Operating performance in Swedish buyouts 1988-2003

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Abstract

This Master's Thesis analyses changes in operating performance for a sample of 67 Swedish leveraged buyouts between 1988 and 2003. In the most extensive Swedish study of its kind, changes in firm growth, operating margins, investment activity and management of working capital are studied. Furthermore, changes in employment and leverage levels are examined. Our results report no significant industry adjusted improvements in operating performance in the first three years after the buyout, which is in contradiction to previous US and Swedish research. Although no conclusive results are found, we believe that the extensive collection of data on Swedish buyout target firms will be a valuable contribution to future related studies.

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1 Introduction

Since its establishment in the 1960's in the US, global buyout activity in terms of number of transactions and total deal value has had two historical highs, one in the late 1980's and one in the late 1990's. Today's buyout activity is again reaching record levels with buoyant credit markets and large pension placements working as catalysts. Although the historical return to buyout investors has been high, critics have questioned their real contribution in terms of value creation.

Critical voices have been heard also in Sweden and the *raison d'être* of the Swedish buyout investors has been debated. Critics have questioned whether buyout investors as owners add any true value to their portfolio companies or if they merely buy undervalued assets and sell them when valuations are more favourable.

In a series of recent articles in the Swedish business press, buyout investors have been criticised for short-sightedness and a too strong exit focus leading to important investments being missed during the holding period of the buyout investor, consequently undermining the buyout target firms' future competitiveness. Critics have gone so far as to call the whole private equity industry a "pyramid game" and claiming that the industry merely is about reallocation of capital rather than value creation[1].

Proponents to the critique, not least the buyout investors themselves, claim that they create value e.g. through active ownership and increased management incentives leading to increased growth and expansion of margins. Moreover, the common use of high leverage in buyout transactions creates value through tax gains and from sharpened focus on cash flow generation, needed to service the higher debt level.

US research has found that buyout target firms experience significant positive changes in operating performance in the years after the buyout. Kaplan (1989a) found significant

[1] See for example; Dagens Industri, 4 May, 2005

increases in industry-adjusted operating performance in the first three years following the buyout. Similar results were also found by Smith (1990) and Lichtenberg and Siegel (1990).

Swedish research in the area is, to our knowledge, very limited. In their master's thesis, Glasfors and Malmros (2000) found significant positive industry-adjusted changes in ROA[2] and EBITDA[3]-margin in a sample of 21 buyout target firms, acquired between 1988 and 1997. The authors also looked at changes in productivity in buyout target firms, but found no evidence of improvements.

1.1 Purpose and contribution

The main purpose of this thesis is to provide further empirical evidence on whether there occur any changes in operating performance in Swedish buyout target firms. We conduct the so far most extensive analysis in this area in terms of number of buyout target firms and the length of the time period analysed. We investigate, for a sample of 67 firms acquired between 1988 and 2003, whether they experience any changes in operating performance up to three years following the buyout and how they perform relative to their industry peers. Moreover we study how the sample firms perform up to two years after the exit of the buyout investor relative the industry. We also look at the pre buyout operating performance of the target firms in order to determine whether their operating performance deviate from their industry peers before the buyout transaction.

We have chosen to rely solely on publicly available information throughout the thesis, in order to provide a fully independent study on the effects on operating performance in Swedish buyout target firms.

1.2 Definitions

For the purpose of this thesis, a *leveraged buyout* is defined as the takeover of a company or controlling interest in a company, using a significant amount of borrowed money. The terms

[2] Return on assets measured as earnings before interest and taxes divided by total assets
[3] Earnings before interest, taxes, depreciation and amortisation

buyout and *leveraged buyout* is used interchangeably throughout the thesis. We refer to the firm acquired through the leveraged buyout transaction as the *buyout target firm* and the acquirer as the *buyout investor*.

1.3 Structure

The thesis proceeds as follows. Following the introduction, backgrounds of the US and Swedish buyout markets are given in section 2. Then follows, in section 3, a review of theories on value creation in leveraged buyouts. Section 4 presents results from previous research in the area. In section 5, backed by the theories and empirical evidence from sections 3 and 4, the hypotheses used in the empirical study are presented. The methodology used to test the hypotheses is described in section 6. Having presented the hypotheses and methodology, the data used is described in section 7. Section 8 presents the empirical findings and analysis. Finally, conclusions are drawn in section 9 and suggestions for further research on the leveraged buyout industry are given in section 10.

2 Background and overview

The market for buyout investments was born in the post-war period in the United States. During the 1960s and early 1970s, buyout investments consisted of a small asset pool and attracted only modest attention from larger investors. In the 1980s, buyout activity accelerated alongside the rise of the junk bond market. Between 1979 and 1989 there were over 2000 leveraged buyout transactions valued in excess of $250bn[4]. The buyout market reached its peak in the late years of the decade with deals such as Kohlberg Kravis Roberts' $25bn buyout of the tobacco company / food producer RJR Nabisco in 1989. During the first half of the 1990s the US buyout market declined substantially, but accelerated again towards the end of the decade. Today, buyout investment funds are considered a major, yet alternative asset class[5]. Throughout its history, the US buyout market has been characterised by large public to private transactions.

In Sweden, the first pure buyout focused investment firm was Procuritas, which launched its Procuritas MBO[6] Investment Consortium in 1986. Three years later, in 1989, Industri Kapital and Nordic Capital were founded. During the 1990s, several new players entered the Swedish buyout market, both domestic and international. Two examples are EQT, which was started in 1994 by Investor under the name of Scandinavian Equity Partners, and Segulah, founded the same year. Today, around 50 buyout investors are active in the Swedish market. Procuritas, Industrikapital, Nordic Capital, EQT and Segulah are the only Swedish buyout investors that conducted any buyouts prior to 1997, which is why we chose to focus on the buyout target firms acquired by these five buyout investors in our study. On the contrary to the US market, the Swedish buyout market has up to today been characterised by buyouts of divisions or separate business units of larger corporations. Also buyouts of founder owned firms have been common.

[4] Opler and Titman (1993)
[5] Piper Jaffray (www.piperjaffray.com)
[6] MBO - Management Buyout. Management, often backed by a buyout investor takes a controlling stake in the company or a division of a company.

3 Theory

In this section we present relevant theory on value creation in leveraged buyout transactions. We consider theories on the six most commonly discussed value sources in buyouts; tax savings, reduction of agency costs, wealth transfer effects, undervaluation, transaction costs reduction and takeover defences. Each of these different sources of value creation will first be explained and then discussed in light of the Swedish buyout market characteristics. Most emphasis will be given the agency cost related hypothesis, which is the value creation hypothesis closest related to improvements in operational performance.

3.1 Agency cost related hypothesis

Essentially three different sources of value creation in leveraged buyout transactions emanate from the basics of agency theory and reduction of agency costs, *(i)* the incentives realignment hypothesis, *(ii)* the control hypothesis and *(iii)* the free cash flow hypothesis. Each of these will be discussed below.

3.1.1 Improving incentive alignment

According to the incentive realignment theory value is created in buyouts through the alignment of interests between shareholders and management. As management often are given a substantial equity stake in the buyout target firm a stronger relationship between management's and shareholder's interests is being created. This encourages management to focus more on value maximising activities and solely undertake positive net present value (NPV) projects. Other potential positive effects that may be attributable to realignment of interests are increased operational efficiency and restructuring of corporate assets. An increased management equity stake will further lead to larger personal costs of inefficiency and will consequently discourage shirking (e.g. Smith, 1990b). Increased managerial ownership may however also lead to some negative effects. A possible under diversification of management's wealth may lead to underinvestment if management becomes too risk

averse. A concentration of managerial equity ownership also risk giving management inefficiently high control over the organisation (Holthausen and Larcker, 1996).

3.1.2 Improving monitoring and controlling

This hypothesis is primarily relevant for buyout target firms acquired in a public-to-private transaction, as public firms often have dispersed ownership. In this type of transaction ownership and control are reunited and shareholders benefit from the reduction of "free-riding" investors. With less dispersed ownership shareholders' incentives to actively monitor the firm strengthens (Cotter and Peck 2001). Wealth gains from the buyout transaction may also derive from increased quality of control as buyout investors, being professional active investors, may have a comparative advantage over other equity investors in monitoring. Furthermore, the new shareholders of a de-listed buyout target firm no longer have access to a secondary market to sell their shares in, which increases their incentives to improve monitoring as no easy exit opportunity is available.

3.1.3 Reducing agency costs of free cash flow

The increased debt level in buyout target firms force management to allocate a larger part of operating cash flows to service debt payments and thereby limits management's opportunities to spend it inefficiently. If management possesses large discretion over corporate expenditures, "empire building" managers may be enticed to retain inefficiently large amount of resources and grow the firm beyond its optimal size. By replacing equity with debt, management implicitly commit to pay out excess cash flow instead of investing in projects with negative NPV. Another possible value enhancing effect of the increased debt burden following a leveraged buyout transaction is that managers may be forced to operate the company more efficiently in order to avoid default (Jensen, 1986). Bankruptcy is costly for managers as they lose valuable control and reputation, consequently increased default risk due to increased leverage can induce managers to work harder, consummate fewer perquisites and make better investment decisions in order to limit the risk of bankruptcy. An increased debt burden in the buyout target firm may however also incur some indirect costs, e.g. an increased leverage ratio lead to greater exposure to financial distress and highly leveraged firms may not be able to endure unanticipated chocks as large interest payments

reduce the firm's financial flexibility (Rappaport, 1990). An increased vulnerability of financial distress can also make a firm short-term oriented and disregard positive NPV investment opportunities (Palepu, 1990). Another possible implication of increased leverage is that management may alter their investment decisions towards low-risk assets in order to reduce the risk of default.

Most of the research on leveraged buyout transactions are studies covering the US market. In the US, public-to-private transactions have been the most common type of buyout transaction, making all three of the above discussed motives relevant. In Sweden, most buyout targets have often been either divisions of large corporations or smaller private firms owned by the founders. Hence, the most important motives originating from agency cost theory for the Swedish market are the incentive realignment hypothesis and the free cash flow hypothesis. The control hypothesis is more relevant when pre buyout ownership is dispersed as is often the case in public to private transactions.

3.2 Tax benefit hypothesis

According to the tax benefit hypothesis, value is created in the buyout transaction through tax benefits earned. Increased leverage generates increased interest deductions which may constitute an important source of wealth gains. According to the tax benefit hypothesis, tax deductibility of interest payments on new loans creates a tax shield which increases the pre-transaction value of the firm. For the period 1980 to 1989 the median value of tax benefits in US leveraged buyout transactions is estimated to between 21% and 72% of the premium paid to pre-buyout shareholders to take the company private (Kaplan, 1989b). The potential wealth gains from tax benefits may however vary across different markets and are dependent on existing tax laws and the marginal tax rate the specific company is subject to.

3.3 Wealth transfer hypothesis

The most commonly discussed wealth transfer effect in buyout transactions is the one from bondholders to stockholders. Wealth transfer from bondholders to stockholders can

essentially come to pass through three mechanisms; by unexpected increased risk in investment projects, by large increased dividend payments, or by an unexpected issue of debt of higher or equal seniority as the existing debt, particularly the latter being most common in buyout transactions.

Another potential wealth transfer effect in buyout transactions is one from employees to shareholders. Critics of buyouts have questioned the legitimacy of value being created at the expense of employees or wage cuts. Shleifer and Summers (1988) conclude that value gains in hostile takeovers are likely to come from lay-offs of employees and through reduction in wages. Jensen et al (1989) find that the total number of employees in buyout target firms is cut, but that wages increase as a result of new, incentive-based compensation schemes.

Most applicable on the Swedish market is the wealth transfer effect between employees and shareholders. As the number of public to private buyout transactions is quite small in Sweden the wealth transfer effect from bondholders to stockholders is not as relevant.

3.4 Other sources of wealth creation

The following three sources of wealth creation are relevant mainly in a public-to-private transaction. As mentioned these type of transactions are quite infrequent in the Swedish market and therefore the following sources will only be discussed briefly.

3.4.1 Undervaluation

There may be asymmetric information between managers and outsiders about the possible value that can be realised from the firm's assets. If managers have superior knowledge about earnings distributions and future prospects of the firm, they know if the share price undervalues the true value of the firm (Renneboog and Simons 2005). Hence, the buyout is seen more as a way of realising expected future improvements rather than being the origin of them. Studies by e.g. Harlow and Howe (1993) have found that pre-buyout insider trading of shares in MBO targets is connected to management's superior information.

3.4.2 Transaction costs hypothesis

According to the transaction costs hypothesis wealth gains in buyouts are created through eliminating large costs associated with maintaining a stock exchange listing. Benoit (1999) mentions annual exchange listing related costs for UK firms of up to £250'000. Renneboog and Simons (2005) argues that the implementation of the Sarbanes-Oxley Act on corporate governance increase the cost of an exchange listing substantially, and that the extra burden fall disproportionably on smaller listed firms. On the contrary some other costs may arise for public firms going private, e.g. as private companies are less transparent to investors than listed companies the cost of debt financing could increase.

3.4.3 Takeover defence hypothesis

Some corporations have gone private as a defence against hostile takeovers. The research in this area suggests that wealth gains from going private is the result of the management team's willingness to buy out the other shareholders at a premium in order to maintain control of the company, see e.g. Lowenstein (1985).

4 Previous research

To complement the theories presented in section three we consider previous empirical findings on changes in company characteristics in buyout target firms before stating our hypotheses.

Swedish research on changes in operating performance and productivity in buyout target firms is rather limited, but on an international level, especially in the US, the topic has been more extensively covered. Most of the studies however, date back to the late 1980s and early 1990s, when the effects of the first historical high of the buyout industry were examined. In this section the relevant findings from a selection of previous studies are presented.

4.1 Characteristics of operating performance and efficiency pre buyout

Kaplan (1989a) is perhaps the most referred to study of changes in operating performance prior to and following leveraged buyouts. In his study, Kaplan measures the effects on operating income, capital expenditures and net cash flow in 48 management buyouts (MBOs) of large US public companies between 1980 and 1986. Kaplan finds insignificant mixed evidence of the pre buyout operating performance of the buyout target firms in his sample. Industry adjusted operating income and operating income to assets decrease from two years before the buyout to one year before the buyout while operating income to sales increases.

In their master's thesis, Glasfors and Malmros (2000) studied the effect on operating performance in Swedish firms prior to and following a leveraged buyout. In a sample consisting of 21 buyout target firms, acquired between 1988 and 1997 they find a significant positive trend in ROA from three years before the buyout to one year before the buyout. They also look at trends in EBITDA-margins prior to the buyout and find an insignificant negative trend, both from three and from two years before the buyout to one year before the buyout.

4.2 Impact on operating performance and efficiency during holding period

Kaplan (1989a) finds that operating income, measured in levels, decreases significantly in the year after the buyout relative to the year before the buyout. Furthermore, he finds significant increases in industry-adjusted operating income and net cash flow as a fraction of both sales and assets of around 20% in the first three years following the buyout. Kaplan also finds evidence of reduced capital expenditures in the buyout target firms in his sample, both in levels and as fractions of sales and total assets.

Similar results were found by Smith (1990a) in her study of changes in operating performance in 58 management buyout target firms, taken private between 1977 and 1986. She measures operating performance as industry-adjusted operating cash flows deflated by employees and operating assets, and finds that both measures increases significantly from the year before the buyout to the first and the second year following the buyout. To test for effects from divesting underperforming divisions following the buyout, she divides the sample into two sub-groups, one including firms that carried out major asset sales and one including firms that did not. Both sub-samples show similar results as the aggregated sample, and she concludes that increases in operating performance does not entirely originate from divestments of loss-making divisions. In the same study, Smith also looks at the drivers of the observed improvements in operating performance. She finds no evidence that decreased capital expenditure or R&D expenses could explain the improvements; however she finds that the ratio of sales to net working capital increased significantly, indicating improved capital management. Furthermore, she finds that the firms' operating cycle, i.e. the time after payment to suppliers in which cash is received from customers decreases, another indication of improved efficiency.

Lichtenberg and Siegel (1990) examined the effects on leveraged buyouts on total factor productivity (TFP) in manufacturing plants using a database with over 12,000 plants included. In a sample consisting of buyout target firms acquired between 1983 and 1986, they found that there was a strong positive change in TFP during the first three years following the buyout.

Opler (1992) studied effects of leveraged buyouts on operating performance using a sample of 44 buyout target firms bought between 1985 and 1989. He finds significant positive industry adjusted changes in the ratios operating profit to sales and operating profit to employees as well as in cash flow before investments. His results imply that the decline in the buyout market following the high in 1989 was not matched by a decline in operating performance in the buyout target firms.

Some previous researchers have concluded that corporate restructuring activity is the primary source of improvements in operating performance. In their 1992 study, Liebeskind, Wiersema and Hansen found that the most important managerial action following a leveraged buyout is downsizing of the firm and elimination of excess growth. They found evidence of slower growth and a higher degree of plant closures for the buyout target firms in their sample compared to non-buyout firms.

Glasfors and Malmros (2000) find significant positive industry-adjusted changes in ROA and EBITDA-margin of 1.83% and 2.94% respectively. The authors also analyse improvements in productivity in buyout target firms, measuring changes in sales per employee, employee costs over sales and net working capital over sales. They find no evidence of improvements in these measures, indicating that productivity levels in Swedish buyout target firms remain unchanged following the buyout.

To sum up, previous researchers have found evidence of improvements in operational performance, and somewhat mixed evidence of productivity improvements.

4.3 Impact on operating performance and efficiency post exit

Several researchers have concluded that the peak of operating performance and productivity in buyout target firms coincides with the time of the exit of the buyout investor. Degeorge and Zeckhauser (1993) found that buyout target firms substantially outperform peer firms in terms of operating income in the year prior to the exit of the buyout investor. During the first year following the exit, the authors finds that operating income in the buyout target firms

falls by 10% relative to the pre exit year and by 4% relative to the respective industry peer firms.

Holthausen and Larcker (1996) find that operating performance in the buyout target firm is significantly better than the median firm in respective industry in the year prior to the exit and in the year following the exit. They also found that the out performance is sustained in the four following years. Furthermore, they found that levels of working capital increased following the exit of the buyout investor, indicating a lower level of productivity.

Envall, Hielte and Nordling (2001) find indicative evidence of sustained levels of operating performance following the exit of the buyout investor. Productivity, measured as working capital to sales, declines in the years following the exit. Notable is that all their results are lacking statistical significance. Their sample consisted of 26 Swedish buyout target firms between 1993 and 2000.

5 Hypotheses

Given the relevant theory presented in section 3 and the previous research presented in section 4 we formulate and test the following hypotheses related to firm growth, profitability, investing activity, employment and capital structure in the buyout target firms.

- ***Hypothesis 1: Swedish buyout target firms experience no change in growth levels after the buyout.***

According to agency cost related hypothesis, alignment of interests between owners and management encourages management to solely invest in positive net present value projects. The reduction of free cash flow due to increased interest payments forces management to pay out excess cash flow instead of investing in projects with negative net present value. These two factors should lead to the elimination of excess growth in the firm. Evidence of this has been found by previous researchers (e.g. Liebeskind, Wiersema and Hansen 1992)

To measure growth in the buyout target firms we analyse sales growth and growth in total assets.

- ***Hypothesis 2: Swedish buyout target firms experience improvements in profitability and capital management after the buyout.***

Following the same argument on the basic of agency theory as in hypothesis one in addition to empirical evidence found in the US and in Sweden, we expect to see improvements in profitability and capital management of the buyout target firms.

To examine potential changes in profitability and capital management we employ two different cash flow variables; change in operating income and change in net working capital.

Operating income equals net sales less cost of goods sold and selling, general and administrative expenses before depreciation, depletion and amortization. Operating income is a measure of the cash generated by the company's operations before depreciation, interest and tax which is available to both equity and debt holders. Since we examine the operational performance we do not include interest payments, as we want the variables used to reflect the operational decisions made by the management and not the financial decisions.

Change in net working capital is measured as the change in current assets minus current liabilities from t_n to t_{n+1}.

- ***Hypothesis 3: Investing activity in Swedish target buyout firms is reduced after the buyout.***

A decline in net investing activity is consistent with the reduced agency costs hypothesis. Kaplan (1989a) found evidence of decreased capital expenditures which we believe is closely related to investing activity.

We measure net investing activity as the difference in fixed assets between t_{n+1} and t_n plus depreciation and amortization in t_{n+1}.

- ***Hypothesis 4: Employment and wages per employee in the buyout target firm decrease after the buyout.***

This is consistent with the wealth transfer hypothesis, but is in contradiction to some of the empirical evidence presented in section 4.

In order to assess any potential wealth transfer effects we measure the change in number of employees and wage per employee.

- ***Hypothesis 5: Leverage levels in the buyout target firms increase after the buyout.***

This is in line with the tax benefit hypothesis, and with previous empirical findings, e.g. Kaplan (1989b).

We look at leverage levels, measured as debt to debt plus book value of equity and interest coverage, measured as operating income to net interest expense, before and after the buyout transaction in order to find any indicative evidence on value creation through increased tax shields generated by increased interest payments. We do not explore this factor any deeper through for example quantifying the increase in interest payments, as the main focus of the paper is on effects on operational performance.

- ***Hypothesis 6: Pre buyout and post exit performance is in line with the industry.***

To isolate the changes in the different variables attributable to the ownership of the buyout investor, we also look at pre- and post buyout changes in the variables analysed. Empirical studies have shown contradictory results both prior to the buyout and after the exit. Kaplan (1989a) finds insignificant mixed evidence, as does Glasfors and Malmros (2000). Degeorge and Zeckhauser (1993) find decreasing operating performance post exit while Holthausen and Larcker (1996) find evidence of sustained out performance. Due to these mixed findings, we expect performance to be in line with industry peer firms.

Table 1 summarises our predicted changes in firm characteristics following the buyout and the proxies used to measure the changes.

Table 1

Summary of testable predictions during holding period

The table displays the different variables we examine for analysing operational changes resulting from the buyout transaction. We present each company characteristic analysed and the proxy we use to estimate the change resulting from the buyout transaction. We depict the predicted relationship changes attributable to the buyout. The index symbols A and B in the predicted relationship column stand for after and before the buyout

Characteristics	Proxies	Predicted Relationship
Firm growth	Sales Growth	$SG_A=SG_B$
	Growth in assets	$AG_A=AG_B$
Profitability and	Return on Sales = Operating Income ÷ Sales	$OITS_A>OITS_B$
Capital management	Return on Assets = Operating Income ÷ Total Assets♠	$OITA_A>OITA_B$
	Net working capital = $Current\ Assets_t$ - $Current\ Liabilities_t$	$NWC_A<NWC_B$
	Net working capital ÷ Sales = $Current\ Assets_t$ - $Current\ Liabilities_t$ ÷ Sales	$NWCTS_A<NWCTS_B$
	Net working capital ÷ Assets = $Current\ Assets_t$ - $Current\ Liabilities_t$ ÷ Assets	$NWCTA_A<NWCTA_B$
Capital investments	Investing Activity = $Total\ Fixed\ Assets_t$ - $Total\ Fixed\ Assets_{t-1}$ + $Depreciation_t$ + $Amortisation_t$	$IA_A<IA_B$
	Investing Activity ÷ Sales = $Total\ Fixed\ Assets_t$ - $Total\ Fixed\ Assets_{t-1}$ + $Depreciation_t$ + $Amortisation_t$ ÷ $Sales_t$	$IATS_A<IATS_B$
	Investing Activity ÷ Assets = $Total\ Fixed\ Assets_t$ - $Total\ Fixed\ Assets_{t-1}$ + $Depreciation_t$ + $Amortisation_t$ ÷ Assets♠	$IATA_A<IATA_B$
Employment	Sales to Employees = Total Sales ÷ Total Number of Employees	$ETS_A>ETS_B$
	Wages to Employees = Total Wages ÷ Total Number of Employees	$WTW_A<WTE_B$
Leverage	Debt to assets = Total debt ÷ total assets	$LEV_A>LEV_B$
	Interest coverage = Operating Income ÷ Net Interest Expense	$OI/NI_A<OI/NI_B$

♠Total assets are calculated as the averaged assets between t_n and t_{n-1} adjusted for goodwill created in the buyout transaction.

6 Methodology

In this section, the relevant methodology for testing our hypotheses is presented.

6.1 Time periods

We define three time periods in our study; *(i) The pre-buyout period*, which consists of three full years before the year of the buyout. *(ii) The holding period,* which includes all years from the date of the buyout transaction to the date of the exit of the buyout investor. *(iii) The post exit period,* which consists of up to two years after the exit of the buyout investor.

6.2 Controlling for acquisitions and divestitures

If all buyout companies would acquire and divest at the exact same levels as the firms in the control group, the industry adjusted change in levels would be an appropriate measure of the real change in operating performance. But since acquisition and divestiture activity in reality vary substantially across different buyout firms and their industry peers, the change in levels could be misleading. In case the buyout firms divest more or experience slower growth than the control group, changes in operating income and net investing activity will be underestimated. We partially control for acquisitions and divestitures by measuring our analysed variables as a ratio of sales and/or assets.

6.3 Goodwill adjustment

To make comparisons between pre buyout and post buyout years meaningful, we adjust the asset base for purchase goodwill created in the buyout transaction[7], which represents the premium paid by the buyout investor above the "fair value" of the target. The purchase goodwill is approximated as the change in goodwill between the year prior to the buyout

[7] Adjustments for purchase goodwill created in the buyout transaction are also made in similar studies, see e.g. Kaplan (1989a).

(year t-1) and the actual year of the buyout *(year t=0[8])*. Purchase goodwill is shown in the balance sheet and amortised over an extensive period, usually 20 years in Sweden. Amortisation of goodwill is expensed through the income statement and thus influences earnings negatively. Amortisation of goodwill is however not affecting operating cash flows and should therefore not be included in the book value of assets when measuring operating improvements in the buyout target firm.

6.4 Measuring changes in variables

To measure the change in the variables analysed during the holding period we measure the gross change as well as the industry-adjusted change in the variables up to three years after the buyout transaction *(years t+1, t+2, and t+3)* compared to the last fiscal year prior to the buyout *(year t-1)*. The industry adjusted change in levels is measured using a standard growth formula according to equation (1). The industry adjusted change in ratios is measured using a *difference in differences* approach according to equation (2)[9]. We report our results for medians rather than for means as some of the samples analysed are quite small and possible outliers will have a large influence on the mean.[10]

$$(1) \qquad \left(\frac{X^F_{t+n}}{X^F_{t-1}} - 1\right) - \left(\frac{X^I_{t+n}}{X^I_{t-1}} - 1\right),$$

$$(2) \qquad \left(X^F_{t+n} - X^F_{t-1}\right) - \left(X^I_{t+n} - X^I_{t-1}\right),$$

In equations (1) and (2), X^F represents the relevant measure for the buyout target firm analysed and X^I represents the same measure for the relevant industry control group, *t-1* represents the last fiscal year prior to the buyout and *t+n* represents the fiscal years in the

[8] This measure of purchase goodwill may be distorted if purchase goodwill has been created also in other transactions in t=0. We consider this to be quite rare and therefore regard it to be a valid proxy of the real creation of purchase goodwill in the buyout target firm in connection to the buyout.
[9] This is a recognised method that has been used in similar studies by e.g. Kaplan (1989a) and Lichtenberg and Siegel (1990).
[10] Similar studies also report the results for medians rather than for means. See e.g. Kaplan (1989a)

holding period running from *n* equals 1 to *n* equals 3. For all firms, the year of the buyout (*year t=0*) is not taken into account due to difficulties in allocating changes in the variable analysed to the pre- and post-buyout periods in that year.

The same method is used in measuring the change in the variables in the pre buyout- and post exit period. In the pre buyout period we analyse changes between *t-3* to *t -2* and *t -2* to *t -1*. In the post exit period we analyse changes in up to two years after the exit of the buyout investor *(year*s *++1 and, ++2)* relative the last year pre exit

6.5 Statistical significance

Having computed pre buyout, holding period and post buyout industry adjusted change in the variables analysed we use, the Wilcoxon signed rank test in order to test for significant changes in the different time periods[11]. According to this procedure we test if the difference between the change in the firm variable and the change in the median control group firm is statistically different from zero. We base our conclusions on the standardised test statistic *Z*, which for samples of *n>10* approximately follow a standard normal distribution.

[11] Given our relatively small sample, the Wilcoxon signed rank test is well suited for determining statistically significance. This is also the most common test used in similar studies, e.g. see Kaplan (1989a) and Glasfors and Malmros (2000).

7 Data

The sample of buyout target firms in this study consists of all publicly disclosed leveraged buyout transactions with a Swedish target made by one of the following five Swedish buyout funds; EQT, Industri Kapital, Nordic Capital, Segulah or Procuritas during the years 1988 to 2003. 2003 is chosen as the last year in the sample since at least one fiscal year post buyout is required in order to make comparisons between pre- and post buyout performance. A total of 89 buyout target firms meet these selection criteria, consequently making up our total population of leveraged buyout transactions.[12] As mentioned in section 2 the five analysed funds have historically been the largest and most active buyout investors in the Swedish market and the only Swedish buyout investors with an investment history prior to 1997. In recent years some new local players have emerged at the same time as a number of foreign buyout funds have entered the Swedish market. Given this, our sample will not cover all Swedish buyout transactions between the years 1988 and 2003. However, as most of the other buyout investors entered the market relatively recently we expect to be covering a large part of the Swedish buyout transactions executed during this time period.

Table 2

Buyout distribution 1988-2003

Distribution of completed Swedish leveraged buyouts during the period 1988-2003 by year of completion.

Dates of LBO transactions	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Total
All firms[a]	1	2	4	3	2	6	7	3	6	10	8	18	4	7	3	5	89
Firms in sample[b]	1	2	4	1	1	4	5	2	6	7	5	12	4	6	3	4	67

[a]All firms include all Swedish buyouts between 1988 and 2003 with one of following five Swedish buyout funds as buyers; EQT, Industri Kapital, Nordic Capital, Procuritas or Segulah.

[b]Firms in sample include all Swedish buyouts which meet the criteria in a as well as for whom we have obtained some form of pre and post buyout accounting data.

[12] For a list of the buyout transactions in the total population and in our total sample, see appendix 2

7.1 Data Collection

As mentioned in section 5 above the total sample is divided into three different time periods; *the pre-buyout period*, *the holding period* and *the post exit period*. The organisation numbers for each buyout target firm in each time period[13] is obtained primarily through communication with the financial departments of the buyout target firms, but also from the data base *Affärsdata* and company annual reports[14]. Accounting data for each time period is obtained primarily through *Market Manager Partners (MMP)* data bases. If relevant data could not be obtained through the *MMP* data bases it is collected either from *Affärsdata* or directly from the firm's annual reports. Some annual reports have been received straight from the target company; others have been purchased from *Bolagsverket*. In some cases, when pre-buyout annual reports have not been available but pro forma financials have been disclosed by the buyout target firm this information has been used in the analysis[15].

(1) Pre-buyout period data

Pre-buyout data is analysed three years prior to the leveraged buyout transaction up to the actual year of the buyout. Lack of pre buyout data is attributable to two different circumstances, *(i)* the buyout target firm had to be excluded from our sample due to lack of group accounts from the target firm. This is primarily the case when the target firm and its subsidiaries formed one or several specific divisions within a larger firm before the buyout[16], *(ii)* the buyout target firm could not be included in the analysis as a result of a significant change of the corporate entity in connection with the leveraged buyout, this was the case

[13] In most of the leveraged buyout transactions, the leveraged buyout firm is acquired through a holding company, set up solely for the purpose of the transaction. Hence the organization number usually changes in year t=0. Depending on the type of exit route, the organisation number could also change following the exit of the buyout investor.

[14] In some cases, mainly for the earlier buyouts, the relevant organization number is difficult to identify, since the name of the buyout target firm often undergo several changes during the time periods of the analysis. In addition, historical information on organisation numbers is sometimes limited at the financial departments of firms.

[15] An example of this is for Sydsvenska Kemi, which was formed in 2001 in connection to Industri Kapital's buyouts of Neste Oxo in 1999 and Perstorp AB in 2001. The items used in the analysis are pro forma sales and EBITDA for the pre-formation year.

[16] An example of this is the household sewing machines producer VSM Group which was formed in connection with Industri Kapital's acquisition of the Husqvarna Viking product line from Electrolux in 1997. Industri Kapital completed an add-on acquisition of Pfaff in 1999 and the VSM group today consists of the two brands Viking and Pfaff.

when several divisions or companies where acquired and merged with each other in connection to the buyout[17].

(2) Holding period data

The average holding period for the buyout target firms included in our sample is 3.2 years. The shortest holding period is 13 months and the longest holding period is 9 years. Buyout target firms were excluded if the length of the holding period was too short, i.e. if no data for a complete fiscal year after the year of the buyout could be obtained[18].

Table 3

Holding period characteristics

Number of full fiscal years in the buyout investor's holding period for a number of Swedish leveraged buyouts completed during the period 1988-2003 and holding period statistics for realised investment during the same years.

Panel A: Number of full fiscal years in holding period[a]

	0	1	2	3	4	5	6	7	8	9	Total
All firms	7	17	11	14	11	12	8	5	2	2	89
Firms in sample	0	16	10	12	7	10	5	3	2	2	67

Panel B: Holding period statistics[b]

	Min	Max	Median	Mean	Std. dev.	N
All firms	0.0	9.0	3.0	3.1	2.4	67
Firms in sample	1.0	9.0	3.0	3.2	2.3	49

[a]Number of full fiscal years in the holding period are equal to all full fiscal years in the holding period in realised as well as unrealised investments, i.e. all years available for analysis.

[b]The holding period statistics are calculated solely on realised investments.

(3) Post exit period data

Missing data in the post exit period is attributable to four different circumstances, *(i)* the buyout target firm is still in the portfolio of the buyout investor[19], *(ii)* the buyout target firm

[17] An example of this is the logistics company Wilson Group which was acquired by Nordic Capital from BTL. The pre buyout Wilson group was the global air, sea and logistics arm of BTL. The transaction also included the acquisition of 90% of the Canadian listed company Combined Logistics and 100% of the Italian company Castelletti.

[18] An of this example is the cable television company StjärnTV-Nätet which was acquired by EQT in March 1998 from Singapore Telecom International and sold in July 1999 to United Pan-Europe Communications (UPC).

[19] An example of this is Findus which was acquired by EQT from Nestlé in January 2000 and still is part of the EQT II fund.

was exited in 2004 or later[20], *(iii)* the firm subject to the leveraged buyout was merged into another company after the exit of the buyout investor and has not filed any separate accounts[21], *(iv)* the buyout target firm changed nationality in connection with the exit of the buyout investor[22].

In a few cases when the buyout target firm reports less or more than 12 months financials for the year in connection to the buyout, the year has been extended with or reduced by between 1-3 months to fit a 12-months fiscal year. This is true for a relatively small number of buyout firms and has been done by subtracting or adding back the relevant excessive or missing fraction from the surrounding years. We acknowledge that this method is imperfect and could lead to a small bias for the sample firm, but we believe that the advantage of adding more data points for the purpose of the analysis exceeds this disadvantage.

7.2 Control data

To construct control data groups, for each of the 67 buyout target firms in our sample, accounting data is collected for a group consisting of 10-15 firms with the same five-digit SNI-code[23] and of similar size as the buyout target firm as of December 2005. The accounting data for the firms in the control groups is primarily collected from the *MMP* data bases.

The method for the construction of the control group is subject to two main problems; *(i)* the control group could suffer from a *survivorship bias*, i.e. the control group today is biased upwards in terms of performance because of the fact that under performing firms in earlier periods may have have gone bankrupt as of today. This could constitute a problem, especially when analysing the buyout target firms early in the chosen time period, *(ii)* for some control groups, the number of companies with the same size as the buyout target firm is limited, and

[20] An example of this is Ahlsell which was acquired by Nordic Capital from Trelleborg in November 1999 and sold to Cinven and Goldman Sachs Capital Partners in November 2005.
[21] An example of this is Nyge Aero which was acquired by Industri Kapital from CSE Oxford in December 1994 and sold to SAAB in May 1999.
[22] An example of this is Orrefors Kosta Boda AB which was bought out from the Stockholm Stock Exchange in October 1996 and sold to Royal Copenhagen in June 1998.
[23] All Swedish companies have a five digit SNI-code according to the Swedish industry classification.

significantly smaller companies have been included. Hence, the comparability with the buyout target firm is reduced.

An alternative way of collecting control data is to use the material on accounting key ratios of Swedish industries published annually by *Statistics Sweden (SCB)*[24]. This data has the advantage that it includes substantially more firms in the different groups than our own groups do. Using the *SCB* data however puts some restrictions on the variables available for analysis, since the data in the publications is limited and lacks operating cash flow variables. We argue that a more specified, although smaller[25], industry peer group provides a better picture and as a consequence, the *SCB* alternative for control data is left out.

7.3 Summarising statistics of buyout target firms in sample

Table 4 summarizes some key characteristics of the firms in our sample in the year before the buyout. As can be seen there is a large difference between the variables maximum and minimum value as well as a large difference between the median and the mean, which indicate the existence of outliers. This supports the use of medians rather than means for the analysis.

Table 4

Pre buyout summary statistics

The table displays summary statistics for sales, size and leverage, the last fiscal year before the buyout, for 67 Swedish leveraged buyouts during the years 1988-2003 (SEK in thousands).

Variable	Max	Min	Median	Mean	Std. dev.	N
Sales	14 966 500	20 128	525 622	1 612 685	2 582 585	67
Book value of total assets	12 703 500	14 332	271 082	854 412	1 789 105	62
Book value of equity	3 342 600	52	91 190	315 925	592 221	59
Book value of total debt as percentage of total capital	109.7%	23.9%	67.2%	68.0%	19.7%	61
Employees	11 696	9	324	946	1 687	66

[24] This data collection method has been used in previous Swedish research on operating performance in buyout target firms, see e.g. Glasfors and Malmros (2000)

[25] Previous acknowledged research on the similar topic has used specified industry peer groups with few companies, see e.g. Kaplan (1989a) and Jain and Kini (1994)

8 Empirical Results and Analysis

In this section we present and analyse our empirical findings related to the relevant hypotheses presented in section 5. We report findings on effects of Swedish buyouts during the period of 1988 to 2003 on firm growth, profitability, capital investments, employment and leverage ratios.

- ***Hypothesis 1: Swedish buyout target firms experience no change in growth levels after the buyout.***

Table 5

Effect of leveraged buyouts on firm growth

The table displays the percentage change in net sales and total assets for 67 Swedish leveraged buyouts completed in 1988-2003. The industry adjusted change equals the median change for the buyout company minus the median change for a control group consisting of firms in the same industry and of similar size.

		From year *i* to *j*						
Variable		-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	Te-1 to ++1	Te-1 to ++2
A. Sales	N =	59	63	67	59	48	26	26
Percentage change								
Median		11.7	7.6	11.3	19.8	27.6	17.4	22.2
Industry-adjusted percentage change								
Median		1.4	-1.7	-3.9 [c]	-8.1	-7.3	3.1	-2.2
B. Assets	N =	55	58	60	52	40	25	24
Percentage change								
Median		5.0	4.8	10.4	26.4	30.7	27.4	48.3
Industry-adjusted percentage change								
Median		-1.7	-3.6	-7.4	-7.5	-9.4	18.0	14.2

[b]Significant at 5% level
[c]Significant at 10% level

-3 to -2 is the period three years before the buyout to two years before the buyout. -2 to -1 is the period two years before the buyout to one year before the buyout. -1 to +1 is the period from one year before the buyout to the first complete year after the buyout -1 to +2 is the period one year before the buyout to two years after the buyout. -1 to +3 is the period one year before the buyout to three years after the buyout. T_{e-1} to ++1 is the period one year before the exit year to the firs full year after the exit. T_{e-1} to ++2 is the period one year before the exit year to two years after the exit.

Table 5 reports changes in sales and assets in the last two years before the buyout, during the first three years of the holding period relative the last year before the buyout and during the first two years after the exit of the buyout investor relative the last year of the holding period.

The only significant observation on firm growth is the industry adjusted change in sales between year -1 and +1 which is negative by -3.9%. This is in line with the findings of Glasfors and Malmros (2000) but contradicts our predictions of unchanged firm growth during the holding period. Negative change in levels of sales in the first year of the holding period could be the result of divestitures.

The rest of our findings on changes in firm growth can only be seen as indicative as they lack statistical significance. The overall trends in the holding period relative the pre buyout year seem to be negative in industry adjusted changes in both sales and assets. These indicative results coincide with the findings of Liebeskind, Wiersema and Hansen (1992), who reports that downsizing and the elimination of excess growth is the most important managerial decision following a buyout.

In the post exit period, no clear pattern can be identified. Industry-adjusted sales growth increases in the first year after the buyout compared to the last year before the exit, but declines sharply two years after the exit. Our insignificant results in the post exit period are in accordance with Envall, Hielte and Nordling (2001) who found no evidence of significant changes in sales between the holding period and the post exit period in their study of Swedish reversed leveraged buyouts. Indicative pre buyout findings are somewhat mixed.

- ***Hypothesis 2: Swedish buyout target firms experience improvements in profitability after the buyout.***

Table 6

Effect of leveraged buyouts on operating income

The table displays the percentage change in operating income, in operating income as a percentage of sales and in operating income as percentage of assets for 65 Swedish leveraged buyouts completed in 1988-2003. Operating income is defined as net sales less cost of goods sold and selling, general and administrative expenses before deducting depreciation and goodwill amortisation. The industry adjusted change equals the median change for the buyout company minus the median change for a control group consisting of firms in the same industry and of similar size.

		From year *i* to *j*						
Variable		-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	T_{e-1} to ++1	T_{e-1} to ++2
A. Operating income	N =	54	57	65	57	45	25	25
Percentage change								
Median		12.3	7.9	22.1	28.9	21.9	13.3	17.4
Industry-adjusted percentage change								
Median		1.8	2.9	-6.0	4.9	13.6	11.2	0.5
B. Operating income / sales	N =	58	61	65	51	46	26	26
Percentage change								
Median		0.4	-0.1	-0.1	0.2	0.5	-0.5	0.2
Industry-adjusted percentage change								
Median		0.1	0.4	-0.2	0.2	1.0	-0.2	-0.5
Level at year -1								
Median 9.6%								
C. Operating income / assets	N =	29	52	55	47	35	23	21
Percentage change								
Median		1.2	0.9	-0.6	-0.7	-0.4	1.2	0.8
Industry-adjusted percentage change								
Median		1.0 [c]	1.6	-0.3	1.5	0.9	-0.9	-0.7
Level at year -1								
Median 17.0%								

[c]Significant at 10% level

Table 6 summarises the change in operating income for the last two years pre buyout, the first three years of the holding period relative the last year before the buyout and the first two years post exit of the buyout investor relative the last year of the holding period.

In contradiction to our predictions of increased firm profitability and previous research by e.g. Kaplan (1989a) and Glasfors and Malmros (2000) none of the reported changes in operating income during the holding period are significantly positive. Thus we can only interpret the results as indicative.

Net of industry changes operating income decreases the first year and then increases in both year +1 and year +2 compared to year -1. The same trend can be seen for operating income measured in levels, in relation sales and in relation to assets. Although not significant the positive trend is in line with our hypothesis of improved operating margins during the holding period.

No clear patterns in the pre buyout or post exit period can be observed, which indicate a performance in line with the industry peers.

According to Kaplan (1989a), operating income could be understated during the first years of the holding period due to potential write-ups of the book value of inventories at the time of the buyout. This would show up as increased cost of goods sold in the first years after the buyout, and affecting operating margins negatively. We have tested for possible write-ups of inventories by analysing the percentage change in inventories in levels and in percentage of sales between the last pre buyout year and the year of the buyout but have not observed any clear patterns, although we do not exclude the possibility of inventory write-ups as many firms in our sample do not provide data on inventories in the two relevant years.

Table 7

Effect of leveraged buyouts on net working capital

The table displays the percentage change in net working capital, net working capital as a percentage of sales and net working capital as a percentage of assets for 51 Swedish leveraged buyouts completed in 1988-2003. Net working capital is defined as current assets less current liabilities. The industry adjusted change equals the median change for the buyout company minus the median change for a control group consisting of firms in the same industry and of similar size.

		From year *i* to *j*						
Variable		-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	Te-1 to ++1	Te-1 to ++2
A. NWC	N =	43	51	47	42	34	19	19
Percentage change								
Median		-2.9	10.3	-22.0	-8.1	28.2	15.5	34.1
Industry-adjusted percentage change								
Median		-13.2[b]	-0.3	-28.8	-25.1	-42.1	9.1	11.9
B. NWC / sales	N =	55	57	59	51	40	26	26
Percentage change								
Median		-1.1	-0.2	-0.7	-0.8	0.5	2.3	1.3
Industry-adjusted percentage change								
Median		-1.0	-0.2	0.0	0.1	-1.5	-3.6	0.0
Level at year -1								
Median 2.8%								
C. NWC / assets	N =	55	58	55	47	36	21	22
Percentage change								
Median		-2.4	1.8	-1.3	0.7	5.5	2.9	3.7
Industry-adjusted percentage change								
Median		-1.7	-1.2	2.7	6.7	2.8	3.8	3.0
Level at year -1								
Median 5.3%								

[b]Significant at 5% level
[c]Significant at 10% level

We have found no significant change in net working capital during the holding period or the post exit period, which is in accordance to previous Swedish studies by Glasfors and Malmros (2000) and Envall, Hielte and Nordling (2001), but contrary to our predictions.

Indicative results show that industry adjusted net working capital decreases in levels during the first three years in the holding period. Net working capital to sales shows unchanged levels in years +1 and +2 but a decrease in year +3. This may again be due to disposals after the buyout. The decrease in year +3 is consistent with findings by US research, e.g. Smith (1990) who finds evidence of improved capital management during the holding period.

In the pre buyout and in the post exit periods, there is mixed indicative evidence of changes in net working capital, hence we draw no conclusions on indicative trends.

- ***Hypothesis 3: Investing activity in Swedish target buyout firms is reduced after the buyout.***

Table 8

Effect of leveraged buyouts on net investing activity

The table displays the percentage change in net investing activity, net investing activity as a percentage of sales and net investing activity as percentage of assets for 51 Swedish leveraged buyouts completed in 1988-2003. Net investing activity is defined as {fixed assets in t_{n+1} - fixed assets in t_n + depreciation and amortisation in t_{n+1}}. The industry adjusted change equals the median change for the buyout company minus the median change for a control group consisting of firms in the same industry and of similar size.

		From year *i* to *j*						
Variable		-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	T_{e-1} to ++1	T_{e-1} to ++2
A. Net investing activity	N =	29	46	51	45	34	22	21
Percentage change								
Median		-15.9	15.0	-125.3	-65.6	-116.6	16.6	65.4
Industry-adjusted percentage change								
Median		-69.4	25.3[c]	-163.5[a]	-98.9[c]	-92.9[a]	16.1	5.5
B. Net investing activity / sales	N =	32	56	57	50	39	23	22
Percentage change								
Median		-0.6	0.5	-4.3	-3.2	-6.5	0.3	0.5
Industry-adjusted percentage change								
Median		-2.8	0.6	-4.5[a]	-3.9[c]	-6.3[a]	0.4	0.6
Level at year -1								
Median 2.7%								
C. Net investing activity / assets	N =	32	56	52	46	35	19	19
Percentage change								
Median		0.0	0.8	-6.6	-5.1	-8.7	2.8	1.7
Industry-adjusted percentage change								
Median		-4.5[c]	1.5	-7.4[a]	-5.0[c]	-8.7[b]	2.2	1.6
Level at year -1								
Median 5.1%								

[a]Significant at 1% level
[b]Significant at 5% level
[c]Significant at 10% level

The industry adjusted change in levels of net investing activity are significant and negative in the first three years of the holding period, -163.5%, -98.9% and -92.9% in years +1, +2 and +3 respectively. Our results are in line with Kaplan (1989a), who measures changes in capital expenditures in buyout target firms and finds a significant negative change in all years in the

holding period relative to the pre buyout year. As our measure contains both tangible and intangible fixed assets and will be affected by changes in the rate of depreciation and amortisation the results may not completely capture the true change in cash outflow from net investing activity, however we consider the measure to be a reasonably good approximation.

The industry adjusted deflated measures presented in panel B and C are significant, and in line with the results in panel A. The results indicate that the buyout target firms have a tendency to divest certain divisions or businesses during the holding period. The results are also in line with the trends in sales, operating income and working capital which also indicate some divestitures.

A decrease in investments is consistent with the theory of reduced agency costs and incentive realignments, in which management will restrain from investing in negative net present value projects. Furthermore, the results can also be interpreted as being in accordance with the theory that highly leveraged firms are cash constrained due to large interest payments and consequently fail to invest in positive net present value projects.

In the post exit period, there seem to be a positive industry-adjusted trend in net investing activity, both in levels and deflated by sales and assets, however not statistically significant.

- ***Hypothesis 4: Employment and wages per employee in the buyout target firm decrease after the buyout.***

Table 9

Effect of leveraged buyouts on employment and wages

The table displays the percentage change in employees, total wages to total number of employees and net sales to total number of employees for 54 Swedish leveraged buyouts completed in 1988-2003. The industry adjusted change equals the median change for the buyout company minus the median change for a control group consisting of firms in the same industry and of similar size.

		From year *i* to *j*						
Variable		-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	Te-1 to ++1	Te-1 to ++2
A. Employees	N =	50	54	52	46	36	17	17
Percentage change								
Median		2.7	2.9	7.7	7.5	6.8	6.8	13.6
Industry-adjusted percentage change								
Median		0.9	-2.1	-3.1	-3.9	-9.6	10.3	17.4
Level at year -1								
Median 169								
B. Wages / employees	N =	48	50	53	50	41	26	26
Percentage change								
Median		3.6	5.3	7.5	14.4	21.4	4.0	3.4
Industry-adjusted percentage change								
Median		-5.6	-1.5	-8.0	-7.0	-8.2	-19.3	-27.3
Level at year -1								
Median 221								
C. Sales / employees	N =	54	55	58	52	41	26	26
Percentage change								
Median		4.6	5.9	8.1	15.0	17.6	5.5	5.1
Industry-adjusted percentage change								
Median		-6.2	4.5[c]	-2.0	0.3	1.3	-0.6	2.4
Level at year -1								
Median 1190								

[c]Significant at 10% level

Table 9 reports changes in employees, wages to employees and sales to employees for the last two years pre buyout, the first three years of the holding period relative the last year before the buyout and the first two years post exit of the buyout investor relative the last year of the holding period.

There are no significant differences in any of the measures in the holding period, the pre buyout period or in the post exit period.

The change in employees from the pre buyout year to year +1 in the holding period is positive, which is in line with previous findings by US researchers, e.g. Kaplan (1989a) and Muscarella and Vetsuypens (1990). The industry adjusted change in employees however, decrease in all years during the holding period compared to the pre buyout year. As can be observed in panel B, industry adjusted wages to employees also decrease. The results give some support to the wealth transfer hypothesis, where wealth is being transferred from company stakeholders such as employees to the buyout investor. According to this view efficiency and profitability will be achieved at costs of stakeholders such as employees through for example job losses and lower salaries. Panel C reports sales to employees which also can be seen as an efficiency measure, this measure displays a negative change of 2% in the first year after the buyout and then a positive change in the to following years relative the last pre buyout year (+0.3% in +2% and +1.3% in +3). In the post exit period, the reported results do not support our hypothesis about equal performance with the median peer group company. Industry-adjusted, the change in employees increases sharply in the first two years of the period.

- ***Hypothesis 5: Leverage levels in the buyout target firms increase after the buyout.***

Table 10

Effect of leveraged buyouts on capital structure and interest coverage

The table displays the level of leverage, the percentage change in level of leverage, the interest coverage and the percentage change of the interest coverage for 67 Swedish leveraged buyouts completed in 1988-2003. The level of leverage is defined as total debt in relation to the total balance, (.i.e. book value of total debt and book value of equity). The interest coverage is defined as operating income (OI) less net interest, where operating income equals net sales less cost of goods sold, less selling, general and administrative expenses before the deduction of depreciation and amortisation. The industry adjusted change equals the median change for the buyout company minus the median change for a control group consisting of firms in the same industry and of similar size.

		From year *i* to *j*						
Variable		-2	-1	+1	+2	+3	++1	++2
A. D / (D+BE)	N =	46	48	67	59	51	27	25
Level (Median)		66.6%	66.1%	71.0%	71.1%	71.6%	65.1%	64.3%
Percentage change♠								
Median		1.3	0.2	5.1	3.2	9.2	-2.9	-0.8
Level at year -1								
Median 66.1%								
B. OI / NI (X)	N =	43	39	67	58	49	23	21
Level (Median)		5.8x	7.1x	4.1x	4.8x	5.5x	8.4x	11.3x
Percentage change♠								
Median		193.2	123.9	-125.5	-90.5	-144.5	288.7	387.6
Level at year -1								
Median 7.1x								

♠The percentage change is the median percentage change compared to the year before in the pre buyout period, the median percentage change compared to the last year pre buyout in the holding period and the median percentage change compared to the last year pre exit of the buyout investor in the post exit period.

As one would expect, the results in Table 10 display an increase in the leverage ratio in connection with the buyout. Panel A reports that the median level of debt to total balance (D/D+BE) increases from 66.1% to 71.0% from the pre buyout year to the first year in the holding period. The leverage ratio for the median firm is fairly constant during the first three years in the holding period, and subsequently decreases to approximately the same level as before the buyout in the two first years after the exit of the buyout investor.

In Panel B it can be observed that the interest coverage ratio decreases quite sharply between the last year before the buyout and the first year in the holding period, which is normal given the higher debt level.

Due to the large part of divisional buyouts included in the sample the leverage ratio and interest coverage presented may not truly reflect the leverage ratio and interest coverage which the pre buyout firm would have as a stand alone entity. Some debt may be allocated to the group mother pre buyout and the interest rates might be lower before the buyout due the greater diversification of the group mother. Some pre buyout firms, particularly divisional buyouts and buyouts from private owners, may display an unusual high leverage ratio, in part because they have limited possibilities to sell equity to outside investors and has to rely on capital injections from the group mother and retained earnings.

The results in table 10 are in accordance with the tax effect hypothesis, where wealth is created through tax shields earned on increased interest payments due to higher debt levels.

9 Conclusions

We have conducted the most extensive study as of today on changes in operational performance in Swedish leveraged buyout firms, in terms of number of firms and length of the time period analysed.

When analysing a total sample consisting of 67 Swedish leverage buyouts between 1988 and 2003 we find no statistically significant industry adjusted changes in operating performance subsequent to the buyout. These findings contradict previous empirical results, especially from studies on the US buyout market, e.g. Kaplan (1989a). Swedish research is limited, but in their master's thesis, Glasfors and Malmros (2000) find evidence on increased ROA and EBITDA margins in buyout target firms.

Although not statistically significant, we find some indicative evidence of improvements in operating performance in the second and third years following the buyout. We also find a significant decrease in investing activity in the buyout target firms following the buyout.

Different buyout market characteristics of the US and Swedish market may to some extent explain our conflicting findings. Another possible explanation may be that different buyout investors undertake different strategies for value creation. Some buyout investors try to expand margins and increase efficiency through divestitures; others focus on growth through add-on acquisitions or strategic redirection, demanding large initial investments. One source of potential understatement of the industry adjusted operating performance in the buyout target firms in our sample could be attributable to the survivorship bias in the control groups. This problem overstates the performance of the control groups.

Based on our findings we cannot reject the possibility that the buyout target firms fail to outperform their industry peers in terms of operating performance.

Although no conclusive evidence on changes in operating performance is found we believe that the extensive data collection behind this thesis will be a valuable platform for further studies on the Swedish buyout market.

10 Suggestions for further research

There are numerous so far, to our knowledge, uncovered areas in this field of study to be explored. It would be interesting to expand the scope of the thesis and include information from buyout investors and advisors (e.g. investment banks and law firms) in the sample. This approach is likely to result in more observations, especially during the pre-buyout period. One could also aggregate the geographical level and include other Nordic, European, US and rest of the world buyout target firms in the sample, and look at differences in characteristics between markets.

The possible difference in performance with respect to buyout type (i.e. divisional buyout, "regular buyout" or public-to-private transaction) is another, to our knowledge, uncovered area of study in Sweden.

Secondary buyouts have been extensively discussed in the last years. Given that secondary buyouts are a relatively new phenomenon, in a few years time, one could perform a study on operational performance in secondary buyout target firms. Another area to cover could be to analyse differences in performance in consortia backed buyouts and regular buyouts.

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European Venture Capital Organization	www.evca.com
Piper Jaffray	www.piperjaffray.com

12 Appendices

Appendix 1: Exit routes for realised investments in population

Table 1
Distribution of methods of exit

The table displays the distribution of methods of exit for 70 Swedish leveraged buyouts completed during the period 1988-2003. In an IPO the buyout investor has sold a part of or its entire stake in the firm through a stock exchange listing. In a secondary buyout the buyout investor has sold a part of or its entire stake in the firm to another financial buyer. In a trade sale the buyout investor has sold a part of or its entire stake of the firm to a strategic buyer. In case of chapter 11 the firm's business has been terminated.

Type of exit by buyout investor, all firms included

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
IPO	1	0	4	2	1	2	1	0	0	4	0	1	0	16
Secondary buyout	0	0	0	0	0	1	0	0	0	0	2	4	8	15
Trade sale	3	1	4	2	4	3	4	3	1	1	3	3	6	38
Chapter 11	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	4	1	8	4	5	6	5	3	2	5	5	8	14	70

Appendix 2: List of buyout transactions in population, by buyout investor

Table 2
Realised investments

Realised investments

Panel A : EQT

Company	Year Invested	Investment type	Seller	Year exited	Exit type	Acquiror
Brukens Thermotreat AB *	1995	Divisional buyout	Boehler-Uddeholm AG	1997	Trade sale	Bodycote Plc
Orrefors Kosta Boda AB *	1996	Public-to-private	na	1998	Trade sale	Royal Copenhagen
FlexLink AB *	1997	Divisional buyout	SKF	2005	SBO	ABN Amro Capital
TAC AB *	1998	Divisional buyout	Incentive	2003	Trade sale	Schneider Electric
StjärnTVnätet AB	1998	Divisional buyout	Singapore Telecom	1999	Trade sale	UPC
Ballingslöv International AB	1998	Divisional buyout	Electrolux	2002	IPO	na
Stenqvist AB *	1999	Divisional buyout	Duni	2003	SBO	Triton
Dahl International AB *	1999	Public-to-private	na	2004	Trade sale	Saint Gobain
Thule *	1999	Public-to-private	na	2004	SBO	Candover
Dometic *	2001	Divisional buyout	Electrolux	2005	SBO	BC Partners
Bewator AB *	2002	Buyout	Private investors	2005	Trade sale	Siemens
Com Hem AB *	2003	Divisional buyout	Telia	2005	SBO	Carlyle Group and Providence EP
Total EQT	10 (12)					

Panel B: Industri Kapital

Company	Year Invested	Investment type	Seller	Year exited	Exit type	Acquiror
Idesta *	1989	Divisional buyout	Atlas Copco	1999	Trade sale	Nyge Aero Norden AB
Liber	1990	Divisional buyout	Marieberg and Esselte	1993	Trade sale	Wolters Kluwer
Graphium *	1990	Divisional buyout	Esselte	1993	IPO	na
Partena	1992	Divisional buyout	Procordia/BCP Group	1995	Trade sale	Sodexho
Guldfynd	1993	Divisional buyout	KF	2001	Trade sale	Albrekts Guld
Lindex *	1993	Divisional buyout	ICA	1995	IPO	na
Lithells *	1994	Divisional buyout	Procordia	1997	Trade sale	Atria
Nyge Aero	1994	Divisional buyout	CSE Oxford	1999	Trade sale	SAAB
Addum *	1996	Divisional buyout	Securum AB	2000	Trade sale	Geveke N.V.
Ellos *	1995	Divisional buyout	ICA Handlarnas AB	1997	Trade sale	La Redoute
Nobia *	1996	Divisional buyout	Stora Group	2002	IPO	na
VSM Group	1997	Divisional buyout	Electrolux	2005	SBO	Kohlberg Management IV, LLC
Intrum Justitia *	1998	Public-to-private	na	2002	IPO	na
Arca Systems	1998	Divisional buyout	Perstorp	2005	Trade sale	Schoeller Wavin Systems
MacGREGOR *	1998	Divisional buyout	Gambro	2005	Trade sale	Kone Corporation
Oriflame *	1999	Public-to-private	na	2004	IPO	na
Alfa Laval *	2000	Divisional buyout	Tetra Laval	2002	IPO	na
Sydsvenska Kemi AB *	2001	Public-to-private	na	2005	SBO	PAI Partners
Total Industri Kapital	12 (17)					

Panel C: Nordic Capital

Company	Year Invested	Investment type	Seller	Year exited	Exit type	Acquiror
Intentia	1990	Public-to-private	na	1996	IPO	na
Liber	1990	Divisional buyout	Marieberg and Esselte	1993	Trade sale	Wolters Kluwer
Meda	1991	Divisional buyout	Procordia	1995	IPO	na
Anticimex *	1992	Public-to-private	na	1995	Trade sale	Servicemaster
Candelia	1993	Divisional buyout	KF	1994	Trade sale	Spira Invest
Skrivab *	1993	Divisional buyout	Wolters Kluwer	1996	Trade sale	Tybring-Gjedde
Falcon	1994	Divisional buyout	Unilever	1995	Trade sale	Spira Invest, Carlsberg and Sinebrychoff
Karlshamns *	1994	Divisional buyout	Nordico	1997	IPO	na
BT Industries	1994	Divisional buyout	Nordico	1995	IPO	na
Gislaved Folie *	1994	Divisional buyout	Nordico	2003	Trade sale	Stena
Elmo Leather *	1994	Divisional buyout	Nordico	2004	Trade sale	Management
Fritidsresor Group	1995	Divisional buyout	Borgtornet	1997	Trade Sale	Thomson
Optimera *	1996	Divisional buyout	Euroc	1998	Trade sale	Ogreid and Byggmo
Hilding Anders *	1997	Buyout	Founder families	2003	SBO	Investcorp
Mölnlycke Health Care	1997	Divisional buyout	SCA	2005	SBO	Apax
Essex *	1998	Buyout	Founders	2000	Trade sale	Sanmina
Wilson Logistics Group	1999	Divisional buyout	Schenker	2004	Trade sale	TNT
Ahlsell	1999	Divisional buyout	Trelleborg	2005	SBO	Cinven & Goldman Sachs
Anticimex *	2001	Divisional buyout	Terminix	2005	SBO	Ratos
C More Group *	2003	Divisional buyout	Canal Plus	2005	Trade sale	SBS Broadcasting
Total Nordic Capital	10 (20)					

Panel D: Segulah

Company	Year Invested	Investment type	Seller	Year exited	Exit type	Acquiror
Wilkenson Handskmakarn *	1994	Buyout	Founder famliy	1997	IPO	na
Byggfakta *	1996	Divisional buyout	Thomson Corporation	1998	Trade sale	CMD (US)
Ordning & Reda *	1996	Buyout	Founder family	2003	Trade sale	Bodum (Denmark)
Adveta *	1997	Buyout	Private investors	2001	Chapter 11	na
Teli Service AB *	1997	Divisional buyout	Telia	2000	Trade sale	A Novo
EKH Ekonomihuset AB *	1997	Buyout	Founder family	1999	Trade sale	SEB and Aragon
Håells Modul-System AB *	1999	Buyout	Founder	2002	Trade sale	Carl Bennet
EEN AB *	1999	Buyout	Founder	2004	SBO	Management
Norfoods AB *	2000	Divisional buyout	Hexagon	2004	SBO	Management
Clean Chemical Sweden AB *	2003	Divisional buyout	Medivir	2005	Trade sale	C.B. Fleet
Total Segulah	10 (10)					

Panel E: Procuritas

Company	Year Invested	Investment type	Seller	Year exited	Exit type	Acquiror
Gunnebo *	1988	Buyout	Industrivärden	1995	Trade sale	HIDEF Capital
Swedish Match	1989	Divisional buyout	Stora Kopparbergs	1996	IPO	na
Aura Light *	1991	Divisional buyout	KF	1998	SBO	DuroLight
Chromogenix	1991	Divisional buyout	Pharmacia	1996	Trade sale	Instrumention Lab
HKC Holding	1992	Buyout	Chapter 11	1993	Merger with LIC	na
LIC Care *	1993	Divisonal buyout	Axel Johnson Group	1995	IPO	na
Ticket *	1993	Buyout	Private investors	1998	IPO	na
City Mail / Optimail	1997	Buyout	Founder	1998	IPO	na
AB Orwak *	1999	Divisional buyout	Finnveden	2004	Trade sale	Tomra Systems ASA
JH Tidbeck *	1999	Divisional buyout	Finnveden	2004	SBO	Private investors
O Malmkvist AB *	1999	Divisional buyout	Finnveden	2004	SBO	Private investors
Total Procuritas	7 (11)					

[a]Liber was a co-investment of Nordic Capital and Industri Kapital, hence only accounted for once in total realised investments
*Firms included in our sample.

Table 3
Unrealised investments

Unrealised investments

Panel A: EQT

Company	Year Invested	Investment type	Seller	Year exited	Exit type	Acquiror
Duni AB *	1997	Divisional buyout	Marieberg	In portfolio	na	na
HemoCue AB *	1999	Divisional buyout	Mallinckrodt Inc	In portfolio	na	na
Nederman AB *	1999	SBO	Candover	In portfolio	na	na
Findus AB *	2000	Divisional buyout	Nestlé	In portfolio	na	na
Tradex AB *	2000	Buyout	Founders	In portfolio	na	na
Eldon Enclosures AB *	2001	Public-to-private	na	In portfolio	na	na
Total EQT	6 (6)					

Panel B: Industri Kapital

Company	Year Invested	Investment type	Seller	Year exited	Exit type	Acquiror
Elektrokoppar *	1997	Divisional buyout	ABB	In portfolio	na	na
Eltel Networks	2001	Divisional buyout	Telia	In portfolio	na	na
Total Industri Kapital	1 (2)					

Panel C: Nordic Capital

Company	Year Invested	Investment type	Seller	Year exited	Exit type	Acquiror
Bröderna Edstrand Group *	1999	Divisional buyout	Trelleborg	In portfolio	na	na
Guide Konsult *	2001	Buyout	Framfab	In portfolio	na	na
Biovitrum AB	2001	Divisional buyout	Pharmacia	In portfolio	na	na
SATS AB *	2002	Divisional buyout	24 Hour Fitness Worldwide	In portfolio	na	na
Total Nordic Capital	3 (4)					

Panel D: Segulah

Company	Year Invested	Investment type	Seller	Year exited	Exit type	Acquiror
Callenberg Group AB *	2001	Divisional buyout	Expanda	In portfolio	na	na
NVS Installation AB *	2002	Divisional buyout	NCC	In portfolio	na	na
Total Segulah	2 (2)					

Panel E: Procuritas

Company	Year Invested	Investment type	Seller	Year exited	Exit type	Acquiror
Sandå *	1998	Buyout	Chapter 11 restrucuring fund	In portfolio	na	na
Mikroponent *	1999	Divisional buyout	Finnveden	In portfolio	na	na
Pelly Industri *	1999	Divisional buyout	Finnveden	In portfolio	na	na
Isakssongruppen *	1999	Divisional buyout	Finnveden	In portfolio	na	na
AB Petterssons Järnförädling *	1999	Divisional buyout	Finnveden	In portfolio	na	na
Wermland Paper *	2003	Buyout	Founder family	In portfolio	na	na
Total Procuritas	6 (6)					
Total unrealised investments:	18 (20)					
Total investments	67 (89)					

Appendix 3: SPSS Wilcoxon output tables

Percentage change in capex

	-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	T_{e-1} to ++1	T_{e-1} to ++2	T_{e-1} to ++3
Z	-,536(a)	-1,832(b)	-3,436(a)	-1,864(a)	-3,547(a)	-1,248(b)	-,980(b)	-,227(a)
Asymp. Sig. (2-tailed)	,592	,067	,001	,062	,000	,212	,327	,820

a Based on negative ranks.
b Based on positive ranks.
c Wilcoxon Signed Ranks Test

Percentage change in capex to assets

	-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	t_{e-1} to ++1	t_{e-1} to ++2	t_{e-1} to ++3
Z	-1,769(a)	-1,209(b)	-3,210(a)	-1,870(a)	-2,861(a)	-,852(b)	-1,874(b)	-1,224(a)
Asymp. Sig. (2-tailed)	,077	,227	,001	,061	,004	,394	,061	,221

a Based on negative ranks.
b Based on positive ranks.
c Wilcoxon Signed Ranks Test

Percentage change in capex to sales

	-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	t_{e-1} to ++1	t_{e-1} to ++2	t_{e-1} to ++3
Z	-1,899(a)	-,384(b)	-3,413(a)	-1,739(a)	-2,686(a)	-,080(b)	-,719(b)	-1,136(a)
Asymp. Sig. (2-tailed)	,058	,701	,001	,082	,007	,936	,472	,256

a Based on negative ranks.
b Based on positive ranks.
c Wilcoxon Signed Ranks Test

Percentage change in employees

	-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	t_{e-1} to ++1	t_{e-1} to ++2	t_{e-1} to ++3
Z	-,869(a)	-,040(a)	-,301(a)	-,366(b)	-,079(b)	-1,254(a)	-1,079(a)	-,943(a)
Asymp. Sig. (2-tailed)	,385	,968	,764	,714	,937	,210	,281	,345

a Based on positive ranks.
b Based on negative ranks.
c Wilcoxon Signed Ranks Test

Percentage change in net working capital

	-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	t_{e-1} to ++1	t_{e-1} to ++2	t_{e-1} to ++3
Z	-2,419(a)	-,359(a)	-,654(a)	-,314(a)	-1,366(a)	-,719(b)	-,639(b)	-1,852(b)
Asymp. Sig. (2-tailed)	,016	,720	,513	,753	,172	,472	,523	,064

a Based on negative ranks.
b Based on positive ranks.
c Wilcoxon Signed Ranks Test

Percentage change in net working capital to assets

	-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	t_{e-1} to ++1	t_{e-1} to ++2	t_{e-1} to ++3
Z	-1,097(a)	-1,040(a)	-,684(b)	-,847(b)	-,195(b)	-,909(b)	-,454(b)	-1,664(b)
Asymp. Sig. (2-tailed)	,272	,298	,494	,397	,845	,363	,650	,096

a Based on negative ranks.
b Based on positive ranks.
c Wilcoxon Signed Ranks Test

Percentage change in net working capital to sales

	-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	t_{e-1} to ++1	t_{e-1} to ++2	t_{e-1} to ++3
Z	-1,405(a)	-,544(a)	-,109(a)	-,257(a)	-1,409(a)	-,821(b)	-,201(b)	-1,704(b)
Asymp. Sig. (2-tailed)	,160	,586	,913	,797	,159	,411	,841	,088

a Based on negative ranks.
b Based on positive ranks.
c Wilcoxon Signed Ranks Test

Percentage change in operating income

	-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	t_{e-1} to ++1	t_{e-1} to ++2	t_{e-1} to ++3
Z	-,594(a)	-,919(a)	-,427(b)	-1,258(a)	-,600(a)	-,523(a)	-,327(a)	-1,022(b)
Asymp. Sig. (2-tailed)	,553	,358	,669	,208	,548	,601	,744	,307

a Based on positive ranks.

b Based on negative ranks.

c Wilcoxon Signed Ranks Test

Percentage change in operating income to assets

	-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	t_{e-1} to ++1	t_{e-1} to ++2	t_{e-1} to ++3
Z	-1,717(a)	-1,037(a)	-,741(b)	-,430(a)	-,216(a)	-,523(b)	-,893(b)	-1,363(b)
Asymp. Sig. (2-tailed)	,086	,300	,459	,667	,829	,601	,372	,173

a Based on positive ranks.

b Based on negative ranks.

c Wilcoxon Signed Ranks Test

Percentage change in operating income to sales

	-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	t_{e-1} to ++1	t_{e-1} to ++2	t_{e-1} to ++3
Z	-,164(a)	-1,181(a)	-,950(b)	-,363(b)	-,417(a)	-,299(b)	-,483(b)	-1,420(b)
Asymp. Sig. (2-tailed)	,870	,237	,342	,717	,677	,765	,629	,156

a Based on positive ranks.

b Based on negative ranks.

c Wilcoxon Signed Ranks Test

Percentage change in assets

	-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	t_{e-1} to ++1	t_{e-1} to ++2	t_{e-1} to ++3
Z	-,240(a)	-,872(a)	-1,191(a)	-,017(a)	-,590(a)	-,805(b)	-,631(b)	
Asymp. Sig. (2-tailed)	,811	,383	,234	,986	,555	,421	,528	

a Based on negative ranks.

b Based on positive ranks.

c Wilcoxon Signed Ranks Test

Percentage change in sales

	-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	t_{e-1} to ++1	t_{e-1} to ++2	t_{e-1} to ++3
Z	-,772(a)	-,276(a)	-1,756(b)	-1,163(b)	-,343(b)	-,373(a)	-,483(a)	-1,477(a)
Asymp. Sig. (2-tailed)	,440	,782	,079	,245	,731	,709	,629	,140

a Based on positive ranks.

b Based on negative ranks.

c Wilcoxon Signed Ranks Test

Percentage change in sales per employee

	-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	t_{e-1} to ++1	t_{e-1} to ++2	t_{e-1} to ++3
Z	-1,228(a)	-2,006(b)	-,155(a)	-,202(b)	-,471(b)	,000(c)	-,523(a)	-,454(a)
Asymp. Sig. (2-tailed)	,219	,045	,877	,840	,637	1,000	,601	,650

a Based on negative ranks.

b Based on positive ranks.

c The sum of negative ranks equals the sum of positive ranks.

d Wilcoxon Signed Ranks Test

Percentage change in sales to assets

	-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	t_{e-1} to ++1	t_{e-1} to ++2	t_{e-1} to ++3
Z	-1,717(a)	-2,246(a)	-,690(a)	-1,561(a)	-,280(a)	-,765(b)	-,065(a)	-,398(a)
Asymp. Sig. (2-tailed)	,086	,025	,490	,118	,779	,445	,948	,691

a Based on positive ranks.

b Based on negative ranks.

c Wilcoxon Signed Ranks Test

Percentage change in wages

	-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	t_{e-1} to ++1	t_{e-1} to ++2	t_{e-1} to ++3
Z	-,267(a)	-,856(a)	-,436(a)	-,464(a)	-,456(a)	-,261(a)	-,644(a)	-1,590(a)
Asymp. Sig. (2-tailed)	,790	,392	,663	,642	,649	,794	,520	,112

a Based on positive ranks.

b Wilcoxon Signed Ranks Test

Percentage change in wages per employee

	-3 to -2	-2 to -1	-1 to +1	-1 to +2	-1 to +3	t_{e-1} to ++1	t_{e-1} to ++2	t_{e-1} to ++3
Z	-,333(a)	-1,897(b)	-,938(b)	-,579(b)	-,635(b)	-1,982(a)	-1,633(a)	-,471(a)
Asymp. Sig. (2-tailed)	,739	,058	,348	,563	,526	,048	,102	,638

a Based on negative ranks.

b Based on positive ranks.

c Wilcoxon Signed Ranks Test