LUND UNIVERSITY
School of Economics and Management

Department of Business Administration **May 2011**

Bachelor Thesis

Operating Performance in Private Equity Buyouts

- A study of buyouts in Sweden between 2001-2008

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Sammanfattning

Titel:	Operating Performance in Private Equity Buyouts
Seminariedatum:	2011-06-03
Ämne/kurs:	FEKK01, Examensarbete kandidatnivå, 15 högskolepoäng
Författare:	Alexander Molander, Emil Nerme och Tobias Nordblom
Handledare:	Tore Eriksson
Fem nyckelbegrepp:	Private equity, buyout, operating performance, agency cost, working capital management
Syfte:	Denna uppsats syftar till att undersöka operationella förbättringar i private equity buyouts från tre perspektiv; lönsamhet, arbetskapitalhantering och anställda
Metod:	En studie med kvantitativ och deduktiv metod
Teoretiska perspektiv:	Agency cost, working capital management och wealth transfer
Empiri:	Detta examensarbete analyserar förändringar i operativa resultat för ett urval av 110 svenska buyouts från 2001 till 2008. Uppsats analyserar förändringar i lönsamhet, rörelsekapitalet och anställda. I de fall där vi har signifikanta skillnader mellan de två urvalsgrupper har regressioner gjorts för att testa sambandet mellan storlek på företaget och operativa förbättrningar.
Slutsats:	Våra resultat påvisar signifikanta industri-justerade förbättringar för avkastning på operativt kapital och för leverantörsskulder. För resterande variabler hittades inga signifikanta resultat. För de variabler med signifkant skillnad har en regressioner gjorts, där endast payables visade sig signifikant. Resultatet påvisar att värde fortfarande skapas genom private equity buyouts med hänsyn till lönsamhet och working capital management, medans resultaten för employee management påvisar att värde inte skapas på bekostnad av de anställda.

Abstract

Title:	Operating Performance in Private Equity Buyouts
Seminar date:	2011-06-03
Course:	FEKK01, Bachelor thesis, 15 ECTS credits
Authors:	Alexander Molander, Emil Nerme and Tobias Nordblom
Tutor:	Tore Eriksson
Key terms:	Private equity, buyout, operating performance, agency cost, working capital management
Purpose:	The purpose of this thesis is to study value creation in private equity buyouts in Sweden from operational improvements in three areas; profitability, working capital management and employee management
Methodology:	A study using quantitative and deductive methods
Theoretical perspectives:	Agency theory, working capital management and wealth transfer
Empirical foundation:	This thesis analyses changes in operating performance for a sample of 110 Swedish buyouts from 2001 through 2008 based on measures of profitability, working capital management and employee management. Furthermore, regression models have been made in cases where we have significant differences between our sample and peer groups to test the correlation between company size and operational performance.
Conclusions:	Our results report only significant industry-adjusted improvements in return on operating capital and for payables. For the rest of our results no conclusive results were found. For the regression, only payables were found significant. Concluding, the results document that value is created in private equity buyouts with regards to profitability and working capital management while results for employee management show that wealth transfer is not found to be a source of value creation.

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1 Introduction

In 2010 the worldwide deal value of the private equity buyout market summed up to 180 billion USD, down from its record values before the financial crisis of 698 billion USD in 2006 and 665 billion USD in 2007 (MacArthur et al. 2011). In the aftermath of the financial crisis, private equity fundraising activity has also dramatically declined from 666 billion dollars in 2008 to 228 billion dollars in 2010. Furthermore, there has been a trend of an increasing number of smaller buyouts relative the total number of buyouts with buyouts valued above 5 billion dollars almost vanishing (MacArthur et al. 2011). For the Swedish market the development has followed similar trends, explained in the following quotation: *"From my perspective I see three main trends affecting the private equity market in Sweden*

- *2008 and 2009 was characterized by a significant decrease in the number of buyouts*
- *Swedish private equity funds has still large amounts of committed capital that needs to be invested in the coming years*
- *The buyout size has decreased because of lack of bank financing as well as a skepticism amongst Limited Partners to mega buyouts with regards to returns*

Due to committed capital and the decreased buyout size has asset prices increased significantly recently. This effect has further been accelerated because of the strong business cycle in Sweden relative Europe and Nordic attracting interest not from only Swedish private equity firms but also from international private equity firms" (Kühl, J. J., pers. medd., 2011)
With the recent trends in both the global and Swedish private equity market in mind it is reasonable to question if a explanation can be found by studying value creation in private equity buyouts and if value creation depend on investment size

1.1 Background

The history of the private equity industry began already in the middle of the last century in the United States and United Kingdom but with few formal private equity investors, instead the market was dominated by individuals, foundations, universities and charities well into the 1970s (Grabenwarter & Weidig 2005). However, after regulatory changes and easily available financing through the junk bond market the private equity buyout market boomed in the late 1980s, peaking in 1988 with KKR's 25 billion acquisition of RJR Nabisco. Following the fall

of the junk bond market the deal value of buyouts dropped in the early 1990s to peak again in the late 1990s with the dot-com boom (Kaplan & Strömberg 2009). Transaction values once again dropped in the early 2000s with the business cycle to again increase dramatically up to the financial crisis in 2008 (MacArthur et al. 2011). During the history of private equity the type of buyouts has changed from the large public-to-private transactions in the late 1980s to a dominance of middle market buyouts of non-listed firms or carve-outs from large companies in the 1990s and early 2000s, making up 80 percent of the transaction value. Also, a new phenomenon of secondary buyouts, private-equity-to-private-equity transactions, emerged during the early 2000s. Up until the financial crisis the large public-to-private buyouts returned, tripling in size between 2001 and 2006 (Kaplan & Strömberg 2009). After the financials crisis the total buyout deal value and size has once again dropped, raising questions about value creation in private equity buyouts and if the relatively larger fraction of smaller buyouts is a new standard or due to illiquidity in the credit market (MacArthur et al. 2011).

From a geographical perspective private equity buyouts have developed from being a United States, Canada and to some extent United Kingdom phenomenon in the 1980s to a global phenomenon in more recent times. However, in regard to transaction value, North America and Europe still make up over 80 percent of total buyout value (MacArthur et al. 2011). The first Swedish private equity firm Procuritas was founded in 1986 followed by Industri Kapital and Nordic Capital in 1989 (Lundgren & Norberg 2006). Since then the number of firms in the Swedish private equity market has grown substantially and today there are more than 60 private equity firms active in Sweden (SVCA Member Database). From a European perspective is the Swedish private equity market well developed with private equity buyouts representing 0.43 percent of GDP in 2009, the second highest country percentage after United Kingdom and well above the European average of 0.19 percent of GDP (EVCA Private Equity Investment as Percentage of GDP in 2009).

1.2 Problem discussion

Since the surge of private equity buyouts in late 1980s questions have been raised if private equity creates value. From a theoretical perspective operational value in private equity buyouts can be created based on three theories; reduction of agency costs, working capital management and wealth transfer (Jensen 1986a). Research on private equity value creation started already in the late 1980s where Kaplan published one of the most influential papers on private equity buyouts and operational value creation. The study found that private equity

buyouts lead to increases in operating income before depreciation, increases in net cash flow and decreases in capital expenditures compared to industry changes (Kaplan 1989). After Kaplan (1989) there has been a large number of research papers studying operating performance in private equity buyouts from three perspectives; profitability, working capital management and employee management. However, the results have been somewhat inconclusive. Furthermore, there have been studies focusing on the Swedish market where e.g. Lundgren and Norberg (2006) found no statistically significant differences for private equity buyouts adjusted for industry changes while Grubb and Jonsson (2007) found a significant positive industry-adjusted change in profitability but no significant results for employee management. The number of Swedish private equity buyouts studied in previous research has ranged from 21 to 73 making this study, to our knowledge, the most extensive study on private equity buyouts in Sweden with 110 buyouts included in the sample. Moreover, studying the relationship between operating performance and company size is a novel approach to private equity, aimed to provide more understanding of the recent trend of smaller private equity buyouts (MacArthur et al. 2011). Selecting a shorter and more recent time period compared to previous research additionally increases the studies ability to explain and test recent trends in private equity buyouts.

1.3 Purpose

The purpose of this thesis is to study value creation in private equity buyouts in Sweden from operating performance in three areas; profitability, working capital management and employee management. The results are a contribution to previous research on operating performance in private equity buyouts and can be used by private equity investors or to gain more knowledge on how value is created in private equity buyouts.

1.4 Delimitations

The study is limited to private equity buyouts during the period 2001-2008 in Sweden. The buyouts are tested from entry to exit, or if no exit has been made from entry to 2009 as no annual reports were available after 2009 when conducting this study. Buyouts with private equity ownership of less than two years are excluded from the sample. Furthermore are buyouts from venture capital and other non private equity companies excluded. Variables are tested as the first difference for year-on-year changes. Entry is defined as the accounting year for which the private equity firm acquires the company and thus the first year of private equity ownership. Exit year is defined as the accounting year during which the private equity

firm divest the company and is also the last year of observation. No consideration is made regarding when during the accounting year entry or exit is made. All information used is publicly available from the respective company annual reports.

1.5 Audience

The thesis assumes the reader is familiar with basic understanding of finance, statistics and econometrics. More detailed descriptions of the theoretical framework can found by reading reference literature. The results are relevant for both academic and professional purposes.

1.6 Outline

This thesis is constructed as follows. The next section presents the theoretical framework used, where both finance and econometrics theories are presented. The third section outlines previous research and the fourth section presents the methodology. Empirical findings are presented in the fifth section followed by analysis in the sixth section. The last and seventh section is conclusions, summarizing the contribution of this thesis.

2 Theory

The following section aims to give the reader a brief introduction and explanation of the theories used. More detailed descriptions of the theoretical framework can found by reading reference literature.

2.1 Agency theory

The agency theory looks at organizational conflicts, risk and incentives. In other words, the potential conflicts of interest between parties with different interests in the same asset. A well-known situation is the conflict between management and shareholders (Eisenhardt 1989).

2.1.1 Improved incentives alignment

Traditionally in buyouts the private equity firm's management acquires a substantial equity stake in the target company. This action eliminates the potential misalignment between the management and the shareholders. Moreover, a substantial equity stake in the target company encourages management to focus on value maximizing procedures leading to better investment and operational decisions (Kaplan 1989). Furthermore, with management owning a substantial stake in the company this makes the personal cost of inefficiency to increase which further leads to reduced incentives for management to shirk (DeAngelo 1984).In addition, as target companies equity becomes illiquid with private equity ownership, incentives for short-term manipulation by the management is reduced (Kaplan & Strömberg 2009).

Management owning a substantial equity stake in the portfolio company can also induce negative effects for the firm. Positive net present value investment opportunities might be avoided as they are considered too risky by management due to risk aversion as their own wealth is at stake (Holthausen & Larcker 1996).

2.1.2 Improved monitoring and control

Cotter and Peck (2001), argue that shareholders' of buyout firms have greater incentives to actively monitor the company. This follows as private equity owned companies have less dispersed ownership than public companies. The illiquid equity in companies owned by private equity firms further strengthens shareholders incentives to monitor the company as there is an illiquid secondary market leading to no easy exit opportunities. Other benefits following a buyout are the increased control of the company. As private equity firms control

their companies they are also in control of the management as well as the board of directors, the possible misalignment conflict can thereby be solved more easily than in public companies (Jensen & Murphy 1989). According to Acharya et al. (2009), the board of directors of private equity owned companies tend to be more active and meet more frequently than for publicly traded companies. The active ownership could partially be explanatory for the high return of private equity funds.

2.1.3 Reduction of agency cost of free cash flow

The increased debt level following a leveraged buyout contributes to reduce the agency cost that could arise when management decide to make investments with lower returns than cost of capital (Jensen 1986a). Therefore, one of the primary contributions of high debts levels is that management is forced to allocate future cash flow to debt payments and thereby reducing opportunities of wasteful and inefficient spending. The increased debt level also motivates management to run the company more efficiently in order to avoid default, which is costly for managers with respect to loss of control and a damaged reputation (Jensen 1986b). Consequently, the downside of default might induce management to work harder and more efficiently.

The increased level of debt could also lead to negative effects for the target company. High debt levels leads to the company being more sensitive to unforeseen events such as market shocks which auxiliary contributes to an increased probability of default (Singh 1990). The greater exposure to financial stress comes as a result from the high leverage and that the company could not be able to endure the unanticipated shocks as large interest payments reduce the company's financial flexibility (Rappaport 1990). Moreover, pursuant to Palepu (1990), the augmented vulnerability of financial stress can possibly make a company more short-term oriented and therefore disregard positive net present value investment opportunities, what Berk and DeMarzo (2007), refers to as a debt overhang.

2.1.4 Agency cost hypotheses

Based on the agency theory the following hypotheses related to profitability are tested:

- *Hypothesis 1: Target companies experience no post-buyout change in EBITDA margin relative to peers*
- *Hypothesis 2: Target companies experience no post-buyout change in ROA relative to peers*

- *Hypothesis 3: Target companies experience no post-buyout change in ROOC relative to peers*

According to the agency theory reduction of agency cost leads to firms being run more efficiently as management focus on value maximizing; hence EBITDA margin is expected to increase. The theory suggests that improved incentives, monitoring and control lead to improved profitability therefore ROA is anticipated to increase. Moreover, ROOC is likely to increase as reduction of agency cost of free cash flow includes reduction of wasteful spending. If any of the statistical hypotheses prove to be significant, a regression will be made with profitability operating performance variable as dependant variable and company size, measured as revenue, as independent variable. The reason is to test if operational improvements are larger in smaller companies and can explain the recent trend of smaller buyouts.

2.2 Working capital management

Following a buyout it is common for private equity firms to induce operational restructuring for their target companies. Operational and capital restructuring enables a more efficient use of the companies' resources (Muscarella & Vetsuypens 1990). An imperative step for increasing the overall efficiency following a buyout is by initiating cost reduction programs and decreasing the overhead costs (Easterwood et al. 1989). Common ways of enhancing the operational efficiency is by increasing capital productivity or reducing capital requirements or a combination of the two (Berg & Gottschalg 2004). According to Singh (1990), private equity held companies have lower levels of inventory and accounts receivable compared to industry peers. These improvements are a result of a more efficient inventory management as well as better management of accounts receivable and lowered amounts of working capital. Additionally, a common feature for post-buyout companies is the reduction of organizational complexity and thus strengthened focus on company core business, which further fortifies the connection between strategic refocusing and buyouts.

2.2.1 Working capital management hypotheses

Based on the above presented theory the following hypotheses are tested:

- *Hypothesis 4: Target companies experience no post-buyout change in net working capital divided by sales relative to peers*

- *Hypothesis 5: Target companies experience no post-buyout change in accounts receivable divided by sales relative to peers*
- *Hypothesis 6: Target companies experience no post-buyout change in accounts payable divided by sales relative to peers*

Theories conclude that target companies often experience post-buyout restructuring and a more efficient use of company resources by e.g. increased capital productivity. NWC/Sales are therefore likely to decrease. In addition, theory implies that buyout companies experience improved accounts receivable and working capital management, therefore accounts receivable/sales is expected to decrease and accounts payable/sales is expected to increase. If any of the statistical hypotheses prove to be significant, a regression will be made with working capital management operating performance variable as dependant variable and company size, measured as revenue, as independent variable. This will be done in order to test if operational improvements are larger in smaller companies and can explain the recent trend of smaller buyouts.

2.3 Wealth transfer

The wealth transfer hypothesis looks at the transition of wealth from one party to another. The most common case is the transfer between bondholders and shareholders, but the transfer of wealth from employees to shareholders is also a familiar case (Palepu 1990). The wealth transfer hypothesis is often cited by critics of private equity as they argue that private equity firms create value by reducing wages and employee lay-offs and according to Schleifer and Summers (1988), value creation at the cost of employees is a common factor for buyouts, and especially common when private equity firms perform hostile takeovers. In addition Easterwood et al. (1989) concludes that employee lay-offs are commonly used as a way of reducing costs.

2.3.1 Wealth transfer hypotheses

Based on the wealth transfer hypothesis and related research the following hypotheses are tested:

- *Hypothesis 7: Target companies experience no post-buyout change in sales per number of employees relative to peers*
- *Hypothesis 8: Target companies experience no post-buyout change in personnel cost per employee relative to peers*

- *Hypothesis 9: Target companies experience no post-buyout change in personnel cost divided by sales relative to peers*

The wealth transfer hypothesis signifies post-buyout companies to experience reduced workforce and the agency theory imply increased operating performance; hence sales per number of employees are projected to increase. In addition, personnel cost/sales are expected to decrease along with personnel cost per employee, as reduced wages and workforce are common according to the theory. If any of the statistical hypotheses prove to be significant, a regression will be made with wealth transfer related operating performance variable as dependant variable and company size, measured as revenue, as independent variable. As for the earlier theories, the reason is to test if operational improvements are larger in smaller companies and can explain the recent trend of smaller buyouts.

2.4 Statistical and econometric theory

2.4.1 Student's t-test

Student's t-test is a hypothesis test that is used when the standard deviation of the population is not known. The standard deviation for the population is estimated from the sample and the data follows a so-called t-distribution, which is very similar to the normal distribution. The Student's t-test can be used to test one sample data, two sample data and paired data. For paired data is the difference between each paired data sample tested based on the null hypothesis that the difference is zero (Lantz 2009).

2.4.2 Wilcoxon signed rank test

The Wilcoxon signed rank test is a non-parametric equivalent of the Student's t-test where the median difference in a paired data set is tested based on a null hypothesis that difference in the paired data is zero. Non-parametric techniques make no assumption that the tested data follow a normal distribution compared to parametric techniques (Conover 1998).

2.4.3 The classical linear regression model

The classical linear regression model (CLRM) assumes that every observation of the dependent variable consists of two parts; one part that systematically depends on the dependent variable and an intercept and one part which is an error term (Westerlund 2005). Hence the single linear regression model can be written:

$$y_i = b_1 + b_2 x_i + e_i$$

Furthermore does the CLRM make the following assumptions A1.-A6. (Hill et al. 2001):

A1. $y_i = b_1 + b_2 x_i + e_i$

The dependent variable is a linear function of intercept (b_1), a slope (b_2) and an independent variable (x_i) and an error term (e_i).

A2. $E(e_i) = 0$

The expected value of the error term equals to zero.

A3. $var(e) = \sigma^2 = var(y)$

The variance of the error term is constant

A4. $cov(e_i, e_j) = cov(y_i, y_j) = 0$

The covariance of the error terms is equal to zero hence the value of y is statistically independent

A5. The independent variable x_i is not random and takes at least two different values

A6. $e_i \sim N(0, \sigma^2)$

The error term has a normal distribution. This assumption is optional and can be ignored if there are more than 30 sample observations.

2.4.4 Least squares principle

The estimation of B_1 and B_2 based on the sample observations can be done by the least squares principle. The principle is applicable on both single and multiple regressions. By minimizing the sum of the squared residuals in the regression a line is fitted through the middle of the data. The least squared estimates of B_1 and B_2 are referred to as b_1 and b_2, the intercept and slope of the estimated line (Hill et al. 2001).

$$\hat{y}_t = b_1 + b_2 x_t$$

$$\hat{e}_t = y_t - b_1 - b_2 x_t$$

2.4.5 Ordinary least squares

According to the Gauss-Markov theorem is the ordinary least square principle (OLS) best linear unbiased estimators (BLUE) given the assumptions of the classical linear regression model. Hence the OLS estimators have the minimum variance (Gujarati 2006).

2.4.6 RESET-test

The regression specification error test or RESET-test is a general test developed by J. B Ramsey to test for incorrect functional form and detect omitted variables hence testing A1. and A2. (Gujarati 2006). The RESET-test is constructed by assuming an already specified and estimated regression with the least square estimates b_1, b_2 and b_3:

$$\hat{y}_t = b_1 + b_2 x_{t2} + b_3 x_{t3}$$

Then create and artificial model:

$$\hat{y}_t = b_1 + b_2 x_{t2} + b_3 x_{t3} + \gamma_1 \hat{y}_t^2 + e_t$$

The RESET-test is a test of H_0: $\gamma_1 = 0$ against the alternative H_1: $\gamma_1 \neq 0$. A failure to reject H_0 suggests that there is no evidence of misspecification. Rejection of H_0 implies that model is incorrectly specified and improvements are possible. The test can be extended by testing $\gamma_2 \hat{y}_t^3$, $\gamma_3 \hat{y}_t^{43}$ etc. (Hill et al. 2001).

2.4.7 White's general test of heteroscedasticity

White's test is constructed to test all types of heteroscedasticity hence testing A.3. By estimating the regression and test the OLS error term ($\hat{e}_i$) with the following artificial model:

$$\hat{e}_i^2 = \alpha_1 + \alpha_2 x_{2i} + \alpha_3 x_{3i} + \alpha_4 x_{2i}^2 + \alpha_5 x_{3i}^2 + u_i$$

The model is estimated with OLS testing H_0: Homoscedasticity: $\alpha_1 = \cdots = \alpha_5 = 0$ against the alternative H_1: Heteroscedasticity: at least one $\alpha_j \neq 0$. Failure of rejecting H_0 implies that the test has not been able to detect any heteroscedasticity. Rejection of H_0 implies existence of heteroscedasticity (Westerlund 2005).

2.4.8 Cross sectional data

Cross sectional data is collected for a random sample of economic units in the same time period or without regard of the time period. Because of the randomness of the sample are

observations assumed to be uncorrelated in cross sectional data (Hill et al. 2001). Hence there is no autocorrelation in the sample and A.4 in CLRM is accepted for cross sectional data.

2.4.9 Central limit theory

According to the central limit theory a random will a sample taken from any population with probability distribution become normally distributed as the number of observations in the sample increases indefinitely. In practice it is often assumed that a sample mean of at least 30 observations will approximately follow a normal distribution (Gujarati 2006)

3 Previous research of relevance for this study

Research on private equity has mainly focused on returns in the form of internal rate of return, operating performance, financial engineering and market timing (Kaplan & Stein 1993; Berg & Gottschalg 2004). The focus of this essay is on value creation from operating performance where Steven Kaplan published one of the first and most influential papers in 1989. In a study of 76 large management buyouts of public companies between 1980 and 1986 Kaplan found that the companies three years after the transaction experienced increases in operating income before depreciation, increases in net cash flow and decreases in capital expenditures compared to industry changes (Kaplan 1989). The results favour reduced-agency as the primary driver of value creation in buyouts. The results found by Kaplan (1989) are consistent with the papers published by Jensen (1989), Bull (1989) and Smith (1990) who all argue that leveraged buyouts improve (LBO) operating performance through reduction of primarily agency costs.

In 1991 Lichtenberg and Siegel published a paper investigating economics effects of LBOs between 1981 and 1986. Their results indicate that manufacturing plants involved in a LBO had significant higher growth in total factor productivity compared to industry average. Moreover, they found that the ratio of non-production to production labour cost declines sharply, and production worker wage rates increase post an LBO (Lichtenberg & Siegel 1991).

However, research on the most recent wave of private equity transaction has once again questioned whether buyouts still create value. Leslie and Oyer (2008) find in a study of US private equity owned firms between 1996 and 2006 little evidence that PE-owned firms outperform public firms in profitability or operational efficiency. Furthermore Guo et al. (2009) use a sample of 94 US public to private transaction between 1990 and 2006 and find no statistical difference in operating performance between the observed firms compared to benchmarks firms. Nevertheless, there has also been more recent research with conclusive results on that private equity ownership increase operating performance. Harris et al. (2005) find that plants post a management buyout experience a substantial increase in productivity after a buyout in a sample of approximately 36,000 U.K. manufacturing establishments. Additionally Acharya et al. (2010) find higher operating performance of private equity owned companies relative peers, where the improvement in the EBITDA margin is especially significant.

Research on the employee perspective of private equity owned firms are inconsistent. Jensen et al. (1989) findings imply that wages in fact increased as a result of new incentive-based compensation schemes. In line with previous findings Kaplan (1989) found that the industry-adjusted change in number of employees was negative but not statistically significant, although with a sample of companies without large post-buyout divestments the opposite relation is found, that the number of employees in fact increases following a buyout. Likewise, Opler (1992) found a small increase in employment after a buyout. While Amess and Wright (2007) found no significant employment effect of private equity versus non private equity backed buyouts based on a study conducted in the United Kingdom. Additionally, Amess et al. (2009) found that private equity buyouts have no significant effect on employment relative comparable firms in the United Kingdom.

From a perspective on private equity buyouts in Sweden there has been fairly conclusive research done finding positive effects of private equity ownership on operating performance. Glasfors and Malmros (2000) found that in 21 leveraged buyouts between 1988 and 1997 the industry-adjusted EBITDA margin and ROA increase. However they found no industry-adjusted improvement in working capital management and employee management. In 2006 Lundgren and Norberg studied 67 private equity backed buyouts in the period 1988 and 2003, but found no significant industry-adjusted improvements in operating performance measured as profitability, working capital management and employee management. Furthermore in a study of 73 private equity backed buyouts between 1998 and 2006 Grubb and Jonsson (2007) found a significant positive industry-adjusted change in EBITDA and ROIC while employee management variables had very low explanatory power in operating impact. The most recent study was conducted by Andersson and Gilstring (2009) on 38 Swedish buyouts entered and exited between 1998 and 2008. Results suggest ROIC and EBITDA margin increased significantly in the buyout companies relative industry peers. Additionally, working capital management improved during the period while employee management variables were inconclusive.

4 Methodology

The following section outlines the methodology used in this study. Selected methods will be discussed and motivated based on their relevance for our study. Furthermore will selected variables be motivated and presented, statistical and econometric methods outlined along with other considerations taken in conducting the study.

4.1 Deductive method

A deductive study refers to when the hypothesis is formulated based on existing theory and applying it to empirical findings (Jensen 2002). In this thesis a deductive method is selected meaning that the hypotheses presented in the theory section are based on existing theory and previous research, formulated vis-à-vis operating performance in private equity buyouts. Moreover, previous research of similar nature is based on a deductive method further motivating the selection of a deductive method for this thesis.

4.2 Quantitative method

In a quantitative method data is gathered as empirical findings of quantifiable character for a narrow set of variables extending over numerous of units (Jacobsen 2002). The use of a quantitative method further enables comparison to previous research of quantitative character. The formulated hypotheses in the theory section are easily quantifiable enabling the use of a quantitative study. Through the selection of a quantitative method results can be generalized on the whole population and used to explain the extent of a phenomenon (Jacobsen 2002). Furthermore, the generalization enables the results to be applicable on the whole population of private equity buyouts in Sweden. In addition, the quantitative method is the common approach when conducting a deductive study (Bryman & Bell 2003).

4.3 Validity, reliability and replicability

Reflecting on and minimize eventual problems regarding validity and reliability of the content in the study is of great importance (Jacobsen 2002). Validity can be described as the absence of systematic measurement errors. Internal validity explains the extent to which the study measures what it intends to measure and if the study contains for the subject non-relevant information. External validity measures to which degree the results of study can be generalized and transferable to a larger population much like a theoretical framework (Jacobsen 2002). In this thesis choosing measuring variables based on related theories and

previous research ensures internal validity. Moreover, testing for validation can be done by critically scrutinizing the results and by compare findings and results with previous research in the field (Jacobsen 2002). In accordance to Jacobsen (2002), external validity in this study has been assured by comparing our results with previous research and theories. The fact that this study examines a more recent time period than previous research can partially be explanatory for differences in the results. It is possible that the findings in this study would correspond more with previous research if the time period would be stretched further back in time. Additionally, much of the existing theory are made on the US market and in some cases with larger samples than what has been used in this study.

Another measure of importance is reliability that evaluate to which extent the findings are trustworthy, stated differently, to which degree measurement errors are absent. In order for the research to be valid, it is presumed that the paper holds a high level of reliability (Jacobsen 2002). To ensure that this study is reliable, databases considered as highly reliable such as Mergermarket and accounting data directly gathered from company annual reports are used. Furthermore has additional sources of information been used if possible to reassure that the information is accurate while deceptive data have been excluded to make certain of high quality results.

Additionally, it is important for the results of the study to be replicable, the possibility to achieve the same results by repeating the test in the same way as the authors have done (Bryman & Bell 2003). Thus, the research process in this thesis is described in detail throughout this chapter enabling the reader to repeat the test and validate the results.

4.4 Operating performance variables

The variables selected to measure operating performance have been chosen to cover the three areas; profitability, working capital management and employee management. The areas are selected based on existing theory on private equity buyouts. Furthermore, the area division enable conclusions on where and how value has been created in the private equity buyout. For each of the areas three variables have been selected to measure operating performance. The variables have been chosen based on private equity theory and previous research. Besides gathering data for operating variables, data for company revenue has also been gathered to be able to conduct a regression with the operating performance variable as dependant variable

and company revenue as independent variable. All the variables are based on publicly available data from company annual reports.

4.4.1 Profitability

To measure changes in profitability we have selected three variables, earnings before interest, taxes, depreciation and amortization (EBITDA) margin, return on assets (ROA) and return on operating capital (ROOC), these measures are chosen as they are considered to provide an accurate depiction of the changes in profitability. EBITDA is expressed as a margin by dividing by revenue to adjust for changes in EBITDA due to changes in company revenue as well as enabling comparison between companies. Moreover, the EBITDA margin is found to be a particularly suitable measure since valuation often is quoted in multiples of EBITDA as it removes the effect of financial leverage on profitability (Barber & Lyon 1996). The second measure, return on assets (ROA) demonstrate how effective the management make profits from the assets of the company, which is one of the most frequently used measure in studies regarding private equity buyouts (Barber & Lyon 1996). In addition, as ROA is multiple based on net income it includes the leverage effect of debt. The third profitability measure used is return on operating capital, ROOC, which measures the operating profit (EBIT) as a percentage of average operating capital; working capital less cash and other financial assets. ROOC is a good indicator to compare profitability between companies since it measures the firms operating profit regardless of funding (Sveriges Finansanalytikers Förening 2009).

EBITDA margin: $\frac{EBITDA}{Sales}$

ROA: $\frac{Net\ income}{Total\ assets}$

ROOC: $\frac{Operating\ income\ (EBIT)}{Average\ operating\ capital}$

4.4.2 Working capital management

According to the working capital management hypotheses target firms are often induced to operational restructuring post buyout. As improved operational efficiency is an imperative step for private equity firms it is of high relevance to examine capital management. To control for changes in firm size due to acquisitions and divestitures indicators are measured as a ratio of sales. One of the measuring variables used is net working capital (NWC) divided by sales. Net working capital is chosen as it is considered a good measure for scrutinizing a company's

short-tem financial position and underlying operational efficiency. In addition to NWC/sales it is of interest to examine cash flow effecting variables as liquidity is essential for the day-to-day operations of a firm (Berck & DeMarzo, 2007). Other variables of interest with respect to working capital management are accounts receivable and accounts payable, these are important as they both are included in the NWC and show a company's ratio of short-term assets and liabilities. Both measures are set against sales to adjust for changes in company size. By using these two measures we can more precisely locate where in the working capital the changes are being made. In addition, indications of potential problems in cash flow can be discovered if, for example, accounts receivable grows relative to sales, meaning that money is tied up by slow paying customers (Berck & DeMarzo, 2007).

NWC/Sales: $\frac{Current\ assets - current\ liabilities}{Sales}$

Receivable/Sales: $\frac{Accounts\ receivable}{Sales}$

Payable/Sales: $\frac{Accounts\ payable}{Sales}$

4.4.3 Employee management

As the wealth theory implies it is common for management to initiate a cost reduction program following a private equity buyout, often leading to employee lay-offs and wage cuts, we wish to examine the rational for employee management. In addition, it is common for private equity firms to make acquisition or divestitures in target companies leading to an increase or decrease in the workforce. As all companies does not grow at the same pace or acquire or divest during the same period of time this might induce misleading results. To examine whether changes in employment are a consequence of acquisitions or divestitures, number of employees relative to sales is tested. Moreover, to observe whether changes in wages relative to workforce occur, personnel cost relative to number of employees are being tested. Lastly, changes in personnel cost relative to sales are being tested to investigate changes in wages following acquisitions or divestitures.

Sales per number of employees: $\frac{Sales}{Total\ number\ of\ employees}$

Personnel cost per employee: $\frac{Personnel\ costs}{Total\ number\ of\ employees}$

Personnel cost/Sales: $\frac{Personnel\ costs}{Sales}$

4.5 Calculating variables

The operating performance variables are measured as the first difference and will be compared as year-on-year changes. This is done in order to obtain percentage changes from one year to the next one. In addition, yearly percentage changes have been chosen to allow inclusion of target firms that are still under private equity ownership and thereby removing effects of marketing timing. This is particularly important since private equity firms tend to hold the target company until profitable exit is possible (Nowak et al. 2004). As a result, this thesis has access to a larger sample group of buyouts than earlier studies during the same period of time e.g. Grubb and Jonsson (2007) 73 buyouts, Lundgren and Norberg (2006) 67 buyouts. Moreover, the annual changes will be compared relative to a peer group to adjust for changes linked to a specific industry and overall macroeconomic effects. The industry-adjusted changes enable statistical testing on the samples to examine whether private equity firms add value and outperform non-private equity owned companies (Kaplan 1989). To adjust for changes in operating income depending on new acquisitions and divestures the variables is calculated as a ratio to assets or sales (Kaplan 1989). Albeit, Kaplan (1989) further mentions that performance ratios relative to asset or sales could increase following an acquisition without any actual change taking place, potentially leading to misguiding results.

For all industry-adjusted operating performance variables the industry-adjusted changes are calculated as the yearly changes for target company (TC) less yearly changes for peer group (PG). Below are calculations for each variable presented:

$$\text{EBITDA} = \Delta\text{EBITDA/sales}_{\text{TC}} - \Delta\text{EBITDA/sales}_{\text{PG}}$$

$$\text{ROA} = \Delta\text{ROA}_{\text{TC}} - \Delta\text{ROA}_{\text{PG}}$$

$$\text{ROOC} = \Delta\text{ROOC}_{\text{TC}} - \Delta\text{ROOC}_{\text{PG}}$$

$$\text{NWC} = \Delta\text{NWC/sales}_{\text{TC}} - \Delta\text{NWC/sales}_{\text{PG}}$$

$$\text{Receivable} = \Delta\text{Receivable/sales}_{\text{TC}} - \Delta\text{Receivable/sales}_{\text{PG}}$$

$$\text{Payable} = \Delta\text{Payable/sales}_{\text{TC}} - \Delta\text{Payable/sales}_{\text{PG}}$$

$$\text{Personnel Cost/sales} = \Delta\text{Personnel Cost/sales}_{\text{TC}} - \Delta\text{Personnel Cost/sales}_{\text{PG}}$$

$$\text{Personnel Cost/ no. Of employee} = \Delta\text{Personnel Cost/sales}_{\text{TC}} - \Delta\text{Personnel Cost/sales}_{\text{PG}}$$

$$\text{Sales/no. of employees} = \Delta\text{Sales/no. of employees}_{\text{TC}} - \Delta\text{Sales/no. of employees}_{\text{PG}}$$

4.6 Time period

The selected time period for this study is private equity buyouts done between 2001 and 2008 tested from accounting year of entry until exit or until latest available annual report, in all cases 2009. Operating performance variables are tested as year-on-year changes. A year is considered a calendar year and cut-off points are set to prevailing accounting year. Firms with split fiscal year or when buyouts or exits have been made during the year, we have chosen to include the whole accounting year. Data from one year prior to the buyout is included as a reference year to measure changes as the first difference. Furthermore, the sample of buyouts have been limited to investments made at latest in 2008 as a criterion have been set for private equity ownership of at least two years. This criterion has been formulated in order to exclude quick-flips, defined as ownership period less than two years. The rationale behind this delimitation is that it is reasonable to believe that short holding periods are often explained by mispricing, market timing or other favourable conditions not affected by operating performance (Cao 2010). Compared to previous studies this study is more up to date and thereby examines recent trend in private equity by choosing the recent time period from 2001 to 2009.

4.7 Data

For this study secondary data is used. The initial data set is collected as annual reports from Bolagsverket and Retriever. From the annual reports accounting data is collected and processed in order to calculate the operating performance variables. The compilation of buyout deals and peer group companies is done in different ways, however, the data is gathered and calculated in the same practice for both sample and peer group in order to rightfully present the results. The number of observations in our data sets varies depending on the number of atypical or non-accessible variables. Atypical variables are those where the year-on-year industry-adjusted changes have been highly fluctuating, indicating that there is something peculiar with the data. In addition, industry-adjusted variables with extreme changes have been adjusted for, setting the utmost alteration to 100 percent relative to peer group. This is a method used in previous studies e.g. Phalippou and Gottschalg (2007) to control for overstated accounting values.

4.7.1 Sample group

The primary source used for gathering information about buyouts is Mergermarket, which is an independent merger and acquisitions intelligence service and a comprehensive buyout

atabase. Our initial sample included all buyouts with data available on Mergermarket for buyouts made between 2001 through 2008. The initial sample consisted of approximately 280 buyouts. Buyouts by non-private equity firms, such as venture capital and investment companies, and buyouts where the holding period did not exceed two years were excluded from the sample group. To ensure that the sample gathered from Mergermarket included all buyouts during the time period, the list was compared against supplementary databases and sources including Nordic Unquote, Prequin and private equity firms' home pages (see Appendix 3), thereafter the sample consisted of roughly 180 buyouts. To further exclude for deceptive data the buyouts with complicated ownership structures before and after the buyout, making changes in operating performance difficult to measure, were excluded. The final sample consists of 110 buyouts, see Appendix 1.

4.7.2 Peer group

A peer group is a form of benchmark constructed of a group of companies, similar to a stock index. The peer group is used to investigate how a company performs relative a benchmark, often companies in the same industry. In this thesis the peer groups are based on the SNI code system, which is the Swedish counterpart to the American SIC and the European NACE code system. The system is built to sort companies by industry and consists of a five digit code where the first numbers of the code are more general than the latter (SCB 2011). According to Barber and Lyon (1996) the choice of using e.g. the first two digits instead of the entire code is dependent on numbers of companies included in the peer group. If one wishes to have a peer group of fewer companies, a more precise digit code should be used, whilst if the peer consists of a larger sample of companies one could settle with the first two digits of the code. To enable the use of a large peer group a two digits selection criteria is used.

From the two digits SNI code the peer groups were created for each company based on the 30 largest companies in Sweden measured by revenue in 2009. If some of the 30 largest companies could not be used as peers due to deceptive or otherwise unfulfilling information disclosed, the next largest company is included. For revenue-based selection we used the database from Retriever, which is a leading distributor of media and business information in the Nordic area and considered as a reliable source for financial data since it distributes company annual reports. For companies sharing the first two digits in the SNI code the same peer group was used. In some of the companies the specified SNI code was "Activities of head office". In these cases looking at subsidiaries and company's home pages were used to

adjust for and assign the most appropriate SNI code for the company. In addition, we double-check peer group companies against sample group and Mergermarket database over private equity buyouts to control for that no private equity owned companies are included as a peer. Selected peer groups with descriptions based on the two digits SNI code can be found in Appendix 2.

The peer groups are used, as briefly mentioned above, to correct for fluctuations in the market and business segments and to examine whether private equity firms add value in the buyout companies. Based on the median in the peer group calculations are completed in the same way as for our sample group enabling comparison of the results. This has been done in similar manners in previous studies by e.g. Nyrén and Åsbrink (2009). However an alternative measure to use would be the peer group mean but studying the standard deviation of the mean showed that the median corrects better for data outliers. The use of median is supported by Kaplan (1989) amongst other research.

As our peer groups include the 30 largest companies, measured as revenue of 2009, this could induce deceiving results based on survivorship bias. However, as we have chosen a relatively short period of time and that the number of large corporations in Sweden is limited; we expect no significant changes that might affect the performance variables to be biased upwards. In addition, we have used the median to study changes for our peer groups, which will help minimize this kind of errors (Kaplan 1989).

4.8 Statistical tests

In order to test the hypotheses presented earlier in this paper two methods of statistical testing have been used; the Student's t-test and the Wilcoxon signed rank test. As previous studies have used both Student's t-test, e.g. Andersson and Gilstring (2009) and Wilcoxon signed rank test, e.g. Kaplan (1989), we wish to ensure that the results of this thesis are robust and reliable, hence that both tests have been conducted. By doing so, we have carried out tests with both the mean and median to check for differences between the tests and ensure to capture any potential differences.

The variables are tested as the difference between the operating performances in the buyout company subtracted by the operating performance in respective peer group, consequently creating the industry-adjusted performance data. Both Student's t-test and Wilcoxon signed rank test will test the data against the null hypothesis stating that the difference is zero.

Results completed in E-Views will be reported by p-values based on which the null hypothesis can be accepted and rejected. Furthermore, if results are found significant in either Student's t-test, Wilcoxon signed rank test or both, the industry-adjusted performance will be regressed in E-Views with company revenue as independent variable. A simple regression model will be used based on ordinary least squares. Test for A.1-A.3 will be conducted by using a RESET-test and White's general test of heteroscedasticity. As the data is cross sectional data no test for autocorrelation (A.4) is conducted. Moreover, as the regression is a simple regression there is no multicollinearty present and the independent variable takes at least two different values A.5 is accepted. In addition, as our sample is larger than 30 observations A.6. for normality in the error terms is accepted. Results will be reported as an intercept coefficient and beta coefficient as well as reported p-values for each coefficient. Significance will be found by studying the p-values whilst the beta coefficient will describe how changes in revenue affect operating performance.

The following models are used and variables tested if results are found significant in Student's t-test, Wilcoxon signed rank test or both:

$$\text{EBITDA} = \beta_1 + \beta_2 \text{Revenue} + e_i$$

$$\text{ROA} = \beta_1 + \beta_2 \text{Revenue} + e_i$$

$$\text{ROOC} = \beta_1 + \beta_2 \text{Revenue} + e_i$$

$$\text{NWC/Sales} = \beta_1 + \beta_2 \text{Revenue} + e_i$$

$$\text{Payable/Sales} = \beta_1 + \beta_2 \text{Revenue} + e_i$$

$$\text{Receivable/Sales} = \beta_1 + \beta_2 \text{Revenue} + e_i$$

$$\text{Employee} = \beta_1 + \beta_2 \text{Revenue} + e_i$$

$$\text{ROA} = \beta_1 + \beta_2 \text{Revenue} + e_i$$

$$\text{ROA} = \beta_1 + \beta_2 \text{Revenue} + e_i$$

5 Empirical findings

In this section we present our results for each of the operating performance areas.

5.1 Profitability

For profitability the following hypothesis were tested and below is results presented

- *Hypothesis 1: Target companies experience no post-buyout change in EBITDA margin relative to peers*
- *Hypothesis 2: Target companies experience no post-buyout change in ROA relative to peers*
- *Hypothesis 3: Target companies experience no post-buyout change in ROOC relative to peers*

Table 1 Profitability results for Student's t-test and Wilcoxon signed rank test
Mean and median values are expressed as percentage change

Variable	Obser. after adjustments	Std. Dev.	Sample mean	Student's t-test p-value	Sample median	Wilcoxon signed rank test p-value
EBITDA	378	11,34	0,26	0,64	0,04	0,84
ROA	407	11,28	-0,32	0,57	-0,02	0,64
ROOC	358	28,91	2,75 *	0,07	2,27 **	0,04

For all tests in table 1, *** denotes significant at 1% level, ** denotes significant at 5% level, * denotes significant at 10% level

- *Hypothesis 10: There are no differences in operating performance depending on company size measured as revenue with respect to ROOC*

Table 2 Profitability results for simple regression analysis

Dependant variable	Obser. after adjustments	Intercept, b1 (p-value)	Revenue, b2 (p-value)	RESET-test p-value	Whites-test p-value
ROOC	358	1,80 (0,33)	8,19E-07 (0,36)	0,70	0,61

For all tests in table 2, *** denotes significant at 1% level, ** denotes significant at 5% level, * denotes significant at 10% level

Reset-test: Based on null hypothesis that there is no evidence of misspecification or omitted variables.

Whites-test: Based on null hypothesis that error-terms is homoscedastic

Studying table 1, ROOC is the only variable found statistically significant, meaning that the null hypothesis (H.3), based on the p-values, can be rejected on a 10 percent significant level for the Student's t-test and on a 5 percent significant level for Wilcoxon signed rank test. Both the mean and median are positive denoting that private equity buyout companies on average

has higher return on operating capital compared to peers. For EBITDA the mean and median are both positive indicating that private equity buyouts increase EBITDA margin relative peers while the opposite is found for ROA. Nonetheless, the differences are small and not statistically significant; thereby can the null hypothesis (H.1) and (H.2) not be rejected based on a 10 percent level. As the null hypothesis for ROOC (H3) can be rejected for both Student's t-test and Wilcoxon signed rank test, a regression is made, based on the model specified in the method section. The high p-values for RESET-test and White's test show that the model is correctly specified and the error terms are homoscedastic. Studying the p-value for the revenue, the explanatory variable, the null hypothesis (H.10) cannot be rejected hence the revenue effect on ROOC cannot be statistically differed from zero.

5.2 Working capital management

For working capital management the following hypothesis were tested and below is results presented

- *Hypothesis 4: Target companies experience no post-buyout change in net working capital divided by sales relative to peers*
- *Hypothesis 5: Target companies experience no post-buyout change in accounts receivable divided by sales relative to peers*
- *Hypothesis 6: Target companies experience no post-buyout change in accounts payable divided by sales relative to peers*

Table 3 Working capital management results for Student's t-test and Wilcoxon signed rank test
Mean and median values are expressed as percentage change

Variable	Obser. after adjustments	Std. Dev.	Sample mean	Student's t-test p-value	Sample median	Wilcoxon signed rank test p-value
NWC	399	16,91	-0,63	0,45	-0,26	0,29
Receivable	403	11,65	0,45	0,44	-0,05	0,86
Payable	389	18,29	2,01 **	0,03	0,46 **	0,05

For all tests in table 3, *** denotes significant at 1% level, ** denotes significant at 5% level, * denotes significant at 10% level

- *Hypothesis 11: There are no differences in operating performance depending on company size measured as revenue with respect to payable*

Table 4 Working capital management results for simple regression analysis

Dependant variable	Obser. after adjustments	Intercept, b1 (p-value)		Revenue, b2 (p-value)		RESET-test p-value	Whites-test p-value
Payable	389	3,37 (0,0027)	***	-1,21E-06 (0,03)	**	0,89	0,34

For all tests in table 4, *** denotes significant at 1% level, ** denotes significant at 5% level, * denotes significant at 10% level

Reset-test: Based on null hypothesis that there is no evidence of misspecification or omitted variables.

Whites-test: Based on null hypothesis that error-terms is homoscedastic

For working capital management segment the payable variable is the only one found statistically significant. The null hypothesis (H.6) can be rejected both for Student's t-test and for Wilcoxon signed rank test based on a five percent level, meaning that the variable is statistically separated from zero. Both the mean and median are positive indicating that private equity buyouts increase their payable relative peers; denoting payment to suppliers is prolonged. Studying the variables for NWC and Receivable the results are not statically significant and the null hypothesis (H.4 & H.5) cannot be rejected. Still, the mean and median for NWC are negative indicating that private equity buyouts decrease NWC as percentage of revenue relative its peers. For receivable the result are more inconclusive as the mean is positive and the median is negative. Since the null hypothesis (H.6) is rejected for the payable, a regression with earnings as explanatory variables was constructed. The high p-values for the RESET-test and White's test indicate that the model is correctly specified and there are no problems with heteroscedasticity. The revenue coefficient is negative and significant, meaning we can reject the null hypothesis (H.11) on a five percent level. This means that, as revenue grows the improvement in payable dived by sales decreases. Hence improvements in payable for private equity buyouts are larger for smaller companies, measured as revenue, and vice versa.

5.3 Employee management

For employee management the following hypothesis were tested and below is results presented

- *Hypothesis 7: Target companies experience no post-buyout change in sales per number of employees relative to peers*
- *Hypothesis 8: Target companies experience no post-buyout change in personnel cost per employee relative to peers*

- *Hypothesis 9: Target companies experience no post-buyout change in personnel cost divided by sales relative to peers*

Table 5 Employee management results for Student's t-test and Wilcoxon signed rank test
Mean and median values are expressed as percentage change

Variable	Obser. after adjustments	Std. Dev.	Sample mean	Student's t-test p-value	Sample median	Wilcoxon signed rank test p-value
Personnel cost/sales	366	7,83	-0,12	0,76	0,13	0,61
Personnel cost/no. of employees	321	24,52	-0,14	0,92	0,67	0,59
Sales/no. of employees	354	29,41	0,95	0,54	0,00	0,89

For all tests in table 5, *** denotes significant at 1% level, ** denotes significant at 5% level, * denotes significant at 10% level

Studying table 5 above, none of the null hypothesis regarding employee management (H.7-H.9) can be rejected, meaning that there are no variable statistically significant different from zero. For personnel cost/sales and personnel cost/no. of employees variables results are inconclusive as the mean is negative while the median is positive. For sales/no. of employees both the mean and median are positive, however very slightly positive for median, indicating that sales per employee increases for private equity buyouts relative peers.

6 Analysis

In this section results for profitability, working capital management and employment will be analysed in isolation followed by a more general discussion with a broader perspective

6.1 Profitability

For profitability, variables were tested on three different profitability measures; EBITDA, EBIT and net profit. A company is able to affect the variables to a different degree by accounting measures and leverage where EBITDA is the variable that is hardest to affect and net profit the easiest. From this perspective EBITDA should be the most reliable variable, possibly why it is also a frequently used valuation measure (Barber & Lyon 1996). However the EBITDA variable was only slightly positive and not statistically significant hence no strong argument can be made for that value is created from improving EBITDA margin. For ROA a possible source for the inconclusive and even negative tendency could be that the net profit is easy manipulated enabling companies to avoid taxes and thereby decreasing net profit by implementing an aggressive capital structures or by accounting measures that minimize tax liability. For ROOC there are two ways to achieve changes, either by increasing EBIT or by decreasing operating capital. The affect of private equity buyouts on ROOC was as discussed earlier significant and positive but no conclusion can be made in which of the possible two ways ROOC was improved by studying the profitability variables in isolation. However, the regression on ROOC was insignificant, hence no relationship could be found between company revenue and operating performance measured as ROOC.

Comparing the results to previous research both supportive and contrary results can be found but no study exhibits the exact same results. From a Swedish perspective Glasfors and Malmros (2000) found partially in contrary to our results that the industry-adjusted EBITDA margin and ROA variables increase for private equity buyouts while Grubb and Jonsson (2007) and Andersson and Gilstring (2009) both found EBITDA margin positive and statistically significant as well as return on invested capital (ROIC), a similar measure to ROOC. The results for previous research on EBITDA margin further support the positive tendency found in our study as well as the significance found for ROOC. Additionally, the studies conducted by Grubb and Jonsson (2007) and Andersson and Gilstring (2009) are both based on more recent time periods which further motivates their relevance for this study and reassurance of our results. The positive effect on ROA found by Glasfors and Malmros (2000)

and the insignificant results on profitability variables found by Lundgren and Norberg (2006) are somewhat surprising and opposing to the results of this study. Furthermore, if comparing the results to research on private equity buyouts outside Sweden e.g. Kaplan (1989) found that companies three years after private equity buyout experienced increases in EBITDA margin. But for more recent research on US private equity buyouts found no evidence of industry-adjusted improvements in EBITDA margins is found (Leslie & Oyer 2008; Guo et al. 2009). While the most recent study by Acharya et al. (2010) found increases in the EBITDA margin especially significant for operating performance improvements.

From a theoretical perspective we find that agency cost reductions are noticeable by increases in ROOC and a slight tendency of higher EBITDA margin for private equity buyouts compared to peers. To connect our findings to the increase control hypothesis as well as the reduction of agency cost of free cash flow, less inefficient spending and an increased focus on value maximizing procedures and cost reductions could be explanatory for an improved cash flow cycle leading to improvements in ROOC as well as an improved EBITDA margin. The results that private equity buyouts create value by reducing agency costs are supported by studies done by Jensen (1989), Bull (1989) and Smith (1990).

6.2 Working capital management

The variables tested for working capital management are connected in the way that both payable and receivable are a part of NWC. With that in mind it is somewhat surprising to find payables positive and significant while the negative changes in NWC are not significant as an increase in payable decrease NWC. However, the results for NWC exhibit a negative tendency for both mean and median. A decrease in NWC means that capital is freed up for the company and cash flows are increased. An increase in payables suggests the payments to suppliers are prolonged and thereby decreasing NWC and improving the cash flow cycle. However increases in payable are not necessarily positive. Positive increases in payable include renegotiated agreement with supplier regarding payment period and avoidance of payment to supplier before due date to maximize credit time. Negative increases in payable can include delayed payments leading to penalty fees and interest rate expenses or general deterioration of supplier relations affecting future business (Berk & DeMarzo 2008). Based on the variables tested in this study it is not possible to draw any conclusions on how payable are increased for private equity buyouts. As the positive effect on the payable variable was found significant a regression was conducted according to the model specified in the method section

with revenue as explanatory variable. The significant negative coefficient for revenue provides evidence for that improvement in payable is greater for smaller companies' relative large. Hence more value is created from a working capital perspective for smaller buyouts relative large when studying payable.

Previous research on working capital management is as in the case of profitability somewhat inconclusive. The most recent study on private equity buyouts in Sweden by Andersson and Gilstring (2009) are supportive of our results where they find working capital to decrease after a private equity buyout. Opposing results were found by Glasfors and Malmros (2000) and Lundgren and Norberg (2007) suggesting no improvements in working capital management post a private equity buyout.

The working capital management theory suggests that target companies often experience post-buyout operational restructuring and that this leads to a more efficient use of the company's resources. The results indicate improvements in working capital management by increasing payable and possibly decrease in net working capital; however, the net working capital variable is not statistically significant.

6.3 Employee management

The results found for employee management are inconclusive for all variables suggesting that private equity buyouts have no effect on employee management relative peers. Compared to previous research these results are consistent with most publications, especially studies conducted on private equity buyouts in Sweden found low significance levels in industry-adjusted employee management variables (Glasfors & Malmros 2000; Lundgren & Norberg 2006; Grubb & Jonsson 2007; Andersson & Gilstring 2009). Recent studies outside Sweden further conclude the statistically insignificance of industry employee management variables post buyouts (Amess & Wright 2007; Amess et al. 2009). Connecting the result to the theory no support for the wealth transfer from employees to shareholders is found, neither in form of employee lay-offs or wage cuts.

6.4 General analysis

Comparing the results for profitability and working capital management in unison might suggest a possible connection between results for ROOC, payable and NWC. As increases in payable lead to decreases in NWC which in turn decrease operating capital this could possibly

be an explanation for the significant positive increases in ROOC as the ROOC variable increase when operating capital decrease. This suggests that the main source of value creation through operating performance might be improvements in working capital management.

For the novel approach in this study by connecting operating performance and company size measured as revenue only two regressions were made which limits the analysing possibilities. For ROOC no relationship was found while the results for payable indicate that the private equity buyout improvements from a working capital perspective are larger for smaller companies. A possible reason could be the experience and knowledge in corporate governance that private equity firms possess relative to management in smaller companies. Thereby new practices and routines might be initiated after a private equity buyout which improves working capital management; though the results would have been more reliable if more regressions were conducted.

Furthermore when comparing the results to previous research it is important to stress that a possible source of difference in the results might arise from the methodology applied. Previous research mainly focused on entry variables compared to exit variables thereby including the market timing effect of buyouts, referring to private equity firms tendency to hold companies until profitable exit is possible (Nowak et al. 2004). By testing operating performance with entry as base year and exit as final year the results can be somewhat biased by enhancing the effect of private equity ownership. In contrast, the method used for this thesis studies year-on-year changes to remove the market timing effect and removing the condition that exit is necessary for inclusion in the sample. However, studying our sample (see Appendix 1) the method also results in more observations for the later years of the time period compared to the first years as few exits has been made partially due to the financial crisis. Hence, our study is somewhat weighted more towards the more recent years while it is also the most updated time period in broad-spectrum and the inclusion of observations from the financial crisis further motivates why different results are possible. But except the financial crisis and aftermath effects of the dot-com bubble it is worth noting that there has also been a strong business cycle during the time period of this thesis.

7 Conclusions

Operating performance in private equity value creation has been a subject attracting attention from both academics and professionals since the surge of private equity market in late 1980s. The subject is increasingly interesting following the sharp decline in deal value of private equity buyouts as well as an increasing relative number of smaller buyouts. There have been a fairly large number of studies conducted based on profitability, working capital management and employee management where Kaplan (1989) published one of the most influential papers finding improvements in EBITDA margin and net cash flow both adjusted for industry changes. Since then, results have been fairly inconclusive regarding the effect of private equity buyouts. The contribution of this thesis is to study operating performance in private equity buyouts in Sweden by testing a more recent time period, from 2001 to 2008, as well as investigating the relationship between operating performance and company size measured as revenue to explain recent private equity buyout trends.

This thesis documents that for profitability, ROOC is the only variable found positive and statistically significant differed from zero while median and mean values for EBITDA margin indicate improvements relative peers. Nonetheless, the results for ROA are negative but statistically insignificant. Testing profitability measures from different parts of the income statements enables testing of variables that are, in different degrees, affected by capital structures and accounting measures. All in all, improvements in profitability are consistent with the theory of reduction of agency costs in private equity buyouts.

In addition, in the results for working capital management the payable variable is positive and statistically separated from zero indicating that private equity buyouts increase payables relative peers. Conversely can increases in payable be both negative and positive, which of the two is not possible to determine in this study. Furthermore, private equity buyouts is found to have a negative effect on NWC meaning that working capital management is improved by reducing requirements for working capital. For receivable the results are insignificant and inconclusive.

Results found for employee management are not statistically significant and thereby consistent with previous research on private equity buyouts in Sweden. Based on the results, the theory stating that value is created by wealth transfer from employees to shareholders can be rejected.

Connecting the results for profitability and working capital management may suggest that the significant results for increasing payables and indication of decreases in net working capital could possibly explain the significant increase in ROOC. This is because ROOC can be increased in two ways, either by increases in EBIT or decreases in operating capital, a variable that includes NWC. This in turn means that increases in payables results in decreases in NWC.

From the Student's t-test and Wilcoxon signed rank test there were only two variables found statistically significant separated from zero. In the regression analysis of these the results came out diverse. For ROOC the results was inconclusive while there was a link between improvements in payables and the company size measured as revenue, suggesting that increases in payables are greater for smaller companies. However more research has to be done to give more reliable results for explaining why private equity firms can create more value from operating performance in smaller companies.

Overall the results document that value is still created in private equity buyouts with regards to profitability and working capital management while results for employee management show that wealth transfer is not found to be a source of value creation. Furthermore, it is important to add that operating performance is not the only source of value creation in private equity buyouts, previous research outside the scoop of this thesis show that value also can be created from financial engineering and market timing (Kaplan & Stein, 1993; Berg & Gottschalg, 2004). Given these results the decline of private equity buyouts is more likely due to the financial crisis and illiquidity in the market. The connection between operating performance and company size as an explanation for the recent trend of smaller buyouts is less obvious as only two variables where found significant and regression could be made for. However, the results indicate that payables increase more for smaller companies relative to large ones.

Based on the results of this thesis future research on private equity buyouts with larger samples and for different time periods might be able to find more conclusive results on operating performance and especially how it relates to the size of the company. Additionally, an interesting field for further research would be to examine value creation from operating performance on other geographical areas and the difference between different types of buyouts or how performance is affected by number of simultaneously held companies and the holding period.

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9 Appendix

9.1 Appendix 1

Entry	Target	Exit	Acquirer	SNI	Peer group
2001	CallenBerg Group AB	2007	Segulah	71122	71
2001	Eldon AB	2006	EQT	46434	46
2001	Guide Konsult AB	2006	Nordic Capital	62020	62
2002	Dometic AB (buyout 1)	2005	EQT	46431	46
2002	Frigoscandia Distribution AB	2005	Triton	10390	10
2002	NVS Installation AB (buyout 1)	2006	Segulah	43221	43
2003	ACO Hud AB	2004	Altor	46450	46
2003	Balco AB	2010	3i	25120	25
2003	BTJ Group AB	No exit	Litorina	46499	46
2003	Bäckhammars Bruk AB	No exit	Procuritas	17123	17
2003	Clean Chemcial Sweden AB	2004	Segulah	20420	20
2003	Com Hem AB (buyout 1)	2005	EQT	61100	61
2003	Gant AB	2007	3i, L Capital	46420	46
2003	Hildings Anders AB (buyout 1)	2006	Investcorp International	31030	31
2003	JD Stenqvist AB	2007	Triton	17129	17
2003	Nicator AB	2008	AAC	46510	46
2003	Semper AB	2006	Triton	10860	10
2004	Dynapac AB	2007	Altor	28920	28
2004	Euroflorist Sverige AB	No exit	Accent	82990	82
2004	HMS Industrial Networks AB	No exit	Segulah	26300	26
2004	Inwido AB	No exit	Ratos	16233	16
2004	Kappahl AB	2006	Nordic Capital, Accent	47711	47
2004	Lekolar AB (buyout 1)	2007	Procuritas	46499	46
2004	Phadia AB	2006	Silverfleet Capital, Triton	20590	20
2004	Point Transactions AB	No exit	Nordic Capital	46699	46
2004	Powermill Service Group AB	2007	Segulah	27900	27
2004	Previa AB	2007	Segulah	86612	86
2004	Q-Matic AB	2007	3i, Litorina	27900	27
2004	Sefina AB	2007	Rutland Partners	64920	64
2004	Thermia Värme AB	2005	Procuritas	28250	28
2004	Thule AB (buyout 1)	2007	Candover Partners	29320	29
2005	AB Annas Pepparkakor	2008	Accent	10722	10
2005	AddPro AB	No exit	Polaris	62010	62
2005	Aleris Holding AB	2010	EQT	87310	87
2005	Atos Medical AB	No exit	Nordic Capital	32510	32
2005	Attendo AB (buyout 1)	2007	Bridgepoint	87301	87
2005	Carema Vård och Omsorg AB	No exit	3i	87310	87
2005	Dometic AB (buyout 2)	2009	BC Partners	46431	46
2005	Finnved AB	No exit	Nordic Capital	29320	29
2005	Flexlink AB	No exit	AAC	46699	46
2005	GCE Holdning AB	No exit	Argan Capital	46699	46
2005	Inflight Service Europe AB	2009	CapMan	47999	47
2005	JetPak Group AB	No exit	Polaris, Accent	52290	52
2005	LBC Sweden AB	2009	Litorina	52290	52
2005	Munksjö AB	No exit	EQT	17129	17

Entry	Target	Exit	Acquirer	SNI	Peer group
2005	Mönlycke Health Care AB	2007	Apax	46460	46
2005	Nordform Mark och VA-System AB	No exit	Segulah	23610	23
2005	Nordic Bake Off AB	2006	Accent	10710	10
2005	Pax Electro Products AB	No exit	Litorina	27510	27
2005	Plastal AB	2009	Nordic Capital	29320	29
2005	Prevesta AB	2007	IK Investment	16231	16
2006	Alignment Systems AB	No exit	FSN	26510	26
2006	Aura Group AB	No exit	FSN	27400	27
2006	Bravida AB	No exit	Triton	43210	43
2006	ByggMax AB	No exit	Altor	47521	47
2006	Capio AB	No exit	Apax , Nordic Capital	86211	86
2006	Com Hem AB (buyout 2)	No exit	Carlyle, Providence, AXA Partners	61100	61
2006	Dustin AB	No exit	Altor	47911	47
2006	Elfa AB	2008	IK Investment	64202	64
2006	Energo AB	2010	Bure	71121	71
2006	Espresso House Sweden AB	No exit	Palamon Capital	56100	56
2006	Findus AB	No exit	CapVest	10850	10
2006	Five Seasons AB	2009	EQT	46420	46
2006	Grycksbo Paper AB	2008	Accent	17129	17
2006	Hildings Anders AB (buyout 2)	No exit	Candover Partners	31030	31
2006	Innovativ Vision AB	No exit	Eqvitec Partners, Priveq Investment	26510	26
2006	MQ Sweden AB	No exit	CapMan, RPE Capital	47711	47
2006	NEA AB	2010	Segulah	43210	43
2006	Nimbus Boats AB	No exit	Altor	46491	46
2006	North Trade AB	No exit	Procuritas	46320	46
2006	NVS Installation AB (buyout 2)	2008	Triton	43221	43
2006	Pelly Industrier Holding AB	No exit	Litorina	25999	25
2006	PIAB Invest AB	No exit	Altor	28130	28
2006	Saddler Scandinavia AB	No exit	Credelity Capital	46420	46
2006	Scandbook AB	No exit	Accent	18122	18
2006	Tolerans AB	No exit	Litorina	28990	28
2007	Alimak Hek Group AB	No exit	Triton	28220	28
2007	Attendo AB (buyout 2)	No exit	IK Investment	87301	87
2007	Candyking AB	No exit	Accent	46360	46
2007	Coffe Queen AB	No exit	Accent	28290	28
2007	Coor Service Management AB	No exit	Cinven	81100	81
2007	Diaverum AB	No exit	Bridgepoint	86909	86
2007	Emotron AB	No exit	Polaris	27110	27
2007	EuroMaint AB	No exit	Ratos	33170	33
2007	European Furniture Group AB	No exit	Herkules	31011	31
2007	Gycom AB	No exit	Credelity Capital	47540	47
2007	Heatex AB	No exit	Odin	28250	28
2007	Inredningsglas Skandinavien AB	2010	Accent	23190	23
2007	Isaberg Rapid AB	2009	Segulah	25730	25
2007	Johnson Metall AB	No exit	Norvestor	28150	28
2007	Lekolar AB (buyout 2)	No exit	3i	46499	46
2007	Lundhags AB	No exit	EQT	46420	46
2007	Mont Blanc AB	No exit	Accent	29320	29
2007	Proxima AB Nacka Närsjukhus	No exit	CapMan	86222	86
2007	RH Form AB	No exit	Ratos	31011	31
2007	Scandic Hotels AB	No exit	EQT, Accent	55101	55

Entry	Target	Exit	Acquirer	SNI	Peer group
2007	Solhagagruppen AB	2010	Valedo	87201	87
2007	Thule AB (buyout 2)	2010	Nordic Capital	29320	29
2008	Almondy AB	No exit	Segulah	10710	10
2008	Bindomatic AB	No exit	Valedo	46762	46
2008	Bluestep Bostadslån AB	No exit	Englefield Capital	64190	64
2008	Cerderroth AB	No exit	CapMan, Litorina	20410	20
2008	Coromatic Group AB	No exit	Litorina	71122	71
2008	CTEK Sweden AB	No exit	FSN	46434	46
2008	Gothia Financial Group AB	No exit	Herkules	64920	64
2008	Lantmännen Granngården AB	No exit	EQT	47199	47
2008	Mobile Climate Control	No exit	Ratos	28250	28
2008	San Sac AB	No exit	Priveq Investment	46900	46
2008	Sverige Ontime Logistics AB	No exit	CapMan	52290	52
2008	Åkers AB	No exit	Altor	28910	28

9.2 Appendix 2

Peer group	Peer group description
10	Manufacture of food products
16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles
17	Manufacture of paper and paper products
18	Manufacture of chemicals and chemical products
20	Manufacture of chemicals and chemical products
23	Manufacture of other non-metallic mineral products
25	Manufacture of fabricated metal products, except machinery and equipment
26	Manufacture of computer, electronic and optical products
27	Manufacture of electrical equipment
28	Manufacture of machinery and equipment n.e.c.
29	Manufacture of motor vehicles, trailers and semi-trailers
31	Manufacture of furniture
32	Other manufacturing
33	Repair and installation of machinery and equipment

Peer group	Peer group description
43	Specialised construction activities
46	Wholesale trade, except of motor vehicles and motorcycles
47	Retail trade, except of motor vehicles and motorcycles
52	Warehousing and support activities for transportation
55	Accommodation
56	Food and beverage service activities
61	Telecommunications
62	Computer programming, consultancy and related activities
64	Financial service activities, except insurance and pension funding
71	Architectural and engineering activities; technical testing and analysis
81	Services to buildings and landscape activities
82	Office administrative, office support and other business support activities
86	Human health activities
87	Residential care activities

9.3 Appendix 3

Private Equity Firm	Company Website
3i	www.3i.com
AAC	www.aaccapitalpartners.com
Accent	www.accentequity.se
Altor	www.altor.com
Apax	www.apax.com
Argan Capital	www.argancapital.com
AXA Partners	*www.axaprivateequity.com*
BC Partners	*www.bcpartners.com*
Bridgepoint	*www.bridgepoint.se*
Bure	*www.bure.se*
Candover Partners	*www.candover.com*
CapMan	*www.capman.com*
CapVest	*www.capvest.co.uk*
Carlyle Group	www.carlyle.com
Cinven	*www.cinven.com*
Credelity Capital	*www.credelity.se*
EQT	*www.eqt.se*
Eqvitec Partners	*www.eqvitec.com*
Englefield Capital	*www.englefieldcapital.com*
FSN	*www.fsncapital.com*
Herkules	*www.herkulescapital.no*
IK Investment	*www.ikinvest.com*
Investcorp International	*www.investcorp.com*
L Capital	*www.lcapitalpartners.com*
Litorina	*www.litorina.se*
Nordic Capital	*www.nordiccapital.com*
Norvestor	*www.norvestor.com*
Odin	*www.odinequity.dk*
Palamon Capital	*www.palamon.com*
Polaris	*www.polarisequity.dk*
Priveq Investment	*www.priveq.se*
Procuritas	*www.procuritas.com*
Providence	*www.provequity.com*
Ratos	*www.ratos.se*
RPE Capital	www.rpe.se
Rutland Partners	*www.rutlandpartners.com*
Segulah	*www.segulah.se*
Silverfleet Capital	*www.silverfleetcapital.com*
Triton	*www.triton-partners.com*
Valedo	*www.valedopartners.com*