

# *Are PE firms better owners?*

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## **Abstract:**

This paper investigates the effect of PE ownership for 126 Scandinavian portfolio companies. We analyze the selection of portfolio companies, and whether the change to PE ownership has a positive effect on the companies' value creation. Our findings reject Jensen's (1986) free cash flow hypothesis, while supporting the underperformance hypothesis (among others Jensen and Meckling (1976) and Fox and Marcus (1992)) that PE firms select underperformers and improve performance post buyout. We also find that for the Norwegian portfolio companies the value created goes to all stakeholders, supporting the notion that PE firms create value to society as a whole.

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## 1. Introduction

The popularity of private equity (PE) as an asset class has grown tremendously over the last decades. The PE industry as an important part of the financial system has moved far beyond the US and UK. In Scandinavia, Sweden has long had a

mature PE industry, while Denmark and Norway have smaller and younger industries<sup>1</sup>. In mid 2006 over 39 billion euro was managed in the Scandinavian countries. This is a growth of 44 % since 2003<sup>2</sup>. Sweden accounted for 80 % of the managed capital in 2006, while Denmark and Norway only accounted for 6.5% and 12.5 % respectively. Norway is the Scandinavian country experiencing highest growth. Managed capital increased with as much as 160 % from 2003 to 2006. Even the financial crisis does not seem to stop this growth. In fact, the Norwegian PE industry experienced in 2008 the highest level of fundraising in its history<sup>3</sup>.

The PE industry is organized in the following way. The equity comes from outside investors as well as PE firms. PE firms are professionally managed partnerships, specializing in business and governance. The equity from the two types of investors is pooled into funds, which in turn invest the equity into a portfolio of private companies. The PE firm manages the funds as well as functioning as the owner of the portfolio companies. The outside investors are passive investors. Figure 1 shows the PE industry structure.

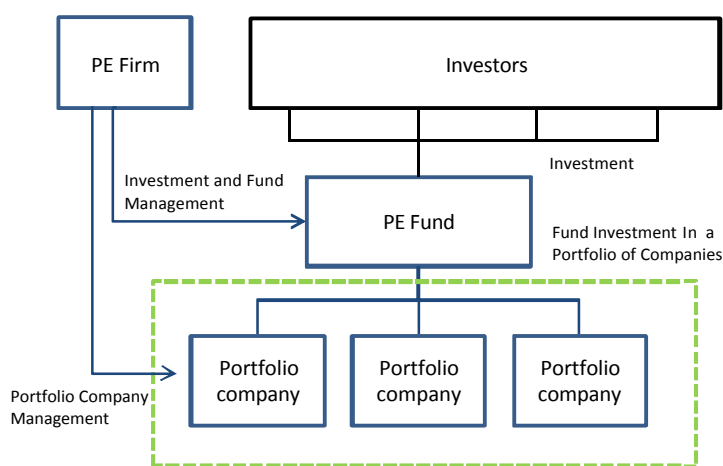


Figure 1 *PE Industry Structure*<sup>4</sup>

The scope of this paper is to investigate the value created in the portfolio companies, marked by the (green) dotted line in the figure. The analysis will further be limited to investigating companies in the leveraged buyout (LBO) segment of the PE industry. This segment contains companies that have already

<sup>1</sup> Helsingreen (2009)

<sup>2</sup> Sørheim, Roger, Lars Øystein Widding and Kjetil Havn (2006)

<sup>3</sup> Norwegian Private Equity and Venture Capital Association (NVCA) (2008)

<sup>4</sup> Adapted from Jensen (1989:15)

gone through the first stages of development, like start-up and expansion stage<sup>5</sup>. LBOs are characterized by their financing of both equity and debt, and usually the PE firm buys out the current shareholders to become the majority owner<sup>6</sup>.

Our research question is “Are PE firms better owners?” With this research question we want to investigate whether PE firms actively select their portfolio companies, and whether the change to PE ownership has a positive effect on the value creation in the portfolio companies, compared to previous owners. In the analysis we further examine two main hypotheses; Jensen’s (1986) free cash flow (FCF) hypothesis and the underperformance hypothesis, among others based on research by Jensen and Meckling (1976) and Fox and Marcus (1992).

Our sample consists of portfolio companies in the three Scandinavian countries; Norway, Sweden and Denmark. We use accounting data for the analysis, and look at the change in size, growth, productivity, profitability, efficiency, leverage and liquidity for the portfolio companies.

Many previous PE studies focus on the return to investors. However, being a good investor does not equal being a good owner. Thus for the purpose of investigating direct ownership, we focus on the return to all stakeholders, that being shareholders, other capital providers, employees and the state. We consider this point of view especially important for the Norwegian PE industry, since a large part of the funding originates from the state<sup>7</sup>.

The most important contribution of this paper is the findings that PE firms increase the value creation to all stakeholders. The evidence is especially strong for Norway, which contributes to the justification of investing state funds into the Norwegian PE industry. Further this paper supports previous evidence that the FCF hypothesis is not adequate in explaining selection of portfolio companies.

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<sup>5</sup> Swedish Private Equity and Venture Capital Association (SVCA) (2009)

<sup>6</sup> European Private Equity and Venture Capital Association (EVCA) (2008b: Glossary)

<sup>7</sup> The Norwegian government contributes to the investment in the PE industry through the state owned investment fund Argentum. Argentum had more than 4 BNOK invested in 2007 (about 50.2 million euro with the exchange rate December 2007 of NOK/Euro 8.0161). According to their financial report and figures on total capital managed in Norway in 2007, Argentum had about 18 % of Norwegian PE investments, making them a significant player in the Norwegian PE industry. (Argentum (2007), exchange rate taken from DnbNOR (2009))

Finally, the results support the underperformance hypothesis for explaining both pre buyout selection and post buyout value creation in portfolio companies. The paper also indicates some differences between the PE industries in Norway and Sweden, possibly due to the differences in the maturity of the two industries.

### **1.1. Outline**

The outline of this paper is as follows; first, we present relevant theory and research together with corresponding hypotheses. Thereafter, we describe how the sample was collected. Third, we present the methodology and the specific hypotheses tested in the analysis. Subsequently, we present the results of the analysis. Fifth, we provide a thorough discussion of the results. We also outline some of the limitations and propose suggestions for future research. Finally, we offer some concluding remarks for the paper.

## **2. Theory and Hypotheses**

The objective with this chapter is to discuss with root in Jensen's (1986) free cash flow (FCF) hypothesis and the underperformance hypothesis<sup>8</sup> the effect of PE ownership on value creation in their portfolio companies. In the discussion we provide empirical evidence from several previous PE studies, followed by hypothesis related to our own empirical study. By doing this we hope to answer the question of whether PE firms are better owners by actively selecting their target companies and if they, by improving corporate governance and actively involve themselves in the portfolio companies, create higher value to stakeholders than the previous owners. However, before we move on we want to briefly explain the concepts of agency problems; opportunism and asymmetric information, and why fragmented ownership aggravates the agency problem.

In companies of a certain size the owner often does not manage the company directly, but rather he elects agents to form a board of directors and a management team, to run the company on his behalf<sup>9</sup>. Without well-functioning corporate governance mechanisms, these agents might act in their own personal interest instead of acting in the owners interest; so-called opportunism. Opportunism may

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<sup>8</sup> Jensen and Meckling (1976), Fox and Marcus (1992), and other studies such as Nikoskelainen (2006) and Reiersen (2008)

<sup>9</sup> Grünfeld and Jakobsen ( 2006: 22-24), Jensen and Meckling (1976)

take the form of excess spending by the management, empire building or simply less effort spent on achieving good results<sup>10</sup>. Owning only a small part of a company may not make it worthwhile to reduce the risk of opportunism. If one owner uses time and resources on monitoring the company, the extra return from this activity is shared with other owners that have remained passive. This is called the free-rider problem<sup>11</sup>. A result of the free-rider problem is that companies with fragmented ownership do not have active involvement by the owners, increasing the risk of opportunism by the board and management. Further, in companies with little monitoring and control the management has more information about the company's opportunities than the owners. Such asymmetric information further aggravates the agency problems, resulting in higher agency costs<sup>12</sup>.

## **2.1. Selection**

In this section we want to discuss whether PE firms actively select their target companies. As such we focus on the pre buyout activity of the PE firm. According to Gründfeld and Jakobsen (2006:21-22) selecting which company to invest in is crucial for ensuring good returns. This requires the skill to analyse what a company is worth, and more importantly what it is worth with the new owner. They stress the point that selection is not just identifying investment opportunities which are underpriced. It has also to do with finding a company that fits the new owner's characteristics. Later we will focus on what happens after the buyout, and whether PE firms manage to enhance value in their portfolio companies.

### **2.1.1. FCF Hypothesis**

The FCF hypothesis has its origins from Jensen's (1986). He proposes that due to fragmented ownership, public firms with excess free cash flows (FCF) are prone to agency problems. The reason is that excess FCF, especially together with low growth opportunities; do not motivate the management to make profitable investments nor to run the company efficiently. Jensen (1989) further considers the early PE deals as a response to weak corporate governance structures allowing for large agency costs on the U.S. stock exchanges. By taking such companies of

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<sup>10</sup> Tirole (2006:17-19)

<sup>11</sup> Jensen and Meckling (1976) explain the issue of agency problem, agency costs and free-rider problem in their piece "Theory of the Firm: Managerial behavior, agency costs and ownership structure".

<sup>12</sup> Jensen and Meckling (1976), Tirole (2006:ch 1)

the stock exchange, the PE firms are able to improve the corporate governance and thus lowering the agency costs.

Several LBO studies investigate Jensen's (1986) FCF hypothesis, with mixed results. Lehn and Poulsen (1989) find support that high undistributed FCF and low growth rates on sales increase the probability of a company to be chosen for public-to-private transactions (PTPs). Kieschnick (1998), however, criticizes their sampling and statistical procedures, arguing that when controlling for these issues the results are insignificant. This is supported by Weir, Laing and Wright (2005), Nikoskelainen (2006)(European PTPs) and Reiersen (2008) (Scandinavian PTPs) who do not find evidence of high FCF or low growth opportunities. Nevertheless, Opler and Titman (1993) report high FCF in companies undergoing LBOs compared to companies that do not. Also low growth opportunities, measured by Tobin's  $Q^{13}$  are found to have significant effect on whether the company is bought up or not. Further, they find that high costs of financial distress deter LBOs. By leveraging up the company the risk of financial distress is increased, the results thus supports the notion that leveraging up the company is important in realizing gains in PTPs. This may be further supported by the Swedish Venture Capital Association (SVCA, 2009) which state that PE firms target companies with strong cash flows and competent management team, while at the same time having possibilities for operating improvements. A competent management team may here suggest that the company does not have a high risk of financial distress. The studies presented here focus on PTP. In our empirical study we investigate private to private transactions, where according to Grünfeld and Jakobsen's (2006:75-77) ownership is considerably less fragmented. Nevertheless, we consider it of interest to test the FCF hypothesis for our sample. Consequently we hypothesize:

*H<sub>1</sub>: High free cash flows increases the probability of being bought up by PE firms*

*H<sub>2</sub>: Low growth rates on sales increases the probability of being bought up by PE firms*

*H<sub>3</sub>: High liquidity increases the probability of being bought up by PE firms*

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<sup>13</sup> Opler and Titman (1993) defines the Tobin's Q as "the ratio of the firm's market value to the replacement value of its assets".

We use liquidity as a proxy for the risk of financial distress. Being that leverage is suggested as an important factor in post buyout gains, we further hypothesize that *H<sub>4</sub>: Low leverage increases the probability of being bought up by PE firms*

### **2.1.2. Underperformance Hypothesis**

Other PTP hypotheses include that undervaluation or asymmetric information held by the management increases the odds of being targeted for LBOs<sup>14</sup>. We consider the use of private information of most interest in MBOs, where the management taking over the ownership. Further, for private companies it is difficult to assess whether there existed any undervaluation of the company at the time of the buyout. Since the shares in a private company are illiquid, it is more likely that a company's performance is reflected in the price paid by the PE firm. This rather makes the hypothesis of underperformance interesting. This hypothesis states that fragmented ownership might lead to operating inefficiencies in public companies<sup>15</sup>. Even though this hypothesis is originally connected to public companies with fragmented ownership, we consider underperformance just as relevant for private companies with more concentrated ownership. Private or not, we expect the lack of sufficient corporate governance to increase the risk of agency problems, and that this may lead to underperformance.

According to Nikoskelainen (2006) an underperforming company is a company that has lower operating and cost efficiency than industry peers. In such cases, he argues, LBOs open up to considerable improvements in performance. Indeed, he finds evidence of lower efficiency (measured by EBITDA margin) for target companies. Further evidence of underperformance is give by Harris, Siegel and Wright (2005), which report that plants with less than average productivity were targeted for MBOs. What is more, these plants also experienced a sharp increase in total factor productivity after the MBO. In line with these arguments, we propose the following hypotheses:

*H<sub>5</sub>: Low operating efficiency increases the probability of being bought up by PE firms*

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<sup>14</sup> Both these hypotheses are supported by Weir, Laing and Wright (2005)

<sup>15</sup> Jensen and Meckling (1976), Fox and Marcus (1992). Other studies on underperformance include Nikoskelainen (2006) and Reiersen (2008)

*H<sub>6</sub>: Low cost efficiency increases the probability of being bought up by PE firms*

*H<sub>7</sub>: Low productivity increases the probability of being bought up by PE firms*

*H<sub>8</sub>: Low profitability increases the probability of being bought up by PE firms*

Note that while the FCF hypothesis predicts high FCF, the underperformance hypothesis predicts low profitability, which also includes the CF variable.

## **2.2. Corporate governance and active involvement**

This part looks at the value creation in portfolio companies after the buyout. By building on the FCF and underperformance hypotheses we focus on three corporate governance tools; to leverage up the financial structure of the portfolio company, to incentivize the management through management ownership and to use monitoring & active involvement to reduce agency problems and enhance value creation. In the last tool we include active involvement, which goes beyond being only being a corporate governance tool by also including knowledge transfer from the PE firm to the portfolio company.

### **2.2.1. Leverage**

According to his FCF hypothesis, Jensen (1986) suggests that restricting free cash flows through higher leverage will reduce agency costs. The rationale is that through increasing the company debt, interest payments made to creditors will reduce the company's free cash flow. This reduces the risk of excess spending by the management, as well as ensuring the management's focus on efficiency to cover payments<sup>16</sup>. Kaplan (1989) finds that the average debt ratio for LBOs is 85% on completion of the buyout, which supports Jensen's (1986) argument. A more recent study by Guo, Hotchkiss and Song (2008) suggests a leverage of 70 %, which is still very high. Such a high leverage increases the risk of financial distress. This may be a reason why, according to the SVCA (2009), PE firms select portfolio companies with strong cash flows, as to be able to support high interest payments. High leverage also reduces corporate taxes by creating a tax shield. According to Kaplan and Strömberg (2008) this is however not thought to make up a large part of the total value gain in the PE industry. Hence we offer the following hypotheses

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<sup>16</sup> Jensen (1989), Kaplan and Strömberg (2008)

*H<sub>9</sub>: The change to PE ownership increases the leverage of the portfolio company*  
*H<sub>10</sub>: The change to PE ownership does not have a strong effect on the tax shield of the portfolio company*

### **2.2.2. Management Ownership**

Linking the managements' compensation scheme to the company value is often used by PE firms to reduce the risk of opportunism. The rationale is that this ownership stake incentivizes the management to exert effort, and that this improves the company performance<sup>17</sup>. Further combining stocks and options may give the management upside potential as well as some downside risk. Kaplan and Strömberg (2008) argue that management ownership in the PE industry is non-negligible and therefore provides goal alignment between the management and the owner. Moreover, since the ownership stake in private companies are often illiquid, this reduces the incentive to boost short-term performance, thus ensuring a long-term perspective for both management and owner.

The positive effect of interest alignment through management ownership on performance is supported by numerous theoretical and empirical studies<sup>18</sup>. Kaplan (1989) studies a sample of management buyouts (MBO). He finds that operating income to total assets and to sales, increases by approximately 20 % the first three years post buyout, while net cash flow increases by more than 20 % every year. Operating income is virtually unchanged the first two years, while being 24% higher in the third year post buyout. The results are adjusted for the industry median, showing that the MBO firms outperform their industry peers. Moreover, Kaplan (1989) finds indications that the operational improvements were due to better managerial incentives rather than layoffs.

Harris et al (2005) support Kaplan's (1989) results, by reporting substantial increase in short and long run total factor productivity for UK manufacturing plants going through MBOs. They attribute a substantial part of the post buyout gains to management efforts in redeploying the companies' resources more efficiently. However, they point to reduced labor intensity through outsourcing of

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<sup>17</sup> Jensen (1989)

<sup>18</sup> Among others Kaplan (1989), Lehn and Poulsen (1989), Nikoskelainen and Wright (2005), Harris, Siegel and Wright (2005), Cressy, Munari and Malipiero (2007), Kaplan and Strömberg (2008) and Acharya and Kehoe (2008)

intermediary goods and material, as opposed to Kaplan(1989) who report no layoffs. Further, they find that the MBO plants were less productive than peers before buyout. This may imply underperformance due to low management incentives, which further supports the notion that opportunism or other agency problems prevent company performance. Hence we provide the hypotheses that

*H<sub>11</sub>: The change to PE ownership increases the profitability of the portfolio company*

*H<sub>12</sub>: The change to PE ownership increases the productivity of the portfolio company*

### **2.2.3. Monitoring and Active Involvement**

Another tool to reduce opportunism is monitoring of the board and management<sup>19</sup>. In their study of PE deals done by mature UK PE firms, Acharya and Kehoe (2008) find substantial margin improvements realized in the early phase of the buyout, especially for EBITDA/Sales. They attribute these results to monitoring and active involvement by the PE firms. By interviewing the PE firms they find that one third of the CEO/CFOs in portfolio companies are replaced during the first 100 days after buyout. Moreover, two-thirds are replaced during the first four years. The PE firms also use merit-based hiring and firing policies, and tend to have tough evaluation matrices focusing both on short and long-term management performance.

Moreover, they report that PE firms actively involve themselves in their portfolio companies; trying to increase the productivity, achieve organic growth and that they may use external support to assist in cutting costs and improve efficiency. Interestingly they find that this out-performance is specifically robust in industry downturns, and that these deals would not have generated positive IRRs without the PE firms' efforts. Grünfeld and Jakobsen's (2006) support the notion that involvement in the managing of the portfolio company is an important element of PE ownership. They propose that PE firms not only actively select their portfolio companies and use management ownership, but that they also involve themselves actively and transfer their knowledge and resources to the portfolio company.

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<sup>19</sup> Jensen and Meckling (1976)

Cressy, Munari and Malipiero (2007) find that PE-owned companies have 4.5% higher operating profitability than their peers in the first three years post buyout. Industry specialization adds 8.5% to this premium. Finding higher returns when PE firms specialize on certain industries may be seen as supporting evidence that PE firms do indeed transfer their knowledge to their portfolio companies and that this enhances company value. Other studies show that improvements in operating efficiency are largely found not to be at the expense of investments in R&D, capital expenditures or wages<sup>20</sup>. This supports the earlier hypotheses on profitability and productivity, and leads us to further hypothesize that:

*H<sub>13</sub>: The change to PE ownership increases the efficiency of the portfolio company*

*H<sub>14</sub>: The change to PE ownership spurs growth in the size of the portfolio company*

*H<sub>15</sub>: The change to PE ownership does not have a negative effect on the wage level for the employees*

As a final remark we note that Nikoskelainen and Wright (2005) find that a balance between leverage, owner monitoring and incentive alignment have a positive effect on performance, while a too strong focus on only one element reduces value creation. This suggests that a key success factor of PE ownership is not using either leverage, incentive alignment or monitoring, but rather that the right combination of these factors will spur value creation.

### **3. Sample Data**

#### **3.1. Creation of Sample**

To identify the PE deals conducted in the Scandinavian countries, we start with a broad search in the Merger Market database. We then check this with the database Zephyr to control for underreporting in the two databases. We search for completed deals in the period 1998-2008, where the target company is situated in one of the Scandinavian countries. The deal types specified are MBOs, MBIs and

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<sup>20</sup> Kaplan (1989a), Smith (1990), Lichtenberg and Siegel (1990), Harris et al. (2005), Acharya and Kehoe (2008), Guo, Hotchkiss and Song (2008) and Lerner, Sørensen and Strömberg (2008)

IBOs where the equity stake of the PE firm is above 30%<sup>21</sup>. We decide to put a lower limit on the PE-ownership stake to 30 % of the deal equity. This is to ensure that the PE ownership is sufficiently large for the PE-owner to be able to exert influential ownership. After conducting this search in both databases we end up with a total sample of 430 deals net duplicates. Reiersen (2008:11) reports that only 33 PTP transactions were executed in Scandinavia from 1999 to 2007. Hence, we consider our sample to mostly consist of private companies.

In our analysis we rely on accounting data, so the next step is to identify which deals can be provided with accounting data. The reason for choosing accounting measures is based on the fact that most PE portfolio companies are not publically traded and thus there is no way to accurately value the portfolio companies. Further, in contradiccion to many other countries like UK and US, accounting data is publically available in Scandinavia, both for public and private companies. This makes these countries ideal for studying non-listed companies. For the Norwegian deals the accounting data is provided from the Centre for Corporate Governance Research (CCGR) database at The Norwegian School of Management. For the Danish and Swedish sample we have gathered the data from the Amadeus database, provided by Bureau van Dijk Electronic Publishing. In CCGR we identify companies by their name only, while in Amadeus we use a combination of names and organizational number (organizational number are provided in Zephyr, but not in Merger Market).

We register the first deal year, noted as  $t$ , as the first year where the PE-owner has control over the company for the majority of the year. This means that deals finished before 30<sup>th</sup> of June will have  $t$  in the deal year, while deals finished after this will have  $t$  the following year. We extract accounting data from year  $t-3$  to  $t+2$ . In cases where more than one pre or post buyouts year is missing in the time series, the deal is excluded from the sample. An exception is when the company in question is established in the year  $t-1$ .

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<sup>21</sup> An IBO is when an external institution, in this case a PE firm, buys the shares of the current shareholders. In an MBO the current management buys the shares, with the help of a PE fund to get enough equity. In an MBI an external management team takes over the company. We include a few MBIs with PE majority ownership, arguing that these are quite similar to IBOs. (EVCA, 2008b: Glossary)

All companies are sorted by industry. This was done by using the industry codes provided in the databases, US SIC core code and NACE 2-digit primary codes for Amadeus, and NAICS 2-digit codes for CCGR (see appendix Table II for further details on industry affiliation in the samples). All companies are converted to NAICS 2-digit codes. Financial companies (NAICS 65, 66, 67 and some companies in 74 and 93) are filtered out of the sample, because their accounting statements by nature differ greatly from the rest of the sample. We end up with a total sample of 126 portfolio companies; 31 for Norway, 74 for Sweden and 21 for Denmark. For detailed information about the adding and subtraction of deals during the creation of the samples we refer to Table I in the appendix.

### **3.2. Sample bias**

A possible bias in our sample is that we have limited access to consolidated accounts. Amadeus provides consolidated accounts only for some companies, while we do not have access to any consolidated accounts in CCGR. This may give a bias in cases where much of the activity is conducted in subsidiaries, since this activity is not included in unconsolidated accounts. We estimate this to give a possible bias for about half of the portfolio companies (please see Table III in the appendix for this calculation). Further, since we are only following the companies identified in the deals, there is no opportunity to control for divestments and demergers or in the cases where the company is merged into another company. On the other hand, we can control for bankruptcies that happen more than one year after deal completion. We believe the direction of the bias can go both ways.

### **3.3. Variables**

From the accounting data we construct several variables for use in the analyses. Table IV in the appendix provides an overview of these variables and their units. Since the variables are constructed from both Amadeus (for Sweden and Denmark) and CCGR (for Norway) databases the definitions used to construct variables for both databases are given. We carefully ensure that the definitions of variables from the two databases are as similar as possible. After the construction of the variables we search them for outliers. We want the sample data to give an as correct picture of the group of portfolio companies identified, thus we only exclude outliers that clearly indicate mistyping or breach the definitions. Examples are current ratios of a thousand or negative operating revenue.

The variables proxy for size and growth in the portfolio companies, productivity, profitability, efficiency, leverage and liquidity. Note that proxies for profitability measure profitability both in level and in percentages. Further, profitability to different stakeholders is included to be able to test for value gain to different stakeholders from change to PE ownership. The efficiency proxies include both operating and cost efficiency. Many of the variables are adjusted for size, and provided in percentages, which make it easier to compare results across countries.

While most of the variables are standard proxies, we want to make further comments on some. One such variable is Total Assets; we consider the book value of total assets to be the weakest proxy for size. The reason is that book value of assets may differ according to leasing and depreciation/age of property, plant and equipment, which makes it a poor proxy for assets in place. Even so, in lack of a better proxy for assets in place, we still use the proxy as a variable and as a component in other variables. As a proxy for the value creation to all stakeholders we use both Return on Assets (ROA) and Added Value. Added Value is a variable defined and used by Grünfeld and Jakobsen (2006) in their study of ownership in Norway. It captures the value created to all stakeholders; shareholders, capital providers, employees and the state. The definition of cash flow (CF) is taken from Lehn and Poulsen (1989). It is however modified to not include paid out dividend, because this information is not provided in our sample. Finally, we want to comment on the proxy for liquidity. Here we use the Current Ratio, defined by Amadeus as current assets over current liabilities.

## **4. Analysis**

In this section we present detailed hypotheses and the methodology used in the analysis of selection and corporate governance & active involvement by PE firms. However, we start out by briefly explaining the methodology used when calculating descriptive statistics for the three Scandinavian samples.

### **4.1. Methodology Descriptive Statistics**

We provide descriptive statistics separately for the three countries because of the difficulties in correcting for price levels and exchange rates between the countries.

It is possible to use a purchasing power standard (PPS) to convert the level numbers into an artificial currency, and thereby make them comparable<sup>22</sup>. However, we consider the information given by such an artificial currency to be of little interest, since it is hard for the reader to relate this currency to other known measures. Thus we choose to provide descriptive statistics separately for the three country samples in their respective currencies. Even though the ratios are strictly speaking possible to provide for all three samples together, we choose to provide them for each country so that they can be compared with the level variables for that country.

Since the years pre and post buyout differ across portfolio companies, the price level due to inflation will also differ within a given country sample. To be able to compare level data within each year, we adjust the level variables in the three countries with their respective national yearly consumer price index (CPI)<sup>23</sup>. The base year is set to 2007, such that all level descriptive statistics are reported in 2007-currencies; that is 2007-NOK, 2007-SEK and 2007-DKK. Variables in percentages and ratios are not adjusted for CPI. The descriptive statistics are shown in Table VI in the appendix.

## **4.2. Selection**

In the following we will investigate whether PE firms actively select their portfolio companies. The study is done for the Norwegian sample only, due to the availability of good peers from the CCGR database. The focus is here on the conditions in the portfolio companies in the year before the buyout, comparing them to peer companies for the same year. The method used is cross-sectional logistic regressions (logit). But before we take a closer look at the methodology, we will provide further details on the hypotheses that are going to be tested.

### **4.2.1. Hypotheses**

From FCF hypotheses ( $H_1$  to  $H_4$ ) we have that FCF and liquidity should be higher for portfolio companies, while growth in sales and leverage should be lower.

Following the underperformance hypotheses ( $H_5$  to  $H_8$ ), operating and cost

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<sup>22</sup> Statistical Office of the European Communities (Eurostat) (2008), Eurostat (2009), Statistisk Sentral Byrå (SSB) (2009), Statistiska Centralbyrån (SCB) (2009)

<sup>23</sup>The World Bank Group (2009)

efficiency, productivity and profitability should be lower. Table 1 below show the proxies used for each of these hypotheses, and the expected sign on the coefficients. The logit hypothesis is also shown:

<b>Logit Hypotheses</b>			
<b>H0: The expected value of the variables for target companies are equal to their peers</b>			
<b>HA: The expected value of the variables for target companies are unequal to their peers</b>			
<b>Variables</b>	<b>Proxy for</b>	<b>Hypothesis (number)</b>	<b>Expected sign</b>
<i>Growth Operating Revenue</i>	<i>Growth</i>	<i>Free Cash Flow (H2)</i>	<i>Negative</i>
<i>Operating Revenue per Employee</i>	<i>Productivity</i>	<i>Underperformance (H7)</i>	<i>Negative</i>
<i>Operating Profit or Loss</i>	<i>Profitability</i>	<i>Underperformance (H8)</i>	<i>Negative</i>
<i>Cash Flow</i>	<i>Profitability</i>	<i>Free Cash Flow (H1)</i>	<i>Positive</i>
<i>Cash Flow/Equity</i>	<i>Profitability</i>	<i>Free Cash Flow (H1)</i>	<i>Positive</i>
<i>Added Value</i>	<i>Profitability</i>	<i>Underperformance (H8)</i>	<i>Negative</i>
<i>Return on Equity</i>	<i>Profitability</i>	<i>Underperformance (H8)</i>	<i>Negative</i>
<i>Return on Assets</i>	<i>Profitability</i>	<i>Underperformance (H8)</i>	<i>Negative</i>
<i>Wage per Employee</i>	<i>Profitability</i>	<i>Underperformance (H8)</i>	<i>Negative</i>
<i>Corporate Tax per Employee</i>	<i>Profitability</i>	<i>Underperformance (H8)</i>	<i>Negative</i>
<i>Profit per Employee</i>	<i>Operating Efficiency</i>	<i>Underperformance (H5)</i>	<i>Negative</i>
<i>Profit Margin</i>	<i>Operating Efficiency</i>	<i>Underperformance (H5)</i>	<i>Negative</i>
<i>Ebit Margin</i>	<i>Operating Efficiency</i>	<i>Underperformance (H5)</i>	<i>Negative</i>
<i>Costs of Employees/ Operating Revenue</i>	<i>Cost Efficiency</i>	<i>Underperformance (H6)</i>	<i>Positive</i>
<i>[(Operating Revenue – Operating Profit or Loss- Costs of Employees) /Operating Revenue]x100</i>	<i>Cost Efficiency</i>	<i>Underperformance (H6)</i>	<i>Positive</i>
<i>Total Liabilities/ Total Assets</i>	<i>Leverage</i>	<i>Free Cash Flow (H4)</i>	<i>Negative</i>
<i>Current Ratio</i>	<i>Liquidity</i>	<i>Free Cash Flow (H3)</i>	<i>Positive</i>

Table 1 *Hypotheses for Logit Regressions*

Most of the variables are taken straight from the variable list in Table IV in the appendix. However, some variables deserve further comments; as a proxy for sales growth we use growth in operating revenue, which is basically the same numbers. As a proxies for free cash flow we use Lehn and Poulsen's (1989) measure CF/Equity and also only CF. However since we do not have any data on dividends nor on the market value of equity, we exclude dividends from the CF definition and use the book value of equity. The definition is thus:

$$CF = (\text{Profit or Loss for period} + \text{Depreciation} - \text{Taxation} - \text{Interest Paid})$$

For CF/Equity we divide CF by the book value of equity.

Since dividend payouts are not included this is a relatively weaker measure than that used by Lehn and Poulsen (1989). However, we believe it may still capture information about the level of CF in the companies.

There are two proxies for cost efficiency; Cost of Employees and Other Costs as percentages of operating revenue. The first proxy is taken from the list of variables, while the second deserves some explanation. Since we do not have a direct measure of other costs, we define other costs as a residual size:

*Other Costs = Operating Revenue – Operating Profit or Loss - Costs of Employees*

This is then divided by the operating revenue, and transferred to percentage size.

This variable measures other variable costs than wages and fixed costs. Being that our sample does not allow us to separate fixed and variable costs, we consider this a relatively good measure of the cost level in the companies.

#### **4.2.2. Methodology Logit Regressions**

To compare the Norwegian portfolio companies to their peer companies, we perform cross-sectional logit regressions with matching pairs. This method is widely used in previous studies on selection, including Lehn and Poulsen (1989), Opler and Titman (1993), Nikoskelainen (2006), Cressy et al. (2007) (use probit) and Reiersen (2008). We choose logit over probit since the difference between the model results is minimal when the dependent variable is evenly spread<sup>24</sup>.

The objective with doing a logit regression is to determine the factors that affect the probability of a company being bought up by a PE firm, and it is conducted on data from the year before the buyout, t-1. The dependent variable is a binary categorical variable, which is one if the company is bought up by a PE firm and zero otherwise. For a description of the logistic function and logistic cumulative function, we refer to Text-Box I the appendix. We use Eviews5 statistical software for the estimations<sup>25</sup>.

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<sup>24</sup> According to Brooks (2008:218) the relationship between one and zero in the dependent variable has to be as high as 1:9 for the results of probit to be superior to logit.

<sup>25</sup> The default conditions in Eviews5 are used. This is a maximum-likelihood estimation using and iterative estimation algorithm. We refer to Quantitative Micro Software's (1994-2004: Appendix C) EViews5 User's Guide for more information on the estimation techniques used by EViews5.

### 4.2.2.1. Matching Peers

We construct a matching sample for the 30 Norwegian portfolio companies by random sampling, controlling for industry and size. The peer sample consists of two firms in the same industry and of similar size as the matched PE firm. We use 2-digit NAICS codes to control for industry type. To control for size we chose total revenue as a primary size measure. To further ensure that the companies are similar we also take into account the number of employees<sup>26</sup>. We do not use total assets as a measure of size due to its weaknesses as a proxy for assets in place. The sample used in the logistic regressions consists of 90 companies; 30 portfolio companies and 60 peer companies.

### 4.2.2.2. Models

We first take a look at the correlation matrix of the variables included in the hypotheses above, shown in Table V in the appendix. The correlations look overall logical. Further, there are some variables with higher correlations than +/- 0.70 (marked in the figure with bold letters on a red background). It is natural that the accounting variables correlate with each other since their definitions are quite similar. However, high correlations between the explanatory variables might give multicollinearity in the regressions. This would give high variances and by that lower z-statistics<sup>27</sup>. Thus we estimate four different models, not including any highly correlated variables in the same models<sup>28</sup>:

$$Z_i = \beta_0 + \beta_1 G\_oprev + \beta_2 Oprev\_empl + \beta_3 Op\_p\_l + \beta_4 Cf\_equity + \beta_5 Av + \beta_6 Roa + \beta_7 Wage\_empl + \beta_8 Tax\_empl + \beta_9 Costs\_empl\_oprev + \beta_{10} Other\_costs\_oprev + \beta_{11} Leverage + \beta_{12} Liquidity + u \quad (1)$$

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<sup>26</sup> The use of matching peers is common in selection studies. Matching according to industry code is used by Kaplan (1989) and Opler and Titman (1993). Matching by industry code and size is used by Cressy et al. (2007), Guo et al. (2008) and Lehn and Poulsen (1989, using the market value of equity as size measure), while Nikoskelainen (2006) and Reiersen (2008) use industry code, size and business model or product category.

<sup>27</sup> Brooks (2008:170-174)

<sup>28</sup> Abbreviations used in the equations are G\_oprev= growth in operating revenue, Oprev\_empl= operating revenue per employee, Op\_p\_l= operating profit or loss, Cf= cash flow, Cf\_equity= cash flow divided by equity, Av= added value, Roa= return on assets, Wage\_empl= wage per employee, Tax\_empl= corporate tax per employee, Prof\_empl= profit per employee, Prof\_marg= profit margin, Ebit\_marg= ebit margin, Costs\_empl\_oprev= costs of employees as a percentage of operating revenue, Other\_costs\_oprev= other costs (than costs of employees) as a percentage of operating revenue, Leverage= total liabilities divided by total assets and Liquidity= current ratio= current assets divided by current liabilities.

Model (1) excludes *Cf*, *Roe*, *Prof\_empl*, *Prof\_marg* and *Ebit\_marg*

$$Z_i = \beta_0 + \beta_1 G\_oprev + \beta_2 Oprev\_emp + \beta_3 Op\_p\_l + \beta_4 Av + \beta_5 Roe + \beta_6 Roa + \beta_7 Wage\_empl + \beta_8 Prof\_empl + \beta_9 Costs\_empl\_oprev + \beta_{10} Other\_costs\_oprev + \beta_{11} Leverage + \beta_{12} Liquidity + u \quad (2)$$

Model (2) excludes *Cf*, *Cf\_equity*, *Tax\_empl*, *Prof\_marg* and *Ebit\_marg*

$$Z_i = \beta_0 + \beta_1 G\_oprev + \beta_2 Oprev\_emp + \beta_3 Cf + \beta_4 Cf\_equity + \beta_5 Roa + \beta_6 Wage\_empl + \beta_7 Ebit\_marg + \beta_8 Costs\_empl\_oprev + \beta_9 Other\_costs\_oprev + \beta_{10} Leverage + \beta_{11} Liquidity + u \quad (3)$$

Model (3) excludes *Op\_p\_l*, *Av*, *Roe*, *Prof\_empl*, *Tax\_empl* and *Prof\_marg*

$$Z_i = \beta_0 + \beta_1 G\_oprev + \beta_2 Oprev\_emp + \beta_3 Cf + \beta_4 Roe + \beta_5 Roa + \beta_6 Wage\_empl + \beta_7 Prof\_marg + \beta_8 Costs\_empl\_oprev + \beta_9 Other\_costs\_oprev + \beta_{10} Leverage + \beta_{11} Liquidity + u \quad (4)$$

Model (4) excludes *Op\_p\_l*, *Av*, *Cf\_equity*, *Prof\_empl*, *Tax\_empl* and *Ebit\_marg*

$Z_i$  is here the dependent binary variable, which is one if the company is bought up by a PE firm and zero otherwise.  $\beta_0$  is the constant,  $\beta_1$  to  $\beta_{12}$  measures the coefficients and  $u$  is the disturbance term, which measures unexplained variation in the dependent variable. The effect of changes in the explanatory variables on the dependent variable cannot be read directly from  $\beta_1$  to  $\beta_{12}$ . Rather they must be calculated from the output. The method used to find these effects, called marginal effects is shown in Text-Box I in the appendix.

#### 4.2.2.3. Robustness Checks

The four models estimated include many explanatory variables. Including many explanatory variables in a model may induce higher overall explanatory power of the model, even when the explanatory variables individually do not affect the dependent variable significantly. Thus we look at several goodness-of-fit statistics; Hosmer-Lemeshow (H-L) and Andrews statistics, as well as looking at the McFadden R-square. The H-L and Andrews test compare the fitted values to the actual values, thus estimating the fit of the model to the actual data. Model one has an Andrews probability below 0.05, which indicates that this model has a

lower fit than the other models. All the other P-values are above 0.05 which indicate good model fits<sup>29</sup>. The McFadden R-square shows the explanatory power of the model, much like the ordinary R-square for OLS regressions<sup>30</sup>. The models have varying McFadden R-squares. However, excluding model one, we find them quite consistent when taking into account that model two has one more variable than model three and four. As a last robustness check we look at the parameters going from model one to four. Overall the parameters are fairly stable, with a little more variety in Cash Flow/Equity, ROA, Wage per Employee, Leverage and Liquidity. Wage per Employee also changes sign going from the two first to the two last models. This is a weak point for that variable. None of the other variables change sign across models. Overall we therefore consider the models to be quite robust. The regression outputs may be seen from Table VII in the appendix.

### **4.3. Corporate Governance and Active Involvement**

In the following we will investigate the effect of PE ownership on the portfolio company after buyout. More specifically we want to test the hypotheses related to using leverage, management ownership, and monitoring and active involvement. We use panel regressions to estimate the difference in means for the variables in the hypotheses, separating pre and post buyout periods by using a dummy variable. We investigate the three country samples separately, due to differences in price level and exchange rate, as mentioned for descriptive statistics. Before moving onto the methodology, we take a closer look at the hypotheses.

#### **4.3.1. Hypotheses**

From hypotheses H<sub>9</sub> to H<sub>15</sub> we have the expectations that leverage, profitability, productivity, efficiency and growth should all increase after the change to PE ownership. Further, the tax shield is expected to receive no effect or a small positive effect from changing ownership, while the wage level is expected to stay the same or to improve. The detailed hypotheses are shown in table 2 below, also indicating which hypothesis, FCF or underperformance and which corporate governance tool they belong to:

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<sup>29</sup> Quantitative Micro Software (1994-2004) EViews 5 User's Guide (page 615-617, 652-653)

<sup>30</sup> Quantitative Micro Software (1994-2004) EViews 5 User's Guide (page 610)

<b>Panel Hypotheses</b>				
<b>Variables</b>	<b>Proxy for</b>	<b>Hypothesis</b>	<b>Corporate Governance Tool 2)</b>	<b>Expected sign of PE-dummy</b>
Operating Revenue	Growth	Underperformance (H14)	Involvement	Positive
Number of Employees	Growth	Underperformance (H14)	Involvement	Positive
Total Assets	Growth	Underperformance (H14)	Involvement	Positive
Operating Revenue per Employee	Productivity	Underperformance (H12)	Ownership & Involvement	Positive
Operating Profit or Loss	Profitability	Underperformance (H11)	Ownership & Involvement	Positive
Cash Flow	Profitability	Underperformance (H11)	Ownership & Involvement	Positive
Added Value	Profitability	Underperformance (H11)	Ownership & Involvement	Positive
Return on Equity	Profitability	Underperformance (H11)	Ownership & Involvement	Positive
Return on Assets	Profitability	Underperformance (H11)	Ownership & Involvement	Positive
Wage per Employee	Profitability	Underperformance (H15)	Ownership & Involvement	Non-significant or positive
Corporate Tax per Employee	Profitability	Free Cash Flow (H10)	Leverage	Non-significant or small negative
Profit per Employee	Efficiency	Underperformance (H13)	Involvement	Positive
Profit Margin	Efficiency	Underperformance (H13)	Involvement	Positive
Ebit Margin	Efficiency	Underperformance (H13)	Involvement	Positive
Costs of Employees/ Operating Revenue	Efficiency	Underperformance (H13)	Involvement	Negative
(Other Costs/Operating Revenue)x100 1)	Efficiency	Underperformance (H13)	Involvement	Negative
Total Liabilities/ Total Assets	Leverage	Free Cash Flow (H9)	Leverage	Positive
<p>1) Other Costs=Operating Revenue – Operating Profit or Loss- Costs of Employees  2)Corporate governance tools to reduce agency problems and enhance value creation:  Leverage to leverage up the financial structure of the portfolio company  Ownership; to incentivize the management through management ownership  Involvement; to use monitoring &amp; active involvement</p>				

Table 2 Hypotheses for Panel Regressions

The proxies used in the above hypotheses are by large the variables presented previously, however, some are worth further comments; as proxies for growth, we investigate the change in the three size proxies; Operating Revenue, Number of Employees and Total Assets. We do not use the growth proxies here, due to the fact that by calculating growth in size the samples sizes are reduced by one observation per company. As a proxy for the tax shield we use Corporate Tax per Employee, which gives the size adjusted tax level pre and post buyout. In the analysis we also include the variable Other Costs/Operating Revenue (other costs than the cost of employees as a percentage of operating revenue) from the selection study, due to its statistical significance in two of the logit regressions.

### **4.3.2. Methodology Panel Regressions**

To investigate whether there are significant changes in the portfolio companies from the change to PE ownership, we look at the mean value of the seventeen variables connected to the above hypotheses. The method used in this part is quite similar to the method used by Kaplan (1989). He compares the pre and post buyout sample by using a test for difference in mean for non-normal data<sup>31</sup>. To account for macroeconomic changes in the period he adjusts the results for industry average. We will use panel regressions to test for differences in mean pre to post buyout. We adjust for non-normality by using logarithm, and include macroeconomic variables to control for changes in macroeconomic conditions in the period. With the panel data technique it is also possible to adjust the results for company specific factors that do not change over time, using fixed effects models. This helps ensure that the differences in geometric mean is caused by the ownership change, which is not possible to ensure with Kaplan's (1989) technique. Among the studies using panel regressions are Lerner et al. (2008) in their study of patent frequency and strength from change to PE ownership.

Panel regressions, if estimated for a pooled sample, is very similar to ordinary least squares (OLS) estimation. The only difference is that the data includes both a time-series dimension and a cross-sectional dimension. An important step in the estimation is to ensure correct reading of the sample as panel data. The three samples are defined as two-dimensional unbalanced dated panels with irregular frequency data<sup>32</sup>. The range is set to 6, by converting the time variable from t-3 to t+2 to 1-6, and cross-sections are identified by unique company identifiers. This gives samples of 30 Norwegian companies (158 observations), 72 Swedish companies (398) and 21 Danish companies (98 observations). Eviews5 software with least squares technique is used for estimating the panel regressions.

#### **4.3.2.1. Fixed versus Random Effects**

The question of whether to use a fixed effects model or a random effects model is widely discussed. Some scholars, like Baltagi (2006), advice rigorous testing to see whether assumptions for using pooled sample, fixed effects or random effects

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<sup>31</sup> Kaplan (1989) used the Wilcoxon signed rank sum test, a test comparing differences in mean for two non-normal populations. Other studies also using this method includes Nikoskelainen (2006) and Cressy et al. (2007)

<sup>32</sup> Brooks (2008:502-509)

regression are violated. Others believe that theory should suggest which model to use. While testing for fixed and random effects is perfectly possible, we believe that a theoretically based choice of model is more appropriate. If the choice is based solely on testing it is possible to end up with different models for different dependent variables, which theoretically makes little sense when the companies in each model are equal.

In our models we choose cross-sectional fixed effects, believing that there are some company-specific factors which are different for each company and do not change over time<sup>33</sup>. These factors may for instance be company culture. Company culture is known for being hard to change, thus we expect this to be relatively stable even with a change to PE ownership. Cross-sectional fixed effects allow for company-specific heterogeneity in the way that the model estimates a dummy for each firm, which measures the difference from the sample mean due to the company-specific factors. This also ensures that the constant in the models is the mean for the total sample, i.e. that it is not affected by company-specific factors<sup>34</sup>.

#### **4.3.2.2. Controlling for Macroeconomic Conditions**

The companies included in the samples have largely experienced positive macroeconomic conditions throughout the sample period. To be able to compare the companies pre to post buyout we need to control for change in the macroeconomic environment. The most important effects to control for are inflation and business cycles. As in the descriptive statistics we use yearly CPI with base year 2007 to control for inflation in the level accounting variables.

To control for business cycles in the panel regressions we include two proxies; the unemployment rate and the consumer confidence index (CCI)<sup>35</sup>. Unemployment is measured as a percentage of total employment. While higher levels of employment indicate a growth in the amount of goods and services produced and thereby the growth rate of GDP, higher unemployment indicates a decrease in GDP growth<sup>36</sup>. Thus unemployment is low in boom times and high in bust times. The CCI gives an indication to the optimism the consumers have to their own

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<sup>33</sup> Brooks (2008:506)

<sup>34</sup> For more on fixed-effects models we refer to Brooks (2008:490-494)

<sup>35</sup> The World Bank Group (2009), Roubini and Backus (1998)

<sup>36</sup> Roubini and Backus (1998)

economy and this will again be reflected on consumer spending. It is based on a survey done in the respective countries, where the respondents answer questions related to their current consumer situation and their expectations for the following six months. The CCI is expected to be high in boom times and low in bust times.

There are many macroeconomic variables which may be important proxies for business cycles<sup>37</sup>, but different proxies may affect different firms in different ways. We believe the effects of unemployment and the CCI will go in the same direction and be somewhat consistent across companies and industries. Thus we consider them adequate proxies to account for business cycle.

### 4.3.2.3. Models

The models estimated are least squares cross-sectional fixed effects models. For the variables that show high kurtosis and skewness and non-normal histograms, we use transformation by the natural logarithm. The two macroeconomic variables are approximately normally distributed. Thus we estimate two types of models; linear (5) and log-linear (6) models:

$$Y_{it} = \beta_0 + \beta_1 PE\_dummy_{it} + \beta_2 Unemployment_{it} + \beta_3 CCI_{it} + u_{it} \quad (5)$$

$$\text{Log}(Y_{it} + \text{constant}) = \beta_0 + \beta_1 PE\_dummy_{it} + \beta_2 Unemployment_{it} + \beta_3 CCI_{it} + u_{it} \quad (6)$$

Where the disturbance term  $u_{it}$  contains a fixed effect for each cross-section  $\mu_i$  and the remainder disturbance varying across time and cross-sections  $v_{it}$ .

There will be seventeen panel regressions for each of the Scandinavian countries, where the dependent variable  $Y_{it}$  will be each of the variables to be tested in the seventeen hypotheses. For non-normal dependent variables including negative observations a constant is added to allow for logarithmic transformation. The explanatory variables are the same for all models. Observations on each variable are included for cross-sections (i.e. companies)  $i$  and time periods (i.e. years)  $t$ .

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<sup>37</sup> Roubini and Backus (1998)

#### 4.3.2.4. Interpretation of Variable Mean

In all the regressions a PE dummy variable is included. The  $\beta_0$  shows the mean for the pre buyout period, and the coefficient of the PE-dummy  $\beta_1$  shows the difference in mean after change to PE ownership. In log-linear models the geometric mean is shown by the constant and dummy, while in ordinary models the arithmetic mean is estimated. This is however not an important issue for the interpretation, since  $\beta_0$  and  $\beta_1$  will always be the same within each model. What is more important is that in log-linear models, especially when there are negative observations of the dependent variable, the interpretation of the betas is not straight forward. Further, by adding a constant to the variable observations before taking logarithm gives a slight bias in the results. The constant increases  $\beta_0$  and  $\beta_1$ , while reducing  $\beta_2$  and  $\beta_3$ <sup>38</sup>. To investigate this we perform a sensitivity analysis of the results, which confirms that the inclusion of a constant in the logarithmic expression gives a slight upward bias in the difference  $(\beta_0 + \beta_1) - \beta_0$  (i.e. the difference in the geometric mean going from pre to post buyout). The higher the constant added, the higher is this upward bias. Because of this we add a constant only slightly above the smallest negative observation.

When calculating the difference in geometric mean for the log-linear models, the results are given for a fixed value of the explanatory variables, unemployment and CCI. We set these values to the median value of the variables, since these are the most common values for the time period. We choose to report both geometric and arithmetic means given these median values, to make it easier to compare differences in mean across countries where both linear and log-linear models are used. However, the geometric means will be slightly lower than the arithmetic means<sup>39</sup>. Further, we report the absolute rather than the relative difference in means, because the sensitivity analysis shows that the absolute difference is more robust to different values chosen for the business cycle proxies. The constant added to the logarithmic expression is taken out of the final results, so that the actual level of geometric mean can be seen from the results. Further notes on the calculation of means are shown in Text-Box II in the appendix.

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<sup>38</sup> Kreiberg (2009)

<sup>39</sup> Wolfram Research, Inc. (1999-2009)

### 4.3.2.5. Robustness Checks

We take several steps to ensure robust models. As mentioned above, we use logarithmic transformation for non-normal variables to ensure approximately normal distribution of the variables. Before running the models, we further ensure that the correlation between the two macroeconomic variables, unemployment and consumer confidence, do not have too high correlations. The correlations are -0.14, 0.37 and -0.615 for Norway, Sweden and Denmark respectively. Since the correlations are below +/- 0.70 we assume a low risk of multicollinearity. We notice that the correlations are negative for Norway and Denmark, while positive for Sweden. For Sweden this suggests that when unemployment increases, consumer confidence also increases. We would expect the correlations to be negative as for the other countries. Because of this difference in correlations the coefficient sign on these variables may differ across countries.

When it comes to heteroscedasticity, this might be due to differences in the size of companies in our sample or to omitted variables in explaining the dependent variable<sup>40</sup>. The differences in size will naturally be reduced for the dependent variables going through a logarithmic transformation. Also running fixed effects models reduce the risk of heteroscedasticity from omitted variables. Even so, we check the residuals of the models to find no signs of heteroscedasticity.

After running the models, we look at the Durbin-Watson statistic for signs of serial correlation. We find that several of the models show evidence of positive and negative serial correlation (DW below 1.5 and above 2.5 respectively<sup>41</sup>). The recommended solution to reduce serial correlation is to use a dynamic model, such as two-stage least squares or general method of moments (GMM), including lagged dependent variables as an explanatory variable<sup>42</sup>. GMM is for instance used in the study conducted by Harris et al. (2005). However, due to the short time period of our sample including lags of two and three years will give us many missing values and reduce the sample sizes significantly. Thus, to try to correct for serial correlation we instead use White's period coefficient covariance method

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<sup>40</sup> Brooks (2008:132-139)

<sup>41</sup> Quantitative Micro Software (1994-2004) EViews 5 User's Guide (page 478-479)

<sup>42</sup> Brooks(2008: 139-160)

to try to correct for serial correlation. This method makes the disturbances robust to arbitrary serial correlation and time-varying variances<sup>43</sup>.

Finally, we want to test for unit root in the variables, knowing that this may cause spurious regressions<sup>44</sup>. However, due to the short time series it is difficult to test this formally for our sample. We therefore only inspect the t-statistics and find that they are appropriate. According to Baltagi (2005:237, 250) unit root may be a problem in panels with long time series. Since we have a time period of maximum six years, we do not suspect unit root to be an issue in the panel regressions.

The panel regression outputs are shown in Table IX in the appendix.

## **5. Results**

In this section we present descriptive statistics for the Scandinavian samples and results from the logit and panel regressions. For the regressions we present the results for the hypotheses and leave it to the reader to look at the full result tables; the marginal effects for logit are shown in Table VIII and the differences in mean for panel is shown in Tables X, XI and XII in the appendix.

### **5.1.1. Results Descriptive Statistics**

The descriptive statistics calculated for the three country samples are shown in Table VI in the appendix. We focus on the median, 25 % and 75 % percentiles considering these most adequate in describing the total sample. Also we exclude some findings in year +2 for Norway and Denmark, believing that small sample sizes has affected these results.

Looking at the size proxies there is evidence of growth throughout the six year period, especially for Swedish companies which show increasing growth for all three proxies. While the Number of Employees increases in Norway and Sweden, the results are mixed for Denmark; with a decreasing median, while at the same time increasing percentiles post buyout. The productivity is slightly increasing for all countries. In general the profitability proxies also show an increasing trend; in

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<sup>43</sup> Eviews5 software, the help-function, search term "Pooled Estimation"

<sup>44</sup> Brooks (2008:318-335)

particular CF and Added Value show a high increase. ROE shows no significant trend for Sweden, while being quite volatile throughout the period for Norway. Denmark, however, has a positive trend in ROE after buyout. ROA on the other hand is quite stable for all three countries. The efficiency proxies are fairly stable, except for Profit per Employee which show a positive trend for both Norway and Denmark. Both leverage and liquidity are quite steady throughout the period.

### **5.1.2. Results Logit Regressions**

The marginal effects from the explanatory variables on the dependent variable and their P-values may be seen in Table VIII in the appendix. The marginal effects are quite stable across the different models as mentioned in the robustness checks earlier. The exception is Wage per Employee, but this variable is anyway not significant. Recall also that model one has an Andrews statistic showing poor goodness-of-fit for the model, thus we consider this model to give weaker results than the other models. Thus if any variable is significant for other models than model one, we report the result for this model. We do not report the constants, being that these do not give valid information to the probability of buyout.

We first look at the FCF hypotheses. There is support that higher cash flows and lower leverage increase the probability of being bought up by PE firms. There is not support that lower risk of financial distress increases the probability of being bought up by PE firms, and the results for growth in sales are insignificant. The significant results are shown below:

#### ***Cash Flow***

For every 100 000 NOK more in CF the probability of being bought up increases with 0.007 percentage points. 10 % statistical significance

### ***Cash Flow/Equity***

For every unit change in Cash Flow over book value of equity the probability of being bought up increases with 3.579 percentage points. Recall that results in model one are weaker, due to poor fit of the model. 5 % statistical significance

### ***Leverage***

For every percentage point increase in Total Liabilities/Total Assets the probability of being bought up by a PE-firm is reduced by 0.108 percentage points. 5 % statistical significance

### ***Current Ratio***

For every unit of Current Ratio increased the probability of being bought up by a PE-firm is reduced by 1.932 percentage points. 10 % statistical significance

Looking at the hypotheses for underperformance, there is overall positive results that low profitability (all variables except Operating Profit or Loss) and low operating efficiency increases the probability of being bought up by PE firms. The hypothesis on productivity is not supported due to non-significant result, and the results on cost efficiency do not support the hypothesis that low cost efficiency increases the odds of a being bought by PE firms. The marginal effects for statistical significant results are as follows:

### ***Operating Profit or Loss***

For every 100 000 NOK more in Operating Profit the probability of being bought up increases with 0.016 percentage points. 1 % statistical significance

### ***Added Value***

For every 100 000 NOK more in Added Value the probability of being bought up is reduced by 0.003 percentage points. 10 % statistical significance

### ***ROA***

For every percentage point increase in Return on Assets the probability of being bought up is reduced by 0.200 percentage points. 10 % statistical significance

### ***Corporate Tax per Employee***

For every 100 000 NOK more in Corporate Tax per Employee the probability of being bought up is reduced by 1.528 percentage points. Recall that results in model one are weaker, due to poor fit of the model. 5 % statistical significance

### ***Profit Margin***

For every percentage point increase in Profit Margin the probability of being bought up is reduced by 0.179 percentage points. 5 % statistical significance

### ***Ebit Margin***

For every percentage point increase in Ebit Margin the probability of being bought up is reduced by 0.158 percentage points. 10 % statistical significance

### ***Other Costs/Operating Revenue***

For every percentage point increase in Other Costs/Operating Revenue the probability of being bought is reduced by 0.255 percentage points. 10 % statistical significance

## **5.1.3. Results Panel Regressions**

Tables X, XI and XII in the appendix show the variable means pre and post buyout, the difference between them and the corresponding P-values for the three countries. The tables also indicate whether the variable mean is arithmetic or geometric. We do not report the type of mean for the results below, since we are most interested in the difference in mean. In the following we will report the results that are statistically significant for the three countries.

Looking at Norway, we do not find support for the FCF hypothesis. There is a significant positive increase in Corporate Tax per Employee, which is the opposite of the expected sign ( $H_{10}$ ). This result actually is in favor of the underperformance hypothesis of higher profitability. The leverage hypothesis ( $H_9$ ) gives insignificant results, although the difference is positive. The results show more support for the underperformance hypothesis; the results indicate that profitability increases ( $H_{11}$ ), while the wage level ( $H_{15}$ ) will not change significantly from change to PE ownership. The results for the other underperformance hypotheses (predicting higher productivity, efficiency and growth) show the expected signs but are

insignificant. We note here that the result of the panel regression is overall consistent with the descriptive statistics for the Norwegian sample. The variables with significant results are as follows:

***Operating Profit or Loss***

The mean increases by 38 954 000 NOK from a change to PE ownership. 10 % statistical significance

***Added Value***

The mean increases by 32 261 000 NOK from a change to PE ownership. 5 % statistical significance

***ROA***

The mean increases by 15.56 percentage point from a change to PE ownership. 5% statistical significance

***Corporate Tax per Employee***

The mean increases by 130 545 NOK from a change to PE ownership. 5 % statistical significance

***Wage per Employee***

The result on Wage per Employee is non-significant, with a positive sign on the difference in the mean. This is seen as significant results supporting no significant difference in wage level from change to PE ownership.

We also note that CF show an increase in mean of 22 439 000 NOK with a P-value of 0.145.

The results for Sweden show some support for the underperformance hypothesis, with positive increase in size (proxy for growth), productivity and efficiency (H<sub>14</sub>, H<sub>12</sub> and H<sub>13</sub>). There are also weak results of higher profitability (H<sub>11</sub>) by positive difference for Operating Profit, with statistical significance level of 10.5%. Hypothesis fifteen is supported also for Sweden, showing no significant difference in wage per employee. The FCF hypothesis is not supported, giving results similar to Norway; significant increase in tax per employee and non-

significant results in leverage ( $H_{10}$  and  $H_9$ ). Further, the difference in geometric means for Norway and Sweden go in the same direction for twelve of the seventeen variables tested. Also for Sweden the indications by the descriptive statistics is mostly consistent with the panel results. The differences in means for variables with significant results are as follows:

***Total Assets***

The mean increases by 74 659 000 SEK from a change to PE ownership. 5 % statistical significance

***Operating Revenue per Employee***

The mean increases by 203 134 SEK from a change to PE ownership. 10 % statistical significance

***Corporate Tax per Employee***

The mean increases by 185 871 SEK from a change to PE ownership. 10 % statistical significance

***Profit per Employee***

The mean increases by 1 439 638 SEK from a change to PE ownership. 5 % statistical significance

***Wage per Employee***

The result on Wage per Employee is non-significant, with a positive sign on the difference in the mean, which supporting hypothesis fifteen.

We also note that Operating Profit or Loss show an increase in mean of 11 615 000 SEK, with a P-value of 0.105.

The results for Denmark show signs of poorer profitability ( $H_{11}$ ) after change to PE ownership, not supporting the underperformance hypothesis. The Tax per Employee is reduced after the buyout, but rather than seeing this as supporting evidence of the FCF hypothesis, this is likely to be a direct effect of the negative difference in profitability. The non-significant results for Wage per Employee show support for hypothesis fifteen that the change to PE ownership does not

worsen the gain to employees. Looking at the differences in mean for all variables, the results show signs of poorer performance post buyout for the Danish companies. These results are not consistent with the two other countries; with only five differences with equal sign as Norway, and eight differences with equal sign as Sweden. The descriptive statistics are not very consistent with the panel results. The statistical significant results are shown below:

### ***ROA***

The mean is reduced by 14.84 percentage point from a change to PE ownership. 10 % statistical significance

### ***Corporate Tax per Employee***

The mean is reduced by 47 869 DKK from a change to PE ownership. 10 % statistical significance

### ***Wage per Employee***

The result on Wage per Employee is non-significant, with a positive sign on the difference in the mean, which supporting hypothesis fifteen.

We also note that ROE show a decrease of 68.73 percentage points in mean, with a P-value of 0.111.

## **6. Discussion**

We first assess the results for the FCF hypothesis. The results of the selection study supports the statement that higher CFs do indeed increase the probability of being bought up by a PE firm. Lower leverage is also found to increase this probability. Moving on to the post buyout period, the findings show that leverage does not increase significantly post buyout. Further, Reiersen (2008) finds evidence against the FCF hypothesis in his study of Scandinavian PTPs. Instead he finds evidence of the underperformance hypothesis. This may imply that the FCF hypothesis is not adequate for understanding the selection of target companies, private and public, for the late 1990s and 2000s. This explanation is supported by Nikoskelainen (2006). Moreover, this does not mean that leverage is

not an effective corporate governance tool, simply that PE firms are not the first owners to introduce this tool in the portfolio companies.

In light of the post buyout results, how do we then explain the results for the Norwegian companies, that PE firms select target companies with lower leverage? One possible explanation is that PE firms prefer target companies with higher cash flows and lower leverage. This gives an opportunity for making extra profits by changing the capital structure. Indeed the results for Norway show that the mean leverage increases with 0.21 (not significant results) post buyout. By leveraging up the company the ROE should increase, which is also true for the Norwegian companies (again not significant results). For Sweden and Denmark neither leverage nor ROE increase, which may be a result of previous owners having already leveraged the company to its limits. Sweden shows high consistency in results to Norway, while not showing the same features in leverage and ROE. We ask ourselves whether this may be explained by the fact that Sweden's PE industry is more mature, making such low leveraged companies hard to come by. Further, while the results show profitability improvements in Norwegian portfolio companies, PE firms in Swedish companies seem to focus on growth, productivity and efficiency. We also suggest that this may be due to a more mature (less mature) PE industry in Sweden (Norway).

At this point we want to comment on the inconsistency in results of the Danish sample compared to Norway and Sweden. The results for the Danish sample include decreasing profitability, productivity and efficiency (except profit per employee) post buyout. Looking at the descriptive statistics we see that many variables experience a decrease in value for year -1 and poor levels in year 0 and +1. We wonder whether this may be a result of a different focus by PE firms in Danish companies. For instance a focus on expansion may lead to massive investments, explaining low profitability and higher total assets in the years following the buyout. However, we cannot provide any certain explanation for this, without detailed knowledge on each company in the sample.

We now move on to the underperformance hypothesis. The selection study overall shows supporting evidence that lower profitability and operating efficiency increases the odds of being bought up by PE firms. It is worth noting here that

Operating Profit and CF do not support the evidence of lower profitability. Moving to post buyout results for Norway, we note some interesting results; lower Added Value, ROA and Corporate Tax per Employee increase the probability of a company being targeted by PE firms. At the same time these same variables also show significant increase after buyout. We consider this to be strong evidence in favor of the underperformance hypothesis. This makes us inclined to consider the underperformance hypothesis more adequate in explaining the selection of target portfolio companies in later years than the FCF hypothesis. Also the evidence post buyout supports the notion that corporate governance tools like management ownership and monitoring, and active involvement do indeed have a positive effect on the performance in the portfolio companies.

The results also show evidence of gain to the different stakeholders of the portfolio companies. This is especially true for the Norwegian sample; Added Value, ROA and Tax per Employee all show significant increases post buyout. Further, Wage per Employee does not show any sign of decrease. The Swedish sample show similar results for Wage per Employee and Tax per Employee, while Denmark is only equal to Norway for Wage per Employee. However, the Danish companies show a decrease also in ROE, which supports the notion that PE firms do not increase their gains at the cost of the employees and other stakeholders. Overall we consider this strong evidence that PE firms do not transfer value from other stakeholders of the company to themselves, but rather that they contribute to the value creation to society. We believe that these results help justify today's state investments in the Norwegian PE industry, and that it may encourage an increased focus on and support of the growing PE industry in Norway.

A question still remains; what does it mean that both higher Operating Profits and CFs increase the probability of being bought up by PE firms? To try to answer this question, we turn to the Swedish Venture Capital Association (SVCA). According to SVCA (2009) the main focus of PE firms when identifying buyout candidates is finding target companies with a strong market position, competent management team and strong cash flows, but at the same time there should be a potential for profit improvements. This statement seems to be quite fitting in explaining the results for the Norwegian sample. In this manner PE firms might indeed look for target companies with higher cash flows and lower leverage, to be

able to get higher returns by changing the capital structure of the company. At the same time they might also look for companies with lower profitability and operating efficiency, to realize potential gains from operating improvements.

## **7. Limitations**

In a study there will always be limitations and room for improvements. In the following we have tried to list what we believe are some of the most important limitations of this study.

The first limitation concerns our sample. As mentioned in the section on sample data, about half of the sample consists of unconsolidated accounts for companies with subsidiaries. This may bias the results. We do not know how large this bias is nor which direction it goes. It may also be different for the three Scandinavian samples. This may affect the study results, and is thus a weakness of our sample.

The second limitation is that the samples are not large enough to be divided into different industries. We consider this a limitation for the investigation of changes in performance pre to post buyout. Being able to divide the sample into industries gives much more detailed results, and makes it possible to compare these results with industry averages. Having to use the total country samples we cannot compare this to any benchmarks, thus the analysis is reduced to looking at the changes pre to post buyout inside the portfolio companies. The analysis does correct for business cycles and fixed effects, like corporate culture. However, being able to also correct the results for industry averages would add to the validity of the results.

The third, and final limitation, does also concern the post buyout study. The results of this study give evidence in support of using the corporate governance tools of ownership and monitoring, and also of using active involvement to contribute and share knowledge. However, these two effects; corporate governance and active involvement cannot be separated. Thus, a clear improvement would be to separate these effects by doing further analysis. This can for instance be done by further quantitative analysis on the extent of

management ownership or through qualitative research such as surveying PE firms.

## **8. Future Research**

Having worked from start to end on this study there are two paths for future research we find particularly interesting. The first path concerns the differences between Norway and Sweden. The results of this study indicate that there are differences in the focus of PE firms in Norwegian and Swedish portfolio companies. We attribute these differences to the Norwegian industry being younger and the Swedish industry being more mature. It would be interesting to take a closer look at these differences; to investigate which differences are due to industry life cycle, and which are due to other factors like which industries are most prominent in the two countries.

The second path concerns the difference in selection in PTP and private-to-private transactions. It is not evident which factors concerns the PE firms when they choose listed companies versus unlisted companies. To our knowledge, there have not been done any studies on this specific topic. Do the PE firms look for the same characteristics, or is the focus different for the two types of companies. Further, after the buyout, do they use the different corporate governance tools and do they have the different objectives with the buyout? These are questions just waiting to be answered. However, for our part the journey ends here.

## **9. Concluding Remarks**

This empirical study was undertaken to investigate whether PE firms actively select their portfolio companies, and whether the change to PE ownership has a positive effect on the value creation in the portfolio companies. For both of these areas we test two main hypotheses; Jensen's (1986) FCF hypothesis and the underperformance hypothesis, among others based on research by Jensen and Meckling (1976) and Fox and Marcus (1992). Our findings suggest that the FCF hypothesis is neither adequate in explaining the selection nor the value creation in target companies in the late 1990s and 2000s. Rather the hypothesis that PE firms select underperforming companies is supported. We also find strong evidence

that PE firms have a positive effect on value creation in Norwegian and Swedish portfolio companies. This further supports the underperformance hypothesis. Indications also show that there may be differences in focus of PE firms in Norway and Sweden. We propose that different industry life cycles may explain this. Finally the investigation shows that the value creation, especially in Norwegian portfolio companies is not at the cost of others stakeholders. This supports the notion that PE firms create value to society as a whole. We consider this an important evidence to help justify the high state investments in the Norwegian PE industry.

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## 11. Appendix

**Table I** *Creation of Sample*

This table shows how many deals were initially identified and how the sample size got reduced in the process of gathering accounting data and by removing the financial companies. Financial companies are removed because their business structure is quite different from the rest of the sample.

<b>Creation of sample</b>				
<b>Countries</b>	<b>Norway</b>	<b>Sweden</b>	<b>Denmark</b>	<b>Sum</b>
<b>Deals identified</b>				
<i>Merger Market</i>	49	157	69	275
<i>Zephyr</i>	49	144	89	282
<i>Duplicate deals</i>	20	75	32	127
<i>Sum</i>	78	226	126	430
<b>Deals found accounting data for</b>				
<i>CCGR</i>	31	-	-	31
<i>Amadeus</i>	-	75	22	97
<i>Sum</i>	31	75	22	128
<b>Filtering out financial companies</b> (NAICS codes 65, 66, 67, and financial companies in 74 and 93)				
<i>Financial companies</i>	0	1	1	2
<b>Sample size</b>	<b>31</b>	<b>74</b>	<b>21</b>	<b>126</b>

**Table II NAICS 2-digit industries included in the country samples**

This table shows how the final sample is distributed among industries based on a NAICS 2-digit industry code. (Industry overview taken from Berzins, Bøhren and Rydland, 2008: Appendix 4.A2)

<b>Sample industries</b>					
<b>NAICS</b>		<b>Norway</b>	<b>Sweden</b>	<b>Denmark</b>	<b>Sum</b>
<b>Code</b>	<b>Name</b>				
<b>15</b>	Food products and beverages	1	1	1	3
<b>21</b>	Pulp, paper and paper products	-	3	-	3
<b>22</b>	Publishing, printing, reproduction	-	1	1	2
<b>24</b>	Chemicals and chemical products	3	5	-	8
<b>25</b>	Rubber and plastic products	-	1	-	1
<b>27</b>	Basic metals	1	1	-	2
<b>28</b>	Fabricated metal products	-	2	2	4
<b>29</b>	Machinery and equipment n.e.c.	1	8	5	14
<b>30</b>	Office machinery and computers	-	2	1	3
<b>31</b>	Electrical machinery and apparatus	3	4	-	7
<b>33</b>	Instruments, watches and clocks	-	4	-	4
<b>34</b>	Motor vehicles, trailers, semi-tr.	2	3	-	5
<b>35</b>	Other transport equipment	1	-	-	1
<b>36</b>	Furniture, manufacturing n.e.c.	1	-	1	2
<b>45</b>	Construction	1	1	-	2
<b>51</b>	Wholesale trade, commission trade	5	14	2	21
<b>52</b>	Retail trade, repair personal goods	2	3	3	8
<b>55</b>	Hotels and restaurants	-	1	-	1
<b>60</b>	Land transport, pipeline transport	-	2	-	2
<b>63</b>	Supporting transport activities	1	1	1	3
<b>64</b>	Post and telecommunications	2	3	-	5
<b>71</b>	Renting of machinery and equipment	-	2	-	2
<b>72</b>	Computers and related activities	3	2	2	7
<b>74</b>	Other business activities	4	4	2	9
<b>85</b>	Health and social work	-	2	-	2
<b>92</b>	Cultural and sporting activities	-	1	-	1
<b>93</b>	Other service activities	-	3	-	3
<b>Sum</b>	-	31	74	21	126
<i>n.e.c.= not elsewhere classified</i>					

**Table III Sample Bias**

This table shows how a how many companies we do not have consolidated accounts for and how many companies that are registered as parents. When we are using unconsolidated account we must be aware that may not se the whole picture, since parts of the value creation might be conducted in subsidiaries.

<b>Accounting data bias in sample</b>				
<b>Countries</b>	<b>Norway</b>	<b>Sweden</b>	<b>Denmark</b>	<b>Sum</b>
<b>Companies with unconsolidated data</b>				
<i>Without subsidiaries</i>	21	18	6	45
<i>With subsidiaries</i>	10	46	8	64
<b>Companies with consolidated data</b>				
<i>Number of companies</i>	-	10	7	17
<i>Total sample</i>	31	74	21	126
<b>Fraction of sample with possible bias do to unconsolidated data</b>				
<i>Unconsolidated with subsidiaries/total sample</i>	0,32	0,62	0,38	0,51

**Table IV Descriptives of the variables used in the analyses**

The table provides a description of the used variables names, measurement unit and origin from the two databases, Amadeus and CCGR, or if constructed, how this where done.

<b>Definition of Variables</b>			
<b>Name</b>	<b>Unit</b>	<b>Definition in Amadeus</b>	<b>Replication in CCGR</b>
<b>Proxies for size</b>			
Operating Revenue	NOK, SEK, DKK	Operating Revenue (Turnover)	11 Sum Operating Income
Number of employees	Number	Number of Employees	113 Number of Employees
Total Assets	NOK, SEK, DKK	Shareholders funds+ Non-current liabilities + current liabilities	87 Equity+ 101 Liabilities to Credit Institutions + 109 Current Liabilities
<b>Proxies for growth</b>			
Operating Revenue	%	$\frac{\text{Operating Revenue}(t+1) - \text{Operating Revenue}(t)}{\text{Operating Revenue}(t)} \times 100$	$\frac{11 \text{ Sum Operating Income}(t+1) - 11 \text{ Sum Operating Income}(t)}{11 \text{ Sum Operating Income}(t)} \times 100$
Number of employees	%	$\frac{\text{Number of Employees}(t+1) - \text{Number of Employees}(t)}{\text{Number of Employees}(t)} \times 100$	$\frac{113 \text{ Number of Employees}(t+1) - 113 \text{ Number of Employees}(t)}{113 \text{ Number of Employees}(t)} \times 100$
<b>Proxies for productivity</b>			
Operating Revenue per Employee	NOK, SEK, DKK	Operating Revenue/ Number of Employees	11 Sum Operating Income/ 113 Number of Employees
<b>Proxies for profitability</b>			
Operating Profit or Loss	NOK, SEK, DKK	Operating Profit or Loss	19 Operating Profits
EBIT 1)	NOK, SEK, DKK	Operating Profit or Loss	33 Operating Profit Before Tax - 23 Interest Received From Other Group Companies - 24 Other Interest Received + 29 Interest Paid to Other Group companies + 30 Other Interest Paid
Cash Flow 2)	NOK, SEK, DKK	Profit or Loss for period + Depreciation – Taxation – Interest Paid	39 Net Profits + 15 Depreciation of Fixed Assets and Intangible Assets - 34 Tax on Ordinary Profits - 29 Interest Paid to Other Group Companies - 30 Other Interest Paid
Added Value 3) (Value creation to all stakeholders)	NOK, SEK, DKK	CF+ Costs of Employees+ Interest Paid+ Taxation	“CF”+ 14 Payroll Expense+ 34 Tax on Ordinary Profits+ 29 Interest Paid to Other Group Companies+ 30 Other Interest Paid
<p>1) Due to its similarities with Operating Profit or Loss, Ebit is not used in other estimations then the descriptive statistics.</p> <p>2) In their study Lehn and Poulsen (1989) define free cash flow = Operating income before depreciation– total income taxes- gross interest expense on short- and long-term liabilities - total amount of preferred dividend requirement on cumulative preferred stock and dividends paid on noncumulative preferred stock total dollar amount of dividends declared on common stock. Since we do not have any data on dividend, we do not include this in our definition.</p> <p>3) Grünfeld and Jakobsen (2006) investigate added value as one of three measures in their study of ownership in Norway. Added value reflects the value creation to all stakeholders; shareholders, employees, other capital providers and the state.</p>			

<b>Definition of Variables (cont.)</b>			
<b>Name</b>	<b>Unit</b>	<b>Definition in Amadeus</b>	<b>Replication in CCGR</b>
<b>Proxies for profitability</b>			
ROE (Value creation to shareholders)	%	(Operating Profit or Loss+ Financial Revenues – Financial Expenses/ Shareholders funds)x 100	(19 Operating Profits+ 25 Other Financial Income– 31 Other Financial Expenses/ 87 Equity)x 100
ROA (Value creation to all capital providers)	%	(Operating Profit or Loss+ Financial Revenues – Financial Expenses/ “Total Assets”)x 100	(19 Operating Profits+ 25 Other Financial Income– 31 Other Financial Expenses/ “Total Assets”)x 100
Wage per Employee (Mean value creation to employees)	NOK, SEK, DKK	Costs of employees/Number of Employees	14 Payroll Expense/113 Number of Employees
Corporate Tax per Employee (Size adjusted value creation to the government)	NOK, SEK, DKK	Taxation/Number of Employees	34 Tax on Ordinary Profits/113 Number of Employees
<b>Proxies for efficiency</b>			
Profit per Employee	NOK, SEK, DKK	Profit or Loss Before Tax/ Number of Employees	33 Operating Profit Before Tax/ 113 Number of Employees
Profit Margin	%	(Profit or Loss Before Tax/Operating Revenue) x100	(33 Operating Profit Before Tax/ 11 Sum Operating Income) x100
EBIT Margin	%	(EBIT/Operating Revenue) x100	(“EBIT”/ 11 Sum Operating Income) x100
Cost of Employees/Operating Revenue	%	(Costs of employees/Operating Revenue) x100	(14 Payroll Expense/11 Sum Operating Income) x100
<b>Proxy for leverage</b>			
Total Liabilities/Total Assets	Ratio	Non-current liabilities + current liabilities/ “Total Assets ”	101 Liabilities to Credit Institutions + 109 Current Liabilities/“Total Assets ”
<b>Proxy for Liquidity</b>			
Current Ratio	Ratio	Current Assets/Current Liabilities	78 Current Assets/ 109 Current Liabilities

**Table V Correlation Matrix for Variables in Logistic Regressions**

The correlation matrix shows the correlation among the explanatory variables used in logistic regression. The correlations with an absolute value higher than 0.7 are highlighted, since those might give us a problem of multicollinearity.

Correlation Matrix for Logistic Regressions																	
	GROWTH OPERATING REVENUE	OPERATING REVENUE	OPERATING P/L	Cash Flow	CASH FLOW/EQUITY	ADDED VALUE	ROE	ROA	WAGE PER EMPLOYEE	TAX PER EMPLOYEE	PROFIT PER EMPLOYEE	PROFIT MARGIN	EBIT MARGIN	COSTS OF EMPLOYEES/ OPERATING REVENUE	OTHER COSTS*/ OPERATING REVENUE	TOTAL LIABILITIES/ TOTAL ASSETS	CURRENT RATIO
GROWTH OPERATING REVENUE	1																
OPERATING REVENUE	0,34	1															
OPERATING P/L	0,15	-0,01	1														
Cash Flow	0,17	0,05	<b>0,73</b>	1													
CASH FLOW/EQUITY	0,12	-0,02	0,38	0,34	1												
ADDED VALUE	0,14	-0,11	0,58	<b>0,75</b>	0,25	1											
ROE	0,11	0,01	0,41	0,25	<b>0,91</b>	0,15	1										
ROA	0,06	0,14	0,26	0,22	0,05	0,16	0,03	1									
WAGE PER EMPLOYEE	0,03	0,46	-0,04	0,12	0,14	0,07	0,18	0,03	1								
TAX PER EMPLOYEE	0,05	0,05	0,19	0,34	0,31	0,24	0,34	0,27	0,39	1							
PROFIT PER EMPLOYEE	0,04	0,14	0,18	0,42	0,28	0,26	0,30	0,33	0,42	<b>0,93</b>	1						
PROFIT MARGIN	0,01	0,05	0,22	0,48	0,07	0,33	0,06	0,67	0,19	<b>0,72</b>	<b>0,82</b>	1					
EBIT MARGIN	0,00	0,04	0,22	0,47	0,07	0,32	0,05	0,66	0,17	<b>0,71</b>	<b>0,80</b>	<b>0,99</b>	1				
COSTS OF EMPLOYEES/OPERATING REVENUE	-0,09	-0,43	0,00	0,03	0,27	0,14	0,33	-0,65	0,13	0,06	-0,01	-0,34	-0,35	1			
OTHER COSTS*/OPERATING REVENUE	0,06	0,37	-0,29	-0,23	-0,37	-0,30	-0,42	-0,26	-0,17	-0,63	-0,53	-0,45	-0,47	-0,42	1		
TOTAL LIABILITIES/TOTAL ASSETS	0,00	-0,19	0,02	-0,20	0,21	-0,13	0,17	-0,20	-0,07	0,07	-0,01	-0,15	-0,14	0,32	-0,20	1	
CURRENT RATIO	0,06	0,11	0,01	0,18	-0,11	0,08	-0,07	0,07	0,01	0,01	0,04	0,04	0,02	-0,02	0,00	-0,32	1

\* Other costs = ((Operating Revenue- Operating Profit or Loss-Costs of Employees)/Operating Revenue)x100

**Table VI Descriptives Statistics for the Three Scandinavian Samples**

This table shows the descriptive statistics of the PE companies divided in to the three respective countries. All variables given in currency are adjusted for CPI, with base year 2007. Units are stated in parenthesis after the variable.

<b>Descriptive Statistics</b>																			
Proxies for Size																			
<b>Operating Revenue (Turnover)(in 1000s)</b>																			
	Norway						Sweden						Denmark						
Year	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	
<b>Sample size</b>	28	31	31	31	30	13	60	68	65	65	71	53	6	16	15	16	17	6	
<b>mean</b>	261 571	259 045	284 348	338 993	415 482	396 007	513 386	536 116	489 629	424 788	586 252	714 632	444 949	594 253	609 193	656 701	724 134	942 366	
<b>median</b>	132 803	166 118	201 074	270 078	315 069	305 584	173 068	182 178	182 655	194 737	222 118	308 072	238 960	301 407	286 316	354 339	379 315	363 379	
<b>Standard deviation</b>	376 347	328 865	350 045	399 196	454 787	391 028	888 048	929 274	936 978	573 497	932 956	1 051 342	392 092	699 834	778 171	794 295	912 399	1 161 780	
<b>minimum</b>	0	0	0	93	1 065	426	182	824	48	727	114	59	108 126	152 789	142 037	105 049	8 300	238 119	
<b>maximum</b>	1 621 984	1 346 814	1 443 778	1 604 191	1 832 902	1 457 567	5 409 847	5 995 283	6 385 917	2 816 535	5 416 384	5 538 475	963 979	2 855 859	3 110 905	3 252 973	3 311 778	3 194 375	
<b>25% percentile</b>	51 829	64 869	79 197	48 166	87 017	112 151	57 135	70 078	77 468	88 331	88 421	143 933	193 183	194 118	234 275	245 680	250 342	290 979	
<b>75% percentile</b>	278 155	291 731	309 320	378 775	488 348	434 501	556 420	585 125	508 794	545 653	735 732	784 818	766 048	760 612	605 960	755 055	726 010	1 011 920	
<b>Number of Employees</b>																			
	Norway						Sweden						Denmark						
Year	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	
<b>Sample size</b>	28	31	31	31	30	13	59	69	65	65	70	54	9	20	20	21	21	6	
<b>mean</b>	215	179	160	195	190	190	364	334	350	258	344	379	172	380	371	353	375	440	
<b>median</b>	85	64	64	95	121	143	63	74	79	77	86	114	86	147	142	127	122	99	
<b>Standard deviation</b>	411	296	210	253	241	232	938	822	792	666	897	1 010	196	592	601	538	579	613	
<b>minimum</b>	1	1	1	1	3	3	2	1	2	2	3	4	15	11	12	11	10	73	
<b>maximum</b>	2 166	1 565	980	930	973	854	4 985	4 736	4 353	4 928	6 249	6 580	551	2 397	2 360	1 906	2 258	1 593	
<b>25% percentile</b>	28	29	28	28	31	34	22	24	25	32	32	53	75	80	80	84	87	93	
<b>75% percentile</b>	287	259	263	238	240	224	261	261	219	216	251	283	125	430	387	388	466	537	
<b>Total Assets(in 1000s)</b>																			
	Norway						Sweden						Denmark						
Year	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	
<b>Sample size</b>	28	31	31	31	30	13	60	68	68	67	70	57	9	21	20	21	21	6	
<b>mean</b>	197 190	202 924	220 758	266 957	375 191	512 004	899 800	923 545	748 183	1 000 020	1 093 129	1 323 575	360 227	368 772	349 963	416 685	471 989	529 468	
<b>median</b>	99 312	151 362	173 667	213 841	307 808	294 121	198 759	180 608	187 027	219 816	295 030	441 344	191 592	178 909	180 146	162 987	178 779	318 560	
<b>Standard deviation</b>	282 051	262 659	239 300	263 678	362 381	786 699	1 956 856	2 242 302	1 355 479	2 541 580	2 581 668	2 940 065	446 049	393 446	377 023	513 720	584 280	508 450	
<b>minimum</b>	-552	-3 352	-3 020	-9 732	-941	5 595	421	797	18 754	6 550	7 629	8 340	8 567	8 741	13 168	14 035	7 384	65 319	
<b>maximum</b>	1 367 855	1 331 395	1 191 674	1 226 754	1 467 834	2 952 295	11 977 860	15 372 277	6 546 818	19 294 435	19 807 810	20 306 699	1 373 405	1 244 387	1 374 389	1 958 075	2 255 768	1 182 470	
<b>25% percentile</b>	49 696	48 971	97 002	81 575	155 771	49 094	66 517	67 503	58 785	70 892	107 992	126 967	72 734	105 627	92 496	91 392	99 108	155 815	
<b>75% percentile</b>	245 315	253 004	265 280	333 667	449 188	568 974	667 078	615 862	729 899	745 275	893 254	1 322 000	429 253	444 388	474 290	548 512	629 386	972 387	
<b>Proxies for Growth</b>																			
<b>Growth in operating revenue (%)</b>																			
	Norway						Sweden						Denmark						
Year	-3 to -2	-2 to -1	-1 to 0	0 to 1	1 to 2	2	-3 to -2	-2 to -1	-1 to 0	0 to 1	1 to 2	2	-3 to -2	-2 to -1	-1 to 0	0 to 1	1 to 2	2	
<b>mean</b>	-1	10	19	23	-5	-	4	-9	-13	38	22	-	34	3	8	10	30	-	
<b>median</b>	25	21	34	17	-3	-	5	0	7	14	39	-	26	-5	24	7	-4	-	
<b>25% percentile</b>	25	22	-39	81	29	-	23	11	14	0	63	-	0	21	5	2	16	-	
<b>75% percentile</b>	5	6	22	29	-11	-	5	-13	7	35	7	-	-1	-20	25	-4	39	-	

### Descriptive Statistics (cont.)

Growth in number of Employees(%)																		
Year	Norway						Sweden						Denmark					
	-3 to -2	-2 to -1	-1 to 0	0 to 1	1 to 2	2	-3 to -2	-2 to -1	-1 to 0	0 to 1	1 to 2	2	-3 to -2	-2 to -1	-1 to 0	0 to 1	1 to 2	2
mean	-17	-10	22	-3	0	2	-8	5	-26	33	10	2	121	-2	-5	6	17	-
median	-25	0	48	27	19	-	17	7	-3	11	33	-	71	-3	-11	-4	-19	-
25% percentile	2	-2	0	12	9	-	9	4	28	1	65	-	7	0	5	4	7	-
75% percentile	-10	2	-10	1	-6	-	0	-16	-1	16	13	-	244	-10	0	20	15	-
Growth in Total Assets(%)																		
Year	Norway						Sweden						Denmark					
	-3 to -2	-2 to -1	-1 to 0	0 to 1	1 to 2	2	-3 to -2	-2 to -1	-1 to 0	0 to 1	1 to 2	2	-3 to -2	-2 to -1	-1 to 0	0 to 1	1 to 2	2
mean	3	9	21	41	36	-	3	-19	34	9	21	-	2	-5	19	13	12	-
median	52	15	23	44	-4	-	-9	4	18	34	50	-	-7	1	-10	10	78	-
25% percentile	-1	98	-16	91	-68	-	1	-13	21	52	18	-	45	-12	-1	8	57	-
75% percentile	3	5	26	35	27	-	-8	19	2	20	48	-	4	7	16	15	54	-
Proxy for Productivity																		
Operating Revenue per Employee(in 1000s)																		
Year	Norway						Sweden						Denmark					
	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2
Sample size	28	31	31	31	30	13	58	66	63	64	69	51	6	15	15	16	17	6
mean	2 483	3 057	2 686	4 323	4 071	4 917	22 198	15 815	6 550	3 944	4 518	4 685	1 941	1 574	1 613	1 787	1 949	3 025
median	1 519	1 572	1 862	1 892	2 237	2 183	1 694	1 769	1 858	1 783	1 934	2 177	2 170	1 411	1 403	1 560	1 890	2 647
Standard deviation	4 013	5 350	2 577	7 534	4 192	7 184	135 120	100 005	26 491	6 773	7 467	7 515	591	586	656	663	814	1 426
minimum	0	0	0	6	25	10	260	395	7	73	8	643	865	822	850	876	830	1 775
maximum	20 391	29 058	9 957	32 511	15 899	27 584	1 031 239	814 547	210 167	42 392	38 992	33 794	2 456	2 572	2 782	3 051	3 870	5 689
25% percentile	744	785	992	1 001	1 320	1 364	1 177	1 090	1 290	1 215	1 279	1 370	1 778	1 179	1 186	1 321	1 290	2 124
75% percentile	2 345	2 833	3 330	3 381	4 588	5 274	3 399	2 940	2 939	3 101	3 374	3 415	2 297	2 147	2 012	2 223	2 402	3 243
Proxies for Profitability																		
Operating Profit or Loss(in 1000s)																		
Year	Norway						Sweden						Denmark					
	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2
Sample size	28	31	31	31	30	13	63	72	69	68	73	58	9	21	20	21	21	6
mean	15 158	20 683	18 896	32 816	53 341	68 113	28 547	34 053	11 810	23 036	49 872	59 708	36 615	37 009	68 533	35 288	68 859	69 693
median	7 902	7 840	9 627	13 056	12 039	18 252	10 047	11 036	9 554	8 100	17 479	15 611	9 822	11 572	14 698	13 740	17 570	56 080
Standard deviation	81 388	65 180	77 432	110 036	141 944	202 215	147 527	116 856	55 699	131 291	134 038	152 734	116 619	83 425	214 141	72 141	116 589	69 845
minimum	-114 492	-21 433	-97 412	-68 317	-75 172	-196 433	-516 429	-158 160	-193 040	-373 058	-108 659	-121 188	-55 226	-54 419	-33 048	-62 105	-34 067	-12 238
maximum	408 827	357 990	411 009	569 901	704 792	651 132	931 960	876 207	220 112	921 574	965 309	903 000	341 017	347 400	963 269	239 356	382 505	169 755
25% percentile	109	-1 965	-542	-7 151	-1 994	-85	-3 021	-19	-4 099	-9 668	-5 961	-4 836	2 695	2 991	3 540	-4 940	4 472	23 068
75% percentile	13 691	24 251	22 835	27 673	42 029	24 690	33 322	32 982	30 686	39 857	49 884	60 941	11 800	20 222	35 058	28 919	54 133	116 332
EBIT(in 1000s)																		
Year	Norway						Sweden						Denmark					
	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2
Sample size	28	31	31	31	30	13	63	72	69	68	73	58	9	21	20	21	21	6
mean	11 486	21 941	22 762	43 567	91 447	66 058	28 405	34 040	11 781	23 145	49 881	59 853	36 615	37 009	68 533	35 288	68 859	69 693
median	4 970	7 770	12 285	19 973	22 032	12 876	10 047	10 724	10 423	8 100	17 479	15 611	9 822	11 572	14 698	13 740	17 570	56 080
Standard deviation	65 882	70 711	71 495	110 529	196 079	215 288	147 539	116 859	55 697	131 271	134 035	152 678	116 619	83 425	214 141	72 141	116 589	69 845
minimum	-119 470	-22 913	-98 205	-64 287	-64 515	-258 748	-516 429	-158 160	-193 040	-373 058	-108 659	-121 188	-55 226	-54 419	-33 048	-62 105	-34 067	-12 238
maximum	318 501	386 337	363 575	567 213	793 111	675 421	931 960	876 207	220 112	921 574	965 309	903 000	341 017	347 400	963 269	239 356	382 505	169 755
25% percentile	-682	-2 850	1 210	-289	4 435	-187	-3 021	-19	-4 099	-9 668	-5 961	-4 836	2 695	2 991	3 540	-4 940	4 472	23 068
75% percentile	13 745	20 714	29 906	36 494	82 854	44 350	33 326	32 982	30 686	39 857	49 884	60 941	11 800	20 222	35 058	28 919	54 133	116 332

**Descriptive Statistics (cont.)**

<b>Cash Flow(in 1000s)</b>																			
Year	Norway							Sweden							Denmark				
	-3	-2	-1	0	1	2	3	-3	-2	-1	0	1	2	3	-3	-2	-1	0	1
Sample size	28	31	31	31	30	13	54	60	55	58	63	46	3	11	9	11	13	4	
mean	31 922	38 657	40 278	64 216	115 684	107 865	9 691	29 931	20 656	6 058	43 070	63 091	-17 709	-3 492	184 047	-36 437	6 882	1 827	
median	13 388	11 551	27 137	26 848	42 931	44 350	6 091	8 246	11 975	9 185	13 334	20 976	-273	285	42	-4 607	4 169	3 281	
Standard deviation	78 510	85 847	84 876	135 736	215 119	287 096	113 240	180 135	85 422	83 813	114 568	151 678	34 209	41 577	555 892	113 658	63 672	10 840	
minimum	-23 517	-22 357	-78 043	-46 054	-61 923	-258 748	-475 481	-455 742	-228 003	-345 682	-136 893	-101 853	-57 124	-81 792	-11 245	-369 081	-154 102	-12 724	
maximum	361 576	409 230	406 964	667 544	825 719	675 421	635 139	1 256 366	375 266	257 659	592 178	789 770	4 269	55 433	1 666 305	55 262	146 539	13 471	
25% percentile	537	7 079	2 401	2 550	15 175	6 345	-1 911	151	-702	-6 725	2 143	-867	-28 698	-6 639	-6 862	-18 117	-2 286	-1 247	
75% percentile	27 036	40 905	44 616	60 850	105 237	140 673	15 747	29 755	33 684	29 870	46 615	56 244	1 998	8 627	7 776	4 776	13 471	6 355	

<b>Added Value(in 1000s)</b>																			
Year	Norway							Sweden							Denmark				
	-3	-2	-1	0	1	2	3	-3	-2	-1	0	1	2	3	-3	-2	-1	0	1
Sample size	28	31	31	31	30	13	51	57	55	58	63	46	3	11	9	11	13	4	
mean	100 498	100 327	112 351	147 417	217 413	197 968	170 368	190 061	157 725	150 421	200 653	266 798	187 593	267 903	328 376	329 573	336 960	234 772	
median	54 190	44 505	71 418	82 366	158 377	96 263	50 433	57 115	49 141	58 638	92 464	139 762	50 578	83 281	75 506	150 337	109 576	146 784	
Standard deviation	180 497	152 769	160 727	216 336	278 926	335 830	363 051	372 724	287 487	269 164	331 088	406 635	242 718	276 630	604 553	343 468	388 245	232 573	
minimum	-15 166	-11 776	-52 868	-31 052	-44 982	-44 213	-433 517	-346 447	-96 726	-97 180	-12 045	-19 896	44 363	12 628	39 695	50 240	38 860	71 923	
maximum	914 542	755 595	788 574	1 019 442	1 164 960	1 227 001	1 784 894	1 607 899	1 424 098	1 525 253	2 043 788	2 309 800	467 836	793 871	1 873 954	1 071 853	1 225 459	573 596	
25% percentile	13 059	22 748	11 271	16 769	34 907	6 458	16 303	22 955	27 311	34 685	36 857	49 053	47 471	48 861	66 576	76 826	72 083	88 865	
75% percentile	124 614	122 752	148 987	172 677	259 312	218 943	138 467	144 111	144 689	154 411	199 172	292 541	259 207	474 471	117 293	561 356	455 032	292 690	

<b>ROE (%)</b>																			
Year	Norway							Sweden							Denmark				
	-3	-2	-1	0	1	2	3	-3	-2	-1	0	1	2	3	-3	-2	-1	0	1
Sample size	28	31	31	31	30	13	62	71	69	68	73	59	9	21	19	20	19	5	
mean	-4	62	54	59	28	30	-12	255	56	106	243	19	12	17	60	-54	42	51	
median	9	23	19	33	13	25	20	20	17	16	17	20	20	23	26	32	45	45	
Standard deviation	149	692	118	107	124	48	410	2335	268	996	1909	99	52	46	105	340	40	13	
minimum	-597	-2237	-111	-133	-198	-44	-2162	-2876	-200	-821	-509	-509	-124	-145	-17	-1478	-70	40	
maximum	275	3047	409	439	528	115	2054	19429	2151	8120	16309	339	53	66	439	102	115	68	
25% percentile	1	-1	4	7	-1	-2	-1	4	-1	-19	2	0	17	14	12	15	26	40	
75% percentile	44	63	70	82	63	51	41	49	49	46	49	45	38	40	57	45	57	60	

<b>ROA (%)</b>																			
Year	Norway							Sweden							Denmark				
	-3	-2	-1	0	1	2	3	-3	-2	-1	0	1	2	3	-3	-2	-1	0	1
Sample size	28	31	31	31	30	13	63	72	70	68	74	59	9	21	20	21	21	6	
mean	4	2	-7	-13	-35	10	6	9	8	5	8	10	9	11	29	7	-1	9	
median	4	9	7	8	6	10	9	9	7	6	7	9	10	11	12	10	14	11	
Standard deviation	122	65	67	157	253	19	25	20	22	22	18	18	11	13	60	25	73	14	
minimum	-212	-198	-343	-844	-1372	-27	-98	-87	-58	-63	-74	-35	-14	-13	-25	-79	-313	-17	
maximum	545	159	41	148	63	47	55	53	86	53	46	51	28	47	244	40	56	23	
25% percentile	0	-2	-1	-2	-1	-2	-1	1	-1	-7	0	0	5	5	3	5	8	8	
75% percentile	12	18	18	21	18	22	17	18	17	19	18	20	13	14	22	22	22	17	

Descriptive Statistics (cont.)																			
Wage per employee(in 1000s)																			
Year	Norway						Sweden						Denmark						
	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	
Sample size	28	31	31	30	13	56	66	65	65	70	53	9	20	20	20	20	20	6	
mean	428	468	526	775	790	523	355	432	389	460	430	452	357	350	376	425	431	410	
median	425	497	537	507	572	537	277	319	324	350	362	365	328	325	353	386	389	406	
Standard deviation	204	214	238	809	795	323	250	298	227	419	257	273	123	160	178	192	163	87	
minimum	0	0	3	26	0	0	20	107	19	195	0	230	239	156	182	223	247	280	
maximum	972	870	1 171	4 063	3 561	1 267	1 454	1 915	1 345	3 007	1 915	1 345	662	974	1 061	1 141	993	542	
25% percentile	326	362	410	404	457	433	229	256	256	275	284	291	307	301	303	336	357	380	
75% percentile	524	595	640	693	771	641	362	475	456	456	500	481	364	371	402	452	452	445	
Corporate tax per employee(in 1000s)																			
Year	Norway						Sweden						Denmark						
	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	
Sample size	28	31	31	31	30	13	59	69	65	65	70	53	9	20	20	20	21	21	6
mean	-32	30	-66	69	42	-121	117	-18	-73	-321	166	139	245	330	340	152	112	85	
median	9	18	8	21	14	29	17	12	16	24	31	33	30	22	50	31	53	57	
Standard deviation	293	78	385	130	279	829	531	1 219	877	4 785	1 041	1 287	628	1 307	1 267	530	285	85	
minimum	-1 500	-248	-1 820	-78	-1 128	-2 823	-2 481	-6 436	-4 804	-37 644	-4 046	-4 804	0	-48	-25	-42	-57	15	
maximum	205	171	229	588	749	593	2 139	4 115	1 652	4 895	4 737	5 318	1 918	5 876	5 717	2 457	1 340	247	
25% percentile	0	0	0	0	0	-1	0	0	0	0	1	1	14	15	11	20	33	36	
75% percentile	25	68	51	83	68	109	78	66	72	102	226	193	43	44	83	63	90	93	
Proxies for Efficiency																			
Profit per employee(in 1000s)																			
Year	Norway						Sweden						Denmark						
	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	
Sample size	28	31	31	31	30	13	59	69	65	65	70	53	9	20	20	20	21	21	6
mean	-217	-46	-254	1 558	713	-156	335	5 467	2 927	65	1 804	2 128	527	1 048	7 823	442	543	294	
median	48	60	71	84	178	136	114	123	128	117	124	126	88	85	118	117	179	174	
Standard deviation	1 033	554	1 282	10 384	4 266	1 613	37 686	36 862	23 462	17 178	6 558	6 496	1 300	4 205	34 089	1 510	1 844	472	
minimum	-5 218	-2 032	-4 992	-5 050	-12 020	-4 752	-229 971	-2 871	-10 778	-114 862	-2 233	-8 456	-131	-155	-254	-407	-609	-214	
maximum	554	717	788	56 973	18 368	2 119	160 401	306 149	188 217	55 841	49 340	32 487	3 979	18 895	152 641	6 966	8 520	1 164	
25% percentile	-38	-46	-122	-6	30	-4	-10	3	-2	-116	14	0	82	38	36	37	124	82	
75% percentile	91	259	287	374	910	379	395	644	288	574	794	779	146	137	284	286	286	355	
Profit Margin (%)																			
Year	Norway						Sweden						Denmark						
	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	
Sample size	27	29	29	31	30	13	60	68	65	65	71	54	6	16	15	16	17	6	
mean	-949	-131	-4	-1547	30	6	-128	34	-176	-5	-141	131	6	6	13	9	70	7	
median	4	4	5	6	5	3	7	7	6	5	7	7	5	5	6	7	11	8	
Standard deviation	4880	699	47	9002	207	27	1296	178	1598	452	2596	444	8	12	30	13	247	10	
minimum	-25365	-3757	-177	-50028	-526	-36	-9912	-200	-12846	-1842	-20729	-165	-6	-13	-15	-8	-11	-9	
maximum	22	48	62	1420	968	55	1274	1352	612	1944	5367	2112	18	37	115	44	1027	20	
25% percentile	0	-1	-1	0	1	-2	-1	0	0	-7	1	0	2	3	3	3	7	3	
75% percentile	7	9	11	13	30	14	17	16	16	19	17	21	9	9	11	10	17	14	

### Descriptive Statistics (cont.)

		EBIT Margin (%)																	
		Norway						Sweden						Denmark					
Year		-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2
Sample size		27	29	29	31	30	13	60	68	65	65	71	54	6	16	15	16	17	6
mean		-945	-125	-1	-1572	31	6	-166	2	-200	-55	-308	-2	11	8	12	7	5	8
median		3	5	7	8	6	5	7	7	5	3	6	6	5	5	6	7	11	9
Standard deviation		4881	680	49	9132	204	27	1268	34	1599	270	2548	40	16	11	29	10	21	9
minimum		-25365	-3650	-177	-50755	-536	-44	-9807	-200	-12890	-1875	-21460	-156	-6	-5	-12	-8	-68	-5
maximum		97	96	97	1397	950	46	63	81	87	64	133	69	37	39	112	26	28	17
25% percentile		-2	-1	1	1	2	-2	-1	1	-2	-8	-3	-3	3	3	3	1	4	4
75% percentile		7	10	11	16	29	14	14	12	13	12	14	17	18	8	10	12	14	15

		Costs of employees/Operating Revenue (%)																	
		Norway						Sweden						Denmark					
Year		-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2
Sample size		27	29	29	30	30	13	55	63	63	64	69	52	6	16	15	16	17	6
mean		577	93	31	568	32	25	20	21	137	38	161	20	20	23	24	23	27	15
median		25	25	23	23	24	25	17	16	17	17	17	16	14	22	24	21	20	15
Standard deviation		2841	347	36	2929	40	14	15	14	926	111	1151	17	13	9	9	9	25	5
minimum		2	2	1	4	0	0	0	0	0	2	0	2	13	13	13	13	12	7
maximum		14794	1892	204	16077	224	49	78	60	7366	883	9580	73	46	40	41	39	120	21
25% percentile		21	17	19	17	14	14	10	12	12	11	11	12	13	14	15	15	14	14
75% percentile		33	29	28	41	32	33	24	27	27	26	25	23	20	29	31	31	27	18

#### Proxy for Leverage

		Total Liabilities/Total Assets(x)																	
		Norway						Sweden						Denmark					
Year		-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2
Sample size		28	31	31	31	30	13	60	68	68	67	70	57	9	21	20	21	21	6
mean		0.39	0.46	0.58	0.79	0.33	0.53	0.61	0.60	0.57	0.58	0.60	0.57	0.61	0.57	0.57	0.60	0.76	0.89
median		0.52	0.44	0.55	0.58	0.51	0.59	0.61	0.63	0.60	0.60	0.61	0.59	0.56	0.57	0.59	0.61	0.67	0.76
Standard deviation		1.19	0.44	0.40	1.52	1.20	0.22	0.26	0.27	0.27	0.23	0.25	0.26	0.18	0.18	0.19	0.22	0.57	0.47
minimum		-5.20	-1.25	-0.58	-0.90	-5.92	0.00	0	0.02	0.02	0.02	0.00	0.02	0.41	0.19	0.16	0.16	0.33	0.43
maximum		2.65	1.06	1.89	8.75	1.15	0.81	1.00	1.00	1.04	1.00	1.15	0.97	0.88	0.90	1.01	1.01	3.11	1.80
25% percentile		0.31	0.30	0.38	0.36	0.36	0.52	0.47	0.43	0.35	0.47	0.46	0.36	0.45	0.41	0.45	0.46	0.51	0.71
75% percentile		0.68	0.79	0.80	0.79	0.72	0.62	0.78	0.80	0.79	0.74	0.77	0.76	0.78	0.67	0.67	0.74	0.73	0.85

#### Proxy for Liquidity

		Current Ratio (x)																	
		Norway						Sweden						Denmark					
Year		-3	-2	-1	0	1	2	-3	-2	-1	0	1	2	-3	-2	-1	0	1	2
Sample size		28	31	31	31	30	13	63	72	70	69	73	58	9	21	20	21	21	6
mean		1.7	1.4	1.5	1.5	1.9	6.8	2.9	4.3	3.3	4.7	2.3	3.2	1.3	1.5	2.1	1.8	1.5	1.3
median		1.3	1.3	1.1	1.2	1.3	1.3	1.5	1.7	1.7	1.5	1.5	1.6	1.3	1.4	1.5	1.6	1.5	1.2
Standard deviation		1.9	0.8	2.0	1.5	2.0	20.1	5.3	9.2	5.7	15.9	3.4	5.1	0.7	0.9	2.3	1.1	0.9	0.6
minimum		0.2	0.0	0.0	0.0	0.1	0.5	0.03	0.0	0.1	0.1	0.0	0	0.3	0.5	0.5	0.6	0.3	0.7
maximum		11.1	3.7	11.8	8.6	10.7	73.8	36.5	56.6	41.0	128.0	27.0	24.0	2.2	4.7	10.8	5.3	4.6	2.0
25% percentile		1.0	1.0	0.8	0.7	1.0	0.7	1.0	1.1	1.1	1.1	1.0	1.1	0.7	1.0	1.3	1.1	1.1	0.9
75% percentile		1.6	1.6	1.6	1.7	1.7	1.7	2.6	2.8	2.8	2.5	2.4	2.7	1.9	1.7	1.8	2.0	1.7	1.8

**Table VII Logistic regression models**

This table shows the results from the logistic regressions done in the selection part of the Thesis. The marginal effects are not taken into account here; please refer to Table VIII for the marginal effects.

<b>Logistic Models</b>								
<i>Dependent Variable: PE-Dummy</i>								
<i>Method: ML - Binary Logit (Quadratic hill climbing)</i>								
<i>Convergence achieved after 8.8.7 and 7 iterations for model 1.2.3 and 4 respectively</i>								
<i>Covariance matrix computed using second derivatives</i>								
<b>Constant and Variables</b>	<b>Model 1</b>		<b>Model 2</b>		<b>Model 3</b>		<b>Model 4</b>	
	<i>Coefficient</i>	<i>z-value (P-value)</i>	<i>Coefficient</i>	<i>z-value (P-value)</i>	<i>Coefficient</i>	<i>z-value (P-value)</i>	<i>Coefficient</i>	<i>z-value (P-value)</i>
<i>Constant</i>	8.560	1.832 (0.067)	5.457	1.565 (0.118)	7.153	2.209 (0.027)	6.658	2.128 (0.033)
<i>Growth in Operating Revenue</i>	-0.012	-1.508 (0.132)	-0.012	-1.611 (0.107)	-0.008	-1.179 (0.238)	-0.009	-1.268 (0.205)
<i>Operating Revenue per Employee</i>	0.038	1.005 (0.315)	0.031	0.890 (0.374)	0.032	1.236 (0.217)	0.030	1.182 (0.237)
<i>Operating Profit or Loss</i>	0.014	2.847 (0.004)	0.008	2.682 (0.007)	-	-	-	-
<i>Cash Flow</i>	-	-	-	-	0.001	1.632 (0.103)	0.002	1.829 (0.067)
<i>Cash flow/Equity</i>	1.906	2.310 (0.021)	-	-	0.354	0.605 (0.545)	-	-
<i>Added Value</i>	-0.001	-1.900 (0.058)	0.000	-0.537 (0.592)	-	-	-	-
<i>ROE</i>	-	-	0.012	1.289 (0.198)	-	-	0.005	0.655 (0.512)
<i>ROA</i>	-0.150	-2.775 (0.006)	-0.108	-1.926 (0.054)	-0.047	-1.408 (0.159)	-0.048	-1.261 (0.207)
<i>Wage per Employee</i>	0.344	1.466 (0.143)	0.194	0.960 (0.337)	-0.062	-0.410 (0.682)	-0.041	-0.271 (0.787)
<i>Corporate Tax per Employee</i>	-0.814	-1.974 (0.049)	-	-	-	-	-	-
<i>Profit per Employee</i>	-	-	-0.094	-1.059 (0.290)	-	-	-	-
<i>Profit Margin</i>	-	-	-	-	-	-	-0.038	-1.960 (0.050)
<i>Ebit Margin</i>	-	-	-	-	-0.032	-1.738 (0.082)	-	-
<i>Costs of Employees/ Operating Revenue</i>	-0.030	-0.543 (0.587)	-0.035	-0.796 (0.426)	-0.032	-0.920 (0.358)	-0.030	-0.897 (0.370)
<i>Other Costs/ Operating Revenue</i>	-0.054	-1.252 (0.211)	-0.024	-0.779 (0.436)	-0.052	-1.931 (0.054)	-0.050	-1.903 (0.057)
<i>Leverage</i>	-8.833	-2.834 (0.005)	-5.834	-2.445 (0.015)	-4.334	-2.153 (0.031)	-4.076	-2.074 (0.038)
<i>Liquidity</i>	-1.127	-1.947 (0.052)	-1.043	-1.735 (0.083)	-0.784	-1.583 (0.113)	-0.717	-1.499 (0.134)
<b>Test Statistics and Sample Sizes</b>								
<i>H-L test Statistics (P-value)</i>	6.886 (0.549)		7.163 (0.519)		6.123 (0.636)		7.796 (0.454)	
<i>Andrews test Statistics (P-value)</i>	20.494 (0.025)		10.952 (0.361)		8.864 (0.545)		14.274 (0.161)	
<i>McFadden R-square</i>	0.438		0.365		0.258		0.268	
<i>Sample Size</i>	83 of 90		83 of 90		83 of 90		83 of 90	

**Table VIII Marginal Effects for Logit Models**

This table shows the marginal increase in the probability of being bought up by a PE firm by a one unit increase in the explanatory variable. Units for level variables and ratios are given in parenthesis under the variable name.

For instance:

For every 100 000 NOK increase in Operating Profit the probability of being bought up by a PE firm increases with 0.026 percentage points.

<b>Marginal Effects for Logistic Models</b>								
<b>Constant and Variables</b>	<b>Model 1</b>		<b>Model 2</b>		<b>Model 3</b>		<b>Model 4</b>	
	<i>Marginal Effect</i>	<i>P-value</i>	<i>Marginal Effect</i>	<i>P-value</i>	<i>Marginal Effect</i>	<i>P-value</i>	<i>Marginal Effect</i>	<i>P-value</i>
<i>Constant</i>	16.075	0.067*	10.110	0.118	35.282	0.027**	31.006	0.033**
<i>Growth in Operating Revenue (in 100 000s)</i>	-0.022	0.132	-0.023	0.107	-0.040	0.238	-0.041	0.205
<i>Operating Revenue per Employee (in 100 000s)</i>	0.071	0.315	0.057	0.374	0.156	0.217	0.139	0.237
<i>Operating Profit or Loss (in 100 000s)</i>	0.026	0.004***	0.016	0.007***	-	-	-	-
<i>Cash Flow (in 100 000s)</i>	-	-	-	-	0.006	0.103	0.007	0.067*
<i>Cash flow/Equity (x)</i>	3.579	0.021**	-	-	1.747	0.545	-	-
<i>Added Value (in 100 000s)</i>	-0.003	0.058*	0.000	0.592	-	-	-	-
<i>ROE (%)</i>	-	-	0.022	0.198	-	-	0.021	0.512
<i>ROA (%)</i>	-0.282	0.006***	-0.200	0.054*	-0.231	0.159	-0.226	0.207
<i>Wage per Employee (in 100 000s)</i>	0.646	0.143	0.359	0.337	-0.304	0.682	-0.191	0.787
<i>Corporate Tax per Employee (in 100 000s)</i>	-1.528	0.049**	-	-	-	-	-	-
<i>Profit per Employee (in 100 000s)</i>	-	-	-0.174	0.290	-	-	-	-
<i>Profit Margin (%)</i>	-	-	-	-	-	-	-0.179	0.050**
<i>Ebit Margin (%)</i>	-	-	-	-	-0.158	0.082*	-	-
<i>Costs of Employees/ Operating Revenue (%)</i>	-0.057	0.587	-0.064	0.426	-0.158	0.358	-0.141	0.370
<i>Other Costs/ Operating Revenue (%)</i>	-0.101	0.211	-0.045	0.436	-0.255	0.054*	-0.232	0.057*
<i>Leverage (x)</i>	-0.16588	0.005***	-0.10808	0.015**	-0.21379	0.031**	-0.18982	0.038**
<i>Liquidity(x)</i>	-2.116	0.052**	-1.932	0.083*	-3.869	0.113	-3.341	0.134

*The levels of statistical significance are marked with \*\*\* for 0.01 significance, \*\* for 0.05 significance and \* for 0.10 significance level.*

**Table IX Panel Regression Models**

The following table shows the raw results of the panel data regressions. These are the raw regression outputs and in the cases where there has been used log-transformations this is not transformed back to see the real effects here. We refer the reader to Tables X – XII to see the effects after transformation.

The dependent variable is put as the name of the different models. All currency variables are adjusted for CPI, with base year 2007. The two macroeconomic variables to adjust for business cycle are unemployment and the national consumer confidence index. The models are estimated as Least Squares (LS) with cross-sectional fixed effects model. Logarithmic transformation is used on non-normal dependent variables. White Period coefficient covariance method is used on models showing signs of serial correlation, since this makes the disturbances robust to arbitrary serial correlation and time-varying variances.

<b>Panel Models</b>						
<b>Constant and Variables</b>	<b>Norway</b>		<b>Sweden</b>		<b>Denmark</b>	
	<b>Coefficient</b>	<b>t-value (P-value)</b>	<b>Coefficient</b>	<b>t-value (P-value)</b>	<b>Coefficient</b>	<b>t-value (P-value)</b>
<b>Operating Revenue (Turnover) [Proxy for growth]</b>						
<i>Constant</i>	481820	5.456 (0.000)	12.223	19.953 (0.000)	13.715	31.241 (0.000)
<i>PE-Dummy</i>	34581.84	1.107 (0.271)	0.162	0.838 (0.403)	-0.090	-0.792 (0.432)
<i>Unemployment</i>	-49314.19	-2.184 (0.031)	-0.020	-0.193 (0.847)	-0.144	-1.553 (0.126)
<i>Consumer Confidence</i>	2491.283	2.453 (0.016)	0.002	0.295 (0.769)	0.002	0.175 (0.862)
<i>Sample size</i>	158		377		75	
<i>Log on dependent variable</i>	no		yes		yes	
<i>White Period</i>	yes		yes		yes	
<b>Number of Employees [Proxy for growth]</b>						
<i>Constant</i>	4.522	14.038 (0.000)	4.287	21.209 (0.000)	4.987	9.956 (0.000)
<i>PE-Dummy</i>	0.034	0.313 (0.755)	0.071	0.547 (0.585)	0.029	0.254 (0.800)
<i>Unemployment</i>	-0.070	-0.789 (0.431)	-0.006	-0.176 (0.860)	0.010	0.097 (0.923)
<i>Consumer Confidence</i>	0.005	1.177 (0.241)	0.005	0.631 (0.528)	-0.002	-0.280 (0.780)
<i>Sample size</i>	158		376		97	
<i>Log on dependent variable</i>	yes		yes		yes	
<i>White Period</i>	yes		yes		yes	

<b>Panel Models (cont.)</b>						
<b>Constant and Variables</b>	<b>Norway</b>		<b>Sweden</b>		<b>Denmark</b>	
	<i>Coefficient</i>	<i>t-value (P-value)</i>	<i>Coefficient</i>	<i>t-value (P-value)</i>	<i>Coefficient</i>	<i>t-value (P-value)</i>
<b>Total Assets [Proxy for growth]</b>						
<i>Constant</i>	11.993	35.751 (0.000)	12.748	55.692 (0.000)	12.386	21.465 (0.000)
<i>PE-Dummy</i>	0.192	1.209 (0.229)	0.257	2.550 (0.011)	-0.000	-0.000 (1.000)
<i>Unemployment</i>	-0.136	-1.595 (0.113)	-0.059	-1.660 (0.098)	-0.033	-0.268 (0.789)
<i>Consumer Confidence</i>	0.021	2.925 (0.004)	0.007	1.032 (0.303)	0.004	0.301 (0.764)
<i>Sample size</i>	158		381		98	
<i>Log on dependent variable</i>	yes		yes		yes	
<i>White Period</i>	yes		yes		yes	
<b>Operating Revenue per Employee [Proxy for Productivity]</b>						
<i>Constant</i>	7.128	8.478 (0.000)	7.485	41.813 (0.000)	2995.611	3.296 (0.002)
<i>PE-Dummy</i>	0.309	0.990 (0.324)	0.086	1.694 (0.091)	-54.599	-0.355 (0.724)
<i>Unemployment</i>	-0.114	-0.738 (0.462)	0.044	1.420 (0.157)	-236.034	-1.315 (0.194)
<i>Consumer Confidence</i>	0.019	1.063 (0.290)	-0.003	-0.863 (0.389)	3.176	0.302 (0.764)
<i>Sample size</i>	158		363		74	
<i>Log on dependent variable</i>	yes		yes		no	
<i>White Period</i>	yes		no		yes	
<b>Operating Profit or Loss [Proxy for Profitability]</b>						
<i>Constant</i>	-36976.46	-0.781 (0.436)	15480.42	0.614 (0.540)	13.174	16.359 (0.000)
<i>PE-Dummy</i>	38954.08	1.895 (0.060)	11615.24	1.624 (0.105)	-0.295	-1.434 (0.156)
<i>Unemployment</i>	15651.08	1.279 (0.203)	409.293	0.094 (0.925)	-0.358	-2.377 (0.020)
<i>Consumer Confidence</i>	-166.995	-0.249 (0.804)	1314.753	2.492 (0.013)	-0.009	-0.549 (0.585)
<i>Sample size</i>	158		393		98	
<i>Log on dependent variable</i>	no		no		yes	
<i>White Period</i>	yes		no		no	

<b>Panel Models (cont.)</b>						
<b>Constant and Variables</b>	<b>Norway</b>		<b>Sweden</b>		<b>Denmark</b>	
	<i>Coefficient</i>	<i>t-value (P-value)</i>	<i>Coefficient</i>	<i>t-value (P-value)</i>	<i>Coefficient</i>	<i>t-value (P-value)</i>
<b>Cash Flow [Proxy for Profitability]</b>						
<i>Constant</i>	46280.05	1.053 (0.294)	-45302.52	-0.852 (0.395)	757832.4	1.399 (0.172)
<i>PE-Dummy</i>	22438.51	1.466 (0.145)	-3080.311	-0.203 (0.839)	-277779.4	-1.022 (0.315)
<i>Unemployment</i>	-5777.162	-0.587 (0.558)	8293.472	0.912 (0.363)	-144999.3	-1.270 (0.214)
<i>Consumer Confidence</i>	72.904	0.085 (0.932)	2460.89	2.225 (0.027)	8807.782	0.416 (0.680)
<i>Sample size</i>	158		331		51	
<i>Log on dependent variable</i>	no		no		no	
<i>White Period</i>	no		no		yes	
<b>Added Value [Proxy for Profitability]</b>						
<i>Constant</i>	12.065	43.651 (0.000)	13.579	91.296 (0.000)	12.234	29.320 (0.000)
<i>PE-Dummy</i>	0.223	2.316 (0.022)	0.052	1.251 (0.212)	-0.306	-0.824 (0.416)
<i>Unemployment</i>	-0.061	-0.981 (0.329)	-0.036	-1.369 (0.172)	-0.114	-1.336 (0.191)
<i>Consumer Confidence</i>	-0.001	-0.220 (0.827)	0.005	1.872 (0.062)	0.059	1.403 (0.171)
<i>Sample size</i>	158		325		51	
<i>Log on dependent variable</i>	yes		yes		yes	
<i>White Period</i>	no		no		yes	
<b>Return on Equity [Proxy for Profitability]</b>						
<i>Constant</i>	-70.973	-0.656 (0.513)	-93.080	-1.244 (0.214)	239.044	2.489 (0.015)
<i>PE-Dummy</i>	6.758	0.115 (0.909)	-11.476	-0.543 (0.588)	-68.727	-1.613 (0.111)
<i>Unemployment</i>	17.196	1.025 (0.307)	18.012	1.403 (0.162)	-43.119	-2.217 (0.030)
<i>Consumer Confidence</i>	1.924	0.528 (0.598)	0.201	0.129 (0.897)	3.187	1.195 (0.236)
<i>Sample size</i>	158		386		92	
<i>Log on dependent variable</i>	no		no		no	
<i>White Period</i>	yes		no		yes	

<b>Panel Models (cont.)</b>						
<b>Constant and Variables</b>	<b>Norway</b>		<b>Sweden</b>		<b>Denmark</b>	
	<i>Coefficient</i>	<i>t-value (P-value)</i>	<i>Coefficient</i>	<i>t-value (P-value)</i>	<i>Coefficient</i>	<i>t-value (P-value)</i>
<b>Return on Assets [Proxy for Profitability]</b>						
<i>Constant</i>	12.380	0.456 (0.649)	0.747	0.148 (0.882)	48.651	1.499 (0.138)
<i>PE-Dummy</i>	15.562	1.661 (0.099)	-0.683	-0.478 (0.633)	-14.845	-1.784 (0.079)
<i>Unemployment</i>	-2.459	-0.405 (0.686)	0.803	0.930 (0.353)	-7.946	-1.310 (0.194)
<i>Consumer Confidence</i>	-0.356	-0.679 (0.499)	0.365	3.482 (0.000)	0.886	1.292 (0.201)
<i>Sample size</i>	155		386		96	
<i>Log on dependent variable</i>	no		no		no	
<i>White Period</i>	no		no		no	
<b>Wage per Employee [Proxy for Profitability]</b>						
<i>Constant</i>	6.281	14.868 (0.000)	408.113	7.370 (0.000)	398.997	4.150 (0.000)
<i>PE-Dummy</i>	0.053	0.283 (0.778)	23.278	1.521 (0.129)	31.395	1.279 (0.205)
<i>Unemployment</i>	-0.085	-0.630 (0.530)	3.120	0.324 (0.746)	-5.974	-0.332 (0.741)
<i>Consumer Confidence</i>	0.001	0.112 (0.911)	-0.974	-0.886 (0.376)	0.165	0.080 (0.936)
<i>Sample size</i>	157		362		91	
<i>Log on dependent variable</i>	yes		no		no	
<i>White Period</i>	yes		no		no	
<b>Corporate Tax per Employee [Proxy for Profitability]</b>						
<i>Constant</i>	-168.739	-0.991 (0.324)	605.205	1.717 (0.087)	6.120	5.325 (0.000)
<i>PE-Dummy</i>	130.545	2.217 (0.029)	185.871	1.862 (0.064)	-0.500	-1.690 (0.095)
<i>Unemployment</i>	38.666	1.020 (0.310)	-126.155	-2.084 (0.038)	-0.321	-1.490 (0.141)
<i>Consumer Confidence</i>	-1.001	-0.305 (0.761)	19.266	2.629 (0.009)	0.029	1.204 (0.233)
<i>Sample size</i>	153		375		95	
<i>Log on dependent variable</i>	no		no		yes	
<i>White Period</i>	no		no		no	

<b>Panel Models (cont.)</b>						
<b>Constant and Variables</b>	<b>Norway</b>		<b>Sweden</b>		<b>Denmark</b>	
	<i>Coefficient</i>	<i>t-value (P-value)</i>	<i>Coefficient</i>	<i>t-value (P-value)</i>	<i>Coefficient</i>	<i>t-value (P-value)</i>
<b>Profit per Employee [Proxy for Efficiency]</b>						
<i>Constant</i>	2547.108	1.504 (0.135)	6667.953	2.922 (0.004)	6.653	5.029 (0.000)
<i>PE-Dummy</i>	1023.175	0.910 (0.366)	1439.638	2.228 (0.027)	0.028	0.053 (0.958)
<i>Unemployment</i>	-570.499	-1.506 (0.135)	-1099.856	-2.808 (0.005)	-0.371	-1.463 (0.149)
<i>Consumer Confidence</i>	-21.649	-0.907 (0.366)	105.543	2.218 (0.027)	0.020	0.891 (0.377)
<i>Sample size</i>	158		371		79	
<i>Log on dependent variable</i>	no		no		no	
<i>White Period</i>	yes		no		yes	
<b>Profit Margin [Proxy for Efficiency]</b>						
<i>Constant</i>	651.747	0.336 (0.738)	199.187	2.058 (0.041)	3.600	4.787 (0.000)
<i>PE-Dummy</i>	-230.208	-0.340 (0.735)	20.509	0.755 (0.451)	-0.100	-0.505 (0.616)
<i>Unemployment</i>	-360.557	-0.832 (0.407)	-31.522	-1.893 (0.059)	-0.139	-0.988 (0.328)
<i>Consumer Confidence</i>	15.100	0.390 (0.697)	3.549	1.787 (0.075)	0.027	1.451 (0.153)
<i>Sample size</i>	153		373		74	
<i>Log on dependent variable</i>	no		no		yes	
<i>White Period</i>	no		no		no	
<b>Ebit Margin [Proxy for Efficiency]</b>						
<i>Constant</i>	682.480	0.399 (0.691)	-32.375	-0.966 (0.335)	25.878	2.829 (0.007)
<i>PE-Dummy</i>	-242.954	-0.525 (0.601)	-24.292	-1.420 (0.157)	-1.593	-0.656 (0.514)
<i>Unemployment</i>	-364.905	-0.800 (0.426)	5.5237	1.017 (0.310)	-3.480	-2.033 (0.047)
<i>Consumer Confidence</i>	14.628	1.142 (0.256)	-0.141	-0.149 (0.882)	-0.185	-0.890 (0.378)
<i>Sample size</i>	153		374		74	
<i>Log on dependent variable</i>	no		no		no	
<i>White Period</i>	yes		yes		no	

<b>Panel Models (cont.)</b>						
<b>Constant and Variables</b>	<b>Norway</b>		<b>Sweden</b>		<b>Denmark</b>	
	<i>Coefficient</i>	<i>t-value (P-value)</i>	<i>Coefficient</i>	<i>t-value (P-value)</i>	<i>Coefficient</i>	<i>t-value (P-value)</i>
<b>Costs of Employees/Operating Revenue [Proxy for Efficiency]</b>						
<i>Constant</i>	3.772	6.914 (0.000)	3.149	15.357 (0.000)	10.484	1.266 (0.211)
<i>PE-Dummy</i>	-0.113	-0.671 (0.504)	0.084	0.828 (0.408)	1.453	1.338 (0.186)
<i>Unemployment</i>	-0.050	-0.475 (0.634)	-0.054	-1.482 (0.140)	2.393	1.378 (0.174)
<i>Consumer Confidence</i>	-0.011	-1.395 (0.166)	-0.004	-0.715 (0.475)	0.011	0.086 (0.932)
<i>Sample size</i>	152		358		75	
<i>Log on dependent variable</i>	yes		yes		no	
<i>White Period</i>	yes		yes		yes	
<b>Other Costs/Operating Revenue [Proxy for Efficiency] 1)</b>						
<i>Constant</i>	4.396	15.886 (0.000)	5.085616	29.861 (0.000)	49.366	2.617 (0.011)
<i>PE-Dummy</i>	-0.079	-0.818 (0.415)	-0.00912	-0.195 (0.846)	7.727	0.871 (0.387)
<i>Unemployment</i>	-0.008	-0.133 (0.895)	0.015719	0.530 (0.597)	3.915	0.975 (0.334)
<i>Consumer Confidence</i>	-0.005	-0.838 (0.404)	0.00385	1.143 (0.254)	-0.399	-0.587 (0.560)
<i>Sample size</i>	153		360		76	
<i>Log on dependent variable</i>	yes		yes		no	
<i>White Period</i>	no		no		yes	
1) Other costs= Operating Revenue/Operating Profit or Loss–Costs of Employees						
<b>Total Liabilities/Total Assets [Proxy for Leverage]</b>						
<i>Constant</i>	-0.974	-1.459 (0.147)	0.666	12.043 (0.000)	0.815	3.397 (0.001)
<i>PE-Dummy</i>	0.209	0.900 (0.370)	0.007	0.414 (0.679)	-0.019	-0.315 (0.754)
<i>Unemployment</i>	0.258	1.728 (0.087)	-0.011	-1.182 (0.238)	-0.046	-1.025 (0.309)
<i>Consumer Confidence</i>	0.015	1.179 (0.241)	-0.001	-0.532 (0.595)	0.001	0.291 (0.772)
<i>Sample size</i>	158		381		96	
<i>Log on dependent variable</i>	no		no		no	
<i>White Period</i>	no		no		no	

**Table X Results from the panel regressions Norway**

This table shows the mean value of the different variables before and after change to PE ownership for the Norwegian sample, adjusted for the median unemployment and median consumer confidence. The column named «Difference» shows the absolute difference in the adjusted mean from changing ownership to PE. All level variables are reported in 2007-NOK, and large numbers are reported in 1000s. For instance, the difference in mean from change to PE ownership is for Cash Flow 22 439 000 NOK<sub>2007</sub> and for ROA 15.56 percentage points. The last column gives the statistical significance of the differences.

<b>Variable Means Pre and Post Buyout Norway</b>				
<b>Variable</b>	<b>Mean Pre Buyout</b>	<b>Mean Post Buyout</b>	<b>Difference</b>	<b>Statistical Significance (P-value)</b>
<i>Operating Revenue (in 1000s)<sub>1</sub></i>	332 256	366 838	34 582	0.271
<i>Number of Employees<sub>2</sub></i>	77	80	3	0.755
<i>Total Assets (in 1000s)<sub>2</sub></i>	143 778	176 396	32 618	0.229
<i>Operating Revenue per Employee<sub>2</sub></i>	1 261 254	1 718 764	457 510	0.324
<i>Operating Profit or Loss (in 1000s)<sub>1</sub></i>	26 875	65 829	38 954	0.060*
<i>Cash Flow (in 1000s)<sub>1</sub></i>	23 007	45 445	22 439	0.145
<i>Added Value (in 1000s)<sub>2</sub></i>	69 178	101 439	32 261	0.022**
<i>ROE (%)<sub>1</sub></i>	54.55	61.31	6.78	0.909
<i>ROA (%)<sub>1</sub></i>	-7.68	7.88	15.56	0.099*
<i>Wage per Employee<sub>2</sub></i>	379 266	399 954	20 687	0.778
<i>Corporate Tax per Employee<sub>1</sub></i>	-26 453	104 092	130 545	0.029**
<i>Profit per Employee<sub>1</sub></i>	508 987	514 188	1 023	0.365
<i>Profit Margin (%)<sub>1</sub></i>	-523.59	-753.80	-230.21	0.735
<i>Ebit Margin (%)<sub>1</sub></i>	-524.23	-767.18	-242.95	0.601
<i>Costs of Employees/ Operating Revenue (%)<sub>2</sub></i>	25.17	22.36	-2.81	0.504
<i>Other Costs/ Operating Revenue (%)<sub>1) 2</sub></i>	69.35	64.08	-5.27	0.415
<i>Total Liabilities/ Total Assets (ratio)</i>	0.56	0.76	0.21	0.370
<sub>1</sub> Arithmetic means <sub>2</sub> Geometric means 1) Other costs= Operating Revenue-Operating Profit or Loss-Costs of Employees The levels of statistical significance are marked with *** for 0.01 significance, ** for 0.05 significance and *for 0.10 significance level				

**Table XI Results from the panel regressions Sweden**

This table shows the mean value of the different variables before and after change to PE ownership for the Swedish sample, adjusted for the median unemployment and median consumer confidence. The column named «Difference» shows the absolute difference in the adjusted mean from changing ownership to PE. All level variables are reported in 2007-SEK, and large numbers are reported in 1000s. For instance, the difference in mean from change to PE ownership is for Cash Flow -3 080 000 SEK<sub>2007</sub> and for ROA -0.68 percentage points. The last column gives the statistical significance of the differences.

<b>Variable Means Pre and Post Buyout Sweden</b>				
<b>Variable</b>	<b>Mean Pre Buyout</b>	<b>Mean Post Buyout</b>	<b>Difference</b>	<b>Statistical Significance (P-value)</b>
<i>Operating Revenue (in 1000s)<sub>2</sub></i>	183 100	215 316	32 216	0.403
<i>Number of Employees<sub>2</sub></i>	74	79	5	0.585
<i>Total Assets (in 1000s)<sub>2</sub></i>	255 023	329 682	74 659	0.011**
<i>Operating Revenue per Employee<sub>2</sub></i>	2 255 297	2 458 431	203 134	0.091*
<i>Operating Profit or Loss (in 1000s)<sub>1</sub></i>	29 377	40 992	11 615	0.105
<i>Cash Flow (in 1000s)<sub>1</sub></i>	26 400	23 319	-3 080	0.839
<i>Added Value (in 1000s)<sub>2</sub></i>	116 608	151 864	35 256	0.212
<i>ROE (%)<sub>1</sub></i>	17.99	6.52	-11.48	0.588
<i>ROA (%)<sub>1</sub></i>	8.79	8.10	-0.68	0.633
<i>Wage per Employee<sub>1</sub></i>	418 593	441 871	23 278	0.129
<i>Corporate Tax per Employee<sub>1</sub></i>	6 670	192 541	185 871	0.064*
<i>Profit per Employee<sub>1</sub></i>	907 944	2 347 582	1 439 638	0.027**
<i>Profit Margin (%)<sub>1</sub></i>	38.65	59.16	20.51	0.451
<i>Ebit Margin (%)<sub>1</sub></i>	-0.07	-24.36	-24.29	0.157
<i>Costs of Employees/ Operating Revenue (%)<sub>2</sub></i>	15.17	16.59	1.42	0.408
<i>Other Costs/ Operating Revenue (%)<sub>1</sub><sub>2</sub></i>	82.91	81.24	-1.67	0.846
<i>Total Liabilities/ Total Assets (ratio)<sub>1</sub></i>	0.59	0.60	0.01	0.679
<sub>1</sub> Arithmetic means <sub>2</sub> Geometric means 1) Other costs= Operating Revenue-Operating Profit or Loss-Costs of Employees The levels of statistical significance are marked with *** for 0.01 significance, ** for 0.05 significance and *for 0.10 significance level				

**Table XII Results from the panel regressions Denmark**

This table shows the mean value of the different variables before and after change to PE ownership for the Danish sample, adjusted for the median unemployment and median consumer confidence. The column named «Difference» shows the absolute difference in the adjusted mean from changing ownership to PE. All level variables are reported in 2007-DKK, and large numbers are reported in 1000s. For instance, the difference in mean from change to PE ownership is for Cash Flow -277 779 000 DKK<sub>2007</sub> and for ROA -14.84 percentage points. The last column gives the statistical significance of the differences.

<b>Variable Means Pre and Post Buyout Denmark</b>				
<b>Variable</b>	<b>Mean Pre Buyout</b>	<b>Mean Post Buyout</b>	<b>Difference</b>	<b>Statistical Significance (P-value)</b>
<i>Operating Revenue (in 1000s)<sub>2</sub></i>	458 459	418 837	-39 622	0.432
<i>Number of Employees<sub>2</sub></i>	151	155	4	0.800
<i>Total Assets (in 1000s)<sub>2</sub></i>	210 200	210 189	-11	1.000
<i>Operating Revenue per Employee<sub>1</sub></i>	1 888 510	1 833 910	-554 599	0.724
<i>Operating Profit or Loss (in 1000s)<sub>2</sub></i>	23 546	935	-22 611	0.156
<i>Cash Flow (in 1000s)</i>	128 463	-149 316	-277 779	0.315
<i>Added Value (in 1000s)<sub>2</sub></i>	184 502	135 921	-48 581	0.416
<i>ROE (%)<sub>1</sub></i>	56.09	-12.64	-68.73	0.111
<i>ROA (%)<sub>1</sub></i>	17.15	2.30	-14.84	0.079*
<i>Wage per Employee<sub>1</sub></i>	371 601	402 996	31 395	0.205
<i>Corporate Tax per Employee<sub>2</sub></i>	61 660	13 791	-47 869	0.095*
<i>Profit per Employee<sub>1</sub></i>	5 026	5 054	28	0.958
<i>Profit Margin (%)<sub>2</sub></i>	6.58	4.42	-2.16	0.616
<i>Ebit Margin (%)<sub>1</sub></i>	7.84	6.25	-1.59	0.514
<i>Costs of Employees/ Operating Revenue (%)<sub>1</sub></i>	22.03	23.48	1.45	0.186
<i>Other Costs/ Operating Revenue (%)<sub>1</sub></i>	65.17	72.89	7.73	0.387
<i>Total Liabilities/ Total Assets (ratio)<sub>1</sub></i>	0.61	0.59	-0.02	0.754
<sub>1</sub> Arithmetic means <sub>2</sub> Geometric means 1) Other costs= Operating Revenue-Operating Profit or Loss-Costs of Employees The levels of statistical significance are marked with *** for 0.01 significance, ** for 0.05 significance and *for 0.10 significance level				

## Text-Box I *Logit regression*

### Logit

Logit regression is used when the dependent variable is a categorical variable taking the form of a dummy<sup>1</sup>. In our case the dependent dummy variable is binary - one if the company is bought up by a PE firm and zero if not.

The logistic function  $F$  follows the cumulative logistic distribution, and the function depends on any random variable  $z$ ,

$$F(z_i) = \frac{e^{z_i}}{1+e^{z_i}} = \frac{1}{1+e^{-z_i}} \quad (1)$$

Where  $e$  is the exponential. The estimated logit model is

$$P_i = \frac{1}{1+e^{-(B_1+B_2x_{2i}+\dots+B_kx_{ki}+u_i)}} \quad (2)$$

Where  $P_i$  is the probability that the dependent variable  $y_i = 1$ .

The fitted regression function appears as an S-shaped line, approaching zero and one asymptotically. Since the model is not linear, a maximum likelihood approach is used to estimate the parameters. Further, since the t-statistics is only valid asymptotically the critical values from the normal distribution, z-statistics, are used<sup>2</sup>.

It is not possible to determine the effect of the explanatory variables on  $y$  directly from the fitted regression. Rather the marginal effects need to be found. These can be found by putting in the regression line in expression (2), together with the mean values of the explanatory variables, to find  $P_i$ . The marginal effect is then the parameter value times the probability  $P_i$ <sup>3</sup>.

<sup>1</sup> We chose logit over probit since the differences between the models, when the dependent variable is evenly spread, is according to Brooks (2008:518) minimal.

<sup>2</sup> Brooks (2008:514-515)

<sup>3</sup> Brooks (2008:519)

## Text-Box II *Semilognormal transformation*

### Comparison of mean using semi-log transformation<sup>1</sup>

Doing a logarithmic transformation only on the dependent variable when using linear regression, is equivalent with taking the geometric mean of the variable. This is parallel to the regular regression on the dependent variable, which gives the arithmetic mean.

$$\left( \prod_{i=1}^n a_i \right)^{1/n} = \exp \left[ \frac{1}{n} \sum_{i=1}^n \ln a_i \right]$$

When comparing the geometric mean and the arithmetic mean it is important to remember that the geometric mean is usually smaller than the arithmetic. This is in our case important to remember if comparing the differences in mean across countries.

While dealing with negative numbers, doing log transformation requires us to add a constant to the dependent variable. The constant will not interfere with the slope of the coefficients, but it will bias the mean slightly upwards.

In our panel data model we have three different forms of equations

1)

$$y = \alpha + \beta_1 X_1 + \beta_2 X_2$$

2)

$$\log(y) = \alpha + \beta_1 X_1 + \beta_2 X_2$$

$$y = e^{\alpha + \beta_1 X_1 + \beta_2 X_2}$$

3)

$$\log(y + c) = \alpha + \beta_1 X_1 + \beta_2 X_2$$

$$y = e^{\alpha + \beta_1 X_1 + \beta_2 X_2} - c$$

To get the y's to give sensible comparable results we use median values of X1 and X2 when presenting the dependent variable means, since the dependent variable most likely never are at the intercept<sup>2</sup>.

<sup>1</sup>Wolfram Research, Inc. (1999-2009)

<sup>2</sup> Kreiberg (2009)