validity of the inferences is difficult to say beforehand, but hopefully the results in this new regression will not differ significantly from the results of our base model.

Table 11 - Regression output for control transfer effects

	Reinvestment	Capital Investment	Relative Employment	Financial Leverage
GDP	0,0020316 (0,0016037)	0,001155* (0,0006525)	0,0063755 (0,3979883)	-0,0088571*** (0,0016692)
INDEX	-0,00000459 (0,00000899)	0,00000127 (0,00000761)	-0,006985 (0,0057006)	-0,000042* (0,0000209)
SECTOR	-0,0000395 (0,0000262)	-0,0000305** (0,0000115)	0,0052069 (0,0111007)	-0,0001235** (0,0000462)
YEAR	-0,0039581 (0,0034714)	-0,0030926** (0,0012529)	-1,477123** (0,5230497)	0,0111519*** (0,001526)
DIVFORTUM	0,115626*** (0,0311445)	0,01488 (0,0129404)	-17,07824*** (3,420148)	0,0702378* (0,0344228)
DIVHYDRO	-0,0212975 (0,026949)	-0,0215867* (0,0108328)	23,06792*** (6,032185)	-0,1427989*** (0,0342878)
MAJTRANSPOST	-0,0658401** (0,0263277)	-0,0264858** (0,0121835)	-10,17117*** (3,226723)	0,0916363*** (0,0173975)
MAJTRANSPOST LAGGED	-0,0598619** (0,0248386)	-0,0212007* (0,011528)	-6,48284 (4,411399)	0,0686179*** (0,0210186)
_cons	7,895862 (6,827834)	6,180381** (2,46969)	3040,616*** (1018,462)	-21,22225*** (2,979038)
N	180	180	180	180
F-test	20,88	172,57	192,76	105,51
Within R Squared	0,2258	0,2478	0,5318	0,431

*** & ** denote significance at the 10%, 5% and 1% levels respectively.

The table above includes only those regressions that show a significant result for MAJTRANSPOST and MAJTRANSPOSTLAGGED, the control transfer dummies we use. The variables were not significantly impacted by the removal of two companies from the dataset. It did have some minor impacts on the quality of the control variables, a point which we will attend later on when we go over each result with more specific control variables for each case.

Table 11 also serves as a convenient overview over the variables for which a majority transfer was found to be significant. Overall, two things are immediately made clear: While the removal of two companies from the dataset and the SH variable has had some impact on the magnitude of the MAJTRANSPOST dummy coefficients, in most cases it did not affect the significance of the variable. The only changes in significance were to the lagged versions of the variable, where we note a decline in significance on the investment and relative employment regressions. The non-lagged variable retains its previous significance, however, and so we will focus on these results for our further analysis.

There were some shifts in the size of the coefficients. This change is not surprising, when we consider that transfers of control away from the state are generally followed by considerable divestments of their overall holdings, which may cause an interaction between the SH and MAJTRANPOST variables. Since the SH variable was not found to be significant in any of the above regressions in the first place, the MAJTRANS variable on its own is much simpler to interpret.

The other is that the overall effect of the government divesting its controlling interest are that the financial structures of the firms seem to lean more toward higher levels of debt, and firms exhibit a lower level of relative employment and lower investment ratios. In the following sections, we will take a closer look at each of these variables, attempting to add more specific control variables and to see how they match up with previous empirical studies and the theoretical framework.

4.8 Financial leverage

Our results imply a statistically significant positive shift in the financial leverage after the state divests its majority share. The index, sector, time trend and GDP all show significant effects. The rest of this analysis will be concerned only with the effect of a transfer of control, as the SH variable was not found to be significant. We will also keep using the reduced dataset that omits non-government-majority firms, in order to keep our base group as well defined as possible.

We find two studies relating to firm size and leverage levels. The first is a paper by Rajan and Zingales (1995) that concludes that firm size is positively correlated with leverage levels for firms in all countries in their study, except Germany (Rajan & Zingales, 1995, p. 1422). On the other hand, Titman and Wessels (1988) show that short-term debt is negatively related to firm size (Titman & Wessels, 1988, p. 17). Since Financial Leverage uses total debt for its ratio, which includes short term debt, this may make the control variable less significant. We will attempt to control for firm size by including the natural logarithm of real total assets, and then consider adjusting for short term and long term debt if this variable does not end up being significant.

Kayo and Kimura (2011, p. 359) argue that excessive free cash flow can give rise to corporate governance issues when there are few growth opportunities, and that increased debt may be an important control mechanism under these circumstances. Kayo and Kimura (2011) goes on to argue that cash on hand increases when there are few growth opportunities, and that intangibility may also serve as a proxy for growth opportunities – with a higher intangibility signaling better growth opportunities for the firm. They note, however, that if cash flows are low and growth opportunities are high, then debt is the natural alternative in terms of financing, implying that increased growth opportunities may also be a source of increased leverage.

We include net cash flow divided by sales, as a measure of the company's cash flows. Kayo and Kimura (2011, p. 359) proposes R&D and advertising expenses as proxies for a firms' intangibility. We do not have access to these items, but Datastream lists total intangible assets. We divide this by total assets to get an intangibility ratio that we include as a control variable. Kayo and Kimura (2011) also uses Tobin's Q as a proxy for a firm's growth opportunities, which need to be taken into account when evaluating the effects of excess cash flows. We will try both options and see which one works best for our dataset.

The pecking order hypothesis, which ranks sources of financing based on their financing costs, states that retaining earnings is the most efficient way to finance projects (Tirole, 2006, p. 238). If this hypothesis holds, we would expect the return on sales, used here as a proxy for profitability, to have a negative relationship with financial leverage levels – in periods where the firms are more profitable, they should prefer to retain earnings rather than take up more debt. We include return on sales as a control variable to control for the effects of profitability.

Table 12 shows the results of four different models. We first regress using only return on assets and firm size, and find both to be highly significant in their expected directions. The second model also includes Tobin's Q as a proxy for growth opportunities, and cash flow divided by sales as a measure of free cash flows. We find both to be highly significant. Intangibility is less so, although it does appear to impact the control transfer variable to a greater degree than Q-ratio does. We also find that the sector variable has no effect on leverage levels – it is negligible and statistically not significant. The final model omits these non-significant variables from the regression. While adding these control variables significantly cuts down on the impact of the majority transfer, the standard error is also reduced, and the finding stands. The results imply that a transfer of control away from the government shows a statistically significant increase in leverage levels.

Table 12 - Regression output for financial leverage

	Financial Leverage			
	Model 1	Model 2	Model 3	Model 4
FIRMSIZE	0,132239*** (0,0327213)	0,1350933*** (0,0320796)	0,1339371*** (0,0303954)	0,1362068*** (0,0270932)
ROS	-0,6097345*** (0,1760865)	-0,6503357*** (0,1766701)	-0,6236651*** (0,1504316)	-0,6813744*** (0,1656101)
QRATIO		0,039114*** (0,0129415)	0,0105389 (0,0230558)	0,0288974* (0,0162452)
INTANG			0,0646692 (0,0497707)	
CASHSALE			0,0003409*** (0,0001042)	0,000294** (0,0001148)
GDP	-0,0085153*** (0,0016315)	-0,0083382*** (0,0016821)	-0,0082355*** (0,001784)	-0,0086139*** (0,0015466)
INDEX	-0,000046*** (0,000016)	-0,0000382** (0,0000139)	-0,0000372** (0,0000149)	-0,0000447*** (0,0000141)
SECTOR	-0,0000305 (0,0000522)	-0,0000671 (0,0000527)	-0,0000479 (0,0000616)	
YEAR	0,0062968** (0,0026718)	0,0062203** (0,0024438)	0,0059886** (0,0024619)	0,0062688** (0,0024657)
DIVFORTUM	0,1862384*** (0,053878)	0,1769874*** (0,049529)	0,1773983*** (0,0512317)	0,1763146*** (0,0484897)
DIVHYDRO	-0,027358 (0,0366823)	-0,0204086 (0,0376217)	-0,0212716 (0,0359382)	-0,0186442 (0,0347884)
MAJTRANSPOST	0,0410593** (0,0182446)	0,0426626** (0,0175043)	0,0373682* (0,0195726)	0,0335609** (0,0130355)
_cons	-13,70367** (5,103521)	-13,64262*** (4,681557)	-13,15914** (4,716224)	-13,73612*** (4,726885)
N	180	180	180	180
F-test	149,56	196,71	302,6	188,05
Within R Squared	0,5895	0,6002	0,6074	0,5976
* ** & *** denote significance at the 10%, 5% and 1% levels respectively.				

We find that the transfer of control away from the state is significant in all four models, and that all control variables except the sector and our tangibility measure are significant. However, we do note that the significance of the majority transfer variable dips below the 5% level in one of the models, although this model includes some non-significant variables. In the article “Capital Control, Debt Financing and Innovative Activity” (Czarnitzki & Kraft, 2009, p. 372) the authors find that higher leverage leads to more disciplined manager behavior. The study

measures innovation using patent applications as a proxy for innovation propensity, and argues that managers that are under stricter financial constraint tend to be more careful with their investments. We find that cash flows, measured here by the CASHSALE variable, may be interpreted in support of this notion. While we cannot conclude any sort of causal link, financial leverage increases with increasing relative cash flows, which is a logical result if debt is being used as a tool to induce cash flow restraints. Such results are consistent with the theoretical framework discussed previously, and that provided by Jensen (1986, pp. 323-325), Hart and Moore (1995) and Shleifer and Vishny (1997, pp. 757-758). Higher leverage represents a strict commitment of cash flows, constraining the ability of management to invest in projects that do not maximize the welfare of the shareholders. Particularly, Shleifer and Vishny (1997, p. 763) argue that even dispersed debt enjoys greater legal protection than that of minority shareholders, because no collective effort among creditors is required in order to enforce their claims. In terms of contract theory, a debt contract is more strictly defined than the claims given by holding shares, and so even a minority creditor is free to pursue legal action in order to secure their claims to a company's cash. From this perspective, the increase in leveraging may be a response to the loss of the government as a large monitor, or simply that of having a majority investor in general.

Studies that compare pre-privatization performance to post-privatization performance generally find that leverage declines when a company is privatized (Megginson and Netter, 2001, p. 353), with only two out of seven studies surveyed by Megginson and Netter finding results that suggest otherwise (Macquieira & Zurita, in Megginson & Netter, 2001, p. 353; Boubakri & Cosset, in Megginson & Netter, 2001, p. 353). However, comparing our results to other empirical research done on privatization is tricky. Megginson et al. (1994) outline in their paper one of the important reasons as to why:

For one thing, SOEs traditionally have extremely high debt levels, at least in part because they cannot sell equity to private investors, and thus the only forms of "equity" available to the firm are capital injections from the government and retained earnings (p. 439).

This argument is repeated in Megginson and Netter's (2001) survey of empirical privatization papers, and in Dewenter and Malatesta's (2001) paper. These studies compare three-year before and after periods of privatizations of the companies in their dataset. However, we exclude the

first years after companies are listed, and so do not expect these effects to be present for our data. Rather, we expect the restructuring because of the initial privatization to have manifested already when the companies enter our dataset. Megginson et al. (1994, p. 440) also notes that when separating the effects of primary issues – where the company sells shares to investors – from pure secondary issues – where the government simply sells existing shares – the decline in leverage is marginally significant and present in two thirds of the dataset.

Another reason to expect leverage to shift downwards rather than up, is the previously mentioned point that state owned enterprises have been shown to enjoy lower interest rates than privately owned firms (Borisova & Megginson 2011; Megginson et al., 1994, p. 421). Further research is required to see if this reduction in interest rates are also the case in Scandinavia. As it stands, if interest rates are lower when the government holds a higher share, this difference cannot account for the changes in leverage that correlate with government ownership, which might mean it is dominated by other effects such as the previously mentioned cash flow constraints.

Since we are measuring the effects of a control transfer in firms that were already privatized both before and after the transfer, it is not necessarily unexpected that our results differ from existing privatization studies. Wolf and Pollitt (2008, p. 30) finds no significant effects on leverage, related to the transfer of control or follow-on issues, and Megginson and Netter's (2001) survey cites Macquieira and Zurita's (Macquieira & Zurita, in Megginson & Netter, 2001) results of finding an increase in leverage in Chilean firms when they controlled for market movements. This may suggest the possibility that this is a regional effect specific to certain legislative environments, and that the different results may be due to the Nordic Model differing from other common legislative systems across the globe.

4.9 Capital investments

Our base regression yielded significant results on the ratio of Capital Expenditures to Sales. Before we attempt to interpret this finding from a theoretical perspective, we first want to see if there are any significant control variables in the empirical literature that might alter the results. In the paper "Determinants of investment cash flow sensitivity," Hovakimian (2009, p. 165) proposes proxy measures of cash flow and growth opportunities as determinants of capital

investment. They use market-to-book values, or in other words Tobin's Q, as a proxy for growth opportunities, and a KZ ratio to reflect liquidity constraints of the firm. The KZ ratio refers to a ratio constructed by Lamont, Polk and Saa-Requejo (Lamont et al., 2001, p. 531), based on the results of Kaplan and Zingales (Kaplan & Zingales, in Lamont et al. 2001). Lamont et al. (2001, p. 552) report this ratio as the sum of:

$$\begin{aligned}
 & -1,002 \times [\text{Cash Flow divided by Lagged Capital}] \\
 & \quad 0,283 \times [\text{Tobin's Q}] \\
 & \quad 3,139 \times [\text{Long Term and Short Term Debt} \div \text{Total Assets}] \\
 & -39,368 \times [\text{Dividends} \div \text{Lagged Capital}] \\
 & -1,315 \times [\text{Cash} \div \text{Lagged Capital}]
 \end{aligned}$$

A higher KZ ratio implies a greater chance that the company is facing financial constraint, and as such we would expect the coefficient of this variable to be negative, implying an inverse relationship with reinvestment. Hovakimian (2009) also uses Tobin's Q as a measure of growth opportunities, in a similar fashion to Kayo and Kimura (2011), stating that growth opportunities should have a positive relationship with reinvestment. We are missing Cash Flow data for some years in the early nineties. We will omit the years with missing cash flow observations from regressions involving the KZ ratio, since the measure cannot be computed for these years.

Finally, Hovakimian (2009, p. 166) points out that firm maturity may affect reinvestment levels, because smaller and younger firms are expected to have higher growth opportunities. He proposes two variables to control for maturity: Firm Size calculated as the natural logarithm of total assets, and an age metric, which is the number of years since the company was listed. In our fixed-effects regression, because the time-demeaning transformation subtracts the firm's mean of each variable from the values of each observation, there is no difference between such an age variable and our time variable. Instead, we will include firm size, but rely on the time trend variable to capture any significant impacts from firm age that are not eliminated by the fixed effects transformation.

Hovakimian (2009, p. 166) also argues that bond rating may be a useful assessment of the firm's ability to find external financing for their projects. Unfortunately, this data is not available to us. He also proposes the firm's asset tangibility as a measure of the firm's ability to find external financing, defined as net fixed assets divided by the company's total assets. Since we do not have access to data on each firm's bond rating from a reliable source, we will use asset tangibility instead.

Finally, Hovakimian (2009) proposes that financial leverage may directly affect firm investment activities, and may therefore be a possible control variable for capital expenditure. Similarly, dividend payout ratio may also have a direct effect on firm investments, because firms with lower dividends are more likely to have higher levels of investment, while firms with higher dividends should generally have less growth opportunities. We include the company's debt divided by total assets as our measure of total leverage, and dividends divided by sales as a measure of the dividend payout ratio.

Table 13 - Regression output for capital investment

	Reinvestment			Investment		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
FIRMSIZE	0,0396059** (0,0173872)	0,0395861** (0,0175181)	0,0300922* (0,0167166)	0,0291182** (0,0112339)	0,0285414** (0,0110215)	0,023774** (0,0112675)
TANG	-0,0132206 (0,0090555)	-0,013214 (0,0090395)		-0,0027542 (0,0027664)	-0,0025382 (0,002933)	
QRATIO	0,06204** (0,0294194)	0,0863181* (0,045371)	0,0559588** (0,0262128)	0,0262264*** (0,0091763)	0,0332534** (0,0149929)	0,0245873*** (0,0075152)
FINLEV	-0,0747084 (0,0688689)	-0,0263626 (0,0905312)		-0,0466714 (0,0466425)	0,0140886 (0,0579669)	
DIVSALES	-0,6750397* (0,3629189)	-0,889961** (0,3807391)	-0,6582764* (0,3625772)	-0,1342225 (0,1235125)	-0,2625021* (0,1280572)	-0,1133589 (0,1200615)
VOLATILITY	-0,0003592 (0,0003573)	-0,0004495 (0,0005081)		-0,0002097 (0,0001998)	-0,0000664 (0,0002177)	
KZ		-0,0063451 (0,0061166)			-0,0061437 (0,0051058)	
GDP	0,0005771 (0,0009114)	0,0003728 (0,0009943)		0,0004904 (0,0006261)	0,0001017 (0,0006379)	
INDEX	-0,00000285 (0,00000876)	-0,000000158 (0,0000105)		-0,00000173 (0,00000877)	-0,00000263 (0,0000086)	
YEAR	-0,0016214 (0,0019063)	-0,0010574 (0,0019169)		-0,0026183** (0,0009271)	-0,0021358** (0,0007757)	-0,0013863* (0,0007965)
DIVFORTUM	0,1854445*** (0,0587448)	0,1956673*** (0,0561966)	0,1812028*** (0,0525959)	0,0217452 (0,0228258)	0,0296299 (0,021106)	0,0161921 (0,0193787)
DIVHYDRO	0,0068438 (0,0202567)	0,0104839 (0,0249166)	0,0039795 (0,019811)	0,0048748 (0,012519)	0,0111033 (0,0166675)	0,0029385 (0,0103423)
MAJTRANSPOST	-0,076013*** (0,0234829)	-0,0847589*** (0,0180302)	-0,0779648*** (0,0208464)	-0,0360867** (0,015115)	-0,0390255*** (0,0133943)	-0,0366544** (0,0142644)
_cons	2,694205 (3,775612)	1,560277 (3,74229)	-0,3900913 (0,2868007)	4,804149** (1,72889)	3,85612** (1,433521)	2,443988 (1,600456)
N	180	168	180	180	168	180
F-test	111,61	113,88	43,07	69,29	58,61	7,89
Within R Squared	0,3698	0,3972	0,3326	0,3127	0,3418	0,2841
* * * & ** denote significance at the 10%, 5% and 1% levels respectively.						

In our regression of the capital investment variables, we retain our significant results on transfer of control in all of the models, and there are no significant variations in magnitude or direction. We find that firm size, growth opportunities and the dividend payout ratio are the most relevant control variables. The final results on both investment and reinvestment are consistent in that there is a decrease in capital investment associated with a control transfer away from the state.

One possible explanation for this effect is that following the increase in leverage levels discussed previously, there is a cash flow constraint – however, we would expect this effect to be picked up by the KZ ratio, which is meant to be a measure of a company’s likelihood of experiencing such constraint. Similarly, it does not appear that controlling for growth opportunities significantly diminishes the effect. Instead, the investment measure actually becomes more significant than in the base model when including these control variables.

In their paper “Determinants of Capital Expenditures Across Nations,” the authors (Subrahmanyam, Chhachhi & Brown, 2013, pp. 38-39) argue that one possible rationale behind a lower capital investment ratio is a shortening of the investment horizon. In this view, capital expenditures are interpreted as a proxy for long-term company investments, and a lowering of this metric may imply that a company is reducing its long-term investments in order to focus more on short-term profits in response to capital market pressures. From a corporate governance point of view, the authors propose two differing perspectives. On the one hand, large investors may serve a monitoring function and so dissuade firms from short-term decision making. On the other hand, investors with a shorter investment horizon may be more interested in gaining a profit as quickly as possible, and exacerbate the problem. In this perspective, if government monitoring has been a driving force behind a higher level of capital investment due to a more long-term investment horizon, divestiture of control away from the state may cause firms to shift toward more myopic behavior.

4.10 Employment

In our regressions on employment and productivity, our primary results were a decrease in the employment level. This goes against the findings of D’Souza et al’s (2007) study on privatization, which find that the number of employees increases following a privatization

(D'Souza et al, 2007, p. 177) the same goes for Megginson et al's (1994, p. 437) study. However, it is in line with the findings of Wolf and Pollitt's (2008) study, who found a similar reduction in employment levels following a transfer of control away from the state.

One problem concerning employment levels is that it is difficult to find well-documented control variables. D'Souza et al's (2007) study find some candidates for relevant control variables in their multivariate analysis – mainly foreign ownership and GNP per capita (D'Souza et al., 2007, p. 177). We do not have access to data on foreign ownership, and as such are unable to replicate D'Souza et al. (2007) in including this as a control. We will however include GNP per capita. We use the World Bank's GNI per capita measure, gathered from Thomson Reuter's Datastream. The reports that GNP and GNI are methodologically identical, and the difference is only a change in terminology (Inter-Secretariat Working Group on National Accounts, 1993, p. 201).

Relative Employment has been calculated as number of employees over real assets. Since the companies in our dataset also use different currencies, we have dealt with this by indexing each of the variables. This was done in the same manner as the indexing of the dependent variable, as discussed in the methodology chapter.

In addition to including control variables from D'Souza et al's (2007) study, we also wish to revisit one of the control variables used during our analysis of capital expenditures and reinvestment – using Tobin's Q as a proxy for growth opportunities. Microeconomic theory states that increasing the workforce is one way to invest in order to increase output levels, in a similar fashion to investing in new equipment and plants (Pindyck & Rubinfeld, 2009, pp. 195-196). The reverse should also hold, if output must be reduced to compensate for increased productivity, it should be possible to do this by decreasing capital investments and the number of employees. In our analysis of capital investments, we showed that including Tobin's Q as a proxy for growth opportunities yielded significant results, and so we also wish to extend this reasoning to control for growth opportunities when looking at the relative employment levels.

Table 14 - Regression output for relative employment

	RELATIVE EMPLOYMENT		
	Model 1	Model 2	Model 3
GNIPC	-0,3181866** (0,1131023)	-0,3578374*** (0,1080327)	-0,3582567*** (0,1044274)
QRATIO		12,07352*** (2,357065)	10,89685*** (2,551311)
GDP	0,5096113 (0,5135808)	0,6172245 (0,4120502)	0,4599577 (0,3064535)
INDEX	-0,0059259 (0,0058082)	-0,0034192 (0,0057276)	
SECTOR	0,0035281 (0,0101052)	-0,0093589 (0,0083696)	
YEAR	(0,4850774)	(0,3856893)	(0,4026496)
DIVFORTUM	-19,64251*** (3,430525)	-25,19204*** (4,339725)	-24,00149*** (4,98406)
DIVHYDRO	34,47445*** (7,01259)	37,49005*** (6,924244)	37,23821*** (6,690875)
MAJTRANSPOST	-8,435808* (4,097028)	-7,281999* (3,749069)	-7,763723** (3,24347)
_cons	2955,545*** (942,9645)	2853,261*** (751,6021)	2847,559*** (789,2555)
N	180	180	180
F-test	185,13	799,41	288,3
Within R Squared	0,5507	0,588	0,5801
* * * & *** denote significance at the 10%, 5% and 1% levels respectively.			

We find that including the GNI per capita reduces the significance of the results to just below the 5% level, with an exact p-value of 5,2%. Removing non-significant variables increased the significance of the majority transfer back above the 5% level. We found that both GNI per capita and Tobin's Q were extremely significant variables when estimating employment levels. Overall, an increase in GNI per capita is correlated with a reduction in employment, while Tobin's Q is positively correlated. If interpreted as a proxy for growth opportunities, this implies that employment increases when growth opportunities are better. Meanwhile, as the overall productivity of the economy increase, employment decreases. Neither of these effects entirely explain away the effect of a government control transfer on employment, as the MAJTRANSPOST maintains its relative size and direction, and its significance varies only slightly.

While these results are not the same as those of Megginson et al's (1994) study or D'Souza et al's (2007) study, in Megginson and Netter's (2001, pp. 356-357) survey they mention that there is no consensus to be found in the empirical work on employment levels. In Megginson and Netter's (2001) paper they document three empirical analyses, including Megginson et al's (1994) study, that find significant increases in employment. Meanwhile they also notes that five of the surveyed studies showed significant negative effects on employment. Wolf and Pollitt (2008, p. 30) also find a reduction in employment over assets associated with a decreasing state share, consistent with our results. However, they do not attempt to investigate the issue further by including additional controls. Our results end up on a lower level of significance than theirs for this reason.

Megginson and Netter (2001, p. 357) argues that one possible reason for a reduction in employment in response to a state divestment is if increases in sales cannot keep up with gains in employee productivity as a result of the privatization. In our base regression we found no evidence supporting a significant change in total output, but neither did we find a significant effect related to output per employee. In terms of increased output being a driver behind this reduction, we therefore find that our results are inconclusive, and finding any sort of causal link will require further research.

5 Summary of findings

In this chapter we review our analysis and summarize our findings from the previous chapter. We have discussed each variable in terms of the theory and other empirical works as we performed the analysis. At the end of our first chapter we outlined the four major areas in which we expected that we might find results. In this chapter we summarize our findings and the discussion relating to each of these areas, in order to see if we have provided any answers to our research problem.

5.1.1 Profitability

We looked at three different variables relating to the firm's profitability in our Fixed Effects model: return on assets, return on equity and return on sales. We did not find any significant effects relating to profitability in terms of government ownership. As such, we cannot reject the null hypothesis in these cases; that changes in state share do not have an impact on firm profitability. Many other empirical studies that focus on the initial privatization of SOEs uncover significant results on these profitability measures (Megginson & Netter, 2001). Our study cuts away the years preceding and directly following the initial privatization, and so we do not necessarily expect to get the same results. However, we do not find any indications that these trends are reversed as the state further divests its shares. As such, our results do not run counter to those found in these other studies – rather, they do not indicate that these increases in profitability grow with further privatization.

5.1.2 Output and investment

We defined three variables for looking at output and investment – sales, reinvestment ratio and investment ratio. While our results did not indicate any significant shifts in sales or the replacement ratio, we did find that the reinvestment ratio declined slightly following a state divestiture. We reject the null hypothesis in this case, as the regression results support the notion that shift of control away from the government affects the level of investment. However, we fail to reject the null hypothesis in terms of total output.

In our analysis we offered two primary reasons for why this might be the case. The first is that cash flow constraints might lead to capital rationing – the firms invest less cash, because there is less free cash to invest. However, when we attempted to include a measure of cash flow constraint we did not find that this had any significant impact on our results. The second alternative was that a shift of control away from the state might give more power to investors

with a shorter investment horizon, sacrificing long-term investments for short term profits. Since we did not find any significant results on profitability, it is difficult to say whether this last reason is actually the case. We might expect profitability or total output to drop somewhat in the long term if the company adopted a myopic investment horizon, and we find no such drop. While the dividend payout was only sometimes significant as a control variable, we found that the relationship between dividend payouts and capital investment was always negative. This is consistent with the notion of capital investment being reduced in order to enhance short term profits for shareholders. A third option is that the company is investing more efficiently, eschewing primarily those investments that were not very profitable. If the overall effects of such a management shift were slight, we might not expect to detect them on any of our other analyses. We were not able to point toward any specific mechanism for the reduction in investments, and this remains an interesting area of future research.

5.1.3 Operating efficiency

Operating efficiency was analysed in terms of two variables – relative employment and employee productivity. We found that there was little gain in productivity in terms of revenues generated by each employee, but a slight decline in the number of employees divided by assets. We therefore reject our null hypothesis in terms of employment levels, but fail to do so for employee productivity. As we noted before, our results on employment levels are also consistent with those uncovered by Wolf and Pollitt (2008). Megginson and Netter (2001) also reported that there is little consensus regarding the effects of privatization on employment levels, and offered a possible interpretation of the result. If sales cannot grow to keep up with increasing productivity as a result of the privatization, employment levels are expected to drop (Megginson & Netter, 2001). If this were the case in our study, we would expect employee productivity to increase. Finally, in D'Souza et al's (2007) study they also included foreign ownership as a variable. We did not have the required data to replicate this control in our study, and therefore cannot exclude the possibility that including data on other investors might influence results. Finally, while our last model did end up finding a significant effect, we do note that two of the estimated models found significant effects only at the 10% levels, and the loss of significance in the lagged variable of our base regression might imply that these effects are immediate, and not necessarily persistent. Once again, more research is necessary in order to gain further insight into the scope of and mechanisms behind the changes in employment levels.

5.1.4 Financial performance and structure

Our analysis of financial performance and structure covered four different variables: Tobin's Q, dividends to sales, market performance and financial leverage. We found few significant results relating to the company's financial performance. There were no significant shifts in Tobin's Q or the company's stock price with regards to government ownership. We did uncover a correlation between the level of government ownership and the dividend payout, although this result was not tied to a transfer of control but rather the rolling state share. The result implies that as government ownership decreases, so does the dividend to sales payout ratio. However, effects relating to profitability and the size of the firms dominate this effect. The relationship between government ownership and dividend payout ratio is consistent with the notion that to government performs what Gugler (2003) refers to as dividend smoothing – meaning that they stick to an inflexible target dividend payout.

In terms of financial structure, we found a statistically significant increase in leverage in response to a transfer of majority control away from the state. This result remained significant at the 95% level even after including multiple control variables, and so we reject the null in this case. In the context of our theoretical framework and existing empirical research, we found this result surprising. This increase in leverage represents a reversion of the tendencies found in many other privatization studies, but we also proposed a possible reason why we might expect such a result. Since non-privatized SOEs do not have access to other forms of capital, they tend to be highly leveraged. Access to capital markets leads to a rebalancing of their leverage. However, in our case, all companies are listed both before and after the transfer of majority control. Instead, we proposed that increased leverage might be a corporate governance mechanism, because it constrains cash flows and reduces the possibilities for abuse. The relationship of leverage levels with our cash flow estimate was consistent with this notion. We also discussed the possibility of the shift being a response to a change in interest rates as a result of the state divestment. Unfortunately, we do not have the necessary data to appropriately control for this effect, and therefore cannot say whether this is the case for our sample. Our other control variables shared relationships with leverage levels consistent with those of previous studies on privatization.

If we look at these results in combination, one possible reason behind them may be that as the government's ability to enforce its target dividend ratios decreases, the resulting relaxation of

cash flow constraints is compensated for by taking on greater levels of debt. Further research may shed more light on whether or not this is the case.

5.1.5 Discussion of findings

In summation, we are left with a total of four significant results.

- The dividend to sales payout ratio is positively correlated with the level of government ownership.
- The transfer of control has a statistically significant positive effect on financial leverage, measured as total debt over total assets.
- There is a statistically significant reduction in the level of relative employment, measured as total employment over total assets.
- Capital investment is reduced by a statistically significant amount, both in terms of capital expenditures to sales, and in terms of capital expenditures to total assets.

If the notion of financial leverage increasing in order to constrain cash flows holds, the decreased employment and investment levels may be a result of this constraint. The positive relationship between cash flows and financial leverage supports this notion, however, the lack of significance of our constraint measure on investment does not. Additionally, we have argued that this constraint from debt, may simply compensate for a relaxation of constraints related to dividend payouts.

The findings may also be a result of a change in investment priorities because of the change in ownership, shifting away from an investment-heavy long-term perspective toward more short term profitability. Our final results show that while the effects of a state divestiture are significant, our investigation into the mechanism of how it happens is inconclusive.

It is also important to note that our lack of significant results on the other variables, especially when looking at productivity, growth and profitability, imply that these changes have little impact on overall firm performance. Generally, the ongoing privatization of the firms in our sample does not bring significant benefits for the firms' operations, but neither do they cause a negative impact.

5.2 Limitations and weaknesses

We have already covered many of the strengths and weaknesses of our study as we went over our methodology and statistical analysis. In this section, we discuss what we perceive to be the primary weaknesses and limitations of our research.

The first and perhaps most significant problem relating to our study, is that while there exists a great deal of research on initial privatizations, little research exists on the effects of follow-on privatizations. For this reason the statistical framework for performing such research is not as well-developed as that for studying initial privatizations. While we have based our model closely on existing research, and drawn heavily on previous methodologies in order to develop it, it may be possible to develop better models that are able to more consistently and comprehensively analyze these relationships.

There are also issues relating to both sample size and selection bias that may be relevant. We have attempted to omit the first year following the privatization of companies to avoid complications as a result of an unbalanced dataset, and to minimize the impact of a possible unobserved error being brought into the data through this mechanism. Our sample consists of the entire population of suitable firms for our geographic region, and as such increasing the number of firms may be difficult without changing the nature of the study. A higher number of companies would still be more optimal, however, as the reliability of inference improves with a greater sample size. It is also possible that the time dimension could be expanded if quarterly data were available for all the companies in the chosen years. Such an increase in the time dimension would increase the reliability of the Driscoll-Kraay estimators in terms of issues relating to heteroscedasticity and autocorrelation.

Finally we have included a comprehensive array of control variables in order to check our significant results, we cannot exclude the possibility that there may be factors relating to endogeneity or omitted variables that should have been taken into account. Making further controls through methodologies such as 2SLS and instrumental variables to attempt to account for missing endogenous factors would be one possible approach to address this issue, although even this approach faces criticism due to the lack of quality instrumental variables (Bøhren & Ødegaard, 2001; Wooldridge, 2013, pp. 520-521). The problem of endogeneity also goes back to the possibility of bias mentioned by Megginson and Netter (2001 p. 332). They point out that if governments are more likely to divest their shares under conditions that affect profitability or

under certain market conditions, it will be difficult to separate these factors from the government divestment itself.

5.3 Suggestions for future research

Our study restricts itself to investigating Scandinavian companies. As such, the findings from this study are not representative of the greater global markets. Existing studies on privatization show a great deal of variation in results between global analyses, and more localized studies. While our study sheds light on some of the effects related to government ownership in Scandinavia, more research is required to see how these results compare to the rest of the world, and to put these results into a global context.

We found that the main effects of post-privatization state divestments were concentrated on the transfer of control away from the state. In the literature on initial privatizations, many studies replicate the methodology put forward by Megginson et al. (1994). Megginson & Netter (2001) refer to this methodology as the MNR methodology, and its wide-spread use means that its results are easily compared to a large amount of existing research. The methodology compares the performance of firms three years before and three years after the event. If a larger sample of companies could be selected, for instance by extending the study to cover a larger region, this methodology may possibly be adapted to look at the effects of a transfer of control instead of an initial privatization.

In our study we attempted to include proxies for the companies' industries and home markets. While the results on these proxies were often significant, we still believe that meticulously gathering groups of comparable companies for each firm in the sample, and including indexes that correspond to the various dependent variables is likely to yield even better results. Even replicating this study with such control groups would likely yield valuable empirical data for further analysis.

Finally, including other ownership data and having a deeper look into how different kinds and concentrations of private owners affect the performance of privatized firms, as well as the prevalence of strategic ownership in partially privatized SOEs – perhaps in comparison to the rest of the market.

6 Conclusion

This study empirically investigates the effects of ongoing privatization on 12 large Scandinavian firms. Using an array of different performance indicators we look at how government ownership affects factors related to financial and operating performance, using measures of profitability, output, investment, efficiency and financial performance and structure. The research is based on yearly accounting and stock data from between 1991 and 2013.

We employed a fixed-effects model to estimate effects relating to both the rolling state share, and of a transfer of majority control. Our results indicate that in general, firm profitability, productivity and performance is not significantly influenced by further privatization. In the context of previous empirical studies, the results imply that the major effects on these factors happen primarily in the initial transition from state-owned enterprise into full or partial privatization. We find that there are statistically significant effects relating to capital investment, financial structure, and employment levels when the state divests its majority stake. We also find that dividends are correlated with the level of government ownership. Leverage levels were shown to increase, while capital investment, dividend payouts and employment levels decrease as the state divests its shares.

Based on theory and existing research, we expected the effects of corporate governance issues relating to government ownership to be substantial, particularly in terms of improvements in profitability and efficiency. While our findings were significant, they were less pronounced and related mainly to firm structure, dividend payouts, employment and investment levels. These effects may be related to cash flow constraints or changes in investment behavior as a result of the change in ownership. However, our analysis of the mechanism through which these changes take place was inconclusive.

The primary aim of our study was to highlight potential avenues of future research, and to supplement to the ongoing debate surrounding privatization. We find that our results lead to a number of interesting possibilities for future research, particularly in terms of expanding the scope to see how these results compare in a greater geographical context. We also hope that the study will be an addition to the overall debate on privatization in Scandinavia by supplying an empirical perspective on the long term post-privatization history of the region.

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Appendices

Appendix A – Data sources for government ownership

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Appendix B – Follow-up regressions on revenues per employee

	Employee Productivity			
GDP	2,1536*** (0,6511171)	2,142474*** (0,6820645)	2,170164*** (0,6580863)	2,144078*** (0,6873876)
INDEX	0,0266123 (0,0192905)	0,0261591 (0,0204486)	0,0267974 (0,0194232)	0,0265557 (0,020613)
SECTOR	0,1069259** (0,0460661)	0,0988778* (0,0479152)	0,1060369** (0,0466469)	0,0965085* (0,0470975)
YEAR	-0,4410488 (0,7079844)	-0,7136827 (1,002757)	-0,5361041 (0,7807602)	-0,8371734 (1,126393)
DIVHYDRO	-67,39749*** (9,571701)	-67,23981*** (8,467423)	-67,48443*** (8,858309)	-67,53718*** (8,402875)
DIVFORTUM	-82,48189*** (8,643621)	-83,11004*** (7,203636)	-82,82912*** (8,413185)	-81,96129*** (7,366631)
SH	0,2555681 (0,2908399)			
MAJTRANSPOST		5,255634 (10,15155)		
SHLAGI			0,164984 (0,2697246)	
MAJTRANSPOST- LAGGED				7,924994 (11,91822)
_cons	792,3216 (1408,327)	1356,075 (1989,191)	985,2914 (1548,962)	1602,901 (2234,698)
N	205	205	203	203
F-test	53,47	68,65	58,11	60,55
Within R Squared	0,548	0,5553	54,22	0,556
* * * & *** denote significance at the 10%, 5% and 1% levels respectively.				

Appendix C – Sector and Index match results

STORA ENSO

	R squared	0,603	
Regressor	Beta	T	
Index HEXINDEX(RI)	0,389	2,045	
Sector Merge between TSEPUPR(RI) and PAPERDV(RI)	0,673	3,541	

RAUTARUUKKI

	R squared	0,922	
Regressor	Beta	T	
Index HEXINDEX(RI)	-0,12	-1,403	
Sector INDMTEE(RI)	1,033	12,056	

KEMIRA

	R squared	0,9	
Regressor	Beta	T	
Index HEXINDEX(RI)	-0,054	-0,582	
Sector CHMSPEE(RI)	0,969	10,509	

FINNAIR

	R squared	0,572	
Regressor	Beta	T	
Index HEXINDEX(RI)	-0,082	-0,407	
Sector AIRLNEA(RI)	0,802	3,994	

FORTUM

	R squared	0,809	
Regressor	Beta	T	
Index HEXINDEX(RI)	-0,138	-0,991	
Sector Merge between OILINDV(RI) and CNVELEE(RI)	0,907	6,501	

OUTOKUMPU

	R squared	0,606	
Regressor	Beta	T	
Index HEXINDEX(RI)	-0,132	-0,681	
Sector INDMTEE(RI)	0,864	4,452	

CPH

	R squared	0,922	
Regressor	Beta		T
Index DKKFXIN(DSRI)	0,144		0,519
Sektor TRNSVEE(RI)	0,821		2,967

NORDEA

	R squared	0,913	
Regressor	Beta		T
Index SWEDOMX(DSRI)	0,932		8,867
Sektor BANKSEE(RI)	0,113		1,078

TELIASONERA

	R squared	0,852	
Regressor	Beta		T
Index SWEDOMX(DSRI)	0,255		0,949
Sektor TELMBEE(RI)	0,699		2,603

DNB

	R squared	0,813	
Regressor	Beta		T
Index OSLOASH(RI)	0,781		6,505
Sektor BANKSEE(RI)	0,209		1,741

TELENOR

	R squared	0,949	
Regressor	Beta		T
Index OSLOASH(RI)	0,206		1,997
Sektor TELMBEE(RI)	0,822		7,967

NORSK HYDRO

	R squared	0,931	
Regressor	Beta		T
Index OSLOASH(RI)	0,519		8,79
Sektor Merge between OILINDV(RI) and ALUMNDV(RI)	0,748		12,655