



Norwegian University of
Science and Technology

Common Traits and Performance of Private Equity Owned Firms

A Nordic Perspective

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Problem Description

Comparative study of Private Equity owned and listed firms in the Nordic countries with two main

perspectives:

1. Identification and analysis of possible common traits of Nordic firms who were private when

being bought by Private Equity funds.

2. Evaluation of the performance of Private Equity owned firms in Norway relative to comparable

listed firms during the recent financial turmoil.

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Preface

This Master's Thesis concludes our Master of Science degree in Industrial Economics and Technology Management at the Norwegian University of Science and Technology (NTNU) in the spring of 2011. After conducting a meta-study and writing a thesis about private equity during the fall of 2010, we saw this Master's Thesis as an opportunity to take a closer look at the Scandinavian private equity sphere. The objective of our work is to contribute to the understanding of common traits and performance pre- and post-buyout for private equity owned firms, compared to their industry peers.

The thesis is organized as two separate articles:

Article I: Common Traits of Non-Listed Scandinavian Buyout Targets

Article II: Performance of Private Equity Owned Firms during a Recession

The papers are written as academic research papers in the article format, and are thus meant for publishing. The papers may partially overlap for the sake of clarity and completeness, as they are intended to be published separately.

The report has been prepared in Microsoft Word 2007, and the different editors in the Microsoft Office 2007 Suite. Numerical analyses and the preparation of figures and graphs have been performed in Microsoft Excel 2007. Statistical analyses have been performed in STATA.

First and foremost, we would like to thank our supervisor Associate Professor Einar Belsom with the Department of Industrial Economics and Technology Management for excellent guidance. We also extend gratitude to Torkild Solli Haukaas (Herkules Capital), Ole Falk-Hansen (McKinsey & Company), Mats Reiersen (BCG) and Maria Borch Helsingreen (Argentum) for providing many helpful suggestions and data material. Furthermore, we would like to thank all other parties contributing to this thesis; our fellow students at NTNU, future colleagues, friends and family and other discussion partners that have all been of invaluable help during this process.

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Article I:

Common Traits of Non-Listed Scandinavian Buyout Targets

Pål Chr. Breyholtz and Eivind Saga*

Abstract By comparing each of 102 Scandinavian non-listed buyout targets with reference groups consisting of 20 European firms matched on industry and total asset size, we find strong evidence of a relationship between operating characteristics and the likelihood of being acquired by a buyout fund. The results are inconsistent with both the agency cost and the underperformance arguments explored in earlier literature that is mainly focused on listed targets. Our analysis suggests that superior growth and revenue generation characterize Scandinavian non-listed private equity target companies. At the same time they seem to be struggling to control costs and optimize their capital structure, causing unstable medium-term performance. A questionnaire-based survey of Scandinavian PE fund managers supports these findings, but also stresses the importance of long-term prospects for potential target companies

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1 Introduction

Private equity has become an increasingly important alternative asset class in Europe over the last few decades. In 2007 and 2008, approximately €80 billion was raised annually in European private equity funds, and private equity investments constituted 0.4% of European GDP. Following the typical boom and bust pattern of private equity, 2009 capital commitments in Europe plummeted by more than 80% from the preceding record-breaking years, but are now rising yet again (EVCA, 2010).

In broad strokes, private equity can be divided into three categories; venture capital, growth capital and buyouts, with the latter clearly being the dominant category. Buyout investments amounted to 71.2% of the total European private equity investments over the last five years¹ (EVCA, 2010). Buyout funds specialize in buying mature companies through leveraged buyouts (LBO), creating value through various measures and selling the companies with a profit within 1 to 10 years (Kaplan and Strömberg, 2008). This study specifically concerns the buyout funds of the private equity sphere, and the term private equity (PE) will from hereon encompass only the private equity buyout category.

Several studies have been conducted on the characteristics of public-to-private LBOs, mostly for USA, UK and Europe. These studies mainly stem from theoretical hypothesis on how LBOs are feasible through value creation in the portfolio companies. The central theoretical explanations for LBOs can briefly be described as the *agency cost argument* and the *underperformance argument*.

According to Jensen (1986), one of the main sources of value in LBOs is to reduce agency costs through the reduction of free cash flows. These are cash flows in excess of what is needed to fund positive net present value projects. Especially for firms with low growth prospects, these cash flows may be spent on negative net present value projects. Thus when reducing these cash flows by increasing leverage, and with it interest expenses, agency costs can be reduced. According to Jensen (1986, p. 325), “desirable leveraged buyout candidates are frequently firms or divisions of larger firms that have stable business histories and substantial free cash flow (i.e., low growth prospects and high potential for generating cash flows) – situations where agency costs of free cash flow are likely to be high.” This can be referred to as the *agency cost argument*.

In line with the agency cost argument, Lehn and Poulsen (1989) investigate the difference in free cash flows between 263 LBOs and a control sample remaining in public control. Using logistic regression, they found significantly higher free cash flows and lower revenue growth for the companies engaged in buyouts. Consistent with Jensen (1986), they also demonstrate that the LBO targets experience lower revenue growth in the years preceding the buyout. Maupin (1987) support the study of Lehn and Poulsen (1989) when finding a

¹ Calculated from 2005-2009

significantly higher free cash flow for 54 companies that went private, compared to a peer group of publicly held companies. Singh (1990) also support the agency cost argument. However, multiple studies have also been unable to establish a link between free cash flows and the probability of being taken private, e.g. (Halpern et al., 1999; Nikoskelainen, 2006; Opler and Titman, 1993; Weir et al., 2005). For this paper, the study of Reiersen (2008) is especially interesting, as it has a Scandinavian perspective on public to private transactions. With a rather limited sample of 20 target companies, it fails to prove significant differences in free cash flows.

The agency cost argument relies heavily on the importance of active post-buyout value creation and shift in governance, on which most existing research has focused. Fewer studies focus on the actual inherent potential of the target companies; the excess value that could be created without engaging in an LBO (Nikoskelainen, 2006). Holthausen and Larcker (1996) address this when questioning the causality of the agency cost argument and post-buyout performance. If the target company has intrinsic potential that is not reflected in the company's performance and sales price, value would simply be transferred from the current owners to the buyout fund. Following this line of reasoning, it can be argued that attractive LBO targets are underperforming companies that still generate sufficient cash flows. Underperformance does not need to be tied to the agency cost argument, as it can be caused by incompetent management, managerial mistakes and organizational problems (Nikoskelainen, 2006). These factors can lead to operational inefficiencies and non-optimal strategic decisions. The underperforming target company is unable to optimize resource use between capital requirements, growth and operating costs. This can be referred to as the *underperformance argument*.

Studies support that buyout targets significantly underperform comparable industry peers. From a sample of 71 target companies, Nikoskelainen (2006) finds evidence of the underperformance argument in the form of a significantly lower EBITDA-margin² and revenue growth as well as a higher cash flow volatility. The underperformance argument is also supported by Reiersen (2008), who finds a significantly lower EBIT-margin³ for Scandinavian buyout targets.

Leverage is included as an important factor of both the agency cost and the underperformance argument. The disciplinary effect of increased debt is crucial for the agency cost argument. Servicing the high debt levels requires great discipline in the investment strategy of the firm (Singh, 1990). In the case of the underperformance argument, gearing is relevant as an underperforming company very well may have a non-optimal capital structure. According to the trade-off theory, the optimal capital structure occurs at the debt to equity level where the marginal benefits of additional tax shield equals

² Earnings Before Interest, Taxes, Depreciation and Amortization.

³ Earnings Before Interest and Taxes.

the marginal additional costs of debt financing, including costs of bankruptcy and financial distress (Grinblatt et al., 2008). The potential tax savings from increased leverage was proposed by Lowenstein (1985) as the main motivator for performing LBOs. Other earlier buyout studies by Singh (1990), Kaplan (1989) and Bull (1989) also provide significant evidence of tax incentives. Although it is widely acknowledged that substantial tax benefits accrue, many reject increased tax shields as the main incentive to engage in LBOs (Nikoskelainen, 2006). This is supported by Opler (1993) who finds that a substantial share of his sample actually took on more debt than needed to eliminate their taxable earnings.

Although they share common characteristics, the underperformance argument and agency cost argument are fundamentally different. Whereas the agency cost argument is, according to Jensen (1986), occupied with the distribution of cash flows after they arise, the underperformance argument is focused on the relative ability to generate cash (Nikoskelainen, 2006).

As mentioned, earlier research has tried to map the characteristics of firms changing from public to private (P2P) ownership through LBOs, but most transactions are actually private-to-private. According to the database of 17,000 LBOs worldwide applied by Kaplan and Strömberg (2008), more than two thirds of the buyout transactions concerned non-listed companies. These transactions differ in nature; P2P transactions occur in full transparency, but private-to-private transactions are characterized by opacity. The transparent process of acquiring public companies makes a bid premium necessary, whereas buying a private company may result in an illiquidity discount for the buyer (Jensen, 1989). Few of the existing studies, if any, focus on private transactions. We extend the understanding of buyout rationale by concentrating specifically on private-to-private LBO transactions.

To further complement existing research, and to broaden the European perspective on PE, this paper will focus on target companies situated in the Scandinavian countries⁴. According to the Argentum market database⁵, a total of 602 Scandinavian companies are currently owned by private equity buyout funds. Of the 57 Scandinavian buyout deals of 2010, the 8 biggest accumulated to a total of €3.1 billion⁶. Sweden has the most mature private equity market of the Scandinavian countries with over 50% of the deal flow for 2010; in 2009, PE investments in Sweden corresponded to 0.36% of the Swedish GDP (EVCA, 2010).

⁴ Denmark, Norway and Sweden.

⁵ <http://www.argentum.no/DB/db-search/>.

⁶ <http://www.argentum.no/Main-categories/Insight3/Argentum-Insight/Argentum-Annual-Analyses/Argentum-Annual-Nordic-Analysis-2010/> Accessed 22 march 2011.

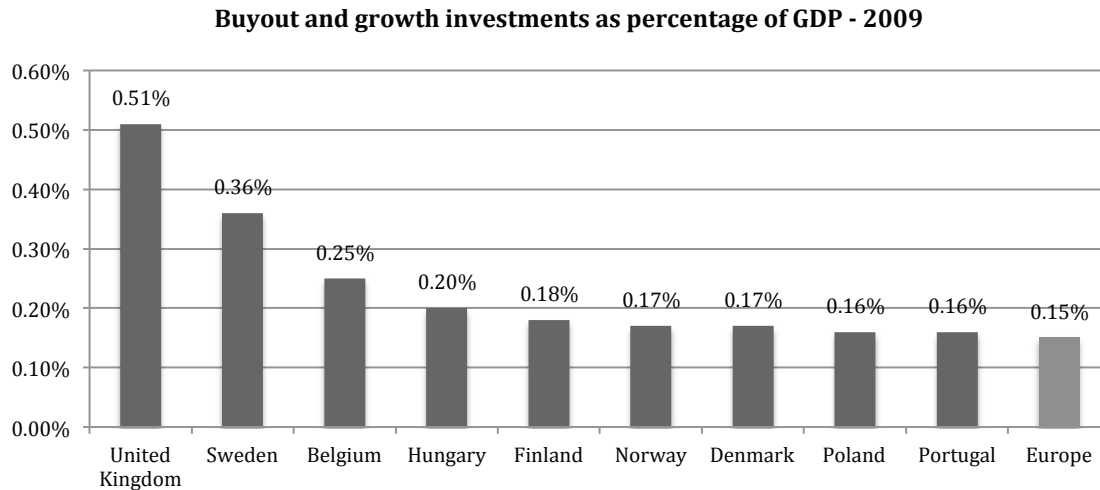


Figure 1 – Buyout and growth investments as a percentage of GDP – Source: EVCA Yearbook 2010

Our quest in this paper is to grasp the rationale behind the selection of non-listed, Scandinavian target companies, and the common denominators of these compared to industry peers. The PE funds search for companies in which they can implement their value creating instruments. Common denominators of target companies can therefore be seen in affiliation with how a private equity fund creates value in the portfolio company; for instance elimination of the free cash flow problem, operational improvements, industry consolidation, concentration of ownership and a (re)focused strategy.

The approach in this paper is twofold. Whereas some of the expected rationale in the selection process is strongly linked to solid financial analysis of the potential targets, an equally important task is a more qualitative view of the target company and its inherent potential. We will therefore supplement our analysis based on financial figures with a survey among Scandinavian private equity fund managers to grasp the underlying qualitative factors of target company selection. The quantitative analysis is based on both univariate and multivariate analysis. By comparing a sample of 102 target companies to an industry mean matched on the asset size of each company, we conduct T-tests and Wilcoxon signed rank tests to determine the difference in mean and median performance indicators. Logistic regressions are then used to determine the contribution of these variables to the probability of being acquired in an LBO.

The remainder of this paper is organized in the following manner. Section 2 gives a comprehensive explanation of the data set and methodology used. The results of the empirical analyses are presented and discussed in Section 3, followed by concluding remarks in Section 4.

2 Data and methodology

In this section we will briefly describe the methods employed in our empirical analysis. The first part describes the data set used, followed by a thorough explanation of the variables and the statistical methods we use. The last part sums up the characteristics of our final sample of variables.

2.1 Sample selection

The sample used in this study is a revised version of the data set used by Gulliksen et al. (2008). Their sample consists of 349 Scandinavian PE portfolio companies with a buyout year between 1993 and 2006, and exit during 2007 at the latest. This novel data set aims to be as comprehensive as possible, and is derived from an extensive list of Scandinavian private equity funds built on information from NVCA⁷, SVCA,⁸ DVCA⁹ and the market database of Argentum. From this list, portfolio companies were identified through the funds' websites and press releases. By using databases such as Zephyr, VentureExpert and Mergermarket, as well as existing research, additional transactions were identified. Financial statements for the companies are collected from the Amadeus database, and complemented by using the domestic Norwegian, Swedish and Danish databases Ravn Foretaksinfo, Affärsdata and NN Markedsdata, respectively. Because of data availability, their sample does not include data for all years for all the portfolio companies. The sample of portfolio companies is therefore an unbalanced data set with financial figures for the years 1997-2006, where available. Another weakness in the data set is caused by the covert nature of private equity. Since disclosure of ownership of portfolio companies is voluntary, the sample may therefore be subject to self-selection bias.

The data set contains a peer group of 20 European companies for each portfolio company. Gulliksen et al. (2008) argue that by comparing with European companies, they better grasp today's international competitive environment. The peer groups were generated through the Amadeus database, and are matched on industry and asset size, hence providing a comparative picture of industry movements and developments for similarly sized companies. Using peer groups of comparably sized companies should accommodate for the fact that companies of dissimilar size tend to perform differently (Fama and French, 1995). This approach also coincides with the approach of Nikoskelainen (2006), as well as that of Barber and Lyon (1996). Several peer groups for each portfolio company were created by clustering on total asset size for companies with identical first four digits of their NACE-codes¹⁰. The appropriate peer group was then selected by comparing the median of total asset size for each peer group to that of the portfolio company, the year before buyout. This approach creates a peer group similar in size before the buyout occurs, coherent with

⁷ Norwegian Venture Capital Association.

⁸ Swedish Private Equity and Venture Capital Association.

⁹ Danish Venture Capital and Private Equity Association.

¹⁰ NACE REC 1.1 (Nomenclature Generales des Activites Economique dans l'Union Europeenne).

earlier studies by Nikoskelainen (2006), Kaplan (1989) and Cao and Lerner (2009). Also in line with these studies, the 20 peer group companies' financials are then used for calculating an industry average figure.

The unbalanced data set of Gulliksen et al. (2008) reports incomplete financial figures from 1997 to 2006 for the 349 sample companies, as well as complete financial figures for a size adjusted industry reference. From this comprehensive data set, our final sample satisfies two additional key criteria. First, financial figures for the pre-buyout period of the company have to be included. We therefore include all companies with complete revenue figures for at least the two years preceding the buyout. For many of the variables analyzed, a period of three years is needed, but to strengthen the analysis where such a time period is not needed, we also include companies where only two years are available. This reduces our sample drastically to 121 companies. A second crucial criterion is that the company has to be non-listed at the time of the buyout. This was determined by searching through press releases and annual reports where available. Our final data set therefore consists of 102 companies. Of this sample, all financial information is not available for each firm, resulting in an unbalanced data set.

2.2 Methodology

The purpose of our methodology is to test whether there are significant differences in pre-buyout operating characteristics of target companies compared to an industry reference. The chosen empirical design aims to explain the probability that a company undergoes an LBO as a result of these characteristics. More precisely, the purpose of the research design is to test the explanatory power of the presented arguments; the agency cost argument and the underperformance argument.

The statistical methods of this paper closely track similar studies. As in Nikoskelainen (2006), Reiersen (2008) and Weir et al. (2005), we employ both univariate and multivariate analysis. The univariate analysis tests the difference between the LBOs and the peer groups using paired t-test for difference in means, and Wilcoxon signed rank test for difference in medians. This is also in line with the approach of Kaplan (1989) and Lehn and Poulsen (1989). However, the Wilcoxon signed rank is considered to be a more appropriate measure than the paired t-test as it is non-parametric; it does not assume a normal distribution like the paired t-test. For each variable we test the null-hypotheses:

Ho: The expected value of the difference between the target company and the peer group is zero.

The multivariate analysis tests the selected variables using logistic regressions. The logit regression analysis uses a dummy variable of 1 if the company is subject to an LBO, and 0 for the peer company as the dependent variable. The model thus reports the independent variables' contribution to the probability of being acquired in an LBO. More specifically, the

dependent variable Z is the logarithm of the odds of being acquired, as seen in the equation below¹¹.

$$Z = \ln(P/(1 - P))$$

Our analysis is based on two or three time periods before the buyout year. Hence, the buyout year itself is excluded, and only the preceding years are included. This creates a more generalizable platform of comparison, as fund managers may or may not have buyout year financials available at the time of decision. This approach is widely used in existing research, but may still bias our results (Kaplan, 1989; Nikoskelainen, 2006; Reiersen, 2008; Singh, 1990).

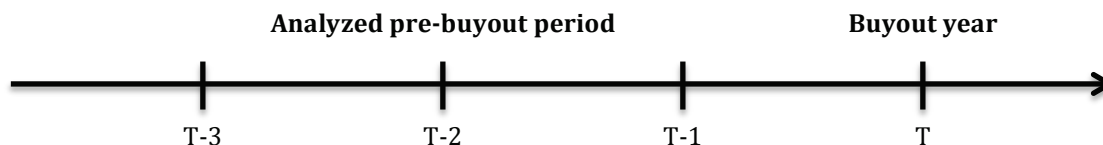


Figure 2 – Overview of analyzed pre-buyout period

The variables tested are selected based on the assumed determinants of the probability of engaging in LBOs. These determinants are identified through our main hypothesis of the underperformance and agency cost argument, as well as through existing research.

Deriving from the agency cost argument, and coherent with previously mentioned research by Lehn and Poulsen (1989) and Maupin (1987), cash flow related variables are expected to differ for target companies and their peers. As drawn from the agency cost argument, higher free cash flows are the main drivers behind LBOs. The volatility of cash flows is also considered, as it closely tracks the ability to generate steady cash flows. If LBOs are driven by the ability to take on debt and hence reduce agency cost, a low volatility is crucial to persuade lenders. However, the expected sign for these variables is contradictory for each argument. According to the agency cost argument, we would expect higher cash flow generation and lower volatility to result in a higher possibility of being acquired. On the other hand, consistent with the underperformance argument, lower cash flows and a higher volatility can be expected. Few existing studies have examined the impact of cash flow volatility, but Nikoskelainen (2006) established a significant positive relationship. It can also be argued that an underperformer may just as well have steady, but low cash flow generation. We use free cash flow over revenue as a proxy for ability to generate cash, and the standard deviation over the last three years for this variable as a measure of cash flow volatility.

¹¹ P is the probability of being acquired in an LBO.

According to Jensen (1986), low growth is an important driver of LBOs. Both the agency cost and the underperformance argument argue that target companies could have lower growth than their peers. Low growth prospects can also be seen in conjunction with the need for operating improvements, making it a suitable target for an LBO (Nikoskelainen, 2006). Grinblatt et al. (2008) contend this view. They claim mature businesses can fuel high growth through mergers and acquisitions, so called “empire building”. Revenue growth has been investigated in several papers; Reiersen (2008), Singh (1990), Vinten (2007) and Weir et al. (2005) were all unable to establish a significant relationship. However, both Nikoskelainen (2006) and Lehn and Poulsen (1989) found the target companies’ sales growth to be lower than their peers. Coherent with earlier research, this paper also employs sales growth as the main variable for growth. Comparing our target companies’ growth to those of the peer group creates a viable proxy of industry-relative growth.

Tracing the conditions of the underperformance argument, several operating variables are gauged. Accordingly, our sample of LBO targets should experience lower ability to generate profits, as well as the ability to generate revenues. To monitor profit margins, we use EBIT over total assets, measuring the ability to generate profit on a given level of assets. EBIT and EBITDA margins (EBIT and EBITDA as a proportion of sales) are also included as appropriate measures for the ability to generate profits. To measure revenues generated at a specific level of assets, we include asset turnover in our analysis. This approach is coherent with several studies, where these variables have been given explanatory power consistent with the underperformance argument (Reiersen, 2008; Vinten, 2007; Nikoskelainen, 2006). However, the agency cost argument would claim that the target company could outperform its industry peers in terms of operational efficiency, as supported by Singh (1990).

Gearing reduces free cash flows through increased debt service, and is seen as a main element of Jensen’s (1986) free cash flow hypothesis, and hence the agency cost argument. By adjusting leverage, the cost of capital can also be reduced. Thus, it can be hypothesized that potential LBO targets have not fully exploited their capital structure and have the ability to carry additional debt. We measure gearing as both book value of equity as a proportion of assets and long-term debt as a proportion of assets. The explanatory power of gearing has been tested by Nikoskelainen (2006), Reiersen (2008) and Singh (1990), of which Nikoskelainen (2006) demonstrated significantly lower gearing for buyout targets. Gulliksen et al. (2008) further support this by establishing higher gearing for post-buyout companies compared to industry peers. Closely related to gearing, we measure liquidity, as this proxies the firms ability to meet its obligations and to make investments. Liquidity is measured as current ratio¹², which was also employed by Singh (1990). Nikoskelainen

¹² Current Ratio = Current Assets / Current liabilities.

(2006) argue that net debt liquidity¹³ is a better measure as it better grasps the cash position of the company, but because of data availability this cannot be accounted for.

All variable definitions and expected signs are presented in Table 1 below. Including the aforementioned variables, each variable is also given as an average of the three years preceding the buyout.

Table 1 - Variable definitions and predicted signs. This table present the variables used in the empirical analysis, and the sign of the expected effect on the probability of being acquired in an LBO

Variable definitions and predicted signs			<i>Predicted sign by argument</i>	
Variable	Abbreviation	Definition	Agency Cost	Under-performance
Growth (1)	LY_GR	Revenue growth, year t-2 to t-1	-	-
Growth (2)	L2Y_GR	Revenue CAGR ¹⁴ , year t-3 to t-1	-	-
Cash flow generation (1)	FCF_M	Free cash flow over revenue, year t-1	+	-
Cash flow generation (2)	FCF_M_AV	Average of free cash flow over revenue, year t-3 to t-1	+	-
Cash flow generation (3)	FCF_VOL	Standard deviation of FCF_M, year t-3 to t-1	-	+/-
Operating efficiency (1)	EBIT_TA	EBIT over total assets, year t-1	+	-
Operating efficiency (2)	EBIT_M	EBIT over revenue, year t-1	+	-
Operating efficiency (3)	EBITDA_M	EBITDA over revenue, year t-1	+	-
Operating efficiency (4)	EBIT_TA_AV	Average of EBIT over total assets, year t-3 to t-1	+	-
Operating efficiency (5)	EBIT_M_AV	Average of EBIT over revenue, year t-3 to t-1	+	-
Operating efficiency (6)	EBITDA_M_AV	Average of EBITDA over revenue, year t-3 to t-1	+	-
Asset turnover (1)	ATURN	Revenue over total assets, year t-1	+	-
Asset turnover (2)	ATURN_AV	Average of revenue over total assets, year t-3 to t-1	+	-
Gearing (1)	EQ	Book equity over total assets, year t-1	+	+
Gearing (2)	EQ_AV	Average of book equity over total, year t-3 to t-1	+	+
Gearing (3)	LTD	Long term debt over total assets, year t-1	-	-
Gearing (4)	LTD_AV	Average long term debt over total assets, year t-3 to t-1	-	-
Liquidity (1)	LIQ	Current ratio (current assets over current liabilities), year t-1	+	-
Liquidity (2)	LIQ_AV	Average of current ratio (current assets over current liabilities), year t-3 to t-1	+	-

¹³ Net debt divided over total assets, where net debt is short and long term debt minus cash and cash equivalents

¹⁴ Compounded annual growth rate.

2.3 Sample characteristics

In total, our data set consist of 102 Scandinavian companies. The distribution of our sample reveals that the bulk of transactions happened in 2000-2001 and 2003-2004, see Figure 3 below. Because of the restriction that the LBO has to be exited in the original Gulliksen et al. (2008) data sample, the significant upturn in global LBO investment levels during the latter years is downplayed, as only so-called “quick-flips”¹⁵ will be included from recent years. The mean and median holding period for the total sample of 349 companies, with buyout year ranging from 1983 to 2007, is 4.81 and 4, respectively, whereas it is 3.48 and 3 for our sub-sample of 102 companies with buyout year from 1999-2006. Meanwhile, a recent study by Strömberg (2008) argues that the holding period for the median target company is increasing. This indicates that the sample drawn in this study could bias the results, as the sample may not grasp the current PE industry trends.

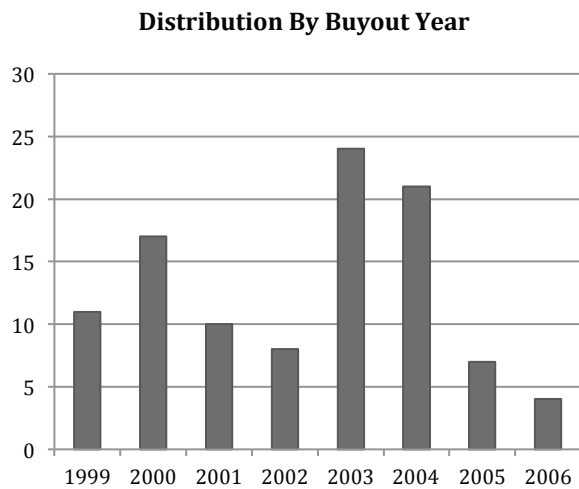


Figure 3 – Sample distribution by year of buyout

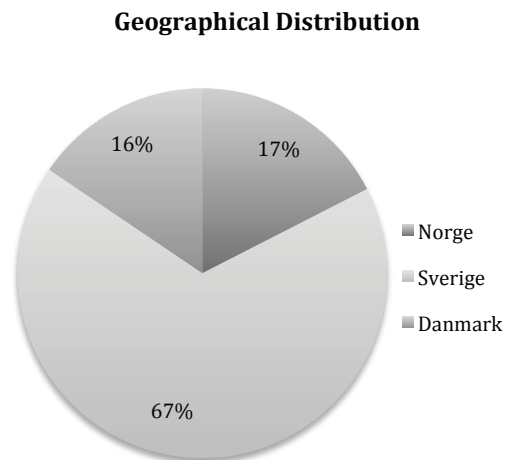


Figure 4 – Sample distribution by country

As shown in Figure 4, the majority of transactions occurred in Sweden. This is coherent with buyout investment levels as described in Figure 1, where Sweden is seen to have twice the buyout and growth capital investment levels of Norway and Denmark as a proportion of GDP in 2009. However, compared to the full sample of Gulliksen et al. (2008), Sweden is slightly overrepresented compared to Norway in our sub-sample.

The sample characteristics displayed in Table 2 reveals substantially higher mean and median revenue for the target companies than their peers. As peers and target companies are matched on median total asset size, the mean and median asset size for both groups is much more similar. Target companies are characterized by higher median revenues and slightly lower median assets than their industry peers.

¹⁵ LBO investments that are exited within 24 months after acquisition.

Table 2 – Selected sample characteristics of our sub-sample of 102 companies. Shown characteristics are from year t, the year of the buyout. All numbers are given in € 1,000.

Sample Characteristics, Year t				
	Target Companies		Industry Peers	
	Mean	Median	Mean	Median
Revenues	99,854	29,564	45,811	22,389
Total assets	53,402	19,623	45,485	21,019

The final sample of processed variables contains a maximum of 101 observations, and a minimum of 58 observations for each variable, for both the target companies and the peer group. As only observations where a value is found for both the target companies and the matching peer groups are included in the sample, the number of observations differ for each variable. The sample characteristics are given in Table 3, Panel A for target LBO companies and Panel B for peer groups.

Table 3 – Descriptive statistics of the sample. The table presents the assessed variables in our study, for target companies and peer groups. Variables presented are thoroughly explained in Table 1.

Panel A: Target Companies							
Category	Variable	N	Median	Mean	Standard Deviation	Min	Max
<i>Growth</i>	LY_GR	101	0.122	0.303	0.750	-0.732	4.999
	L2Y_GR	73	0.164	0.261	0.591	-0.422	4.312
<i>Cash flow generation</i>	FCF_M	88	0.051	0.067	0.248	-0.899	1.208
	FCF_M_AV	58	0.032	0.056	0.200	-0.551	0.936
	FCF_VOL	58	0.030	0.070	0.102	0.001	0.478
	EBIT_TA	97	0.099	0.085	0.230	-0.782	1.441
<i>Operating efficiency</i>	EBIT_M	101	0.054	0.045	0.236	-1.271	0.657
	EBITDA_M	91	0.077	0.091	0.254	-1.161	0.979
	EBIT_TA_AV	73	0.074	0.073	0.166	-0.414	0.821
	EBIT_M_AV	72	0.045	0.035	0.181	-0.632	0.657
	EBITDA_M_AV	59	0.064	0.078	0.201	-0.552	0.681
<i>Asset turnover</i>	ATURN	97	1.709	1.904	1.075	0.115	5.396
	ATURN_AV	70	1.739	1.916	1.114	0.185	5.077
<i>Gearing</i>	EQ	97	0.314	0.327	0.224	-0.093	1.159
	EQ_AV	72	0.301	0.312	0.195	0.014	0.846
	LTD	94	0.161	0.210	0.194	0.000	0.899
<i>Liquidity</i>	LTD_AV	66	0.210	0.238	0.196	0.000	0.835
	LIQ	86	1.534	1.788	1.090	0.579	9.145
	LIQ_AV	62	1.555	1.692	0.675	0.715	4.405

Panel B: Peer Groups							
Category	Variable	N	Median	Mean	Standard Deviation	Min	Max
<i>Growth</i>	LY_GR	101	0.064	0.108	0.323	-0.907	1.383
	L2Y_GR	73	0.078	0.122	0.190	-0.123	0.933
<i>Cash flow generation</i>	FCF_M	88	0.053	0.079	0.136	-0.071	1.119
	FCF_M_AV	58	0.054	0.091	0.174	-0.052	1.272
	FCF_VOL	58	0.013	0.027	0.048	0.002	0.338
	EBIT_TA	97	0.048	0.054	0.052	-0.105	0.357
<i>Operating efficiency</i>	EBIT_M	101	0.040	0.041	0.047	-0.170	0.235
	EBITDA_M	91	0.073	0.093	0.106	-0.017	0.783
	EBIT_TA_AV	73	0.050	0.055	0.056	-0.085	0.358
	EBIT_M_AV	72	0.039	0.041	0.046	-0.225	0.153
<i>Asset turnover</i>	EBITDA_M_AV	59	0.070	0.101	0.133	-0.085	0.882
	ATURN	97	1.344	1.372	0.641	0.070	3.666
	ATURN_AV	70	1.222	1.335	0.637	0.064	3.018
<i>Gearing</i>	EQ	97	0.295	0.289	0.109	0.004	0.551
	EQ_AV	72	0.272	0.283	0.109	0.044	0.533
	LTD	94	0.071	0.090	0.072	0.000	0.335
<i>Liquidity</i>	LTD_AV	66	0.080	0.093	0.069	0.000	0.300
	LIQ	86	1.474	1.510	0.468	0.883	4.626
	LIQ_AV	62	1.462	1.478	0.325	0.959	2.654

3 Empirical results

This section sums up the results of our empirical analyses. The first part discloses the results of the univariate analysis, followed by the results of the logistic regression analysis. The third part accounts for the survey results, before the implications of all three analytical approaches are discussed.

3.1 Univariate analysis

The results of the univariate analysis are listed in panel A and B in Table 4 for the t-tests and Wilcoxon signed rank tests, respectively. The mean and median differences are reported, as well as t- and z-statistics and their corresponding p-values. The two tests attain similar results; both identify significant differences between the target and peer companies for many of the same variables. However, the reported significance levels differ slightly between the t-test and Wilcoxon tests. This is partly due to the nature of the tests; the Wilcoxon test does not rely on an assumed probability distribution and is therefore a more conservative measure for significance. Also, some of the variables that are found to be significant in the Wilcoxon tests are not significant in the t-tests. This may be because of bias in the data set, as a t-test will be more sensitive to outliers influencing the mean values.

Table 4 – Results of Wilcoxon signed rank tests and t-tests. Reports number of observations (N), the mean or median difference between target companies and peer groups, Z or T-statistic and corresponding P-value. Variables presented are thoroughly explained in Table 1.

Panel A: Results of Wilcoxon signed rank tests for difference in medians					
Category	Variable	N	Median difference	Z-Statistic	P-Value
<i>Growth</i>	LY_GR	101	0.059	2.476	0.013**
	L2Y_GR	73	0.087	1.910	0.056*
<i>Cash flow generation</i>	FCF_M	88	-0.001	-0.212	0.832
	FCF_M_AV	58	-0.022	-1.289	0.197
	FCF_VOL	58	0.017	3.921	0.000***
	EBIT_TA	97	0.052	2.576	0.010**
<i>Operating efficiency</i>	EBIT_M	101	0.014	2.090	0.037**
	EBITDA_M	91	0.004	0.461	0.645
	EBIT_TA_AV	73	0.024	0.954	0.340
	EBIT_M_AV	72	0.006	0.084	0.933
<i>Asset turnover</i>	EBITDA_M_AV	59	-0.006	-0.710	0.478
	ATURN	97	0.365	4.492	0.000***
	ATURN_AV	70	0.516	4.439	0.000***
<i>Gearing</i>	EQ	97	0.019	1.241	0.215
	EQ_AV	72	0.029	1.128	0.259
	LTD	94	0.090	5.328	0.000***
<i>Liquidity</i>	LTD_AV	66	0.130	5.360	0.000***
	LIQ	86	0.060	2.799	0.005***
	LIQ_AV	62	0.094	2.282	0.023**

*** Statistically significant at 1% confidence level.

** Statistically significant at 5% confidence level.

* Statistically significant at 10% confidence level.

Panel B: Results of t-tests for difference in means					
Category	Variable	N	Mean difference	T-Statistic	P-Value
<i>Growth</i>	LY_GR	101	0.195	2.760	0.007***
	L2Y_GR	73	0.139	1.919	0.059*
<i>Cash flow generation</i>	FCF_M	88	-0.013	-0.448	0.656
	FCF_M_AV	58	-0.035	-1.081	0.284
	FCF_VOL	58	0.043	2.965	0.004***
	EBIT_TA	97	0.031	1.298	0.197
<i>Operating efficiency</i>	EBIT_M	101	0.004	0.167	0.868
	EBITDA_M	91	-0.003	-0.110	0.913
	EBIT_TA_AV	73	0.018	0.870	0.387
	EBIT_M_AV	72	-0.006	-0.308	0.759
<i>Asset turnover</i>	EBITDA_M_AV	59	-0.023	-0.845	0.402
	ATURN	97	0.532	4.811	0.000***
	ATURN_AV	70	0.581	5.223	0.000***
<i>Gearing</i>	EQ	97	0.038	1.753	0.083*
	EQ_AV	72	0.029	1.329	0.188
	LTD	94	0.120	6.174	0.000***
<i>Liquidity</i>	LTD_AV	66	0.145	6.372	0.000***
	LIQ	86	0.278	2.695	0.009***
	LIQ_AV	62	0.214	2.646	0.010**

*** Statistically significant at 1% confidence level.

** Statistically significant at 5% confidence level.

* Statistically significant at 10% confidence level.

Our sample reveals significant differences for both medians and means. Both tests seem to provide little evidence in support of the agency cost argument and the underperformance argument. For the agency cost argument to hold, a significant positive difference in free cash flow margins should appear, as well as a lower free cash flow volatility causing high, steady cash flows on which to apply leverage. Our results indicate that the average free cash flow margins are lower in the target companies, but this relationship is not significant. The difference in free cash flow margin volatility is highly significant, and suggests that the target companies have less stable cash than their peers, which could support the underperformance argument. Opposite of what was expected by both the underperformance and the agency cost argument, both last year's growth, and latest two year CAGR is significantly higher for the target companies. This is also true for long-term debt over total assets, which is proven significantly different at a 1% level for both tests. The other proxy for leverage, the book value of equity over total assets, is only significant at a 10%-level in the t-test.

The Wilcoxon signed rank test support the agency cost argument in demonstrating significantly higher EBIT margins, EBIT to total assets and asset turnover levels, which at the same time undermines the underperformance argument. Similar results are attained in the t-test, but only the asset turnover levels are significant. Furthermore, the current ratio of the target companies is significantly higher in both tests. While the last three years average of asset turnover and current ratio are significantly higher, it is worth noting that the three year average of both groups' EBIT margins are not significantly different. Together with the higher earnings volatility and higher growth, this suggests that the target companies' superior performance is not stable on a profitability margin level, although they generate more sales per assets and seem financially fit.

3.2 Regression analysis

The variables with p-value of maximum 0.200 in either of the univariate analyses are included in the logistic regression analysis. We test the impact of different time periods by including short- and medium-term variables in separate models, reported as model (1) and (2) in Table 5 below. As several of the included variables are highly correlated, we complement the initial regressions with different models where the highly correlated variables are not included at the same time. This gives a more robust assessment of the impact of each variable on the probability of being acquired in an LBO. The correlation matrix is reported in Appendix 1.

Table 5 – Results of the logistic regression models discussed. Coefficients and standard error for each variable are reported, as well as chi-square and R-square indicating the overall explanatory power of the model. Variables presented are thoroughly explained in Table 1.

Logistic regression models										
Category	Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Growth	LY_GR	0.470 (0.476)		0.715 (0.432)*	0.533 (0.479)	1.100 (0.780)	0.523 (0.473)			
	L2Y_GR		-0.277 (1.636)					2.142 (1.199)*	1.521 (1.141)	
	FCF_M_AV		-3.201 (2.622)					-0.266 (1.319)		-5.717 (2.977)*
Cash flow generations	FCF_VOL		26.793 (9.624)***			6.966 (3.713)*			6.958 (3.891)*	19.746 (9.415)**
	EBIT_TA	-0.327 (1.838)		-0.096 (1.003)	-0.403 (1.197)					
Operating efficiency	EBIT_M	-0.011 (1.434)					-0.260 (0.967)			
	ATURN	1.447 (0.337)***		0.783 (0.226)***	1.547 (0.319)***		1.529 (0.313)***			
Asset turnover	ATURN_AV		2.114 (0.564)***					0.714 (0.274)***		
	EQ	5.894 (1.528)***		2.628 (1.160)**	5.850 (1.464)***	1.295 (1.376)	5.727 (1.392)***		1.003 (1.364)	1.791 (1.875)
Gearing	EQ_AV		5.719 (2.549)**					2.187 (1.748)		
	LTD	10.811 (2.102)***			10.882 (1.932)***	7.155 (2.088)***	10.876 (1.933)***		6.974 (2.092)***	
Liquidity	LTD_AV		11.955 (3.353)***							8.642 (2.302)***
	LIQ	-0.236 (0.282)		0.548 (0.321)*						
Constant	LIQ_AV		-0.204 (0.846)					0.921 (0.512)*		
	Constant	-5.357 (0.999)***		-3.087 (0.775)***	-5.921 (0.984)***	-1.856 (0.602)***	-5.868 (0.965)***	-3.501 (1.094)***	-1.821 (0.600)***	-2.077 (0.714)***
N		166	98	170	186	112	186	104	112	106
Chi-square		71.630***	60.010***	28.24***	84.10***	30.90***	84.06***	19.67***	30.87***	39.46***
R-square		0.311	0.442	0.120	0.326	0.199	0.326	0.136	0.199	0.269

*** Statistically significant at 1% confidence level.

** Statistically significant at 5% confidence level.

* Statistically significant at 10% confidence level.

The logit regressions show slightly diverging results for the growth variables. Where the heavily correlated results for (2) indicate statistically insignificant lower medium term growth (L2Y_GR), (7) and (8) imply higher growth for the target companies. The contribution from the short-term growth variable (LTM_GR) is positive for all 5 models, but only significant for one of the models, at 10%. Thus, the implied higher growth is opposite of what was expected by both the agency cost and the underperformance argument. Asset turnover levels are significantly higher for the target companies at a 1% level for five of six models, and hence support the agency cost argument. There is weak evidence of underperformance on a profitability level with negative, insignificant signs for EBIT_M and EBIT_TA.

The results for the gearing variables are particularly interesting; the target companies appear to have higher equity to assets, consistent with the agency cost argument and underperformance argument, but at the same time higher long-term debt to assets. The short-term book value of equity to total assets (EQ) is tested in six models, where it has a positive sign significant at 1% for three models, and 5% for one model. The medium-term EQ_AV also has a positive sign where included, and is significant at a 5% level in one of the models. LTD and LTD_AV both have a positive sign significant at a 1% level for all seven models, opposite of what was predicted by the agency cost argument and the underperformance argument. The higher equity and long-term debt ratios imply that the target companies are inferior in financing their operations with current liabilities. This is further supported by a positive, significant sign for the current ratio on a short- and medium-term (LIQ and LIQ_AV) in models (3) and (7). It is worth noting that LIQ and LIQ_AV have negative, insignificant signs in (1) and (2), which is most likely due to the high correlation between these variables and the long-term debt variables.

Inconsistent with the agency cost argument, the medium-term free cash flow margin (FCF_M_AV) has a negative sign for all models where included, significant at 10% for one out of three. Furthermore, in line with the underperformance argument the volatility of these cash flows has a positive contribution to the probability of being acquired. FCF_VOL is significant from 1% to 10% in all models. As high, stable cash flows are imperative requirements for the agency cost argument to hold, these results strongly suggest that the agency cost argument is incapable of explaining buyout rationale.

By implementing a dummy variable of 1 if the holding period of the buyout exceeded three years, the robustness of the results is additionally tested. As our sample has a shorter mean and median holding period than that of the total sample of Gulliksen et al. (2008), it could be that the results are biased towards the characteristics of “quick-flips”. However, no such evidence was found. The inclusion of this dummy variable did not affect the results, and the results closely tracked those of the regression models in Table 5.

3.3 Survey results

To complement the quantitative study, a survey on PE fund managers expressed buyout rationale was conducted. It aims to bypass the analyses of financial statements and investigate buyout rationale directly from fund managers. The questionnaire-based survey is focused on the determinants of the agency cost argument and the underperformance argument. It was deployed to all of the 95 Scandinavian buyout funds identified through the Argentum market database, and we received a total of 20 partial answers, yielding a maximum reply rate of 21%.

Whereas the quantitative analyses in this paper emphasize historical performance and growth, the fund managers surveyed appear to concentrate more on the future prospects of the target companies. The selection of non-listed target companies seem to spring more from comprehensive, forward-looking strategic analysis, than the one-dimensional view stemming from financial statement analysis. Approximately 85% of the fund managers chose strategic analysis as a most fitting attribute to assess potential target company performance. Also in line with the importance of future prospects, revenue growth and historical quality of earnings were ranked as the second and third most fitting attributes, respectively, as seen in Figure 5.

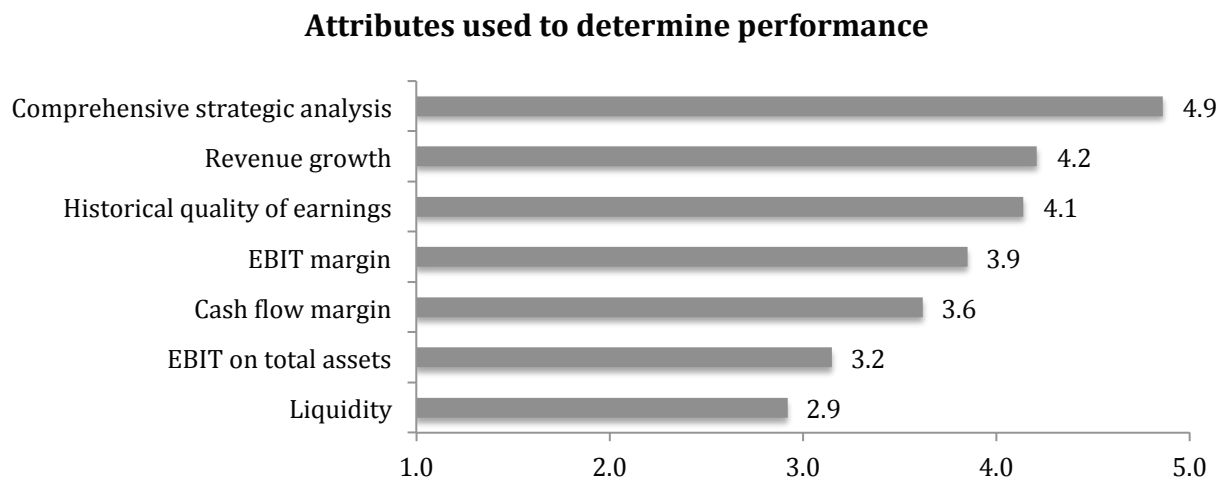


Figure 5 - Attributes used to determine performance. Number corresponds to the average value of the replies, where 5 equals most fitting, 1 equals not fitting. (N=14)

The survey results depicted in Figure 6 support neither of our main arguments. Growth potential for both company and industry, as well as the skills of existing management, the opportunity to do an exclusive deal and to acquire companies at an apparently undervalued price are ranked as the top five explanations for picking target companies. Underperformance of the target company is voted as the second least fitting explanation with 53% of the respondents characterizing it as not fitting, which undermines the underperformance argument. It is also interesting to see that gearing and tax shield

potential are ranked as unimportant factors for buyout rationale. The agency cost argument could be seen as partially supported by the mid-range importance of high free cash flows and superior performance of the target company. However, as these factors can be viewed as a sign of a well-run company, the relative unimportance of gearing factors as well as the importance of growth potential seems to imply that the agency cost argument is an unfitting explanation for buyout rationale.

Possible explanations for picking target companies

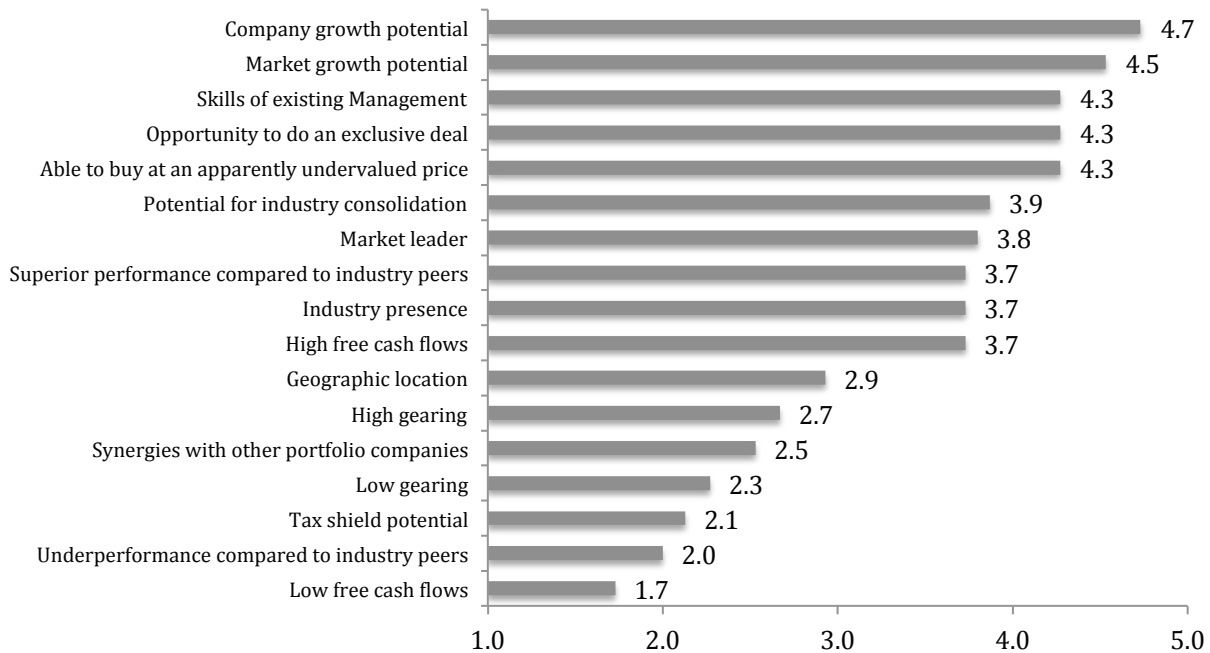


Figure 6 – Possible explanations for picking target companies. Number corresponds to the average value of the replies, where 5 equals most fitting, 1 equals not fitting. (N=15)

To further complement the understanding of the characteristics of target companies, the fund managers were asked to identify the underlying levers applied to create value in the target companies, see Figure 7. These factors also stress the importance of future growth, as 54% votes expansion as a most fitting¹⁶ value creating measure. The rest of the respondents, 46%, graded it with a 4. All respondents also rank operational improvements as a fitting measure, with 38% grading it 5 and 62% grading it 4. Such operational improvements include supply chain optimization, better control with debtors and decreased credit periods, improved inventory management, and better financial control. Hence, this could partially support the existence of underperformance in the target companies, but the answers are not compared to industry benchmarks and the evidence is therefore weak.

¹⁶ Most fitting corresponds to a value of 5.

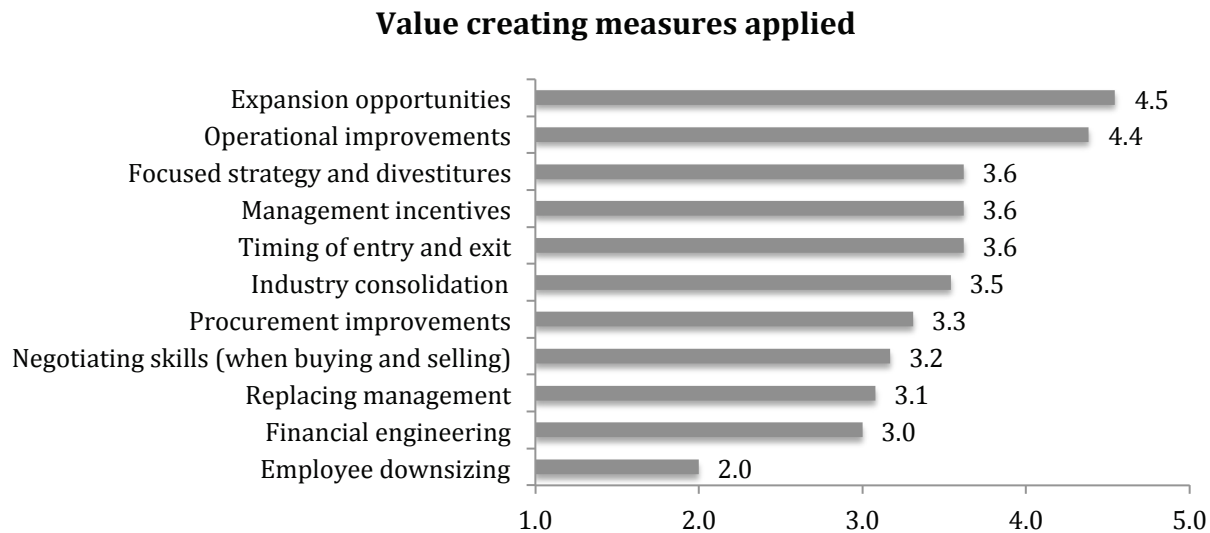


Figure 7 - Value creating measures applied in portfolio companies by PE funds. Number corresponds to the average value of the replies, where 5 equals most fitting, 1 equals not fitting. (N=13)

3.4 Discussion

The three different approaches to determining buyout rationale are mainly consistent. Little evidence is found in support of the agency cost argument as it seems that the nature of LBOs have evolved since the extremely leveraged days of the 1980s, on which most of the research supporting the agency cost argument has been conducted. This is also supported by the fact that modern LBOs are much less leveraged; Kaplan and Stein (1993) found an average of 6.52% equity to total assets ratio for 124 buyouts from the 1980s, whereas Guo et al. (2011) found a corresponding ratio of approximately 30% for a sample of 198 LBOs from 1990 to 2006. The survey is consistent with this view, ranking growth and operational improvements as superior value creating measures, and financial engineering as far less important. One could also point to the fact that the less dispersed ownership base of non-listed companies could mitigate the agency costs occurring in public companies.

Furthermore, little evidence consistent with the underperformance argument was found, and the fund managers surveyed disagreed with this hypothesis. Herein lies a substantial difference between our study of private-to-private transactions, and earlier studies conducted on public-to-private companies confirming the underperformance argument (Nikoskelainen, 2006; Reiersen, 2008). As a private company does not attract the same amount of interest from analysts and investors, the link between price and performance becomes weaker than for the public company. This “lack of interest” may result in a better chance of buying a non-listed company at a bargain price, if the seller is not aware of the companies inherent potential. Also, the illiquid nature of a non-listed company may yield a discount for the buyer. However, we found that the target companies had less stable free

cash flow margins than their peers, through a higher cash flow volatility and a lower average free cash flow margin for the latest three years.

Even though the survey results indicate that analyses of historical financial figures are insufficient in the selection process, several characteristics of a PE target company were found in the univariate and multivariate analyses. The target companies seem to grow faster and have higher asset turnover, but at the same time the higher free cash flow volatility reveals that they generate more unreliable profits compared to their industry peers. The higher level of asset turnover and free cash flow volatility indicates that the target companies are underperforming in the sense that they are controlling their costs poorly. This is also supported by the state of the target companies' capital structure. Our results reveal higher levels of both book equity to total assets, long-term debt to total assets and current assets to current liabilities (current ratio). Hence, the target companies appear to finance their operations with current liabilities in a smaller extent than their peers. In their study of PE ownership during the recent financial crisis, Breyholtz and Saga (2011) finds that PE owned companies are superior to their industry peers in managing current liabilities. This strengthens the belief that poor management of costs and current liabilities in particular may be a characteristic of PE target companies.

The target companies do not appear to be struggling underperformers, but instead companies with a lot of inherent potential to be extracted by the expertise of the PE funds. The typical target company thus seems to experience superior revenue growth and asset turnover, although they do not manage to deliver steady, superior results due to poor cost management. These results are complemented by the survey, where the fund managers stress the importance of expansion and operational improvements.

4 Conclusion

Our study sheds new light on the common characteristics of non-listed Scandinavian buyout target companies. Consistent with the survey results, the quantitative analyses gave little support to both the agency cost argument and the underperformance argument. We were unable to demonstrate significant outperformance, higher free cash flows and lower growth compared to industry peers, which effectively excludes the impact of the agency cost argument. The underperformance argument was partially backed by unstable, low free cash flows, but at the same time the target companies exhibit higher growth and asset turnover than their peers. Hence, the common denominator for the target companies seems to be that they excel in growth and revenue generation, but lag behind their peers in managing and keeping costs down. This is consistent with the survey, where current growth and expansion opportunities is both an important driver of buyouts as well as a value creating measure for private equity funds. Also, the fund managers surveyed emphasized the importance of operational improvements within their portfolio companies.

This paints a picture of the target companies as cost cutting projects with abundant inherent potential for growth and revenue generation.

According to the survey respondents, the analysis of historical financial data yields a too simplistic view of buyout rationale. The fund managers seem to embrace comprehensive strategic analysis, focusing on growth prospects and operational improvements. Following this path, it would be interesting to further investigate buyout rationale on a more qualitative basis through interviews and cooperation with fund managers. However, the undisclosed nature of the private equity industry would certainly make this a challenging task. For further quantitative research, it could be interesting to investigate to stay along the same path of methodology with a larger sample of Scandinavian firms. To broaden the European understanding of buyout rationale, it could be interesting to focus on other geographical regions in Europe. Also, by investigating the change from pre- to post-buyout one could establish firmer evidence of the key performance and growth indicators used by the private equity funds to assess potential targets.

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6 Appendices

6.1 Appendix 1 – Correlation matrix

n=98	LY_GR	L2Y_GR	FCF_M_AV	FCF_VOL	EBIT_TA	EBIT_M	ATURN	ATURN_AV	EK	EK_AV	LTD	LTD_AV	LIQ	LIQ_AV
LY_GR	1.000													
L2Y_GR	0.432	1.000												
FCF_M_AV	0.014	0.058	1.000											
FCF_VOL	-0.049	-0.024	0.179	1.000										
EBIT_TA	0.200	0.073	0.321	-0.432	1.000									
EBIT_M	0.197	0.153	0.586	-0.496	0.745	1.000								
ATURN	0.203	0.379	-0.267	-0.307	0.245	0.039	1.000							
ATURN_AV	0.076	0.242	-0.276	-0.330	0.213	0.019	0.941	1.000						
EK	-0.120	-0.008	0.061	0.226	-0.108	-0.160	-0.255	-0.258	1.000					
EK_AV	-0.181	-0.165	0.094	0.244	-0.091	-0.119	-0.343	-0.297	0.872	1.000				
LTD	0.105	0.253	0.068	0.166	-0.031	0.040	0.017	-0.054	-0.193	-0.222	1.000			
LTD_AV	0.127	0.320	0.005	0.153	-0.064	-0.004	0.058	-0.015	-0.149	-0.242	0.960	1.000		
LIQ	-0.052	-0.072	0.003	-0.034	0.072	0.055	0.023	0.053	-0.014	-0.002	0.371	0.343	1.000	
LIQ_AV	0.004	-0.067	-0.052	-0.023	0.091	0.025	0.050	0.085	0.034	0.120	0.416	0.380	0.822	1.000

6.2 Appendix 2 – Survey questions

Survey on common traits among non-listed buyout targets

This survey is a part of an academic paper concerning common traits among non-listed Scandinavian buyout target companies. The paper is written as a part of a master's thesis at the Norwegian University of Science and Technology (NTNU). The survey is anonymous and any email addresses are handled independently from the answers.

1. On which geographic regions do you focus?

Denmark

Norway

Sweden

Nordic Region

Rest of World

2. What is your main investment category?

Venture

Growth capital

Buyout

3. Capital under management (in € million)

4. Capital allocated to venture (in percent)

5. Capital allocated to growth capital (in percent)

6. Capital allocated to buyout (in percent)

7. Average deal size (Enterprise value in € million)

8. What is your industry focus?

Generalist

Specialist

9. On which industries do you focus?

Oil service

Health care

Consumer

Trade/retail

Services

ICT

Shipping

Cleantech

Energy

Industrial goods

Other, please specify

10. Typical investment horizon for target companies (years)

1-2

2-4

5-7

>7

11. Do you prefer to acquire listed or non-listed companies?

Listed

Non-listed

No preference

12. This question specifically concerns non-listed target companies. Rank possible explanations for picking target companies from 5 (most fitting) to 1 (not fitting)

Geographic location

High free cash flows

Low free cash flows

High gearing

Low gearing

Tax shield potential

Underperformance compared to industry peers

Superior performance compared to industry peers

Industry presence

Market growth potential

Company growth potential

Skills of existing Management

Synergies with other portfolio companies

Potential for industry consolidation

Market leader

Able to buy at an apparently undervalued price

Opportunity to do an exclusive deal

13. Which attributes of non-listed target companies are examined to determine superior performance or underperformance? Rank the attributes from 5 (most fitting) to 1 (not fitting)

EBIT margin

Historical quality of earnings

Revenue growth

EBIT on total assets

Cash flow margin

Liquidity

Comprehensive strategic analysis

14. How important is the fund's expertise of the industry of the target when picking target companies

Very Important

Important

Neutral

Unimportant

Very Unimportant

15. Rank the most attractive Scandinavian industries to invest in from 5 (most attractive) to 1 (least attractive).

Oil Service

Health care

Consumer

Trade/retail

Services

IT & Telecom

Shipping

Cleantech

Energy

Industrial goods

16. Which underlying levers are applied in the portfolio company to create value for the private equity fund? Rate the following levers from 5 (most important) to 1 (not important).

Operational improvements

Procurement improvements

Financial engineering

Negotiating skills (when buying and selling)

Timing of entry and exit

Expansion opportunities

Management incentives

Replacing management

Employee downsizing

Focused strategy and divestitures

Industry consolidation

6.3 Appendix 3 – Target companies assessed

Aalborg Industries	Coor Service Management	Inpac AB	Proline AB
AB Orwak	Cresco Ti Systems AB	IVT Industrier	Q-MATIC AB
AB Previa	CyberCity AS	Jernia AS	Quality-laboratories Sweden
Acando Frontec	Cygate AB	JUN-AIR International A/S	SBL Vaccin
ACO Hud	Damcos (Danfoss Marine Systems)	KAB Kabelprefektion	Semper
Adixen Sensistor AB	Dangaard Telecom AS	KappAhl	Sigicom AB
Åkersberga Bygg & Trä AB	Dansk Droge	Kirudan AS	Silva Sweden AB
APL ASA	DaVinci	Kosan Crisplant	Sonion AS
Aquafarms	Denerco Oil AS	Kreatel Communications AB	Sterling Airlines A/S
Attendo AB	Dynapac AB	Kronans Droghandel	Svenska Fönster
Autoadapt	EFG Hov + Dokka AS	Kungsörs Plast AB	Swe-Dish Satellite Systems AB
Avitec AB	Elitfönster	Logitall AB	Synerco AB
AxxessIT ASA	Elmo Leather	Mactive	SYSteam AB
Bewator AB	Eltel Networks TE AB	Melka	Thermia Värme AB
bluegarden	Euroflorist	Mipac AB	TusenFryd AS
C More Group AB	Expan AS	Modul-System	Valinge Innovation AB
Carpark	FAC Flygbussarna	Multicom Security	VetXX AS
CC System	Frigoscandia Distribution	Nopco Paper Technology AS	Volden Group AS
CCS	Gant	Novasol-dansommer	Welltec A/S
Cefar Medical AB	GET AS	NVS Installation	Wermland Paper
Cerbo Group AB	Global Garden Products S.p.A.	Nybron AB	Wernersson ost
Cermaq ASA	HandiCare	O Malmkvist AB	
Clean Chemical Sweden AB	HemoCue	Paroc	
Coffee Cup AB	Hemtex	Phadia AB	
Collett Pharma	HMS Industrial Networks	Plantasjen	
Com Hem Ab	Höglunds Flak AB	Plymovent AB	
Component Software ASA	Icopal	Popin	

Article II:

Performance of Private Equity Owned Firms during a Recession

Pål Chr. Breyholtz and Eivind Saga*

Abstract By comparing the performance of 36 Norwegian companies owned by private equity funds with comparable listed firms, we find evidence of superior crisis management capabilities in the private equity owned firms. Multifaceted analyses of financial indicators suggest that the main drivers are the funds' active ownership and their professionals' ability to implement strategic changes and drive operational efficiency. The results also suggest that private equity owned firms are better suited than publicly listed peers to leverage their capital structures, despite the increased bankruptcy risk. We believe this ability mainly is due to the private equity owned firms' superior profitability, their relative ease of adjusting strategy and capital to the changing circumstances, and the long-term relationships private equity funds have with banks.

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1 Introduction

Private equity has become an increasingly important alternative asset class in Norway over the last decade. In 2007 and 2008, approximately €460 million was invested in Norway by buyout funds, and total private equity investments constituted around 0.3% of Norway's GDP (EVCA, 2010). Following the typical boom and bust pattern of private equity, 2009 investments plummeted by more than 60% from the preceding record-breaking years, but are now rising yet again¹.

Broadly speaking, private equity can be divided into three categories; venture capital, growth capital and buyouts, with the latter being the dominant category. Buyout investments amounted to 71.2% of the total European private equity investments over the last five years² (EVCA, 2010). Buyout funds invest in firms by acquiring a controlling equity stake, and typically finance the deal by the use of high leverage. The goal is to create value through various measures and sell the companies with a profit within 1 to 10 years (Kaplan and Strömberg, 2008). This paper specifically concerns the buyout funds of the private equity sphere, and the term private equity (PE) will from hereon encompass only the private equity buyout category.

PE has from its infancy in the 1980s up until today been surrounded by mystique in which lack of information, light regulation, and high incentive fees have contributed. The public's curiosity has together with increasingly more committed capital and professional institutional investors led to a demand for more and better research on fund performance and value creation. A large set of published studies on PE has been generated, most of which are produced in the US.

In a meta study of existing research (e.g. Groh and Gottschalg, 2006; Jones and Rhodes-Kropf, 2003; Kaplan and Schoar, 2005; Lerner et al., 2007; Ljungqvist and Richardson, 2003; Phalippou and Gottschalg, 2007; and Swensen, 2000), Breyholtz and Saga (2010) found that PE funds create significant value on the firm level, with an average IRR of 19.37%, but fail to create excess risk adjusted returns to its investors. Furthermore, they investigated studies treating value creation on a portfolio company level.

Kaplan (1989) looks at how EBITDA and cash flow changes from one year pre buyout through the preceding three years for 48 public companies experiencing a buyout in the 1980s. He adjusts for industry effects by subtracting the industry median change, and used Wilcoxon signed rank tests to determine statistical significance. He finds an unchanged EBITDA the first two years after buyout, followed by a 24% increase in the third year. The cash flow increases with 22%, 43%, and 81%, respectively. When adjusting for size by dividing by sales and assets, he finds an increase of 20% in industry adjusted EBITDA. These results are consistent with those found by Smith (1990), after investigating 58 deals in the period 1977-1986. Operating cash flows per employee and

¹ NVCA's activity analysis, first half 2010: http://nvca.no/userfiles/Norsk_Venturekapitalforening_-_Aktivitetsunderskelse_1._halvr_2010.pdf.

² Calculated from 2005-2009.

operating assets increased significantly from the year before buyout to the year after. Smith (1990) also argues that better management of working capital contributes to the value creation, while layoffs and reduced investments do not.

Long and Ravenscraft (1991) observed that the LBO market in the latter half of the 1980s evolved to the point where pricier and riskier transactions took place. They suggest that the dramatic operating improvements documented in the early 1980s LBOs were due to an abundance of attractive LBO targets. Fewer opportunities to remedy agency problems easily through leverage in later years made it harder to achieve real operating gains. Consistent with this view they find that operating profit margins decline by an average of 2% in a sample of 107 LBOs in the period 1985-1987. Opler (1992) did similar research, extending the time period to 1985-1989. He finds different results than Long and Ravenscraft (1991), but consistent with those of Kaplan (1989) and Smith (1990), with industry adjusted operating income to sales increasing 11.6% from one year pre buyout to two years post buyout. Opler (1992) suggests that the difference in results of his study and Long and Ravenscraft (1991) are likely to be due to differences in sample composition; his study includes LBO deals in 1988 and 1989 and his sample have a much larger average deal size.

In a study of 122 UK buyouts in the period 1995-2002, Cressy et al. (2007) measure operating profitability (EBIT/total assets) and turnover growth for the buyout companies and compare it to a peer group. The peer group consists of 122 companies, each similar to one of the buyout companies in terms of industry and size (measured in total sales). They find that the portfolio companies on average increase their operating profitability from 8.51% in the buyout year to 9.06% three years after, while it decreases for the peer group from 6.23% to 4.74%. Likewise, the buyout companies on average increase their turnover with 14% over the three years, while the peer group only increases it with 7%.

Guo et al. (2009) examined 95 American public to private LBOs in the period 1990-2006. They find that gains in operating performance are much smaller than those found in US studies in the 1980s and in European studies in the 1990s. The changes in net cash flow are on average negative for the sample transactions. By comparing the results to benchmark firms, instead of industry, the changes in net cash flow to sales become positive, however not of the same magnitude as those observed by Kaplan (1989).

One of the most relevant studies performed on Norwegian PE owned companies was done by Gulliksen et al. (2008), when they analyzed 349 Scandinavian PE owned companies, of which 94 was Norwegian. They aim to answer whether the operational performance of PE owned companies are improved compared to their peers, relative to both pre and post holding periods. They find that these companies significantly outperform relative to their peer group in measures of EBITDA-levels, ROA-levels and growth. Interestingly, the superior performance is significantly higher in Norway than it

is in Denmark and Sweden, with a 25% industry adjusted change in EBITDA margin, 21% change in ROA, and a 20% CAGR.

Few of the existing studies, however, have concentrated on a specific macroeconomic period. Breyholtz and Saga (2010) find that the timing of PE investments has great influence on fund performance. This indicates that studies of macroeconomic periods could be of great interest. In Denmark, Lund-Nielsen (2010) conducted an analysis of the operational performance of PE owned companies during the latter recession. By comparing 34 companies that were owned by PE funds throughout the recession period, both with a group consisting of similar firms in terms of industry and asset size and with relevant industry averages, he finds that the PE owned firms have had a superior development in profitability. In 2007 and 2008 all three groups experience similar results, with an increase in profitability of 10-20% in 2007, and a decrease of around 30% in 2008. In 2009, however, PE owned firms increase their profitability to 2006 levels, while the two benchmark groups continue to decrease its profitability with around 25%.

The scope of this paper is to investigate how a recession influences portfolio companies' performance during a recession, relative to publicly listed companies. To further complement existing research, this paper will focus on portfolio companies in Norway. We compare financial performance indicators of 36 PE owned firms with data of publicly listed firms that are similar in terms of industry and size. We investigate the development between 2006 and 2009, and conduct Wilcoxon signed rank tests to determine the difference in median performance indicators.

The remainder of this paper is organized in the following manner. Section 2 covers the potential sources to superior performance that PE owned firms could have during a recession. Section 3 covers the methodology that is used to investigate the hypothesis that is developed, while the gathering of data is explained in section 4. The empirical results are outlined in section 5, while section 6 is the concluding part.

2 Potential sources to superior crisis management capability

To understand why we would expect PE owned firms to outperform listed comparables during a recession, we must assess the value creation measures in PE and how they are likely to be affected by financial turmoil. Breyholtz and Saga (2010) found that PE funds create value in portfolio companies along three dimensions; improved governance, superior operational efficiency, and financial engineering.

2.1 Improved governance

Jensen (1989) argue that publicly tradable ownership claims create fundamental conflicts of interest between the shareholders who bear risk and the executives who manage risk. For small equity owners in a listed company it is expensive to monitor the management, while they only receive a small portion of the gains. This creates the "free-

rider problem”, where no investor ends up monitoring enough. Kaplan and Strömberg (2008) claims that PE funds control the boards of their portfolio companies and are more actively involved in governance than boards of public companies. Replacement of management and the threat of dismissals make managers more likely to act in the owners’ interests. Indeed, Acharya et al. (2009) find that one-third of buyout firms’ CEOs are replaced in the first 100 days and two-thirds at some point over a four-year period.

A recession will probably not affect the amount or quality of monitoring and control. However, the need for fast response to the changing circumstances may increase substantially. For example, a change in strategy from expansion to cost control may call for new management. It is likely that a PE fund is more efficient at making such decisions and forcing changes than are dispersed owners.

Kaplan and Strömberg (2008) finds that PE funds also use management shareholdings to align incentives, by giving management a large equity upside and requiring them to participate in the downside risk by investing at their own expense. By transforming executives into owners, Jensen and Murphy (1990) argue that they will look for efficiency gains that will increase the value of their stockholdings. Kaplan and Strömberg (2008) find that the CEO in a median PE company receives 5.4% of the equity upside while the management as a whole receives 16%. In another study, Kaplan (1989) find that the median public-company CEO increased personal wealth by only 0.325% of the increase in shareholder value. Even though publicly listed firms have increased their use of stock-based compensation, Kaplan and Strömberg (2008) state that management’s ownership percentages are still greater in PE.

During a recession, the value of management shareholdings is likely to decline. However, they still hold some value and the holdings are normally not liquidated until an IPO or a secondary sale, when economic conditions are more favorable. Management could also be compensated based on the development in key performance indicators, which in a recession may seem impossible to reach. The use of stock options has been popular among both PE companies and publicly listed companies. These could be so far out-of-the money that the wanted incentives disappear. In some cases these out-of-the money options may even encourage management to take huge risks not aligned with the owners’ interests.

2.2 Superior operational efficiency

Kaplan and Strömberg (2008) states that in addition to hiring dealmakers with financial engineering skills, PE firms increasingly hire professionals with operating backgrounds and industry experts. Together with their network of other industry experts and consultancy firms, the expertise these professionals bring to the table is used to suggest and implement strategic and operational changes in the portfolio companies. Typical measures are outsourcing, downsizing, elimination of perquisites, supply chain optimization, better control with debtors and decreased credit periods, improved inventory management, and better financial control (Lund-Nielsen, 2010). In a

downturn, the focus on such measures will become even more important. Even though publicly listed firms may work just as hard with e.g. cost reductions as PE firms during a recession, they probably do not have the same level of knowhow, experience, negotiating power, and networks.

PE funds also implement large strategic changes as a method to create value. Breyholtz and Saga (2011) find that many PE funds introduce a growth strategy or a refocused strategy to its targets. The former measure is often used to consolidate industries, either by acquisitions, joint ventures, or strategic alliances. This could enable the firm to gain more bargaining power over suppliers and customers, and to take advantage of scope and scale (Lund-Nielsen, 2010). A refocused strategy could mean that the firm should focus on a few core capabilities, products, markets or distributional channels, often fulfilled through the divestments of unhealthy, or non-core, divisions and layoffs. A financial crisis can negatively affect the liquidity available to introduce such changes. It also makes the M&A market tougher, making it harder to sell divisions but at the same time cheaper to buy competitors and other strategic assets.

2.3 Financial engineering

A central source of waste in the large public corporation is the conflict between shareholders and managers over the payout of free cash flow – that is, cash flow that is in excess of that required to fund all projects with positive net present values. Jensen (1989) states that for a company to operate efficiently and maximize value, free cash flow must be distributed to shareholders rather than retained. Executives however, often have incentives to retain rather than distribute the funds. Retained cash could serve a competitive advantage for firms, giving them the flexibility to quickly respond to emerging opportunities, independent from capital markets. However, managers may also use the funds to enrich themselves in terms of perquisites and prestige, by expanding company size beyond that which maximizes shareholders' wealth. Jensen (1989) found that the 1,000 largest public companies (by sales) in the US generated total funds of \$1.6 trillion in 1988, of which it only distributed \$108 billion in dividends and another \$51 billion through share repurchases.

PE funds, being majority owners, can reduce free cash flows and increase leverage as it pleases. The idea is that the management must produce certain levels of cash flows in order to meet interest and principal payments, and thus are forced to evaluate its costs and potential investments more critically. In a recession, other firms are forced to such measures because of decreased earnings, neutralizing the advantage of PE ownership. In addition, PE owners could have tapped cash flows and increased leverage to such an extent that firms may have trouble making their debt payments.

Another source of value for PE owners comes from the increased interest tax shield from leverage. Modigliani and Miller (1958) argues that a firm could increase its value by increasing leverage until no more taxable income is left to be saved, however, only until the incremental cost of bankruptcy risk is higher than the tax shield value of an

incremental amount of debt. In a recession, EBIT could decrease so much that the value of interest tax shields declines. At the same time, risk could increase so much that bankruptcy threatens.

2.4 Bankruptcy risk

When analyzing potential value gains from leveraging a company, we also wish to investigate the increased risk that comes with leverage, and whether or not PE owned firms are more vulnerable during an economic downturn. Hillier et al. (2008) argue that the risk of bankruptcy increases with debt, and describes two types of bankruptcy costs; direct costs, being legal and administrative costs in a bankruptcy procedure; and indirect costs, coming from lost sales, more expensive supplies, key employees quitting, etc, due to the increased uncertainty surrounding the firm.

When a company finds itself in financial distress, a conflict between shareholders and creditors may arise. Even though a firm is more worth as a going concern, equity owners may be unwilling to inject more capital because creditors will receive most of the gains (Hillier et al., 2008). The shareholders may simply be better off letting the firm go into bankruptcy. However, Lund-Nielsen (2010) argue that this may play out differently for a PE owned company, as PE funds are dependent on good bank relationships to fund future deals. Thus PE funds are likely to go further than dispersed and small shareholders would to keep a firm from going into bankruptcy.

If a capital injection were NPV positive for the shareholders, it is easier for a PE fund to do so than for shareholders in a listed company through an equity issuance. A PE fund usually has available capital that they can inject quickly into its portfolio companies if needed. For a publicly listed company, however, the process of making a prospect, sending it out to the shareholders, and receiving subscriptions could take months (Lund-Nielsen, 2010). While the PE fund more easily can observe if the injection will be NPV positive, the shareholders in a listed company may, because of asymmetric information, choose not to participate. This could make the total capital injection smaller than necessary to avoid further distress.

Increasing debt in a distressed situation is usually a very difficult task, as lenders naturally will be hesitant or at least demand high interest and further covenants for the increased risk they are taking. However, Lund-Nielsen (2010) argues that because of the long-term relationships between PE funds and lenders, firms owned by PE firms are likely to receive more and cheaper debt with fewer covenants, as was observed in the boom years prior to the recent turmoil. Thus debt may be less of a disadvantage for PE owned firms in distressed situations³.

³ In two news articles in Dagens Næringsliv (<http://www.dn.no/forsiden/naringsliv/article2121425.ece> and p. 8-9, April 29th, 2011) the financially distressed company Relacom is described. The owner, a PE fund named Altor, had offered to inject new equity into the company if the banks would cancel some of the debt. The banks meant that the risk was too high, and chose to take over the company. However, at the

Overall, the analysis of the various measures that PE funds use to create value lead to a hypothesis that PE owned firms have some advantages over publicly listed firms in a recession. PE funds' active ownership is positive for the firm's ability to take actions to adapt rapidly to a changing environment, while management incentives in some cases can encourage too much risk. The fund's professionals and their networks are probably better suited to improve operational efficiency and implement strategic changes. The highly leveraged capital structures of PE owned firms are likely to be less worth in a recession because of the decreased value of tax shields and increased risk of bankruptcy. We do however believe that PE owned firms could have higher sustainable levels of debt than publicly listed firms.

3 Measuring relative performance

This analysis builds on Lund-Nielsen's (2010) argument that accounting differences for depreciation and appreciation, and the potential effect from PE gearing on interest tax shields, makes EBITDA the most relevant measure for differences in firm's profitability. As in other studies, this analysis scale EBITDA relative to assets and turnover to adjust for such changes as acquisitions and divestments. Accounting methods such as depreciation can affect firms' assets very differently, but as we measure changes over time, the initial level is not important.

As is done by Lund-Nielsen (2010) in his study, the balance sheet is used to calculate Invested Capital, which is preferred over total assets to scale EBITDA. The difference from total assets is that a firm's financial assets and operating debt are subtracted. The idea is to divide EBITDA by a measure that is focused on operational assets. For example, a firm with twice the assets as an otherwise identical firm would be significantly less profitable relative to total assets if much of it were held in a bank account earning low interests. It therefore makes sense to subtract financial assets from total assets. Operating debt, or non-interest bearing debt, is subtracted because it is a huge advantage for a firm if it is able to finance much of its operations through such instruments as payables and tax payable. EBITDA/total assets do not take into consideration such differences, while EBITDA/Invested Capital does. This also enables us to calculate Return On Invested Capital (ROIC).

Often, M&A activity leads to an increase in goodwill on the balance sheet, which is amortized the following years. Since assets increase, while EBITDA is not affected by amortization, we also calculate EBITDA over total assets excluding goodwill. Thus, potential effects from buyout firms improving key numbers with goodwill amortization are excluded.

Because of the importance of financial engineering in PE owned companies, this analysis also measure profitability in terms of cash flows, which incorporates tax benefits of

same time, one of the banks helped Altor finance another major transaction in Norway, explaining that the bank's view on PE had not changed. This describes the dynamics between PE funds and their lenders.

leverage. Kaplan (1989) did not subtract taxes from cash flows, because he argues that operating performance should be isolated. We consider EBITDA to be a proper measure of operating performance, but do however consider potential tax benefits from financial engineering to be an important factor behind value creation in portfolio companies, and therefore measure cash flow as EBITDA – tax – increase in working capital – capital expenditures.

When investigating the performance during financial turmoil, it is also relevant to look at the firms' risk of bankruptcy. To measure risk we look at the changes in the current and quick ratio, debt relative to EBITDA and equity, and Altman's z-score. The latter is a linear combination of five common business ratios, weighted by coefficients, and is used to predict corporate defaults. The lower score, the higher risk of default (Altman and Hotchkiss, 2006).

This analysis also takes into account the change in working capital, assets, gearing, salary expenses, capital expenditures and other reported items that can shed light on the way PE funds manage their portfolio companies.

Changes during the period 2006-2009 are measured as percentage change in the performance variables in years 2007-2009 compared to 2006. This is consistent with methods used in earlier studies (e.g. Kaplan, 1989 and Lund-Nielsen, 2010). A company with a key figure that increases from 10% to 14% between 2006 and 2009 is given an index equal to 140 in 2009. To control for general effects of the financial turmoil and industry, the analysis adjusts the changes relative to peers and industry. If a peer firm had a decrease in the key figure from 6% to 3%, it would be given an index equal to 50. This index is subtracted from 140, which gives an industry-adjusted increase of 90% for the portfolio firm. If the performance variable is negative in year 2006, a formula where an improvement to zero gives an index equal to 200 is used.

$$Index_i = 200 - 100 * (PI_i/PI_{2006})$$

PI_i is the performance indicator value in year i.

PI₂₀₀₆ is the performance indicator value in 2006.

Although the analysis also presents means, medians are preferred in order to control for outliers that potentially can dominate the means in small samples. Outliers, mainly occurring when dividing by numbers close to zero, are controlled for by adjusting extreme changes to an index equal to maximum 300 or minimum -200.

As in earlier studies, two-tailed Wilcoxon signed rank tests are preferred over Student t-tests, because the former is not contingent upon a normally distributed population. Wilcoxon signed rank tests make it possible to calculate whether differences in a given parameter between the study group and its reference group is statistically significant. This test is conservative and assumes a null hypothesis that the changes in portfolio companies equal the changes in public companies.

4 Data

We analyze data from the years 2006 through 2009 for all companies. Because it is important to distinguish the value created in companies with PE owners from the value created before or after the PE holding period, we only include companies owned by a PE fund throughout the period 2007-2009 in our study.

The owners then had at least six months to introduce changes before the first problems in the financial markets occurred, and were able to affect the profitability in 2007, 2008 and 2009. It could be argued that companies should have been owned for a certain period before 2007, so that the PE owners were able to introduce changes before the measurement period started, but that would reduce the number of companies in our database, given the large number of buyouts in 2006. Besides, several months usually passes from a PE fund's first interest in a company until the deal is signed. During this period the funds scrutinize the company and prepare changes they intend to make (Breyholtz and Saga, 2010).

All analyses are performed on reported accounting figures. Most data were acquired from the Norwegian Register Authority and Source of Information⁴. However, when automatically generated information is missing, annual reports from company websites and stock exchange announcements⁵ were used to manually plot the income statements and balance sheets. Consolidated statements were preferred over regular financial statements; however this was not always feasible. Several holding companies were created mid 2006 following buyouts, and thus have not reported consistent consolidated information for the whole period. In such cases regular statements reported for the subsidiary company being acquired are consistently used for all years. For all publicly listed peer firms, consolidated statements have been found.

4.1 Sample of PE owned companies

The Norwegian state owned LP Argentum has published a list of buyouts in Norway⁶. This is however not complete, so we have cross checked it with a similar list from NVCA and Menon⁷. In addition, we searched fund websites for deals not included in the two databases. We exclude companies owned by PE funds without a controlling equity stake throughout the period, as it is a prerequisite that the PE fund could make changes as it pleased⁸. We do however include those companies owned by a PE syndicate and those who were sold from one PE fund to another during the period. The list then includes 52 companies with a PE majority owner as of 01.01.2007, of which eight were exited in

⁴ Ravninfo: www.ravninfo.com.

⁵ Newsweb Oslo Stock Exchange: www.newsweb.no.

⁶ www.argentum.no/main-categories/nordic-pe/portfolio-companies.

⁷ Menon's Gjermund Grimsby sent us a list of Norwegian buyouts on behalf of the Norwegian Venture Capital Association February 18th, 2011.

⁸ To check ownership throughout the period we have searched company websites and annual reports, fund websites, the Norwegian Register authority and source of information (Brønnøysundregisteret and Ravninfo), announcements on Oslo Stock Exchange, and news articles.

2007, four in 2008, and none in 2009. This illustrates how a recession influences exit opportunities.

We also exclude four companies that have merged with foreign companies and therefore have not reported numbers that are comparable to those of the Norwegian companies. A list of the remaining 36 portfolio companies that are investigated in this study is given in Appendix 1.

When excluding the 12 companies that were sold between January 2007 and December 2009, a negative bias could occur because, as Lund-Nielsen (2010) argues, companies being sold by PE funds are usually among the funds' best performers. However, seven of the companies were exited by August 2007 and were thus hardly affected by the recession, which make them irrelevant for our study. The fact that the last five exits happened during the first half of 2008 also reduces the potential effect of the bias. If a company that performed well throughout the recession had been sold in 2009 and therefore had to be excluded, it would be a clear negative bias.

Bankrupt companies would naturally be unable to report numbers for the whole period. These would have been excluded from the database, and thereby given the database a positive selection bias. However, we have only identified one bankruptcy among the PE owned companies during the recession. Kid Interiør went into bankruptcy in 2009, but continued to run with a creditor (DnB NOR) as the new owner⁹. We therefore choose to include Kid, thereby avoiding any positive biases from bankruptcies.

4.2 Peer group

Only companies listed on Oslo Stock Exchange are relevant peers for our group of PE owned companies. The GICS standard¹⁰ is used to find each portfolio company's most relevant benchmark industry. For three companies in our sample, two industries are considered equally relevant. In these cases industry means are calculated based on companies from both industries. No listed firms exist in the relevant industries of ten portfolio companies. In these cases the most comparable industry (within the same industry group) is used as benchmarks. We do however perform the analyses without data for these ten companies as well, to check for significant differences in the results. No major effects were observed when performing this test. A list of the portfolio companies' industry benchmarks and reference companies is given in Appendix 2.

The firms included in each industry benchmark are dependent on a list published by the Oslo Stock Exchange on April 6, 2009, where each publicly listed company is classified based on the GICS standard. Some firms on this list are however excluded; firms not registered in Norway, PE owned firms, and firms not listed throughout the whole period between 2007 and mid 2009. Two potential biases occur when excluding delisted firms. A positive survivorship bias for the benchmark groups occurs as bankrupt and

⁹ Dagens Næringsliv, March 2, 2011, page 23.

¹⁰ The Global Industry Classification Standard (GICS) is developed by Morgan Stanley Capital International and Standard & Poor's. It consists of 10 sectors, 24 industry groups, 68 industries, and 154 sub-industries.

distressed companies are delisted. A negative bias occurs when companies are delisted following M&A activity, as these transactions tend to include successful companies. Several bankruptcies and M&A activities have been observed between 2007 and 2009.

Ghosh (2001) argues that studies performed on companies subject to M&A activity are likely to be biased, because such firms generally are larger than industry-mean firms, and performance is positively related to firm size. This reasoning is in line with that of Fama and French (1995). We find this criticism particularly relevant to our study, although with another reason, because publicly listed firms generally tend to be more mature and larger than industry means. To overcome this, we compare each PE owned firm with a listed company in the same industry, best matching its size in terms of total assets in December 2006. Ghosh (2001) argues that the reference company's asset size must be within the range 25-200% relative to the asset size of the portfolio company. Our rather small dataset do not allow us to be that strict, as many firms would not have a relevant peer and thus had to be excluded from the analysis. Most firms are however within a reasonable range, with a median relative asset size of 111%. In addition, we perform the analysis without the six firms with ten times or larger peer companies to check for potential effects. However, no significant effects were observed.

It is not always a clear distinction between privately owned and listed companies. For example, NEAS is listed on Oslo Stock Exchange, while a majority post is held by a PE fund. Also, several benchmark firms have individuals or other companies as majority owners. It could thus be argued that many of the advantages and disadvantages of PE ownership could be relevant for some of the listed firms as well. However, this only applies for a small proportion of the firms.

5 Empirical results

The first part of this section describes the empirical results obtained when comparing the portfolio companies with the reference companies, while the second part describes the results obtained when comparing with the industry benchmarks. In the last part we investigate bankruptcy risk.

5.1 Profitability in PE owned firms relative to reference companies

Table 1 presents the most relevant profitability and cash flow measures for the group of portfolio companies and the group of reference companies. We observe that the portfolio companies generally perform better than their respective reference companies in terms of EBITDA over total assets, with median margins between 8.6% and 11.6% for the portfolio companies and between 3.2% and 9.2% for the reference group. As expected, the effect becomes stronger when excluding goodwill from total assets. 2008 is the worst year for both groups, which illustrates the time of the financial crisis' impact.

Table 1 – Profitability 2006-2009: Portfolio companies relative to the reference group

	Portfolio companies (%)			Reference group (%)			Change portfolio companies			Change reference Group			Relative change (%-point)				
	2006	2007	2008	2009	2006	2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009
Panel A																	
Mean	11.8	5.0	4.4	6.6	10.4	4.2	1.2	3.0	95	82	94	50	15	41	45	67	53
Median	11.6	9.6	8.6	10.9	9.2	6.0	3.2	8.5	74	83	89	38	20	56	23	46**	28*
P-value															0.169	0.039	0.094
Panel B																	
Mean	23.0	-1.2	27.7	18.5	28.1	0.3	-3.7	-59.2	87	88	104	45	11	34	42	76	69
Median	18.0	12.1	12.4	13.6	13.8	8.4	4.1	11.7	84	84	96	37	17	33	26	65**	51**
P-value															0.222	0.034	0.037
Panel C																	
Mean	16.4	8.5	7.0	7.0	3.9	-2.8	-3.5	-21.6	80	71	87	51	36	58	29	35	29
Median	11.8	8.0	6.9	7.8	5.6	2.9	2.7	3.7	88	82	90	67	74	76	18	6	5
P-value															0.301	0.338	0.381
Panel D																	
Mean	2.7	-13.9	12.0	-0.7	16.7	-11.5	-19.7	-55.0	80	89	63	24	-1	73	56	90	-10
Median	5.4	4.5	3.8	2.1	6.8	4.5	-6.3	5.6	67	91	83	30	-13	83	38	89**	-54
P-value															0.177	0.031	0.756
Panel E																	
Mean	14.5	7.4	6.5	8.9	10.6	5.4	2.1	4.2	95	82	92	54	19	48	41	63	44
Median	15.3	14.6	9.3	11.5	10.0	8.1	4.2	9.1	81	80	84	52	26	72	10	39**	25
P-value															0.242	0.046	0.187
Panel F																	
Mean	4.0	7.6	5.8	8.4	2.3	-23.7	15.1	-4.5	142	151	141	9	150	139	133	1	2
Median	1.5	10.0	9.4	10.1	1.6	-6.1	12.2	3.7	156	150	155	49	242	227	148**	-46	0
P-value															0.013	0.948	0.980
Panel G																	
Mean	14.2	7.1	10.2	31.9	-40.1	-58.4	29.3	-511.9	131	152	148	22	157	117	109	-5	31
Median	2.0	13.3	18.0	13.7	3.3	-13.5	15.9	5.9	133	179	193	41	227	219	116**	-54	15
P-value															0.033	0.896	0.486

*** Statistically significant at 1% confidence level.

** Statistically significant at 5% confidence level.

* Statistically significant at 10% confidence level.

N varies between 34 and 36.

We should, however, not be so concerned about the profitability levels in this analysis, but instead look at the changes in profitability as the financial turmoil increases. In 2007, profitability levels decrease for both groups. While the portfolio companies manage to stabilize EBITDA over assets at median index levels around 85, representing a 15% decrease from 2006 levels, the reference companies continue to plummet after the first shock with a median index at 20 in 2008 before partially rising again with an index level at 56 in 2009. The portfolio companies outperform the reference group with 46% and 28%, both statistically significant, in 2008 and 2009, respectively. The pattern is the same when dividing EBITDA by invested capital instead of assets; however the results come with a stronger level of statistical significance. When excluding goodwill, the performance becomes less superior, as goodwill typically has largest effect closest to the buyout year.

In Table 2, we investigate the numbers behind the ratios in Table 1. The numerators are shown in Panel A and B, while the denominators are shown in Panels C-F. Only indexed numbers are included as nominal numbers do not give any useful insights to the main issues in this study and, besides, are heavily affected by large firms.

Table 2 - Inputs to the profitability analysis 2006-2009 for portfolio companies relative to the reference group

		Change portfolio Companies			Change reference group			Relative change (%-point)		
		2007	2008	2009	2007	2008	2009	2007	2008	2009
Panel A EBITDA	Mean	104	105	122	58	53	78	46	53	44
	Median	116	119	136	98	52	107	37	68	32
	P-value							0.124	0.157	0.248
Panel B FCF	Mean	137	151	155	0	149	141	136	2	13
	Median	153	220	210	10	300	184	131**	0	-6
	P-value							0.011	0.948	0.909
Panel C Total assets	Mean	134	153	145	159	174	158	-25	-20	-13
	Median	136	155	136	128	144	122	-14	-6	8
	P-value							0.228	0.291	0.413
Panel D Turnover	Mean	135	152	152	114	145	126	21	8	26
	Median	119	135	142	124	189	118	2	-17	16
	P-value							0.771	0.706	0.355
Panel E Invested capital	Mean	141	152	144	159	191	164	-18	-39	-21
	Median	117	126	132	112	183	121	3	-22*	0
	P-value							0.602	0.088	0.476
Panel F Total assets excl. goodwill	Mean	131	153	145	144	160	142	-13	-7	3
	Median	131	159	127	128	145	122	-4	3	4
	P-value							0.369	0.800	0.787
*** Statistically significant at 1% confidence level.										
** Statistically significant at 5% confidence level.										
* Statistically significant at 10% confidence level.										
N varies between 34 and 36.										

Improved EBITDA accounts for most of the portfolio companies' superior performance. From 2006 to 2007-2009, median EBITDA in the portfolio companies increases with 16%, 19%, and 36%, respectively, while it for the reference group decreases with 48%

to 2008 before it in 2009 rises to 7% above 2006-levels. The differences between the two groups are however not statistically significant.

Both total assets and invested capital increase for both groups. In 2009, the median asset size of the portfolio companies is 36% higher than in 2006, while it is 22% higher for the reference group. This shows that the portfolio companies' superior performance in EBITDA over assets comes from increased EBITDA, and not decreased assets. It also indicates that divestments have nothing to do with the portfolio companies' superior performance.

Table 3 - A set of underlying numbers for the portfolio companies and the reference group

		Change portfolio Companies			Change reference Group			Relative change (%-point)		
		2007	2008	2009	2007	2008	2009	2007	2008	2009
Panel A	Mean	79	75	82	103	36	110	-23	39	-28
Effective tax Rate	Median	100	97	96	98	52	94	-8	42	-26
	P-value							<i>0.636</i>	<i>0.313</i>	<i>0.212</i>
Panel B	Mean	143	168	168	128	157	136	15	12	32
Salary Expenses	Median	131	158	153	114	147	134	7	25	27
	P-value							<i>0.533</i>	<i>0.330</i>	<i>0.105</i>
Panel C	Mean	134	147	141	135	146	132	-1	1	9
Working Capital	Median	119	144	130	123	139	118	7	7	0
	P-value							<i>0.918</i>	<i>0.647</i>	<i>0.641</i>
Panel D	Mean	113	54	77	129	76	111	-17	-22	-34
Net working Capital	Median	100	59	77	115	98	109	-26	-5	-17
	P-value							<i>0.457</i>	<i>0.658</i>	<i>0.408</i>
Panel E	Mean	90	70	43	146	27	-5	-56	43	48
Capital Expenditures	Median	90	64	7	245	-13	35	-23	58	47
	P-value							<i>0.140</i>	<i>0.351</i>	<i>0.146</i>
*** Statistically significant at 1% confidence level. ** Statistically significant at 5% confidence level. * Statistically significant at 10% confidence level. N varies between 34 and 36.										

When looking at total salary expenses in Panel A, Table 3, it becomes clear that wage cuts or staff downsizing cannot explain portfolio companies' improved EBITDA, either. Total salary expenses increase for both groups and by 27% more for the portfolio companies than for the reference group.

If we look at EBITDA margins¹¹, in Table 1, Panel C, one can clearly observe that the portfolio companies have much higher margins than the other group. However, when investigating the relative changes in margins between 2006 and 2009, no significant superior performance is found. This is different from the results when dividing by assets and invested capital, which partly can be explained by the numbers in Panel D, Table 2, showing that the portfolio companies increase their median turnover from 2006 to 2009 with 42%, while reference companies only increase it by 18%.

¹¹ EBITDA / turnover.

Although the portfolio companies over the three years outperform by 16% in terms of turnover, it does not explain the overall superior performance in EBITDA observed in Panel A and Table 1. Hence, since increased EBITDA cannot be fully explained by increased turnover, portfolio companies must have been better at controlling costs during the financial turmoil than their listed peers. The data does not reveal whether better cost control comes from traditional cost savings, or lower volumes combined with better sales prices for their products or services.

In terms of the development of ROIC, the portfolio companies outperform the reference group with 38% from 2006 to 2007. From 2006 until 2008 and 2009, the portfolio companies seem to outperform by 89% and then underperform by 54%. The latter result are however not significant.

When looking at the cash flow figures in Panel F and G of Table 1, we surprisingly observe that both groups have been able to increase their free cash flow figures substantially throughout the recession. This story is confirmed by the numbers in Table 2, showing that FCF¹² rises for both groups throughout the turmoil. No group, however, improve cash flow performance from 2006 until 2009 significantly more than the other.

Data for taxes, working capital, and capital expenditures can help us explain the development in cash flows. In Panel A, Table 3, one can observe that the effective tax rates are stable for both groups, with the exception of a 48% reduction from 2006 to 2008 for the reference group. In 2009 the portfolio companies reduce taxes by 26% relative to the reference group. However, tax savings as a source to value during a recession cannot significantly be derived from the data.

In several other studies, better management of working capital has been a key factor behind portfolio companies' performance. This is supported by a 9% increase in net working capital between 2006 and 2009 for the reference group, against a 33% decrease for the portfolio companies. Combining these findings with the substantial growth in working capital for both groups, it clearly indicates that portfolio companies are superior to peers at managing current liabilities. The management of current liabilities also explains, at least partly, why portfolio companies seem more efficient in terms of keeping invested capital down.

Capital expenditures are reduced for both groups throughout the recession, which to a large extent explains the improved cash flow performance of both groups.

Overall, this analysis shows that portfolio companies do in fact outperform their reference companies both in terms of EBITDA over assets and invested capital, and revenue growth. The improved EBITDA stems from better cost control. In terms of cash flows both groups increase these throughout the recession.

¹² Free cash flow

5.2 Profitability in PE owned firms relative to industry benchmarks

All analysis performed relative to the reference group have also been performed relative to industry benchmarks. However, only Table 4, presenting overall performance figures, similar to those presented in Table 1, are presented here. The remaining tables are presented in Appendix 3.

We do not observe the significant superior performance in EBITDA over assets as we did when comparing with reference companies. The development between 2006 and 2009 is approximately the same for both groups. Underlying numbers for EBITDA in Table 8 of Appendix 3 confirms this pattern. However, industry benchmarks significantly outperform the portfolio companies in terms of EBITDA over turnover. This could be explained by the portfolio companies' superior turnover growth. Patterns for the denominators turnover and total assets remain largely unchanged compared to the analysis of reference companies.

The pattern for EBITDA over invested capital is similar to that observed in Table 1. The portfolio companies outperform the industry benchmarks with 47% in 2009, although the result has a higher p-value. The underlying numbers for invested capital in Table 8 of Appendix 3, presenting a significant relative 32% reduction in invested capital, explain why the superior performance in terms of EBITDA over invested capital remain strong.

We obtain results that indicate superior performance in the development of ROIC between 2006 and 2007-2009 at 30%, 88%, and 50%, respectively. However, only the first two are significant. The result for 2009 is opposite to that found in the analysis of reference companies, but none of them are significant. It could be argued that high variances in ROIC should be anticipated because of the fluctuating nature of a figure derived from earnings, depreciation, amortization, interest, and tax.

With a very strong significance level, a 132% superior performance is observed in the development of FCF over invested capital between 2006 and 2009. This result is substantially stronger than it was when comparing with the reference group. Again, this can be explained by the stronger performance in the reduction of invested capital, as the FCF remain approximately the same.

All in all, the analysis relative to industry benchmarks confirms the findings from the analysis relative to reference companies, except from some explainable differences. Since none of the findings above are directly contradictory or statistically different to the findings in the tests performed on the reference companies, we still regard the findings from the main analysis valid.

Table 4 – Profitability 2006-2009: Portfolio companies relative to the industry benchmarks

	Portfolio companies (%)			Industry benchmarks (%)			Change portfolio Companies			Change industry Benchmarks			Relative change (%-point)				
	2006	2007	2008	2009	2006	2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009
Panel A																	
EBITDA / total assets	11.8	5.0	4.4	6.6	10.6	7.5	6.2	7.9	95	82	94	80	65	87	15	17	7
	11.6	9.6	8.6	10.9	11.8	7.8	8.4	8.5	74	83	89	71	64	72	-4	-18	1
															0.935	0.863	0.931
Panel B																	
EBITDA / invested capital	23.0	-1.2	27.7	18.5	28.9	9.2	6.3	0.4	87	88	104	72	56	44	15	32	60
	18.0	12.1	12.4	13.6	22.2	13.3	9.5	11.7	84	84	96	62	36	35	-5	17	47*
															0.863	0.300	0.066
Panel C																	
EBITDA / Turnover	16.4	8.5	7.0	7.0	-34.8	7.6	6.3	5.1	80	71	87	126	109	141	-47	-38	-54
	11.8	8.0	6.9	7.8	4.3	7.1	4.2	7.9	88	82	90	76	81	112	-12	-31	-44**
															0.166	0.136	0.048
Panel D																	
EBITDA / ROIC	2.7	-13.9	12.0	-0.7	15.5	-3.7	-6.7	-6.3	80	89	63	19	-14	20	61	104	43
	5.4	4.5	3.8	2.1	11.2	4.5	-5.0	4.6	67	91	83	30	-14	19	30*	88**	50
															0.094	0.012	0.255
Panel E																	
EBITDA / total assets excl. goodwill	14.5	7.4	6.5	8.9	11.2	8.9	7.5	9.5	95	82	92	83	71	96	12	11	-4
	15.3	14.6	9.3	11.5	11.9	8.8	10.0	9.8	81	80	84	71	67	74	-9	-30	-11
															0.967	0.863	0.437
Panel F																	
FCF / total Assets	4.0	7.6	5.8	8.4	-4.2	-8.4	15.4	-5.1	142	151	141	44	224	99	97	-74	42
	1.5	10.0	9.4	10.1	-5.7	-5.3	12.0	1.0	156	150	155	107	268	66	37*	-68**	59
															0.068	0.021	0.242
Panel G																	
FCF / invested capital	14.2	7.1	10.2	31.9	-28.4	-15.5	25.9	-111.2	131	152	148	20	226	18	110	-73	130
	2.0	13.3	18.0	13.7	-3.4	-4.3	16.3	-2.9	133	179	193	57	297	61	32**	-59**	132***
															0.023	0.036	0.005

*** Statistically significant at 1% confidence level.

** Statistically significant at 5% confidence level.

* Statistically significant at 10% confidence level.

N varies between 34 and 36.

5.3 Bankruptcy and risk

The analyses so far have indicated that the portfolio companies regain or improve profitability faster than their respective reference companies. In itself, improved profitability is a clear sign of reduced risk of bankruptcy. To dig deeper, debt and equity levels, and key figures such as interest bearing debt (IBD) over EBITDA, the current ratio, the quick ratio, and debt over equity are studied. These ratios normally form the basis for covenants in contracts between companies and their lenders, where a violation may give the bank the right to demand an extraordinary down payment (Lund-Nielsen, 2010). This may ultimately lead to default and bankruptcy. Risk related factors have been assessed for portfolio and reference companies, shown in Table 5. Similar results, but stronger in terms of significance levels, are obtained by analyzing the industry benchmarks rather than the reference companies. The latter results are shown in Appendix 4.

The portfolio companies are more leveraged than their listed reference companies. For all years, the portfolio companies' median IBD over EBITDA ratio is approximately twice that of the reference group, and the debt to equity ratio is between two and three times higher. While the debt to equity ratio remains relatively constant for both groups, the portfolio companies reduce IBD over EBITDA between 2006 and 2009 with median 65% more than the reference group. This ratio is, of course, affected by the relatively positive development in EBITDA for the portfolio companies. However, the pattern is confirmed by a significant difference between the two groups in terms of debt levels, increasing 40% less for portfolio companies between 2006 and 2008. Both groups do however increase their debt levels throughout the recession.

Also equity is increased for both groups, with a slightly steeper increase for the reference group. These numbers indicate that both groups have used the capital markets actively during the recession. The difference seems to be that the portfolio companies managed to use the funds to fuel growth and enhance performance.

The development in measures of liquidity risk, such as the current ratio and the quick ratio, show only small differences. The portfolio companies start out at lower and riskier levels, but both groups' ratios remain approximately at constant or slightly decreased levels throughout the period.

The direct test of bankruptcy risk in our analysis is the Altman z-score. In 2006, the median z-score was 1.5 for the portfolio companies and 2.1 for the reference companies. Again, we see that the portfolio companies start out at riskier levels. In 2008, though, the z-score is reduced by 35% for the reference companies, while it is basically at 2006-levels for the portfolio companies. Thus, the portfolio companies seem better at controlling risk during the recession than their reference companies. Most importantly, however; risk levels in terms of the z-score are much higher for the portfolio companies every year.

Overall, it seems like portfolio companies operate at higher risk levels than their reference companies, but are better at controlling risk during the recession. Our analysis shows that the portfolio companies are more profitable and are less negatively affected by the recession. This counteracts the effect of high debt levels, and may be part of the explanation why banks allow funds to leverage portfolio companies to relatively high levels. Another explanation could be that PE funds inject new capital into its firms more easily than public investors, although we are not able to observe such behavior in our analysis. However, because of the portfolio companies' superior profitability performance, additional capital may have been more needed in listed firms. Thus the *possibility* and relative *ease* of portfolio companies to inject capital may in itself be enough for the banks to allow higher gearing. Besides, the long-term relationship between a PE fund and a bank also enables the latter to accept more risk. A PE fund has strong incentives to prevent defaults in its portfolio companies' debt, because it is reliant on banks' funding its future deals. Equity holders in listed companies have no such incentives, because small equity holders are hard to blame or even identify when something goes wrong.

6 Conclusion

Our analyses suggest that PE owned firms have superior crisis management capabilities compared to their listed counterparts. From 2006 to 2008, the PE owned firms outperform their peers by 46% in terms of EBITDA over total assets. From 2006 to 2009, the superior performance is 28%. Both results are statistically significant at a 10% level. The results are the same, however with a 5% significance level, when dividing EBITDA by invested capital instead. The results show that better development in EBITDA accounts for most of the superior performance, and suggest that this mainly is due to better turnover growth together with superior cost control. We believe that PE fund's active ownership and their professionals' ability to implement strategic changes and drive operational efficiency in their portfolio firms are the main reasons why PE owned firms outperform their peers.

It is also evident that PE owned firms operate at higher risk levels throughout the recession. However, the results suggest that these firms' keep their risk levels at constant (high) levels during the financial crisis, while the publicly listed firms increase their risk levels. We believe this finding is supported by the PE firms' superior profitability, their relative ease of injecting capital and adjusting strategy to the changing environment, and the long-term relationships PE funds have with banks.

Lund-Nielsen (2010) obtains results that are similar to ours. This strengthens the view that PE owned firms have superior crisis management capabilities compared to listed peers. Our findings are also consistent with the view that PE funds create significant value in their portfolio firms (Breyholtz and Saga, 2010).

It would be interesting if more research was conducted on the relationships between PE funds and banks during the recession. Did banks consider PE funds to be more suited owners than dispersed shareholders? Would PE funds be willing to inject new equity, despite it being NPV negative, to keep its bank relations intact? If the long-term relationships in fact are important, one could expect the bankruptcy rate among companies owned by foreign funds to be higher. Is it possible to find such a pattern? It would also be interesting to find out whether the process of injecting new equity, from the time it was considered necessary to the time it was available for the firm, happened more quickly in PE owned firms than in publicly listed firms.

It would also be interesting to further investigate the value creation measures that PE funds have used during the financial crisis. Was there any particular measure that made the PE firms outperform listed peers? Our study of financial data is only able to explain overall performance indicators, and only to a small extent the underlying value creation measures. Therefore, a more in depth analysis of each firms' performance would be desirable, maybe in the form of a qualitative case study.

7 References

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8 Appendices

8.1 Appendix 1

Table 6 – Portfolio companies 2006-2009

Company name	PE fund	Entry year
NEAS ASA	Nordic Capital Partners	May 2000
Zalaris HR Services AS	Nordic Capital Partners	Nov 2000
Pronova Biopharma ASA	Herkules	Jan 2004
Electromagnetic Geoservices ASA	Warburg Pincus Funds	Jun 2004
Locus AS	CapMan Equity	Aug 2004
Europris Holding AS	Industri Kapital	Oct 2004
Point Transaction Systems AS	Nordic Capital	Oct 2004
Noratel Holding AS	Herkules	Dec 2004
Cardinal Foods ASA	CapMan Equity	Apr 2005
Arcus-Gruppen AS	Ratos	Jun 2005
Nordisk Tekstil Holding AS	Industri Kapital	Jun 2005
Handicare AS	Herkules	Jul 2005
Infocare AS	CapMan Equity, Segulah	Aug 2005
Via Travel Group ASA	FSN Capital	Sep 2005
Navico Holding AS	Altor	Oct 2005
Panorama Gruppen AS	Norvestor	Dec 2005
Wonderland AS	Herkules	Mar 2006
Beerenberg Corp. AS	Herkules	May 2006
Notabene Holding AS	Reiten & Co Capital Partners	May 2006
Nille AS	Herkules	Jun 2006
SPG AS	HitecVision	Jun 2006
Visma AS	HG Capital Funds	Jun 2006
Adra Match AS	Via Venture	Jun 2006
Jøtul AS	Ratos	Jun 2006
Technor Holding AS	HitecVision	Jun 2006
Alliero Holding AS	Altaria	Jul 2006
SPT Group Norway AS	Altor	Jul 2006
Elixia Nordic AS	Norvestor	Sep 2006
Aarbakke AS	HitecVision	Oct 2006
Airlift AS	Reiten & Co Capital Partners	Nov 2006
Ellipse Klinikken AS	Reiten & Co Capital Partners	Nov 2006
Malthus AS	Reiten & Co Capital Partners	Nov 2006
Helly Hansen Group AS	Altor	Nov 2006
Becotek AS	Norvestor	Nov 2006
Plantasjen ASA*	APAX (EQT)	Dec 2006
Aibel AS*	Herkules (Candover, 3i)	Jun 2007

* These companies were acquired from other PE funds (previous owner in parentheses).

Exits 2007: Epax, Marine Farms, ErgoBlue garden, AKVAsmart, Sonans, Intelcom Group, Nopco Paper Technology, NORECO.

Exits 2008: Knowledge Systems, NEC Invest, Norgani, Scandinavian Electric Systems.

Subsidiaries of foreign holding company: SafeRoad, OilCamp, Lindorff Group, Relacom.

8.2 Appendix 2

Table 7 – Portfolio companies, industry benchmarks, number firms in industry benchmarks, reference companies and their relative sizes

Company name	Industry	Number of benchmark firms	Reference company	Relative size****
NEAS ASA	Commercial Service & Supplies	1	Tomra Systems ASA	1789 %
Zalaris HR Services AS	IT Services	8	Inmeta ASA	216 %
Pronova Biopharma ASA	Pharmaceuticals	2	Photocure ASA	14 %
Electromagnetic Geoservices ASA	Energy Equipment & Services	20	Bjørge ASA	115 %
Locus AS	IT Services	8	Inmeta ASA	91 %
Europris Holding AS	Multiline Retail / Internet & Catalog Retail****	1	Komplett ASA	22 %
Point Transaction Systems AS*	Computers & Peripherals	2	Tandberg Storage ASA****	1353 %
Noratel Holding AS	Electronic Equipment, Instruments & Components	4	Otrum AS	104 %
Cardinal Foods ASA	Food products	11	Codfarmers ASA	47 %
Arcus-Gruppen AS	Beverages / Food products****	11	Domstein ASA	82 %
Nordisk Tekstil Holding AS	Specialty Retail / Internet & Catalog Retail****	1	Komplett ASA	47 %
Handicare AS	Health Care Equipment & Supplies	2	Medistim ASA	13 %
Infocare AS	IT Services	8	Telecomputing AS	45 %
Via Travel Group ASA	Hotels, Restaurants & Leisure	1	Hurtigruten ASA	1080 %
Navico Holding AS	Electronic Equipment, Instruments & Components	4	Kitron ASA	39 %
Panorama Gruppen AS	Specialty Retail / Internet & Catalog Retail****	1	Komplett ASA	154 %
Wonderland AS*	Household Durables	3	Hjellegjerde Holding AS	298 %
Beerenberg Corp. AS	Energy Equipment & Services	20	Fred. Olsen Production ASA	101 %
Notabene Holding AS*	Specialty Retail / Internet & Catalog Retail****	1	Komplett ASA	620 %
Nille AS*	Multiline Retail / Internet & Catalog Retail****	1	Komplett ASA	248 %
SPG AS**	Energy Equipment & Services	20	Fred. Olsen Production ASA	111 %
Visma AS	IT Services / Software**	12	Blom ASA	48 %
Adra Match AS	Software	4	Birdstep Technology ASA	1981 %
Jøtul AS*	Household durables	3	Hjellegjerde Holding AS	86 %
Technor Holding AS	Electronic Equipment, Instruments & Components	4	Kitron ASA	93 %
Alliero Holding AS	Household Durables / Construction & Engineering***	7	Hjellegjerde Holding AS	328 %
SPT Group Norway AS*	Energy Equipment & Services	20	GTB Invest ASA	184 %
Elixia Nordic AS*	Hotels, Restaurants & Leisure	1	Hurtigruten ASA	2436 %
Aarbakke AS*	Energy Equipment & Services	20	GTB Invest ASA	130 %

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Airlift AS*	Air Freight & Logistics / Airlines****	1	Norwegian Air Shuttle ASA	852 %
Ellipse Klimikken AS	Health Care Providers & Services / Health Care Equipment & Supplies****	2	Bionor Pharma ASA	278 %
Malthus AS*	Household Durables / Construction & Engineering***	7	Hjellegjerde Holding AS	67 %
Helly Hansen Group AS*	Textiles, Apparel & Luxury Goods / Household Durables****	3	Hjellegjerde Holding AS	47 %
Becotek AS*	Metals & Mining	2	Scana Industrier ASA	1071 %
Plantasjen ASA*	Specialty Retail / Internet & Catalog Retail****	1	Komplett ASA	49 %
Aibel AS*	Energy Equipment & Services	20	Sevan Marine ASA	110 %

* Consolidated statements not feasible. Ordinary financial statements are used.

** No available numbers for 2007.

*** Two industries considered equally relevant.

**** No listed companies in relevant industry. Closest industry, within the same industry group, used as comparison instead.

***** Both listed industry peers bankrupt in 2007. Key figures therefore manipulated in analyses, so that index = -200 each year.

***** Relative size in terms of total assets in 2006.

8.3 Appendix 3

Table 8 - Inputs to the profitability analysis 2006-2009 for portfolio companies relative to the industry benchmarks

		Change portfolio companies			Change industry benchmarks			Relative change (%-point)		
		2007	2008	2009	2007	2008	2009	2007	2008	2009
Panel A EBITDA	Mean	104	105	122	108	95	124	-4	11	-2
	Median	116	119	136	101	106	127	-15	-5	11
	P-value							<i>0.768</i>	<i>0.900</i>	<i>0.919</i>
Panel B FCF	Mean	137	151	155	91	212	144	45	-61	10
	Median	153	220	210	182	300	239	7	-42	0
	P-value							<i>0.383</i>	<i>0.101</i>	<i>0.954</i>
Panel C Total assets	Mean	134	153	145	138	152	140	-4	2	4
	Median	136	155	136	109	130	122	16	15	7
	P-value							<i>0.726</i>	<i>0.635</i>	<i>0.647</i>
Panel D Turnover	Mean	135	152	152	104	119	111	31	33	41
	Median	119	135	142	116	131	119	9	7	13*
	P-value							<i>0.112</i>	<i>0.272</i>	<i>0.087</i>
Panel E Invested capital	Mean	141	152	144	165	196	182	-24	-44	-38
	Median	117	126	132	120	183	172	1	-17**	-32**
	P-value							<i>0.521</i>	<i>0.038</i>	<i>0.037</i>
Panel F Total assets excl. goodwill	Mean	131	153	145	123	139	128	8	13	17
	Median	131	159	127	104	134	120	26	24	2
	P-value							<i>0.321</i>	<i>0.157</i>	<i>0.245</i>
*** Statistically significant at 1% confidence level. ** Statistically significant at 5% confidence level. * Statistically significant at 10% confidence level. N varies between 34 and 36.										

Table 9 – Some underlying numbers for the portfolio companies and the industry benchmarks

		Change portfolio companies			Change industry benchmarks			Relative change (%-point)		
		2007	2008	2009	2007	2008	2009	2007	2008	2009
Panel A	Mean	79	75	82	186	77	132	-107	-1	-50
Effective tax	Median	100	97	96	194	40	134	-92**	8	-81
Rate	P-value							0.001	0.905	0.120
Panel B	Mean	143	169	168	117	138	135	26	31	34
Salary	Median	131	160	160	119	134	136	16**	32**	24**
Expenses	P-value							0.048	0.041	0.014
Panel C	Mean	134	147	141	113	120	111	21	27	29
Working	Median	119	144	130	108	112	112	26	35*	7*
Capital	P-value							0.185	0.050	0.092
Panel D	Mean	113	54	77	146	88	121	-34	-34	-45
Net working	Median	100	59	77	112	83	109	-15	-40	-16
Capital	P-value							0.402	0.476	0.342
Panel E	Mean	90	70	43	113	16	59	-23	54	-16
Capital	Median	90	64	7	54	-7	35	-2	69	-32
Expenditures	P-value							0.734	0.169	0.584
*** Statistically significant at 1% confidence level. ** Statistically significant at 5% confidence level. * Statistically significant at 10% confidence level. N varies between 34 and 36.										

8.4 Appendix 4

Table 10 – Risk and bankruptcy; analysis of portfolio companies relative to the industry benchmarks

	Portfolio companies			Industry benchmarks			Change portfolio companies			Change industry benchmarks			Relative change (%-point)				
	2006	2007	2008	2009	2006	2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009
Panel A																	
IBD /	3.6	10.6	-72.9	1.1	2.7	5.6	8.5	3.3	101	72	79	97	154	163	4	-82	-85
EBITDA	3.7	4.5	4.2	4.0	2.4	1.7	2.0	2.3	96	85	99	129	170	204	-36	-144**	-100**
															0.885	0.024	0.013
Panel B																	
Debt /	-1.8	3.7	5.8	2.8	1.4	1.5	2.5	2.4	130	127	103	120	158	147	9	-32	-44
equity	2.2	3.5	3.6	3.1	1.2	1.4	1.8	1.1	114	102	91	96	121	82	15	-18	3
															0.369	0.252	0.346
Panel C																	
IBD	560,783	689,577	771,766	680,527	3,150,194	1,912,493	2,527,954	2,134,039	145	159	153	172	192	173	-27	-33	-20
	246,200	394,432	364,104	324,500	405,337	906,118	1,187,338	906,258	130	147	140	109	173	158	-7	-39	-12
															0.169	0.112	0.368
Panel D																	
Equity	165,888	169,296	187,599	239,777	2,442,175	1,995,107	2,115,201	2,056,342	118	123	138	145	149	155	-27	-25	-17
	97,241	130,799	131,214	122,410	611,414	999,924	902,171	1,030,863	110	113	128	116	130	140	7	-12	-2
															0.417	0.512	0.471
Panel E																	
Current	1.5	1.2	1.1	1.1	2.3	2.0	1.5	2.3	104	91	96	95	70	102	9	21	-5
Ratio	1.3	1.2	1.0	1.0	2.1	1.7	1.5	1.6	89	82	78	92	70	83	0	13*	-15
															0.701	0.067	0.743
Panel F																	
Quick	1.1	0.9	0.8	0.8	1.8	1.6	1.1	1.9	98	86	96	94	67	98	4	19	-3
Ratio	0.9	0.8	0.8	0.8	1.3	1.3	1.1	1.2	86	76	79	90	68	83	-3	9*	-11
															0.912	0.083	0.922
Panel G																	
Altman	1.6	1.2	1.2	1.3	2.7	2.0	1.8	2.3	99	90	95	72	61	85	27	29	11
z-score	1.5	1.4	1.4	1.5	2.4	2.0	1.7	2.0	95	97	98	84	65	80	15*	26**	13
															0.053	0.026	0.215

*** Statistically significant at 1% confidence level.

** Statistically significant at 5% confidence level.

* Statistically significant at 10% confidence level.

i Amounts 2006-2009 in NOK 1,000.

N varies between 34 and 36.

