STOCKHOLM SCHOOL OF ECONOMICS
Master Thesis – Accounting and Financial Management

CEO OWNERSHIP
AND SHAREHOLDER RETURN

Carl Olsson[a]
Major in Accounting and Financial Management
Stockholm School of Economics

Stefan Öhlén[b]
Major in Accounting and Financial Management
Stockholm School of Economics

ABSTRACT

We analyze the effect of CEO ownership on shareholder return. The current debate is two-fold stemming in part from the academic side suggesting that ownership as a percentage of company is an excellent tool in corporate governance to achieve superior returns, and in part from the journalistic debate in Sweden focusing on Pilotskolan where the absolute value of CEO ownership is the relevant factor in achieving superior returns. We test both for relative ownership and absolute value of ownership. Our sample consists of 52 companies on the Stockholm Large Cap List between 2002 and 2006, totaling 260 observations. We find a significant positive relationship between returns and CEO ownership below ownership of 3 percent, but no such relation for larger ownership. In absolute value terms, we find no statistically significant relation.

[a]19931@student.hhs.se, [b]19946@student.hhs.se

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1. Introduction

Issues regarding corporate governance are of increasing importance in the academic as well as the public debate. The increasing focus on corporate governance may have several different reasons. Holmström and Kaplan (2001) argue that it may be because of the increase in focus on shareholder value, due in part to the increased activities of Private Equity actors. The reason for the public interest may be because listed companies affect the public to a rather extensive degree. Many people are direct shareholders and many more are indirectly affected by the stock exchange because of the pension system, where funds are allocated to the stock market via pension funds. We have found it interesting to look more in-depth at issues regarding the alignment of interest of the CEO with the interests of shareholders.

The current debate regarding alignment of interests is of a broad nature. We have especially focused on two areas of this debate and believe that it will be a suitable case for this thesis. First is the academic debate, described more detailed in the section '2. Previous research', where the primary objective is to find systems that will make CEOs work in the most efficient way and maximize the value of the corporation. The second part is the discussion in Sweden that has been going on for a number of years around the issue that a CEO should own a significant amount of shares in the company he is set to run, the so called Pilotskolan[1].

In the next section about previous research, we will go more into detail around previous findings of relevance for our study. As an introduction, it is interesting to see that several authors have addressed the issues regarding alignments of interests. Jensen and Murphy (1990) have argued for three main ways to make the CEO work in the best interest of shareholder, namely that boards can require that CEOs become substantial owners of the company stock; that salaries, bonuses and stock options can be structured to provide substantial rewards for superior performance and big penalties for poor performance; and that the threat of dismissal for poor performance can be made real. We have examined especially stock ownership and stock option ownership in the literature. We will elaborate more on our findings in sections '2. Previous research' and '3. Theoretical framework'.

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[1] Pilotskolan is the Swedish name of the notion that the CEO should own a substantial amount of shares in the company she runs, see for example Ericson (2006), Dagens Industri (2006) and Dagens Industri (2007).

1.1 Relative ownership

There are plenty of papers showing a relationship between CEO ownership and firm performance (Lewellen et al 1992, Morck et al 1988, Core et al 1999). Others have found that the behavior of a CEO is dependent on whether she holds stock and options in the company, thus focusing on a wider perspective on CEO remuneration than just stocks (Kim et al 1988). When defining ownership, the most commonly used measure is ownership as a percent of shares outstanding. Several authors have argued for this measure including Jensen and Murphy (1990) and Hall and Liebman (1998).

1.2 Absolute ownership

Pilotskolan argues that a CEO should own a significant absolute amount of shares. The notion that the CEO should own stock is in line with the current academic debate. However, the sole focus of Pilotskolan is the holding in absolute terms. This is because it is unreasonable to believe that a CEO of a large corporation has a personal wealth of such nature that she is likely to own more than a fraction of the outstanding shares. The holding in absolute amounts can, however, be significant in economic terms. The reasoning is that a CEO that also is a shareholder should be interested in maximizing shareholder value. Other investors can thus feel confident investing in the share since the top manager is also dependent on share performance as opposed to only interested in cashing her monthly pay check. This is in line with the Swedish public debate, yet it opposes scholars such as Jensen and Murphy (1990) that claim that this variable is not the relevant measure to look at, and Hall and Liebman (1998) who claim that it can have a detrimental effect on performance.

1.3 Conclusion

Our conclusion from these two perspectives is that there are similarities between the two in the view that it is positive with a CEO stock holding. However the two debates define CEO ownership according to different parameters, percentage or relative ownership on the one hand, and ownership in absolute amounts on the other. In addition, we find that the academic debate and the studies previously performed focus on US corporations and US conditions.

Consequently, our study will try to examine CEO ownership with regards to the two different definitions discussed above and we will look at companies based on the Stockholm Stock Exchange that are currently listed on the Large Cap List. In contrast to most studies we will measure firm performance as shareholder return rather than any accounting based measure. We realize that

shareholder return is a measure that takes many factors into account, thus might not be a completely accurate measure of firm performance; however, for a shareholder, the return on the shares is the one factor they should care about. Also, other studies have used shareholder return as a measure of performance, which would facilitate comparison. See for example Lewellen et al (1992).

Following this introduction, we will in more detail present the relevant findings in previous research on this topic, thereafter present what principal-agent theory suggests, and after that describe our methodology and data. The study is based on a foundation in quantitative findings from descriptive statistics as well as a regression model based on data we have collected. We will then move on to discuss the outcome of the regression model, and refine the model if there is reason to believe such refinement is in place. Finally we will draw conclusions on the output from the regression and the descriptive statistics, and put these findings in relation to outside sources of more qualitative nature.

1.4 Definitions

To simplify for the reader this table will describe and define terms used frequently in this thesis.

Table 1. Definitions	
Term	**Defined**
CEO	Chief executive officer
Size	Market Capitalization
Leverage	Book value debt/equity-ratio
Relative ownership	Percent of company owned by CEO
Absolute value of ownership	SEK value of shares held by CEO
OLS	Ordinary least squares; most common regression method

2. Previous research

In this section we will discuss in more detail some of the previous research in this field and elaborate on their findings and their impact on the foundation for our paper. In the sections '3. Theoretical Background' and '3.3 Hypotheses' we will refer to some of the authors and issues also discussed in this section. The purpose of this section is to show the origin of the paper, and in the next sections more specifically show how we on the basis of theory have developed our hypotheses.

2.1 Previous research on CEO ownership

Kim et al (1988) recognize that insider ownership is a significant measure when discussing abnormal returns of companies. They have found that the stock market only to a certain extent takes the

stockh holdings of insiders into account. This contradicts the EMH that we will discuss later and their findings implies that it is possible for investors realizing the effect on insider holdings to gain abnormal returns on their investments.

Agrawal et al (1987) examine the correlation between managers' holdings of common stock and options and the financial leverage and choice of financing for firms. They look in particular at the variance of the firms' results and find that managers with stock and option holdings tend to increase the variance of the firm in order to increase the value of their holdings where managers without holdings tend to lower the variance of the firm in order to lower the risk of the salary.

Lewellen et al (1992) find a positive relation between CEO stock holding and firm performance, as well as between CEO compensation and firm performance. The model used in the paper examines the two different dimensions of CEO ownership and define performance of the firm as shareholder return, which makes it an interesting point of reference for us. Lewellen et al (1992) study 49 companies from the Fortune 500 list during the years 1964 – 1969. Despite some differences, the model is to a large degree suitable as a reference model for our thesis.

Jensen and Murphy (1990) are looking on total executive compensation, including fixed and variable salary, benefits, stock holding and stock option holding. They are critical to the debate that executives have too high total compensation. That debate, they claim, bears no relevance to the important issue: are they paid in such a way that they will act in the best interest of the firm? Regarding ownership, their conclusion is clear; the only variable that is interesting is the ownership of executives as percentage of total equity. They claim that the absolute dollar amount is without relevance; owning only a smaller fraction of a company can represent a significant dollar amount, but the risk of the actions taken by the CEO is predominantly with the other shareholders. Jensen and Murphy (1990) use an example with the purchase of a corporate jet and show that the average CEO in their sample owns 0.066 percent of equity implying that they can buy a corporate jet with a discount of over 99 percent, irrespective of the absolute value of the shareholding.

Morck et al (1986) have made an empirical study of the relationship between management ownership and market valuation. They have measured the market valuation by using the Tobin's Q. Their findings are rather interesting since Tobin's Q increases, decreases and then increases again with board of director ownership indicating a non-linear relationship. They explain this relationship with two theories working against each other: the theory of alignment of interests as discussed by

Jensen and Murphy (1990) and the theory of entrenchment indicating that a CEO with a large relative holding can entrench herself into the position and derive benefits on the expense on other shareholders.

Core et al (1998) want to find a relationship between corporate governance, chief executive compensation and firm performance. What they find is that weak governance increases executive compensation and impairs firm performance. Both of these findings indicate that there is a cost associated with agency problems. With regards to executive ownership, they find that the more an executive owns, the less agency costs are inflicted on the firm.

Hall and Liebman (1998) in their article "Are CEOs really paid like bureaucrats?" discuss several topics that we have found interesting when establishing the basis of our paper. They have first found a strong relationship between firm performance and CEO pay, implying a negative answer to their title question. They found that the majority of the high pay to CEOs of good performing firms stems from change in value of stock options and stock holding. In addition, they agree in theory with Jensen and Murphy (1990) that the best way to align interests of shareholders and CEOs is a high relative ownership. However, they note that the theoretical argument is only valid for a risk neutral CEO. When considering a CEO that is not risk neutral, even a low relative holding that is high in absolute amount relative to total wealth, may affect her actions. This is because the CEO may have a high exposure to the company she runs, making the risk of the company equal the risk of the CEO's investment, whereas an investor minimizes firm-specific risk through diversification. They claim that her risk aversion may incur sub-optimal decisions that impair firm performance thus contradicting the arguments behind Pilotskolan.

2.2 Efficient markets

To test the relationship between CEO ownership and shareholder return, we must also take into account an important feature of the financial markets; are they efficient or not? Lewellen et al (1992) acknowledge that external measures of return, such as a market based one ultimately is the most interesting one for shareholders, but also notice that this measure might be disturbed by noise. Also, it may suffer from an expectations disability i.e. that if the firm pays its executives well, and the market knows this, the market might include this in the pricing of the company stock based on the expectation that this firm will outperform its peers, and studies will only reveal normal returns. This is in effect an introduction of the problem with market efficiency.

The renowned research from Eugene Fama (1970) about the Efficient Market Hypothesis (EMH) suggested full market efficiency in the sense that all information is priced into the assets, i.e. that investors are rational and that the price of the asset is also the fair value of the asset. Under this proposition active portfolio management is a waste of time as prices adapt instantly to all available information; there is no way of beating an efficient market. This is an important suggestion in finance theory, as it facilitates studies on stock market behaviour. The EMH is divided into three forms, weak, semi-strong and strong form efficiency, which in turn encompass past information, present public information and present non-public (i.e. future) information. There are studies showing that investors might not be as rational as the EMH suggests; investors not only trade on fundamentals and facts but also on other factors such as emotion introducing the field of studies labelled Behavioural Finance.

Shleifer (2000) emphasizes that financial markets should not be considered efficient, as numerous studies show evidence of investors underreacting to corporate news announcements; an underreaction that is partly corrected in the time period following the announcement. This is evidence of a violation of the EMH. Fama (1970) suggests that if investors knew that higher CEO ownership would yield better performance, this would be included in the stock price immediately and stock returns would only show as normal, whereas numerous research Shleifer (2000) points to show that this is not the case.

Since Lewellen et al (1992) are aware of this issue, they also test the CEO pay to return relationship using an internal measure of performance; firms reported return on equity. Although this measure is not a perfect measure of economic return to the shareholders, it is at least free of the efficient market and market expectations flaws. Furthermore, Bosch (1989) affirms that the measure works well to rank firms. Thus, if it is reasonable to believe that the return on equity measure ranks firms according to their actual return to shareholders, this relationship serves well as a compliment to the market based relationship we test.

Finally we note that Lewellen et al (1992) find positive relationship between executive ownership and stock returns as well as the internal return on equity.

3. Theoretical background

Previous research has given us an understanding of the current debate. We have found conflicting arguments with regards to the role of CEO ownership and how to align interests with shareholders. With this in mind, and considering our discussion about Pilotskolan from the introduction, we move forward by looking more into the theoretical background of the issues at hand. In the end of this section we draw conclusions from the introduction, previous research and theoretical background when we formulate our hypotheses.

3.1 The principal-agent problem

As we have seen, the principal-agent problem and its importance with regards to the relationship between shareholders and CEOs is widely discussed in the economic literature. In this part of our paper, we will try to summarize this discussion and show how it leads up to the hypotheses that we examine in our paper.

Using the definition by Ross (1973), a principal-agent relationship is when one entity, the principal, contracts someone else, the agent, to take action in his place. Jensen and Meckling (1976) have also discussed agency problems. One vital point of their argument that makes this phenomenon interesting to examine in economic research is captured by the following quote: "If both parties to the relationship are utility maximizers there is good reason to believe that the agent will not always act in the best interest of the principal" (p. 308). In order to translate this into the relationship between shareholders and CEOs, one can reasonably doubt that CEOs will solely focus on maximizing shareholder value; on the contrary, she will maximize her own private utility. This private utility can take many different shapes. Bebchuk and Fried (2003) have given some examples from other prominent scholars of how a CEO can increase her own utility on the expense of other shareholders' interest: "Managers may engage in empire building //…//. They may fail to distribute excess cash when the firm does not have profitable investment opportunities //…//. Managers may also entrench themselves in their positions, making it difficult to oust them when they perform poorly" (p. 72). Morck et al (1988) add that other situations where managers gain at the expense of shareholders include "shirking and perquisite-taking but also encompass pursuit of such non-value maximizing objectives as sales growth, empire building, and employee welfare" (p. 293). To conclude, the argument that there exist problems in the divergence of goals between principals and agents, shareholders and CEOs, is not a matter of debate, but rather a fact.

The true debate stems from the continuation of the previous quote by Jensen and Meckling: "The principal can limit divergences from his interest by establishing appropriate incentives for the agent and by incurring monitoring costs designed to limit the aberrant activities of the agent" (1976, p. 308).

3.2 Alignment of interests: Trial and Error

If it is easy to conclude that there is a divergence of interest between shareholders and CEOs, it is more complicated to solve this problem and align the interest of both parties. Once investors grew interested in issues regarding alignment of interests, they have tried by different measures to put this into practice. To a large degree alignment of interests has been tested, not by direct ownership as we are interested in, but by the use of stock options as also mentioned by Jensen and Murphy (1990) as a way to align interest and mitigate agency problems. The use of stock options has turned out to be successful at times, and often a bit more complicated. We illustrate this issue by briefly describing the way stock options has been used and why there are problems with regards to alignments of interest. We move forward by examining how the direct ownership can account for a more suitable instrument in aligning interests between CEOs and shareholders.

According to Bebchuk and Grinstein (2005), during the last decade there has been a rapid increase in the level of executive pay. The major part of the increase is due to attempts to align the interest of shareholders and CEOs. The single largest factor is the increase in value of stock options. The underlying idea of providing the CEO with stock options in the own company is to give her direct incentives to increase the value of the company stock and thus increasing shareholder value. By making positive NPV-projects, and by all means working in the interest of shareholders, these investments and actions will be priced into the stock and the share price will increase, thus increasing the reward for the CEO. Even though stock options can seem to be an effective way to align interests, there may be concerns. As Hall and Murphy (2003) points out, the construction of stock options gives the CEO incentives to make too many risky investments. The rationale is that superior performance can lead to superior personal returns, while a bad result will not lead to a loss since the minimum value of the stock option is zero. The lack of a downside makes the alignment of interests between shareholders and CEOs imperfect. Stock options can in fact increase the principal agent problem and provide the CEO with incentives to take advantage of shareholders. In a work by Yermack (1997) it is found that if the CEO has a powerful position in relation to the board, she is likely to be able to construct the terms of her own stock options, and therefore change

her behavior to maximizing return from the stock options instead of working for long term shareholder value. Yermack (1997) finds that CEOs often can choose when the stock options should be issued, and that they manage the performance of the firm accordingly.

The core of this issue is how to align interests of principal and agent, or in our case, owners and CEOs. We have seen that stock options, a widely used instrument in addressing the principal-agent problem can perhaps even make the problem larger. Several studies suggest that the best way to align interests is for CEOs to own shares in the company, as she will then be exposed both to the upside and the potential downside of her decisions (Jensen and Murphy 1990, Hall and Liebman 1998). According to Jensen and Murphy (1990), the objective should be that the CEO should own a large percentage of the company since this is the only way to give direct and powerful incentives to the CEO. No matter how big the holding is in absolute amounts, she will still have incentives to get personal benefits on the cost of shareholders, assuming a low relative ownership. Hall and Liebman (1998) also share this view, and they claim that the best alternative is a 1-1 relation between shareholder and CEO change in wealth. However, they add that this only holds for a risk neutral CEO. In fact, people are seldom completely risk neutral. When a CEO owns a rather large part of the company, that is a high absolute amount, and the CEO is not risk neutral, "CEO risk aversion //…// will cause CEOs to avoid some high risk, positive NPV projects that are optimal from the perspective of a diversified shareholder" (p. 657). So even if the percentage of ownership is relatively small, the absolute amount can still be substantial and the CEO may put more emphasis on her role as a shareholder than the theory of Jensen and Murphy (1990) predicts.

3.3 Hypotheses

We will examine relative ownership as well as ownership in absolute value terms, as we find it interesting to sort out which dimension of ownership is most important in corporate governance. Our vehicle for this will be Swedish large caps. Considering the nature of the debate described above we will now explain our hypotheses.

Based on the current debate regarding alignment of interests, it is natural for us to divide our work into two main hypotheses. The first hypothesis will test the relative ownership and its impact on shareholder return in order to find out if there is a positive correlation in line with the theories of Jensen and Murphy (1990) and several others cited above. The second hypothesis will test the absolute ownership in order to find out if there is a positive correlation in accordance with

Pilotskolan or if there is negative correlation in accordance with Hall and Liebman (1998). We formulate our hypotheses accordingly:

1. Relative ownership hypotheses:
   a. A high CEO relative ownership will *increase* shareholder return.
   b. A high CEO relative ownership will *decrease* shareholder return.
2. Absolute value of ownership hypotheses:
   a. A high CEO absolute value stockholding will *increase* shareholder return.
   b. A high CEO absolute value stockholding will *decrease* shareholder return.

We will evaluate these hypotheses independently and then use the finding from both of our hypotheses in order to draw further conclusions.

4. Methodology and Data Description

This part of the thesis will describe the data collection process; the approach and the different sources used. It will also describe the regression model estimated to test the hypothesized relationship.

4.1 The data gathering

To test the hypotheses we have collected data in a range from end of 2001 to end of 2006. Six data points are necessary as we look at the development year-by-year for five years. In order to investigate the given issue, we have collected data from multiple sources. The cross-section sample consists of 52 companies listed on Stockholm Large Cap.[2] The companies included in the sample are divided into industries in accordance with the OMX definitions. From the full extension of the Large Cap List, some companies fail to fulfill characteristics to allow for reasonable comparability. Such reasons include time of listing and primary place of listing. Also, banks have been excluded. This is common as banks tend to mix financing and operating activities, thus disturbing the relevant comparison of for example leverage. Companies that have not been listed throughout the entire period have also been excluded to ensure that data is balanced in the sense that all included

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[2] View appendix I for comprehensive description on included companies

companies have the same time series length. In total, of the companies presently listed on the Stockholm Large Cap List, 21 companies have been excluded from our sample.[3]

Consolidating, our sample is based on 260 observations, and three different sources have been used in the data gathering process; data are grouped accordingly in the description below.

4.1.1 Firm characteristics

Firm characteristics include size, leverage and dividends. Recall the definition of leverage in section 1.4 as book value of debt divided by book value of equity. These data have been obtained from the Worldscope Database. To ensure the quality of downloaded data, we have tested a sample of these data with own calculations based on data available in the annual report.

4.1.2 Market characteristics

Market data include prices on the benchmark index, OMX Stockholm Benchmark Cap GI, the relevant industry indices used to control for industry specific developments, and data on the specific stock. The market benchmark index is a return index rather than a price index to conform to the return measure we are trying to explain, however, no such indices exist for the industries throughout the investigated time period. As a result, industry returns are proxied by industry price indices. These have been obtained from The OMX Group. Two different sets of prices for every stock have been collected; one adjusted to calculate return and one unadjusted to calculate value of CEO ownership. Differences between the two being that the adjusted is normalized with respect to corporate actions like stock splits, whereas the unadjusted price record is always the price as it was at that time.[4]

4.1.3 CEO characteristics

CEO characteristics include the ownership of shares and stock options of the CEO. These are collected from the respective annual reports of the companies.

4.2 Comments on the regression model process

As we examine whether there is a relationship between shareholder return and CEO ownership, a regression model is an excellent tool. Primarily, a regression model can be used for two things;

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[3] View appendix II for comprehensive description on excluded companies
[4] Consider a company that trades at SEK 100 and splits 1:4. Next day price will be SEK 25 and there will be four times as many shares. Adjusted prices will show SEK 25 pre-split as well as post-split, whereas unadjusted prices will show SEK 100 pre-split and SEK 25 post-split, thus unadjusted prices are necessary to determine the SEK value of the CEO's holding at any given point in time.

estimating a model that is as good as a predictor of the dependent variable as possible, indicated by a high R square value, or to test whether an independent variable has any effect on the dependent variable. Our model is of the latter kind; we want to examine whether CEO ownership has any effect on shareholder return.

OLS is the most common regression model method used; however, sometimes more complex models are needed to encompass the increased complexity of the data as well as to meet the requirements of the level of preciseness in the estimated model. Thus, the model itself can be of a simpler kind and show that a relationship exists, or of a more refined, complex kind, showing in detail to what extent each independent variable affects the dependent variable. In this dimension, our model is of the former kind, thus we estimate the model according to the normal OLS method.

There are features of the OLS assumptions that need to be tested. We check for normality of the error term, heteroskedasticity, multicollinearity and autocorrelation which would violate the assumptions of the OLS method. In short, heteroskedasticity occurs when the variance of the error term is not constant throughout the sample; multicollinearity occurs when two independent variables are linear transforms of each other; and autocorrelation when the error terms are not independent.

Our testing confirms that the error term follows a normal distribution, and we see no signs of heteroskedasticity, however, as we will present in section '5. Main results', we have reason to believe that there is multicollinearity between the return on the market and return on the industry index. According to Gujarati (2003) one rule of thumb to detect multicollinearity is to examine whether there is a correlation between coefficients higher than 0.8. With regards to autocorrelation, we use the Durbin-Watson d-statistics to reveal whether the error terms are correlated. Our testing shows a small level of autocorrelation. The implication is that the likelihood of our model declaring a coefficient statistically insignificant when in fact, in a more refined model, it is significant is somewhat higher.

To conclude, we have recognized that a regular OLS regression model may not be the perfect model, but we also recognize that the model is satisfying in the sense that it will show whether the hypothesized relationship exist.

4.3 Regression model

The model takes the log-linear form to allow coefficients to have an elasticity interpretation. This implies that coefficients will show sensitivity in percent rather than in units. To test the relationship between CEO ownership and shareholder return the following regression equation is estimated

$$LR_{it} = \beta_0 + \beta_1 LSIZE_{it} + \beta_2 LDE_{it} + \beta_3 LRI_{it} + \beta_4 LRM_t + \beta_5 LRV_{it} + \beta_6 LAV_{it} + \beta_7 O_{it} + \varepsilon_{it}$$

The model we estimate is somewhat different from the one used by Lewellen et al (1992), as it does not try to estimate a coefficient for after-tax compensation. Instead we want to include a dummy controlling for stock options, which Lewellen et al (1992) did not. Variables are explained in table 2 below.

Table 2. The regression model variables explained

Variable	Definition	Comment
LR_{it}	$ln\left(\dfrac{Price_{it} + Div_{it}}{Price_{it-1}}\right)$	The natural logarithm of (one plus) the rate of return on company i during year t
$LSIZE_{it}$	$ln(NOSH_{it} \cdot Price_{it})$	The natural logarithm of the size of company i at end of year t measured as market capitalization
LDE_{it}	$ln\left(1 + \dfrac{Debt_{it}}{Equity_{it}}\right)$	The natural logarithm of (one plus) the leverage of company i at end of year t measured as book debt/equity ratio
LRI_{it}	$ln\left(\dfrac{Industry_{it}}{Industry_{it-1}}\right)$	The natural logarithm of (one plus) the rate of return on an industry index b belonging to the same industry as company i during year t
LRM_t	$ln\left(\dfrac{Market_t}{Market_{t-1}}\right)$	The natural logarithm of (one plus) the rate of return on market portfolio measured by OMXS Benchmark Cap GI during year t
LRV_{it}	$ln\left(1 + \dfrac{NOSH\ OWNED_{it}}{NOSH_{it}}\right)$	The natural logarithm of (one plus) the relative ownership of CEO in company i at the beginning of year t
LAV_{it}	$ln(NOSH\ OWNED_{it} \cdot Price_{it})$	The natural logarithm of the absolute SEK value of the CEO ownership in company i in the beginning of year t
O_{it}	$OPTIONS_{it}$	Dummy variable, taking the value of 1 if the CEO of company i holds stock options in the beginning of year t, and 0 in all other cases

In this context we would expect the estimates for β_5 and β_6 to be positive and statistically significant to support our hypotheses 1a and 2a and the reasoning behind the recent debate. To control for other variables likely to explain the return of a certain stock, we introduce LRM and LRI which we expect to show positive signs on an aggregate level. Individual stocks can have a countercyclical

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tendency which would allow the coefficient to be negative, but on aggregate we expect market return as well as industry index return to be positively correlated to stock return. LDE controls for leverage as one might suspect that leverage could affect stock returns, and LSIZE controls for the factor of differences in size. Agrawal et al (1987) found that CEOs that have stock holdings tend to increase leverage, and Fama and French (1992) found that the size and return relation is negative and statistically significant, thus we would expect the estimate for β_2 to be negative. One would also expect the presence of stock options to have an effect on CEO behavior and thus on stock performance. On expectation stock options have a positive effect on returns as options align the interest of the CEO to the interest of the shareholders; however, a stock option provide limited downside which make them a blunt tool for use in corporate governance issues (Jensen and Murphy 1990, Hall and Murphy 2003). On aggregate we expect the estimated coefficient for stock options to be positive.

5. Main results

In this section, we will present a description of the main features of our data sample and the results from our preliminary regression. Based on these findings we will try to develop and refine the model if there is reason to believe that the results are not reliable.

5.1 Descriptive statistics of sample

This section describes the characteristics of the sample. To get a feel for what characteristics the examined companies have had during the examined period data will be described in a consolidated manner as well as divided by years and finally by quartiles[5] in relevant dimensions. These descriptive statistics will also serve as preliminary answers to our hypotheses.

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[5] Sorting by quartile refers to the process of grouping the sample in four equally large groups ranging from the group containing the observations with the highest values in the described dimension in the first quartile, to the group of companies with the lowest values in the last quartile

Table 3. Descriptive statistics of the sample, 260 observations.

Variable	Mean	Median	Std Dev	Skewness	Maximum	Minimum
Return i	0.332	0.292	0.471	1.434	2.728	-0.852
Size	35,494	14,312	60,632	3.394	445,991	756
Leverage	0.471	0.301	0.602	3.478	4.344	0.000
Return mkt	0.166	0.270	0.271	-1.313	0.486	-0.364
Return ind	0.168	0.224	0.283	0.080	1.424	-0.787
RelVal	0.03757	0.00017	0.132	4.838	0.845	0.000
AbsVal	252,582	2,711	1,142,892	6.887	10,819,891	0

Size in SEK millions, AbsVal in SEK thousands

Since skewness is positive for all variables except return on the market we can conclude that the sample overall on all variables is characterized by many observations below the mean and few observations high above the mean. The difference between the mean and median confirm this.

The sample is characterized by very high returns which describes the financial market climate post the IT-boom deflation. In terms of size Ericsson stands out and accounts for four of the five largest observations and in terms of leverage, the industry of Real Estate & Finance stands out with a median of 45 percent and an average observation of 79 percent. This is expected as operating risk is generally low, implying that financial risk explains total risk to a large extent.

The average value of CEO stock holding is much higher than the median indicating that the Swedish CEOs in general hold a modest economic value in its company's stock, with a few exceptions. In fact, only 33 observations represent holdings above the average holding. Excluding Lundbergföretagen, the median shows negligible change to SEK 2,648 thousands, whereas the mean value is more than halved at SEK 105,074 thousands and standard deviation would be less than a third at SEK 338,422 thousands.

Table 4. Descriptive statistics year-by-year

Variable	2002 Mean / Median (Std Dev)	2003 Mean / Median (Std Dev)	2004 Mean / Median (Std Dev)	2005 Mean / Median (Std Dev)	2006 Mean / Median (Std Dev)
Return i	-0.077 / -0.083 (0.366)	0.477 / 0.318 (0.536)	0.280 / 0.254 (0.265)	0.565 / 0.420 (0.510)	0.417 / 0.343 (0.343)
Size	20,763 / 7,183 (31,430)	26,911 / 9,753 (42,220)	33,144 / 11,735 (58,015)	43,410 / 17,716 (71,929)	53,242 / 24,829 (79,425)
Leverage	0.597 / 0.358 (0.757)	0.549 / 0.318 (0.725)	0.492 / 0.273 (0.669)	0.377 / 0.266 (0.379)	0.339 / 0.209 (0.320)
Return mkt	-0.364	0.348	0.200	0.376	0.270
RelVal	0.0345 / 0.0001 (0.1218)	0.0387 / 0.0001 (0.1361)	0.0383 / 0.0002 (0.1359)	0.0400 / 0.0002 (0.1360)	0.0363 / 0.0002 (0.1358)
AbsVal	187,100 / 1,789 (759,258)	182,406 / 1,053 (879,996)	233,034 / 2,182 (1,069,801)	312,077 / 3,681 (1,309,383)	348,292 / 4,709 (1,549,484)
Options	27	24	21	20	17

Size in SEK millions, AbsVal in SEK thousands

Splitting the sample year-by-year we can confirm our findings from the total sample descriptive statistics; in the time dimension returns are characterized by post-IT breakdown and poor business cycle success. As we see, the market return during these years has been high. The high return on the average and median individual stock, being superior to aggregate market return during these years, could be explained by the fact that our statistics do not consider the weights of the different stocks whereas the market index is value weighted.

Consistent with the good times, size and absolute value of the CEO ownership have increased. CEO ownership in relative terms has not changed materially over the time period in the sample. Leverage however, seems to have decreased over time. This might be explained by the companies' general financial health after the shaky market conditions around the millennium; as the market has turned, the indebtness of the companies has changed radically and accumulated profits have improved. The inclination to use options to align the interest of the shareholders and management seems to have decreased over time.

Trying to describe the features of the successful company in our sample in terms of shareholder return, we have sorted data in quartiles with the highest return in Q1 and the lowest in Q4. As can be seen in this table, establishing characteristics that describe the high return company is hard. Size

wise, companies in Q2 and Q3 are larger, suggesting that the extreme performers, be they positive or negative, are smaller than the mean of the sample. In terms of leverage, data show no trends, which might suggest that return is independent of leverage. Considering the focus of this thesis, finding a trend where relative ownership as well as absolute ownership is high in Q1 would support previous findings by Jensen and Murphy (1990) as well as Pilotskolan. We see this trend looking on median values but not on average values, suggesting that the normal observation is in line with previous findings, but that the average is distorted by extreme observations. The use of options is scattered all over the quartiles.

Table 5. Descriptive statistics in return quartiles

Variable	Q1 Mean / Median (Std Dev)	Q2 Mean / Median (Std Dev)	Q3 Mean / Median (Std Dev)	Q4 Mean / Median (Std Dev)
Return i	**0.920 / 0.726** **(0.477)**	**0.369 / 0.356** **(0.052)**	**0.195 / 0.194** **(0.061)**	**-0.155 / -0.073** **(0.223)**
Size	30,502 / 11,284 (54,633)	39,501 / 12,238 (73,735)	37,250 / 20,801 (45,130)	34,723 / 12,129 (63,901)
Leverage	0.513 / 0.263 (0.739)	0.602 / 0.351 (0.777)	0.342 / 0.221 (0.368)	0.427 / 0.338 (0.380)
RelVal	0.0431 / 0.0006 (0.0940)	0.0287 / 0.0002 (0.1204)	0.0665 / 0.0002 (0.2050)	0.0112 / 0.0001 (0.0612)
AbsVal	185,498 / 5,174 (437,041)	244,555 / 3,573 (1,368,991)	504,831 / 2,208 (1,744,007)	75,444 / 1,320 (279,657)
Options	29	23	24	33

Size in SEK millions, AbsVal in SEK thousands

5.1.1 Relative ownership

Sorting the descriptive statistics of the data in quartiles based on the ownership of the CEO suggests a confirmation of the relationship between ownership and returns, where the highest ownership quartile has the highest return looking on median values, with a decreasing trend moving to the lower quartiles. Companies with high CEO ownership also seem to have higher leverage than the average in the sample, in line with findings by Agrawal et al (1987). Obviously, the SEK value of the CEO stock holding is following the order of the relative ownership; high relative ownership also means high SEK value of stockholding, although this is not necessarily the case for all observations. Again, the use of stock options does not seem to follow any pattern with regards to relative ownership.

Table 6. Descriptive statistics in relative value quartiles

Variable	Q1 Mean / Median (Std Dev)	Q2 Mean / Median (Std Dev)	Q3 Mean / Median (Std Dev)	Q4 Mean / Median (Std Dev)
Return i	0.418 / 0.385 (0.429)	0.364 / 0.261 (0.467)	0.223 / 0.260 (0.384)	0.323 / 0.239 (0.572)
Size	9,116 / 5,818 (8,318)	45,354 / 18,459 (85,375)	33,220/ 18,784 (40,739)	54,286 / 21,818 (66,332)
Leverage	0.841 / 0.506 (0.990)	0.431 / 0.412 (0.364)	0.312 / 0.229 (0.256)	0.299 / 0.216 (0.306)
RelVal	**0.1495 / 0.0636** **(0.2319)**	**0.0006 / 0.0005** **(0.0005)**	**0.0001 / 0.0001** **(0.0000)**	**0.0000 / 0.0000** **(0.0000)**
AbsVal	977,735/ 241,178 (2,137,360)	30,141 / 6,031 (71,178)	2,153 / 1,130 (2,812)	298 / 100 (440)
Options	24	24	37	24

Size in SEK millions, AbsVal in SEK thousands

5.1.2 Absolute ownership

In table 7 observations are grouped by the level of absolute value of CEO stock holding from the highest in Q1 to the lowest in Q4. On average data, return shows an ambiguous trend, but reviewing the data more thoroughly we see that on median values the companies of the CEOs that have large values in company shares perform better. Size shows no trend, but leverage follows the trend identified when sorting on relative ownership; where CEO ownership is high, leverage is also high. We also note that the difference between the two extreme quartiles is massive in terms of absolute values. This was suggested already in the description of the overall sample and is confirmed by this table. With regards to the use of options, these seem to be far less common in the companies where the CEO have a significant SEK value holding in the stock already.

Table 7. Descriptive statistics in absolute value quartiles

Variable	Q1 Mean / Median (Std Dev)	Q2 Mean / Median (Std Dev)	Q3 Mean / Median (Std Dev)	Q4 Mean / Median (Std Dev)
Return *i*	0.401 / 0.346 (0.432)	0.307 / 0.313 (0.385)	0.257 / 0.241 (0.346)	0.365 / 0.248 (0.656)
Size	38,013 / 10,597 (86,954)	32,555 / 18,913 (38,190)	39,288 / 18,784 (50,265)	32,119 / 10,754 (54,767)
Leverage	0.744 / 0.467 (0.959)	0.523 / 0.455 (0.452)	0.297 / 0.211 (0.311)	0.320 / 0.233 (0.337)
RelVal	0.1476 / 0.0636 (0.2331)	0.0021 / 0.0004 (0.0050)	0.0005 / 0.0001 (0.0037)	0.0001 / 0.0000 (0.0004)
AbsVal	**1,000,433/ 256,076 (2,128,050)**	**8,561 / 6,006 (6,113)**	**1,212 / 1,030 (656)**	**120 / 88 (127)**
Options	17	32	32	28

Size in SEK millions, AbsVal in SEK thousands

5.1.3 Size

Looking at our data sample sorted on size it seems like smaller companies yield higher returns; Q1 returns are substantially lower than Q4. Return variation is much higher in Q4 than in Q1. This would imply a higher dispersion among the returns of smaller companies and you would expect a more favorable development than the average stock in a bull market, but conversely a more sluggish development in bearish market conditions. In the leverage dimension, the smaller companies tend to have higher leverage. Relative CEO ownership is higher in smaller companies, which is in line with expectations, whereas absolute values of ownership tend to be a bit lower in the smaller companies than in Q2 and Q3 implying that although relative ownership is high, the companies are substantially smaller, and the absolute ownership are less significant amounts in economic terms than in bigger companies.

Table 8. Descriptive statistics of variables in size quartiles

Variable	Q1 Mean / Median (Std Dev)	Q2 Mean / Median (Std Dev)	Q3 Mean / Median (Std Dev)	Q4 Mean / Median (Std Dev)
Return i	0.265 / 0.237 (0.365)	0.337 / 0.261 (0.456)	0.391 / 0.326 (0.488)	0.336 / 0.329 (0.556)
Size	**105,010 / 66,734** **(88,257)**	**23,124 / 21,571** **(6,933)**	**10,157 / 10,197** **(2,015)**	**3,684 / 3,680** **(1,614)**
Leverage	0.296 / 0.286 (0.217)	0.373 / 0.254 (0.314)	0.414 / 0.263 (0.417)	0.800 / 0.467 (0.997)
RelVal	0.0002 / 0.0000 (0.0004)	0.0560 / 0.0002 (0.2043)	0.0402 / 0.0002 (0.1241)	0.0539 / 0.0024 (0.1077)
AbsVal	26,379 / 2,937 (71,835)	575,011 / 2,208 (2,085,035)	242,749 / 1,424 (786,090)	166,188 / 6,507 (387,736)
Options	24	27	27	31

Size in SEK millions, AbsVal in SEK thousands

5.1.4 Leverage

Describing the data sorted on leverage gives the most ambiguous result in terms of return. Return is not very different comparing the high levered companies compared to the low. As discussed previously, size and leverage seem to be negatively correlated; high leverage companies tend to be smaller than low leverage companies. None of the ownership variables seem to follow any trend, suggesting that leverage is not related to CEO ownership.

Table 9. Descriptive statistics of variables in leverage quartiles

Variable	Q1 Mean / Median (Std Dev)	Q2 Mean / Median (Std Dev)	Q3 Mean / Median (Std Dev)	Q4 Mean / Median (Std Dev)
Return i	0.372 / 0.332 (0.536)	0.241 / 0.248 (0.423)	0.268 / 0.252 (0.285)	0.447 / 0.303 (0.567)
Size	17,662 / 10,465 (18,951)	37,863 / 18,810 (48,038)	47,622 / 14,940 (80,724)	38,829 / 15,452 (70,104)
Leverage	**1.182 / 0.814** **(0.840)**	**0.426 / 0.427** **(0.075)**	**0.213 / 0.216** **(0.045)**	**0.062 / 0.067** **(0.044)**
RelVal	0.0227 / 0.0013 (0.0445)	0.0041 / 0.0001 (0.0137)	0.0793 / 0.0001 (0.2257)	0.0441 / 0.0001 (0.1200)
AbsVal	118,268 / 10,700 (249,251)	14,236 / 2,937 (34,511)	685,350 / 1,536 (2,158,890)	192,473 / 955 (540,381)
Options	22	26	31	30

Size in SEK millions, AbsVal in SEK thousands

5.2 Regression model results

The result of our preliminary model is an R square value of 0.431. The interpretation is that the explanatory power of this model is 43.1 percent, i.e. that variations in the dependent variable to 43.1 percent can be explained by the independent variables. Comparing the results of our model to the model used by Lewellen et al (1992), the latter had a higher value of 52.9 percent.

Table 10. Pearson correlations of the log of independent variables

	Size	Leverage	Industry	Market	RelVal	AbsVal	Options
Size	1.000						
Leverage	-0.296	1.000					
Industry	0.196	-0.094	1.000				
Market	0.237	-0.113	0.824	1.000			
RelVal	-0.158	-0.039	-0.013	0.014	1.000		
AbsVal	-0.038	0.195	-0.011	0.087	0.529	1.000	
Options	-0.124	-0.091	-0.070	-0.095	-0.128	-0.092	1.000

When looking at correlations between the independent variables, not surprisingly, the correlation between market return and industry index return shows a high level. The correlation between these variables is 0.82. High correlation is also present between the relative value and absolute value variables. The correlation between these variables is 0.53. Both findings are in accordance with our expectations, and suggest that there might be a case of multicollinearity.

Table 11. Estimated coefficients from OLS regression
Asterisks indicate significance on 1 (*), 5 (**) and 10 (***) percent level.

	Intercept	Size	Leverage	Industry	Market	RelVal	AbsVal	Options
b	0.468*	-0.040*	0.024	0.735*	0.164	0.066	0.002	0.029
t-stat	2.869	-2.592	0.362	6.681	1.469	0.301	0.361	0.786
Sign.	0.004	0.010	0.717	0.000	0.143	0.764	0.718	0.433

As predicted size has a negative effect on stock returns. This is in line with previous findings (Fama and French 1992). Industry also follows the predicted pattern with a positive and statistically significant coefficient. Perhaps surprisingly market return is not statistically significant. However, this could be explained by the correlation between market and industry return, where industry return is dominant as explanatory variable for stock return. For options, the coefficient is positive, but not significant.

5.2.1 Relative ownership

The estimated coefficient on relative ownership is perhaps the most disturbing result in this regression, as it is nowhere near significant on relevant levels, which would imply that stock return is independent of the CEO's relative ownership in the company. The fact that it is positive is in this context not important; the low level of significance suggests that it is zero.

5.2.2 Absolute ownership

The estimated coefficient on absolute value of ownership also shows a positive sign. Although the level of significance is somewhat better than for relative ownership, it is not statistically significant on any reasonable level.

5.3 Concluding comments on results

From looking at the distribution of the variables in quartiles we note a few things. Leverage seems to be higher for the firms with higher absolute value of CEO ownership than for the firms with lower. Relative ownership and absolute value of ownership follow each other; higher absolute value also corresponds to higher relative ownership. Median return is lower in the lowest quartile of absolute value than in the highest suggesting that the higher value of absolute ownership, the better return, which would be in line with previous research. On the other hand, the descriptive statistics also suggest in a similar manner that higher leverage gives superior returns when looking at median values, something that may be more disturbing intuitively, since it would imply that industries characterized by high leverage have returns superior to industries with lower leverage e.g. that the financial services industry would have all other things alike higher return than an industry characterized by lower leverage. Thus descriptive statistics only give preliminary suspicions on what outcome one can expect. We find support for the hypothesized relationship in the descriptive statistics but the regression model show no statistical evidence of such a relationship. The following part will try to sort out why this discrepancy occurs.

6. Secondary results

The results from the descriptive statistics and the model were ambiguous, thus we suspect that something in the sample biases our results. To take these findings forward we plotted the returns against relative ownership and estimated a quadratic fitted line to see whether this is convex or concave. Results are shown in figure 1.

Figure 1 – CEO ownership and return
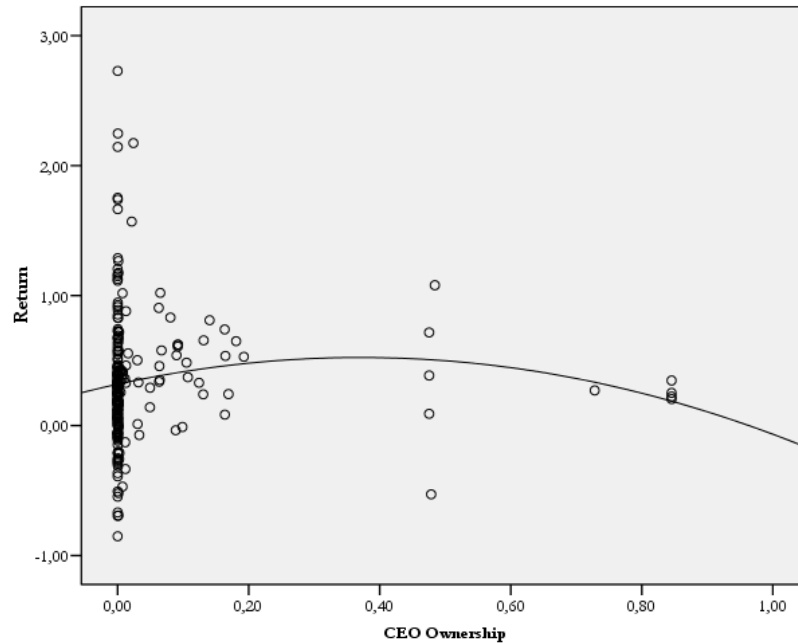
We note that the line is concave implying that the few observations with high ownership actually show worse return than observations with a medium-high level of ownership. Returns are still higher than many observations, but the quadratic trend shows a decreasing return with increasing ownership. We now test this relationship again excluding the abnormally high ownership levels. Results are shown in figure 2.

The trend is the opposite of the one we saw previously implying that, when looking at this sample, a higher level of ownership improves returns. Cut-off level of ownership is in this case 3 percent.

Figure 2 – CEO ownership and return
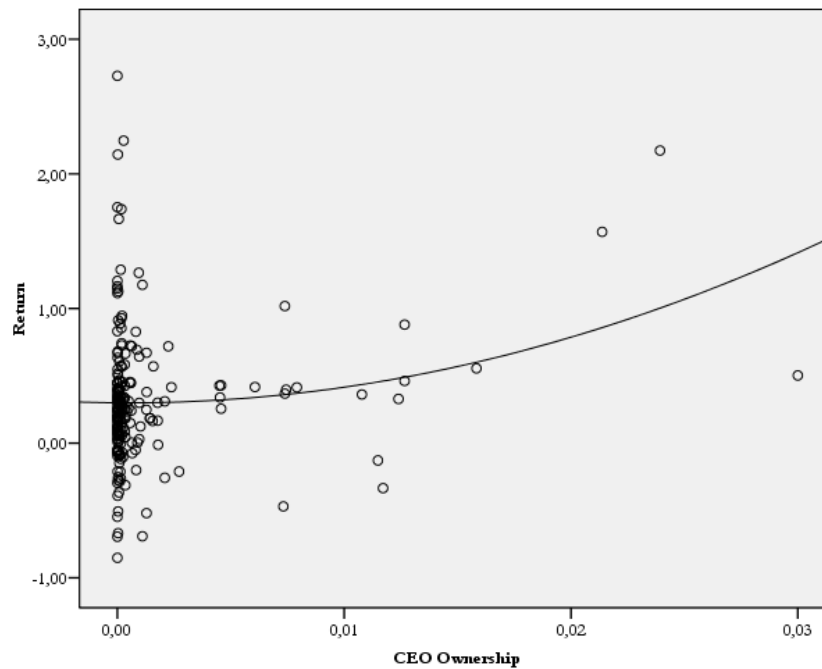
We now re-run the regression model, but limit the sample to observations where relative ownership is less than or equal to 3 percent. Estimated coefficients are shown in table 12 and the R square of this model is 0.485, a slight improvement from the model based on all 260 observations. 40 observations are excluded as they represent ownership levels above the 3 percent cut-off.

Table 12. Estimated coefficients from OLS regression
Asterisks indicate significance on 1 (*), 5 (**) and 10 (***) percent level.

	Intercept	Size	Leverage	Industry	Market	RelVal	AbsVal	Options
b	0.448**	-0.029	-0.115	0.779*	0.162	19.910*	-0.008	-0.015
t-stat	2.485	-1.619	-1.255	6.991	1.425	3.370	-1.120	-0.361
Sign.	0.014	0.107	0.211	0.000	0.156	0.001	0.264	0.719

Now, the coefficient on the level of relative ownership is positive and statistically significant. This would imply that there is a relationship according to expectations, but only for ownership below 3 percent. Size is almost significant at a 10 percent level. Based on these findings, we will try to develop our model to account for the differences between the effects of normal ownership and abnormal ownership. Going forward, we use the cut-off level of 3 percent to differentiate normal from abnormal ownership.

6.1 Regression model additions

To account for the different effects of normal and abnormal relative ownership we introduce three new variables.

Table 13. The regression model variables explained

Variable	Definition	Comment
D_{it}	n/a	Dummy taking the value of 1 if level of ownership is above 3 percent and 0 in all other cases.
$D_{it}LRV_{it}$	n/a	The dummy described above times the natural logarithm of (one plus) relative ownership
$D_{it}LAV_{it}$	n/a	The dummy described above times the natural logarithm of absolute ownership

For increased understanding we would like to elaborate briefly on the meaning of these dummy variables. The first dummy will show whether the *intercept* is different for ownership above 3 percent, the second will show if the *coefficient* on relative ownership is different for ownership above 3 percent and the last will show if the coefficient on absolute ownership is different for ownership above 3 percent. If there is a difference, which there most likely is, the *β* estimates of the intercept and the coefficients will be non-zero. However, they must also be significant to have any explanatory value. The restated estimated regression equation will look as follows

$$LR_{it} = \beta_0 + \beta_1 LSIZE_{it} + \beta_2 LDE_{it} + \beta_3 LRI_{it} + \beta_4 LRM_t + \beta_5 LRV_{it} + \beta_6 LAV_{it} + \beta_7 O_{it} + \beta_8 D_{it} + \beta_9 D_{it} LRV_{it} + \beta_{10} D_{it} LAV_{it} + \varepsilon_{it}$$

6.2 Regression model results

The results of the modified regression model are as follows.

Table 14. Estimated coefficients from OLS regression
Asterisks indicate significance on 1 (*), 5 (**) and 10 (***) percent level.

	Constant	Size	Leverage	Industry	Market	RelVal	AbsVal	Options
b	0.344**	-0.021	-0.020	0.734*	0.148	18.068*	-0.009	0.030
t-stat	2.051	-1.264	-0.291	6.785	1.351	3.144	-1.347	0.818
Sign.	0.041	0.207	0.771	0.000	0.178	0.002	0.179	0.414

	RelVal Dummy		RelVal · Dummy		AbsVal · Dummy	
b	-0.089		-18.393*		0.025	
t-stat	-0.150		-3.192		0.499	
Sign.	0.881		0.002		0.618	

In this model, only industry return and CEO ownership emerges as statistically significant explanations for stock return. The R square of this model is 0.457. Notably, size becomes insignificant. As described before, the number of observations with ownership above 3 percent is 40.

6.2.1 Relative ownership

We see that for relative ownership less than or equal to 3 percent, there is a statistically significant relationship between CEO ownership and return; the *b* is positive and significant at a 1 percent level. Note that for ownership above 3 percent, the slope coefficient *b* is 18.393 *less* than for the group with smaller ownership; the negative sign does not imply that the slope is negative per se, but rather that the curve is kinked at 3 percent ownership. This difference is significant at a 1 percent level. The dummy itself is not significant, implying that the intercept for the two groups is equal. To summarize, we can prove the hypothesized relationship for ownership up to 3 percent but not for ownership levels above the 3 percent cut-off, explaining the ambiguous results from the preliminary model.

6.2.2 Absolute ownership

Again, the dummy separates the results between relative ownership less than or equal to 3 percent, and above 3 percent. Interpreting the results for absolute value of ownership, we see that the slope coefficient is marginally negative at -0.009, but not statistically significant, for ownership less than or equal to 3 percent. The difference in slope coefficients between those owning less than or equal to 3

percent and those owning above 3 percent is 0.025, but not significant either. If both had been statistically significant, we would have been able to say that increased absolute value ownership for CEOs with shareholding less than 3 percent of the company decreases stock returns, whereas this relationship would not hold for ownership above 3 percent. At the present significance we cannot say anything about the relationship between returns and absolute value of ownership.

Adjusting the dummy to instead separate between the 40 observations with the largest absolute value holdings and the rest, at a value of the holding of around 200 MSEK and then re-running the regression confirms previous results and show no significance implying that absolute ownership is irrelevant for stock returns. Doing this adjustment accounts for the fact that the 40 observations we have identified as CEOs with relative holdings above 3 percent, may not be the same as the 40 observations with the highest absolute value of the stock holding.

7. Analysis

In this part we use the findings from our descriptive statistics as well as from our regression model to develop ideas on the causes and effects of the trends we see. We will start by looking at general issues and then moving forward to more closely analyze relative values and absolute values respectively. We will finish our analysis by combining the three parts in one concluding section. Our findings in relation to our hypotheses are summarized in table 15 below.

Table 15. Summary of hypotheses and findings.

Hypothesis	Supported?
1a: A high CEO relative ownership will *increase* shareholder return.	In part
1b: A high CEO relative ownership will *decrease* shareholder return.	No
2a: A high CEO absolute value stockholding will *increase* shareholder return.	No
2b: A high CEO absolute value stockholding will *decrease* shareholder return.	No

7.1 General findings analysis

In this section we will briefly examine the different variables that are not our main variables. From our first regression we find significant relationship between size and return (negative), as well as industry and return (positive). We find no significant relationship between leverage, market and options and shareholder return. That options are not significant is rather interesting since it contradicts the theory of alignment of interests that among others Jensen and Murphy (1990) have discussed. It is, however, somewhat in line with the problems of options as a tool for alignment as

discussed by Hall and Murphy (2003). That size is significant is in line with the findings of Fama and French (1992). That leverage is of no significance is in line with the findings of Lewellen et al (1992).

When performing the second regression we can find no significance for any variable except industry and relative value. This is interesting since it contradicts the findings from the first regression that size is significant. Size does still, however, have a rather high significance in comparison to the other variables.

7.2 Relative ownership

Relative value is one of the two main variables that we wanted to examine with regards to its impact on shareholder return. Our hypotheses with regards to this measure were that a high CEO ownership will either *increase* or *decrease* shareholder return.

As argued earlier in section '3.1 Theoretical Framework', the current academic view in this matter is that there should be a positive correlation between CEO ownership and shareholder return. Before our study we had the expectation to find a positive relationship in accordance with hypothesis 1a.

The results from our first regression were then a bit surprising since we were not able to find a significant positive relationship. In fact, we could not find significance in any direction. From our second regression however, we found a positive and significant relationship for observations with a less than 3 percent relative ownership. The observations above the level of 3 percent relative ownership did not show any significance but the coefficient is significantly smaller than for the sample below 3 percent. Putting this in relation to our hypotheses we find that hypothesis 1a holds for observations below a 3 percent relative ownership and that we have to reject both hypotheses for values above 3 percent.

For the aggregate sample, our findings are interesting since they oppose the theories of Jensen and Murphy (1990), Core et al (1986) and to some extent Hall and Liebman (1998). The theory behind these articles and the conclusions drawn are suggesting that the higher the relative value, the higher should the return be. Our findings cannot verify that position. There may be several reasons for our opposing results. Our sample consists of Swedish companies, as opposed to the previous studies on US data. We have found that the data sample consists of observations where the majority are small relative values and a few show a rather high degree of relative ownership. This may imply that our data sample is biased and that the firms with a high level of CEO relative ownership are not typical

in other respects. We may on the basis of this reasoning wonder if perhaps the theory holds but that our sample makes us unable to draw conclusions for the entire set. This increases the interest for the second regression and the analysis of those results.

When looking at the sample with a less than 3 percent ownership, the relationship is significantly in line with expectations from Jensen and Murphy (1990), Core et al (1986) and Hall and Liebman (1998). The sample above 3 percent however opposes the same authors in the sense that we found no statistically significant coefficient for the observations with relative ownership above 3 percent. The conclusion we can draw is that the relationship expected from previous research and relevant theories hold for relative ownership up to 3 percent. After the 3 percent cut-off, the theories do not hold. This is surprising since for example Jensen and Murphy (1990) and Jensen and Meckling (1976) are indicating that the effect of the ownership starts at a higher level. Even at a 3 percent relative ownership, the CEO, in theory, still has strong incentives to engage in non-shareholder friendly activities since her share of the ownership is of low relative value. What we find is that at low relative ownership levels there is a positive relation to shareholder return. At the higher levels, the same conclusion cannot be drawn. It seems that relative ownership is positively related with return up until a certain point and that the effect then diminishes or disappears in total.

With a sole use of the theories of alignment of interests we cannot explain these results. By analogy, we can take a look at the results found by Morck et al (1998). There are several differences between our study and the Morck et al (1998) study. First of all, they use management ownership where we use CEO ownership. Secondly, they look at market valuation defined by Tobin's Q where we use shareholder return. Where they look at the valuation at a given date, we look at the return the shareholders receive over a period of time. Despite the obvious differences, some conclusions from their study can explain our results where the other authors fail. In their study they have grouped management ownership in three groups of 0-5 percent, 5-25 percent and above 25 percent. They find that market valuation increases for management ownership up to 5 percent. Between 5 and 25 percent valuation decreases and with a valuation above 25 percent the valuation increases again. In order to explain these findings, Morck et al (1998) use the theories of alignment that we have based a large part of this paper on. However they combine this theory with a theory of entrenchment. The entrenchment theory predict that when management owns more, they have more control and can therefore entrench in the positions and derive benefits from the firm. A smaller stake would entail a larger amount of outside monitoring making management having to cope with outside pressure. The

explanation from Morck et al (1998) is that these two effects are both affecting market valuation at different levels of ownership. They even question whether the correlation in the group 0-5 percent really is due to an increase in relative values or if the correlation should not stem from a larger absolute value of the shares. Our study only divides CEO ownership in two groups and we can therefore only see that the same relationship holds below 3 percent and that the effect above 3 percent is insignificant yet somewhat corresponding to their group of 5-25 percent. Due to our smaller data sample, grouping in accordance with Morck et al (1998) would not be useful.

Our findings with regards to the first hypothesis are interesting since we can only partially see that it is correct.

7.3 Absolute ownership

The second of our two main variables is the absolute value measure. Our hypotheses with regards to this measure were that a high CEO absolute value stockholding will either *increase* or *decrease* shareholder return.

According to the popular Swedish debate, absolute ownership should have a positive impact on shareholder return. Looking at the academic debate this measure is of no relevance (Jensen and Murphy 1990) at best and detrimental to performance at worst (Hall and Liebman 1998), in line with hypothesis 2b.

From our first regression, the absolute value variable had no meaningful significance and we can therefore claim that absolute value has no impact on shareholder return. This contradicts Pilotskolan but is in line with Jensen and Murphy (1990).

The second regression did not change the picture of absolute values dramatically. We still have very poor significance. Thus, for observations with a relative ownership of less than 3 percent as well as those with higher relative ownership, the data suggest that the absolute value measure is without relevance.

From our result from the second regression we find no evidence that a CEO with a large absolute ownership should improve shareholder return. We therefore cannot confirm our hypothesis 2a. Results are insignificant, thus we also cannot confirm our hypothesis 2b. Our findings are opposing the proponents of Pilotskolan. If anything, we show that a high absolute ownership is of no importance which is in line with Jensen and Murphy (1990). With poor significance we see that

absolute value under a 3 percent relative ownership may even have a detrimental impact on shareholder return in line with the reasoning of Hall and Liebman (1998). If we suppose that a large relative ownership represents a large part of a CEOs total personal wealth, or that the CEO even has borrowed to buy stock, she will have a risk profile that will be different from the risk profile of a more diversified investor. The CEO will then have incentives not to lose her wealth and will try to sustain the stability of the company in order not to risk the majority of her wealth.

The reasoning is to some extent contradicting Agrawal and Madelker (1987) that are looking at manager ownership and investment decisions. They found that a CEO without stock will try to reduce the variance of the firm in order to minimize the risk of affecting her salary in a negative way. A CEO with stock and option holding will however gain from increased variance. Higher variance may under certain circumstances be positive for CEO wealth; thus a CEO with stock and options will make decisions that promote shareholder value to a greater extent than those who do not.

Our findings with regards to absolute value are interesting simply because they have low significance. We find that the proponents of Pilotskolan may have a valid reasoning in terms of common sense and as a way of signaling. However, based both on previous theory and from the findings of our study, the absolute value measure is of no significance as an explanation for shareholder return. Considering that the significance is poor, our conclusion regarding the relationship between absolute ownership in relation to our hypotheses is that we reject hypotheses 2a and 2b.

7.4 Concluding analysis

What we have found is that absolute value is a non-significant variable in order to explain shareholder return, but that relative value is significant to some extent. From these two findings combined, we can conclude that the proponents of Pilotskolan have a good point in arguing for an increased ownership of the CEO. However, they should look at the measure of relative values as opposed to now, absolute values. This imposes problems of course. For our study, the companies are all listed on the Large Cap List indicating a minimum market capitalization of one billion euro[6]. It is therefore impossible for a CEO with limited personal wealth to show a relative ownership in excess of fractions of a percent. It then becomes natural to look at absolute values since it is

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[6] According to the OMX Group, the size cut-off for listing on the Large Cap list is 1 billion euro.

comparable between firms and CEOs, and the amounts can still be significant. As a tool of alignment of interests however, we find that the relative value measure is better in order to find a correlation with shareholder return.

Our finding that for relative ownership larger than 3 percent, increasing ownership is not a significant explanation for increasing stock returns is interesting since it opposes some common theory. When trying to analyze the difference, one can wonder if the focus on shareholder return diminishes with increasing relative ownership. For a controlling shareholder, also being the CEO it is likely that the corporation is seen more as a family enterprise. In this case the objective with the business might be the long term survival of the corporation rather than a constant focus on maximizing shareholder value. Lewellen et al (1992) also accounts for family ownership and descendants of founders as managers and find that if a descendant is set to run the corporation, the company underperforms in comparison to average. This implies that descendant either has a different agenda than shareholder value or is not the best person for the job. Either way, as a shareholder one should beware.

Contradicting the theory of Jensen and Murphy (1990) we find that the impact of relative ownership decrease above the 3 percent level. By combining the results on absolute values and relative values below 3 percent relative ownership, we find no evidence for the statement made by Morck et al (1988) that positive correlation between value and ownership on the lower levels stem from absolute ownership.

One might find it contradicting that there is a difference in results for relative values and absolute values. An increase in relative values implies an increase in absolute values. How come the difference in significance from the two variables? This could coincide with the negative effect that we see for the size variable; that larger firms have lower shareholder return. Consistently, a stockholding in a large company would typically be negligible in relative terms but may be large in absolute terms, whereas a stockholding in a smaller company would be large in relative terms but lower in absolute terms. This could in part explain the contradictive results.

8. Concluding comments

Each variable has given us some input. First, it was interesting to find a significant relationship between shareholder return and relative ownership up till 3 percent. It was perhaps more startling to

find that no relationship exist above that level. In terms of our absolute variable, we could find no relationship in any of the regressions. This goes against the common debate and it to some degree opposes common sense. What we have learned from our findings is that the alignment of interest through CEO ownership is not an exact science, nor is it a perfect predictor of shareholder return. Even though we can find no relationship between absolute ownership and shareholder return, one might assume that a CEO will not throw her own money down the drain, which also is the justification of Pilotskolan. The general reasoning still holds; we have only showed that there is no relationship in general between absolute ownership and shareholder return. In terms of relative ownership we find that it is significantly positive up until 3 percent and ambiguous thereafter. We have shown that as an investor, CEO ownership is one variable to take into account in your investment decision. However, CEO ownership is only one variable and other important factors include everything from industry and size to general capability of the CEO etc. Our findings can hopefully bring some more insight into the debate regarding CEO ownership and give our reader a more diversified view on the current public and academic debate.

9. Future research

The objective of this thesis has been to examine the impact of CEO ownership on shareholder return of Swedish listed companies. We find that there is a difference between owning up to 3 percent of the company and owning more which raises more questions. In this part we will suggest areas where future research can assume the baton and continue to drive forward.

9.1 Regarding the proved difference

The difference between the two groups of ownership is to our knowledge a unique finding. Morck et al (1998) suggest that there is such a trend in terms of valuation, but looking at returns rather than valuation, this relationship has not been found previously. We therefore find it interesting to study whether this is a result from the institutional environment in Sweden, whether it stems from the time period bias towards extremely good returns, or whether this is just a statistical coincidence present in this sample. Thus, further research could include more companies, especially smaller companies represented by family or entrepreneurship businesses where CEO ownership is generally higher.

9.2 Explaining this difference

Suggesting that our results is in fact not a finding of the sample per se, but a finding relevant for the population, we believe it would be interesting to investigate what characterizes the two different group of owners. This would be research that tries to explain the managerial behavior of different managers in terms of shareholder return, stock price management, and long term value creation. Perhaps those are not the primary objectives of management in family firms or other firms where the manager is the main owner. In the long run, is the most beneficial long term value creation or constant shareholder focus?

9.3 Expanding the study

Our sole focus has been to look at the two dimension of CEO shareholding. Initially, we would suggest that this study could include the actual value of the stock option holding as well, as many scholars have identified that CEO remuneration to a large extent consists of stock options. Also considering that a manager's way to run the company may be an effect of other sources, i.e. taking into account that the stockholding or holding of stock options may not represent the only interest in the company, we would find it reasonable to perform more in-depth research including all forms of CEO remuneration, namely, fixed salary, variable salary, pension benefits, other benefits, all sources of deferred income, as well as stock holdings and the value of stock option holdings. Preferably, a measure relating to the rest of the CEO wealth would also be included. This would expand the understanding of the process of optimizing corporate governance.

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Appendix I – Included companies

The following is a list of included companies

Table I. The companies included in the sample and the industry definitions

Number	Company Name	Industry	Number	Company Name	Industry
1	Assa Abloy	C	27	Meda	F
2	Atlas Copco	C	28	Modern Times Group	D
3	Axfood	E	29	NCC	C
4	Axis Communications	H	30	NIBE Industrier	C
5	Boliden	B	31	OMX Group	G
6	Carnegie	G	32	PEAB	C
7	Castellum	G	33	Q-Med	F
8	Elekta	F	34	Ratos	G
9	Electrolux	D	35	SAAB	C
10	Eniro	D	36	Sandvik	C
11	Ericsson	H	37	SAS	C
12	Fabege	G	38	Svenska Cellulosa Aktiebolaget	B
13	Getinge	F	39	Scania	C
14	Hexagon	C	40	Seco Tools	C
15	Hennes & Mauritz	D	41	Securitas	D
16	Holmen	B	42	Skanska	C
17	Hufvudstaden	G	43	SKF	C
18	Industrivärden	G	44	SSAB	B
19	Investor	G	45	Swedish Match	E
20	JM	G	46	Tele2	I
21	Kinnevik	G	47	TeliaSonera	I
22	Kungsleden	G	48	Trelleborg	C
23	Latour Investment	G	49	Wallenstam	G
24	Ljungberggruppen	G	50	Volvo	C
25	Lundbergföretagen	G	51	Vostok Gas	A
26	Lundin Petroleum	A	52	Öresund	G

Industry Code	Defined
A	Energy
B	Materials
C	Industrials
D	Consumer Discretionary
E	Consumer Staples
F	Healthcare
G	Real Estate & Finance
H	Information Technology
I	Telecommunication

Appendix II – Excluded companies

The following is a list of companies that are excluded from our sample

Table II. The companies excluded from the sample		
Number	Company Name	Reason
1	ABB	●
2	Alfa Laval	○
3	AstraZeneca	●
4	Autoliv	●
5	Hakon Invest	○
6	Husqvarna	○
7	Kaupthing Bank	○
8	Lawson Software	○
9	Lindab	○
10	Lundin Mining	○
11	Melker Schörling	○
12	Millicom	●○
13	Nobel Biocare	●
14	Nobia	○
15	Nordea	♦
16	Oriflame	○
17	SEB	♦
18	StoraEnso	●
19	Svenska Handelsbanken	♦
20	Swedbank	♦
21	TietoEnator	●

● – Stockholm Stock Exchange not primary place of listing

○ – Not listed throughout the entire time period

♦ – Bank

Appendix III – The Lewellen model

The following show the descriptive statistics and the main findings of the model by Lewellen et al (1992). The sample is based on 294 observations on US industrial firms 1964-1969.

Table III. Descriptive statistics of the sample

Variable	Median	Mean	Std Dev	Skewness	Maximum	Minimum
Size	1,347	3,164	5,527	4.003	41,450	196
Leverage	0.267	0.299	0.211	1.055	1.140	0.000
Return m	0.141	0.086	0.134	-0.329	0.286	0.164
Return b	0.134	0.127	0.188	0.192	0.835	-0.234
RelVal	0.002	0.005	0.016	9.970	0.230	0.000
AbsVal	2,358	9,547	24,462	3.983	139,209	48
Compensation	482	606	374	2.644	3,269	185

Size in USD millions, AbsVal in USD thousands

In relation to our sample, it is interesting to see that in this sample leverage is lower, and does not vary across the sample to the extent that our values do; maximum leverage here is 1.140, compared to 4.345 in our sample. In terms of ownership, we note that absolute value ownership is more economically significant on the US data than on Swedish; the median US CEO in the 1960's owned stock worth over USD 2 million. In our sample the median CEO hold stock worth SEK 2 million.

Table IV. Pearson correlations of the log of independent variables

	Size	Leverage	Industry	Market	RelVal	AbsVal	Comp.
Size	1.000						
Leverage	-0.306	1.000					
Industry	0.108	-0.082	1.000				
Market	0.063	-0.083	0.834	1.000			
RelVal	-0.100	0.089	0.033	0.038	1.000		
AbsVal	0.392	0.020	-0.066	-0.042	0.446	1.000	
Compensation	-0.269	-0.070	-0.019	0.011	0.059	0.014	1.000

Pearson correlations reveal the same pattern of suspected multicollinearity as in our regression model. Results below show statistical significance on all variables except leverage.

Table V. Estimated coefficients from OLS regression
Asterisks indicate significance on 5 (**) percent level.

	Constant	Size	Leverage	Industry	Market	RelVal	AbsVal	Comp.
b	-0.582**	0.046**	-0.083	0.714**	0.331**	1.803**	-0.027**	205.137**
t-stat	-2.986	3.703	-1.182	6.706	2.358	2.324	-3.052	5.125